

AN ABSTRACT OF THE THESIS OF

ROBERT BOOTH MARTIN, II for the MASTER OF SCIENCE
(Name) (Degree)

in EDUCATION presented on March 31, 1971
(Major) (Date)

TITLE: HOME MADE EQUIPMENT AS A POSSIBLE SOLUTION TO ATHLETIC BUDGET
PROBLEMS IN CLASS "A" HIGH SCHOOLS OF OREGON

Abstract approved: *Redacted for Privacy*
Charlotte L. Lambert

Much has been written concerning the establishment and improvement of the athletic program in large high schools. However, much of that which is applicable to large high schools is not applicable to the smaller institutions.

The chief purposes of this study were to explore the athletic equipment problems of the small class "A" institutions of Oregon and to suggest various pieces of inexpensive equipment which could be easily constructed.

The procedures used for this work were:

1. a survey of related literature written by experts in the field
2. questionnaires mailed to class "A" Oregon high schools with enrollments of 50 students or more
3. follow-up interviews of selected responding schools.

The resulting information served to support the position that small schools do have budget-related athletic equipment problems. This writer

has provided diagrams and directions for equipment construction and some guidelines which may help to overcome some of the athletic problems found in these schools.

The following recommendations have been drawn from information derived from this study.

1. When lack of money is a problem and savings can be realized, athletic equipment should be home-made rather than purchased.
2. Those funds saved through the construction of equipment should be redirected into other athletic needs, thereby upgrading the total program.
6. The athletic budget should be prepared early and, when possible, its funds pooled with those of other schools to increase the purchasing power of the budget.
3. When feasible the school's industrial arts department should be utilized in equipment construction.
4. Athletic equipment should be of quality material and construction, meeting official specifications and forming the basis of a standardized athletic equipment inventory.
5. A business-like program of equipment control and proper maintenance should be used to insure that athletic equipment and teaching aids have increased usage, preventing early loss, deterioration and replacement.

HOME MADE EQUIPMENT AS A POSSIBLE
SOLUTION TO ATHLETIC BUDGET PROBLEMS
IN CLASS "A" HIGH SCHOOLS OF OREGON

by

ROBERT BOOTH MARTIN

A THESIS

submitted to

OREGON STATE UNIVERSITY

in partial fulfillment of
the requirements for the
degree of

MASTER OF SCIENCE

JUNE 1971

APPROVED:

Redacted for Privacy

Professor of Physical Education
in charge of major

Redacted for Privacy

Dean of School of Education

Redacted for Privacy

Dean of Graduate School

Date thesis is presented March 31, 1971

Thesis typed by Mary Lee Olson for ROBERT BOOTH MARTIN

ACKNOWLEDGEMENT

To Dr. Charlotte Lambert the writer owes a debt of gratitude for her guidance, encouragement, constructive criticism and suggestions in the preparation of this thesis.

The writer wishes to acknowledge also the encouragement of his family. Without their help and sacrifices he could not have reached this point in his education.

Finally the writer wishes to dedicate this work to two men who have served to give this writer help when needed and direction when requested, Coach George "Pop" Poppin and Coach Rowland "Red" Smith.

TABLE OF CONTENTS

| | <u>Page</u> |
|--|-------------|
| I. INTRODUCTION | 1 |
| Statement of the Problem | 2 |
| Purpose of the Study | 2 |
| Sources of Information | 2 |
| Definition of Terms | 2 |
| Limitations of the Study | 3 |
| II. SURVEY OF RELATED LITERATURE | 5 |
| Budgeting | 6 |
| Who Should Purchase Equipment | 7 |
| Buying Early | 8 |
| Buying from Reputable Concerns | 9 |
| To Buy or Not to Buy Locally | 10 |
| Avoiding Inside Discounts and Concessions | 10 |
| Fund Pooling | 11 |
| Purchasing of Official Equipment | 11 |
| Standardization | 12 |
| Buying Quality Equipment | 13 |
| Buying Equipment in Quantity | 15 |
| Records | 15 |
| Purchase Orders | 15 |
| Issuing Equipment | 16 |
| Identification | 17 |
| Equipment Collection | 17 |
| Inventory | 18 |
| Equipment Care | 18 |
| Equipment Storage | 19 |
| The Equipment Room | 19 |
| Equipment Room Management | 20 |
| Equipment Construction | 20 |
| Baseball | 21 |
| Basketball | 21 |
| Football | 22 |
| Track | 22 |
| Summary | 23 |
| III. THE STUDY | 25 |
| Relationship of School Size to Number of Coaches | 25 |
| Budget | 26 |
| Budget and Equipment Adequacy | 27 |
| Quality Purchasing Practices | 30 |
| Quantity Purchasing Practices | 32 |
| Quality and Quantity Purchasing Practices | 32 |

| | |
|---|----|
| Equipment Control | 33 |
| Industrial Arts Departments | 34 |
| Equipment Construction | 34 |
| Teaching Aids | 35 |
| Equipment Storage | 36 |
| Equipment Purchasing | 39 |
| Problems or Needs | 39 |
| Time of Purchasing | 41 |
| Interview Results | 42 |
| Summary | 43 |
| | |
| IV. BUILDING EQUIPMENT FOR THE ATHLETIC PROGRAM | 45 |
| | |
| Baseball | 46 |
| Pitch-Back | 46 |
| Pitching Target | 47 |
| Metal Batting Tee | 48 |
| Basketball | 49 |
| Rectangle Wooden Backboard | 49 |
| Rebound Ring | 50 |
| Basketball Rebounder Ball | 50 |
| Football | 51 |
| Passing Target | 51 |
| Secondary Dummy | 52 |
| Air Hand Shield | 53 |
| Tackling Machine | 53 |
| Two-Man Charging Sled | 54 |
| Seven-Man Charging Sled | 56 |
| Blocking Dummies | 58 |
| Temporary Goal Post | 59 |
| Permanent Goal Post | 59 |
| Yard Line Markers | 60 |
| Field Flags | 60 |
| Down Marker | 61 |
| Lineman's Chain | 61 |
| Track and Field | 62 |
| Hurdles (Lows) | 62 |
| Starting Blocks (Adjustable) | 63 |
| Vaulting Box | 64 |
| Bang-Board | 64 |
| Shot-put and Discus Circle Marker | 65 |
| Discus, Shot-put and Javelin Markers | 65 |
| Baton | 66 |
| Pole Vault Standards | 66 |
| High Jump Standards | 67 |
| Foam Rubber Landing Pit | 68 |
| Equipment Room | 68 |
| Hanging Shoulder Pad Storage Pole | 69 |
| Hanging Helmet Storage Pole | 69 |
| Clothes Pole | 70 |
| Storage Container for Footballs | 71 |

| | |
|-----------------------------------|----|
| Storage Container for Basketballs | 72 |
| Shoe Storage Rack | 72 |
| Wall Bat Rack | 73 |
| Summary | 74 |
| V. SUMMARY AND RECOMMENDATIONS | 75 |
| Recommendations for Further Study | 79 |
| BIBLIOGRAPHY | 80 |
| APPENDIX I | 84 |
| APPENDIX II | 90 |

LIST OF TABLES

| <u>Table</u> | <u>Page</u> |
|--|-------------|
| I. Interscholastic Athletic Programs | 25 |
| II. Relationship of Size of School to Number of Coaches | 26 |
| III. Interscholastic Athletic Budgets | 27 |
| IV. Budget and Equipment Adequacy | 28 |
| V. Equipment Purchasing Practices | 31 |
| VI. Athletic Equipment Control | 33 |
| VII. Availability of Industrial Arts Department for Construction of Home-made Athletic Equipment | 34 |
| VIII. Home-made Equipment Constructions | 35 |
| IX. Class "A" High School Interscholastic Athletic Teaching Aids | 37-38 |
| X. Equipment Storage | 38 |
| XI. Equipment Purchasing | 39 |
| XII. Problems Involving Athletic Equipment | 39 |
| XIII. Chi-Square Table of a Test of Independence Between Budget and Equipment | 40 |
| XIV. Time of Equipment Purchase | 41 |

HOME MADE EQUIPMENT AS A POSSIBLE SOLUTION TO ATHLETIC BUDGET PROBLEMS IN CLASS "A" HIGH SCHOOLS OF OREGON

CHAPTER I

INTRODUCTION

Much has been written concerning the establishment and improvement of the athletic programs in large high schools. In schools of this size the programs are usually able financially to care for themselves, but this is not always the case for the small school. This writer believed that more thought should be given to the special problems present in the small schools, which as a rule do not have large coaching staffs, sizeable athletic budgets, or optimum amounts of athletic equipment. This writer was also of the opinion that the related problems of insufficient athletic funds and equipment found in the small school could be partially cured through the construction of home-made athletic equipment and teaching aids.

Most states have passed laws making physical education compulsory. This means that small as well as large schools are going to have a physical education program of some sort, and quite often an interscholastic athletic program as well. If a school decides to have an athletic program, it should be as effective as possible for the educational value derived from it by the student. To achieve this goal adequate equipment is essential.

Statement of the Problem. This study examined the athletic equipment problems present in class "A" high schools of Oregon and suggested ways in which these problems could partially be solved through the construction of athletic teaching aids and equipment. The term class "A" as employed in this study was that used by the Oregon School Activity Association.

Purpose of the Study. The purposes of this study were:

1. to determine the athletic budget, equipment and storage problems of the class "A" Oregon high schools.
2. to explore those factors which could enable the small high school with limited resources to solve budget-related problems concerning the purchase, care and construction of athletic equipment.
3. to provide a means of constructing some inexpensive interscholastic athletic equipment and teaching aids.
4. to recommend ways and means of overcoming some of the equipment problems in the small high school.

Source of Information. Data was compiled through a survey of related literature in the fields of physical education, interscholastic athletics and athletic administration. Additional information was obtained through questionnaires mailed to all 97 class "A" high schools in Oregon with enrollments of 50 or more students, which preceded telephone interviews of ten randomly selected respondents.

Definition of Terms. Definition of terms applying to the study are listed:

Budget refers to anticipated expenditures and receipts for the fiscal year. It is an administrative device determined by the scope of the athletic program.

Class "A" High Schools are those schools so designated by the Oregon School Activities Association with maximum enrollment of 200 pupils. This classification should not be misconstrued as inferior to other athletic classifications, as school classification is solely for interscholastic athletic competition.

Equipment includes teaching aids and those devices deemed necessary for athletic competition without which athletic training or contests could not take place.

Equipment Storage is the off-season care, protection and retention of teaching aids, specific supplies, uniforms and protective equipment necessary for interscholastic competition.

Home-made Equipment refers to those athletic teaching aids, competitive devices and storage materials which can be made by students, staff, or various departments of the school, which are just as serviceable, insure the same teaching results and are less costly than those which are commercially manufactured.

Industrial Arts is that area of educational organization which deals with the instruction of manual skills and trades as applicable to metals, woods and various machines.

Limitations of the Study. To draw conclusions from a study of this type it is necessary to remain mindful of the following.

1. Written material by experts in this field was difficult to locate since little has been written regarding interscholastic athletic

problems of small high schools.

2. The questionnaire was limited to those class "A" schools with an enrollment of 50-200 students.

3. The geographical locations of class "A" Oregon high schools made it impossible for personal interviews with each respondent to be undertaken.

4. The impracticality of visiting each responding school by the author to gather first-hand information as a follow-up to the questionnaires necessitated the use of telephone interviews of ten randomly selected class "A" schools.

5. It must be recognized that what was true for the responding institutions may not be applicable to all of the class "A" high schools in the State of Oregon.

6. The study was restricted to baseball, basketball, football, track and off-season equipment storage.

7. The study was limited to that athletic equipment which could be used as teaching aids, or in some cases for competition.

8. Seventeen percent (7) of the 42 responding schools did not answer question 4, "size of athletic budget". Therefore the range of budgets as well as the "mean" budget may not be representative of that found in class "A" Oregon high schools.

CHAPTER II

SURVEY OF RELATED LITERATURE

The purpose of the study of related literature was to compile expert opinions regarding various phases of budgeting, procurement, retention, storage, uniforms, protective clothing and equipment construction, as may be applicable to athletic programs of Oregon class 'A' high schools.

Duncan stated that one of the principal difficulties in a small high school athletic program is that of equipment, since it is costly (29, p. 37). However, even with limited resources a well equipped athletic program is still possible through initiative and proper management. According to Voltmer and Esslinger, during the depression many athletic directors cut back as much as forty percent on their respective athletic budgets, yet were still able to carry on an adequate interscholastic athletic program (14, p. 355).

Large sums of money can be either saved or wasted, depending on the skill and technique used by the person or persons charged with equipment purchasing. Peculiarly enough, according to Williams and Hughes, most cases of poor purchasing techniques take place in small schools, which can least afford it (16, p. 185). When consideration is given to the amount of money involved, the meager budgets of many schools, budget sizes and the health and welfare of the participants, error in purchasing take on a new meaning.

Budgeting. The preparation of the athletic budget should be carefully supervised and studied by those who have been delegated the responsibility of approving equipment purchases. In an editorial the Athletic Journal concluded that:

In many instances school men report that their athletic programs are so small that it is not necessary to prepare a budget outlining possible income and expense (19, p. 16).

According to Batterman this is not necessarily the case, no matter what the size of the athletic program may be, because in undertaking any athletic program the expense for the coming year must be analyzed (22, p. 10).

Hixon stated that an athletic budget must be prepared on careful estimates of athletic expenditures and probable income, in the light of monies allocated through the school district (8, p. 82). According to Ahern if no source of money is available to meet the activities cost, the activity should not be undertaken (17, p. 36). It must be remembered that the budget's function is not solely to define what funds are available, but also to outline the extent of purchases for the coming year, as perceived by Batterman (22, p. 10). Therefore, the budget serves as an administrative device which determines the extent of the athletic program and is, as Shepard and Jamerson contended, a statement of educational policy and purpose as expressed in fiscal terms (13, p. 189). The budget also serves as a controlling factor in that it requires careful planning and anticipation of needs along with the facilitation of cost analysis, resulting in the establishment of a valid base for future planning.

Who Should Purchase Equipment. There were divergent views of who should be responsible for the purchasing of equipment in the small high school. For instance Williams and Brownell stated:

Of course the coach should be allowed to recommend the type of equipment to be purchased within the budget, but the average high school coach is not a shrewd buyer. This is out of his field (15, p. 385).

However, Voltmer and Esslinger stated:

The coach knows the specifications, he understands what materials are needed and how they are to be used, and he sees them tried and tested (14, p. 348).

K. Meyer found that in most small high schools the principal is the purchasing agent (11, p. 14). But according to an editorial in Scholastic Coach it is essential that a close working relationship exist between the coach and his superior in matters concerning the acquisition of athletic equipment (42, p. 64).

The solution to the conflicting positions regarding who should purchase athletic equipment can possibly be located in one of the following schemes. The first is the coach and principal working together. According to Vernier and Tebbs the coach should be familiar with the equipment needed and the type which should be purchased, whereas the principal should be familiar with the buying techniques of the institution or district (54, p. 9). Secondly, Shepard and Jamerson suggested that the athletic director, armed with the coach's recommendations, work in conjunction with the principal (13, p. 139). Thirdly, a purchasing agent can be assigned to the duty, as suggested by K. Meyer. He may be the business manager of the school, the treasurer of the athletic or boosters club, the principal, or a

specialist in the field (11, p. 14). Sullivan supported the concept of a specialist handling all of the athletic purchases by stating that:

Actual buying of all supplies and athletic materials must be efficiently and economically effective when delegated to specialist in this field (52, p. 38).

Forsythe proposed that an athletic board be organized to purchase equipment with the funds being allocated by the board's members (3, p. 159). The advantage of an athletic board, as this author saw it, is that it may pave the way for additional types of athletic financial aid, and possibly unite segments of the faculty behind the school's athletic program.

Before purchasing any athletic equipment the need should be carefully considered. This may be accomplished through the keeping of adequate records of all equipment, thus making over-purchasing evident. Vernier and Tebbs stated that the purchasing of equipment means much more than merely buying goods to the extent of the budget (54, p. 9). According to Smith, those responsible for buying must realize that efficient purchasing means quality purchasing at the lowest possible cost (51, p. 50).

In order to accomplish efficient purchasing there are certain procedures recognized as sound business practices. The following modes of buying should operate successfully in most situations which would arise in the small school.

Buying Early. Vernier and Tebbs recommended that athletic equipment be purchased six months before the specific athletic season (56, p. 9). This is especially advantageous if the school is following a program of standardization, as suggested by Howard and Masonbrink (9, p. 315). Batterman stated that athletic equipment must be purchased

early so that the buyer may have an opportunity to select from ample sizes, actual samples and allow the manufacturer enough time to properly make the item (22, p. 10).

Most athletic equipment is made to exacting specifications. Early placement of orders enables the manufacturer to do a better job, usually at lower prices, during the slack time of the year. This is supported by Pease in the following advantages of early purchasing:

1. allows the coach time to get price quotations
2. allows the coach to give attention to those items purchased
3. insures dollar savings
4. insures early delivery dates
5. reduces the probability of mistakes resulting from rushed manufacturing of athletic goods (44, p. 27).

William and Hughes stated that once a preseason delivery date is set, there should be an understanding that the bill will be paid the first month following the month of delivery (16, p. 186).

Buying from Reputable Concerns. The fallacy of excessive economy gained additional support from Smith who stated that the best products are quality pieces of athletic equipment which are manufactured by well known and established companies who market their products through reputable dealerships (51, p. 97). Manufacturers will not sell directly to schools unless a large amount of goods is purchased and there is no local dealership to service the institution. Hixon stated that the buyer must then trust the dealer to give him a price that is consistent with market conditions (8, p. 99). In this case the safest practice is to purchase from reputable concerns who are known dealers of well-manufactured goods and who sell them at a reasonable price, stated Whited (55, p. 31).

Williams and Hughes pointed out that if the dealer is reputable there is

never any questions on repairing or replacing any inferior or defective equipment (16, p. 196). As Voltmer and Esslinger stated, a reliable company will back its product, and this guarantee is well worth paying for (14, p. 35).

To Buy or Not to Buy Locally. Buying locally can be a problem to the purchaser when the local merchants cannot compete with outside firms on either price or service. If the local dealer can offer comparable service, he should be given an opportunity; otherwise the purchaser is obligated to buy from outside firms, as recommended by Howard and Masonbrink (9, p. 313). It is a poor policy to make local enemies, but it is a poorer policy to sacrifice school funds for personal protection, agreed Hixon (8, p. 109).

Avoiding Inside Discounts and Concessions. By purchasing from companies offering "inside discounts", the purchaser is often tempted to buy too much athletic equipment, thus placing the athletic department in debt, warned an editorial in the Athletic Journal (19, p. 16). The less reputable athletic equipment dealers offer discounts as an inducement, and according to Healy, the buyer should be wary of this type of concern (7, p. 137).

The term "concessions" refers to the extension of long-term credit for equipment purchases. However, credit terms can tie up capital and add to the cost of doing business, according to Williams and Hughes (16, p. 187). Serious repercussions can arise if the buyer is planning to pay for them out of gate receipts. According to Shepard and Jamerson, if the income from athletic contests is low and the individual allocating

the athletic funds did not provide for such contingencies, the result is that the bill may go unpaid (13, p. 164).

Any offer of discounts or concessions should immediately arouse the coaches' suspicions. Educational institutions will get a school price considerably lower than the advertised retail price. It is the discount established by the manufacturer and given by the equipment outlet to its school customers. The discount varies depending on the item but usually averages 25 percent below the retail price, according to K. Meyer (11, p. 50). For the small high school the policy of consistent, regular purchasing is preferable, because of the possible outcomes of "inside discounts" and "concessions", as stated by Williams and Hughes (16, p. 187) and George and Lehmann (5, p. 364).

Fund Pooling. If the high school should be too small or have insufficient funds to take advantage of volume buying, there is still an alternative. Hixon proposed that:

small schools take advantage of group purchasing. Standard items and name materials may be purchased at lower prices by joining with some other small schools. By pooling funds small schools can profit by a system of purchasing by bids (8, p. 109).

The above would offer the opportunity to small schools to deal with large reputable firms while also gaining additional purchasing power for their dollars by combining them with other schools in a similar situation.

Purchasing of Official Equipment. Castle stated that practically all sports and games have specific items of equipment that must be manufactured to specifications (26, p. 22). These official specifications

call for definitive weight, length, relative dimensions and specific materials to be included or excluded in the items' construction, according to Shepard and Jamerson (13, p. 127). Vernier and Tebbs stated that:

The use of detailed specifications spell out what is wanted and guards against procurement of items of inferior quality (54, p. 9).

Often the buyer in the small high school will have neither the time nor means of checking goods for "official" specifications. In this case Shepard and Jamerson suggested that:

official equipment be purchased whenever possible, equipment that has been approved by the National Federation of High School Athletic Associations (12, p. 127).

Their reasoning rested on the assumption that the recommending organization worked along with athletic goods manufacturers in attempting to insure satisfactory equipment at a reasonable price.

Standardization. Pease pointed out that standardization helps in consolidation of quantities of materials, simplifies equipment requirements through limiting the number of brands and types of equipment to be used, establishes standards for quality and aids in cost reduction (44, p. 27). Boenheim added that standardization of athletic equipment also insures the establishment of a set pattern, color, type, style and size in the yearly purchasing of athletic goods (25, p. 34).

Fagan contended that standardization also reflects dollar savings, since equipment can be replaced in whole or in part, while maintaining quality, materials, design continuity and known workmanship (30, p. 188). Through standardization only a few uniforms or parts need to be purchased yearly, resulting in far less expense. According to K. Meyer, institutions often find themselves with various types of athletic uniforms for

the same athletic event, none of which are adequate to serve the smallest of teams (11, p. 99). Kaczmarek believed that if this should be the case, the blame for equipment which is not standardized must revert to the coach due to poor purchasing practices or recommendations (38, p. 29).

Buying Quality Equipment. At a National Workshop of Equipment and Supplies for Athletics, Physical Education and Recreation, held at Michigan State University in 1960, the members recommended that the quality of equipment should never be sacrificed for price (12, p. 64). Batterman said that:

Many high school athletic departments are losing the battle of the budget. They are winding up with cheap equipment, poorly equipped teams and unhappy staffs. Coaches do not have to be bargain hunters, just quality hunters (22, p. 10).

There is no such thing as a bargain in equipment, especially when the department is on a tight budget. This was underscored by Castle's statement that:

Excessive economy is most often found in the school needing value for its money. Thus the avid bargain hunter is the one most affected by athletic equipment replacement (26, p. 22).

Boeheim believed that in the small high school the major concern should be serviceability, since the athletic equipment must be used year after year (25, p. 34). According to Baldwin, the more expensive items of quality equipment have been proven to wear better and in the terms of expendable funds, be repaired more advantageously than can equipment of lesser cost (21, p. 12). Baldwin's statement gains additional support from Voltmer and Esslinger who stated that:

The purchasing of cheap equipment for freshman and reserve squads has not proved to be economical. It is far better to pass down quality equipment from the varsity squad in good repair than to provide a cheap grade of equipment that may last a season but give little promise of being suitable for reconditioning (14, p. 350).

It cannot be denied that quality equipment provides for economic and long-term serviceability. In 1924 Griffin had this to say:

The good buyer is the one who insists on quality first and then knows what he should pay for the goods in question (33, p. 13).

Corlis pointed out that when the budget is exceedingly close the coach must think of protection rather than appearance in sports such as football (28, p. 38). Boenheim stated that high cost may not be due to built-in quality (25, p. 34), but, as Kaczmarek contended, due to decorative materials that have nothing to do with serviceability, performance or protective qualities (38, p. 29). If a choice must be made, Bourquardez and Heilman recommended that it is far better for the players to have the best protective equipment, than poor protection covered by "flashy" garments (1, p. 115). Fagan concurred by saying that when buying equipment for protection one should never skimp; safety must be more prominent than cost (30, p. 168).

Pease contended that equipment that is built for competitive usage and fits properly will cut down on player injuries, while adding to player confidence (44, p. 27). Behtendt added that not only is the purchasing of quality equipment a boost to a team's pride and confidence, but it is more economical over the long run than buying inferior equipment just to have a large supply of athletic goods (23, p. 52).

It may therefore be concluded that it was the consensus of opinion of those experts cited that purchasing better grades of athletic equipment

is the least expensive in the long run. The most expensive, however, according to Pease, is not necessarily always the best, but it is reasonable to assume that quality equipment cannot be purchased at low prices (44, p. 27).

Buying Equipment in Quantity. Buying in quantity usually results in a reduction in the price of the item, or the ability to buy more items of the same type. However, this does not usually affect the small high school, unless it places its entire athletic equipment order with the same firm, and as Smith said, these orders are usually too small to bring about additional savings (51, p. 97). For the small school to be constantly hunting for bargains may be a waste of time, with the result being a hodgepodge of athletic equipment, warned Castle (26, p. 22).

Records. Records of all purchases should be kept, recommended Shepard and Jamerson (13, p. 136). Godfrey stated that it is also important to keep records of equipment on hand, noting such things as size, number, catalog numbers, etc. (31, p. 24). Murry pointed out that these records are beneficial when new equipment is planned, because they offer quick, easy comparative reference (41, p. 20).

Purchase Orders. Through an editorial in the Athletic Journal it was stated that the usage of a purchase order or requisition tends to support the business-like manner in which equipment management must be conducted (19, p. 16). Pease pointed out that the usage of purchase orders replaces the necessity of issuing verbal orders for equipment, which often lead to misunderstandings regarding the size, type, cost, delivery date, or a host of other things that cause unnecessary delays in the delivery of athletic goods (44, p. 27).

Issuing Equipment. An efficient method for issuance of equipment is an essential factor in athletic equipment management, so that equipment may be preserved and, as Murry stated, expenses kept to a minimum (41, p. 20). According to George and Lehmann, the main concern should be that each piece of equipment issued is accounted for, with each player made to feel responsible for his own gear (5, p. 185). There are numerous methods of issuing and controlling equipment. The following take little time to prepare, while also serving as a satisfactory checklist for the athletic department.

The first possibility is a permanent athletic equipment card for each athlete, listing those items issued to him and bearing his signature, as suggested by Forsythe (3, p. 220). The signature may be considered unnecessary, but its presence has the psychological effect of a contractual agreement between the student-athlete and the school's athletic department. A second, which would also bear the student's signature, was recommended by Hixon, but would vary from the above in that each piece of athletic equipment would be listed by its inventory number, size, condition at issuance and return (8, p. 99).

Shepard and Jamerson's method differed from the preceding by calling for the usage of multi-colored cards denoting each athletic activity, enabling ease of filing, quick reference and location (13, p. 134). A fourth method was recommended by Godfrey. This system serves as a continual equipment control program, with an individual card for each specific type of equipment, listing the item's number, size, date of first issuance, date of surveying and to whom issued (31, p. 24). Healy stated that equipment issuance control places in motion the basic policy

of student involvement and responsibility, while providing the athletic department with a readily accessible and accurate accounting of the school's athletic goods (7, p. 181).

Identification. Smith insisted that all equipment should be marked with the initials of the school and an inventory number (51, p. 97). A Scholastic Coach editorial proposed that this is easily accomplished with waterproof ink (40, p. 54), and Godfrey recommended that it be done as items are being unpacked following delivery (31, p. 24). Once unmarked equipment is issued there is no way of accurately accounting for it, thus adding to the problem of equipment material control.

Equipment Collection. Murry reported that the coach often finds himself at the season's conclusion with a host of missing equipment (41, p. 20). Griffin suggested that the manager check in all equipment at the conclusion of the season (6, p. 9). However, according to Healy, it is better for the coach and student manager to clear all of the athletes' lockers, because so much equipment is lost during this period (7, p. 182). Behrendt concurred, stating that it is the coach's responsibility to see that the uniforms and equipment are properly collected and cared for at the season's conclusion (23, p. 39). Conversely, Godfrey thought that the athlete should deposit his equipment at collection stations in the same order that it would be removed after use. At each station a coach or manager would collect the articles, check them against the student's issuance card and deposit them for reconditioning, cleaning or to be surveyed (31, p. 24).

Inventory. According to Vernier and Tebbs an inventory of all equipment should be made as soon as the turn-in process has been completed (54, p. 11). Inventorying of goods has both safety and financial implications, pointed out Batterman (22, p. 10).

Shepard and Jamerson listed the classifications of athletic equipment condition as good, usable after repair, or not worth repairing (13, p. 135). According to Forsythe an inventory should show five things:

1. how much equipment is on hand for the sport in question for the coming season
2. what equipment has to be repaired or replaced
3. how much equipment will have to be purchased
4. if the managers have been responsible
5. if athletic equipment has been lost or stolen (3, p. 219).

Baldwin suggested that upon completion of the inventory, dirty clothing be sent to the laundry, with damaged goods going out for repairs (21, p. 10). Also if equipment standardization is being followed, older uniforms can be put in good repair at this time by parts from other uniforms that are no longer serviceable, as suggested by Whited (55, p. 31).

Equipment Care. George and Lehmann stated that the athletic administrator who neglects to clean, repair and store his athletic equipment is not operating his department in the most economical manner (5, p. 184). K. Meyer pointed out that school funds can be saved if proper attention is given to the maintenance of athletic goods, thus allowing for a redistribution of athletic budget funds throughout all of the athletic program (11, p. 104). Coaches have been criticized, and in most cases rightly so, for their carelessness in maintaining athletic equipment, said Kaczmarek (38, p. 29). Hatfield stated that World War II made it

imperative that athletic directors properly care for athletic equipment in order to have an athletic program, in the face of non-availability of athletic equipment and uniforms (35, p. 36).

Equipment Storage. Godfrey stated that once the athletic equipment has been returned from reconditioning or cleaning, the next step is proper storage (31, p. 24). Johnson constructed a combination storage and drying rack which will hold twelve complete football uniforms, allowing for constant circulation of air around the equipment, immediate inspection and ease of storage (37, p. 46). Smarks overcame the problem of helmet storage by placing helmet racks on wheels for ease of location in cramped storage rooms, proper storage during the off-season and ease of issuance at the beginning of the football season (50, p. 27). The advantage of using mobile storage racks or bins was also pointed out in an article by Irwin (36, p. 10). Zirbes recommended that equipment can be stored on racks attached to walls during the off-season (57, p. 58).

The Equipment Room. Howard and Masonbrink stated that the first job of the person in charge of equipment is to find whatever room is available for storage (9, p. 295). K. Meyer said that in many schools some type of room suitable for athletic equipment storage exists but is often used for something of lesser value (11, p. 113). Voltmer and Esslinger said that a well-thought-out, organized equipment room is an essential for the proper care of athletic equipment (14, p. 362).

Some qualities of an adequate equipment room are ample space, good lighting and ventilation, stated Hixon (8, p. 104). Shepard and Masonbrink concurred since care must be taken to guard against dampness

or excessive dryness in order to insure the longevity of athletic equipment (13, p. 133). There is no question in Godfrey's mind that improvement can be made with a little initiative and time on the part of the coach (31, p. 24). Voltmer and Esslinger concurred, stating that great improvements can be made in any room used for the storage of athletic equipment through inventiveness on the part of the person delegated the responsibility of caring for athletic equipment storage (14, p. 363). Boenheim pointed out that it would not be hard to convince the principal of the false economy of purchasing good equipment and not having a proper place to store it (25, p. 34).

Equipment Room Management. The coach of any small high school athletic team is usually not in a position to perform the task of caring for equipment room needs, as he is usually on the court or field when equipment is needed. Griffin recommended the appointment of a student manager to run the equipment room (6, p. 9). Corlis agreed when he wrote that this would assure the coach of a responsible helper who, after training, would know what to do and how to do it (27, p. 38). K. Meyer pointed out that the coach should remind the student-manager of the importance of his contribution to the athletic program, even though it may not be conspicuous (11, p. 52).

Equipment Construction. In recent years little has been written in professional journals and books on the types of athletic equipment which can be home-made. Carter (2) compiled the largest amount of information pertaining to the construction of athletic equipment. His work contained the following items applicable to baseball, basketball, football and

track and field, which were the sports with which this writer was concerned.

| | |
|----------------------|----------------------|
| Backstops | Boxes for track |
| Bags | Broad jump |
| baseball | Buzzer |
| basketball | Charging sleds |
| football | Course markers |
| rosin | Cross-bar |
| uniform | Discus circle |
| Ball dispenser box | Discus equipment |
| Base fasteners | Markers |
| Bat rack | Down markers |
| Batons | Dummy machine |
| Batting cage | Equipment box |
| Batting tee | Equipment cart |
| Bell-bottom dummy | Equipment rack |
| Blocking dummy | Field markers |
| Blocks | finish line post |
| Boundary markers | Football equipment |
| Goal flags | Pads |
| Goal post | Pitcher's place |
| Goals | Pitching target |
| Heavy striking bag | Pits |
| Helmet rack | Pole vault equipment |
| High jump equipment | Rebound ring |
| Hurdles | Starting blocks |
| Indicators for track | Targets |
| and field | |

Baseball. Baseball, being a game which requires individual skill as well as teamwork, places many intrinsic problems on the coach mainly because he must carry on so many different activities simultaneously. Slee and Pote believed that home-made teaching aids are a great asset, because they enable the coach to devote his time to numerous skill development tasks, while allowing the student athlete to practice and learn on his own (49, p. 34).

Basketball. Harris developed an easily constructed machine that aids in the development of rebounding techniques by forcing the jumper to grasp the ball firmly (34, p. 24). Palmer created a "Vertical Jump

Board" which determines the jumping ability and rebounding potential of the athlete (43, p. 53).

Both Shragg and Stites (48, p. 51) and Welford (56, p. 36) constructed inexpensive portable foul indicators. Both indicators show when the required number of fouls exists for a one-and-one situation. The operation of each is quick and effective, with transportation and storage problems being nil, as both are self-contained.

Chiappy pointed out the expense incurred through the replacement of basketballs, especially when they are used for both practice and games. He believed that the longevity of basketballs is directly related to the condition and cleanliness of the court and supplies information regarding the maintenance of both (27, p. 89).

Football. Many football coaches realize that an outstanding teaching aid is one which uses resistive exercise to combine conditioning and teaching. Perrin developed such a teaching aid that is inexpensive and easy to construct (45, p. 70).

Track. Babjak stated that track and field devices can be inexpensively made (20, p. 85). All-weather runways can be added to the field, as suggested by Bergman, through using the black top parking lots or playgrounds as take off areas (24, p. 86). The problem of finding enough time to work vaulters in bad weather can be overcome through the construction of an indoor vaulting box, which Greer found to be easy and inexpensive to make (32, p. 44). Foam rubber landing pits are unusually expensive but have the added advantage of not being dirty, not packing when wet as does sawdust and equal distribution of landing

force over a wide area, reducing the problem of injuries and insuring the peace of mind of the athlete. Kilmer showed how easily foam rubber pits can be made with unused filling for seats, beds, etc. (39, p. 42). Ross demonstrated how inexpensive and durable high jump standards can be made out of scrap iron and cultivator disc in a few hours with the use of a welding torch and hacksaw (46, p. 62).

Summary. Experts agree that the following are necessities of an interscholastic athletic program and that they are applicable to small high schools, such as those listed as class "A" by the Oregon Schools Activities Association.

1. The athletic budget is not just the amount of money available for interscholastic athletics but is also a statement of school policy which should be created through careful planning.

2. Schools can realize additional purchasing power from athletic budgets through sound business practices.

3. The organization of those responsible for the purchasing of athletic equipment may be different in each school. Therefore, the method selected should be that which is most applicable to the specific needs of each individual school.

4. Quality athletic equipment made to official specification should be purchased well in advance of the season for which it is needed, and it should be purchased from reputable concerns in a sound, honest, business-like manner.

5. The key to equipment retention and savings in the budget is sound equipment management, implemented through the keeping of records, inventory, equipment identification and the acceptance of equipment care responsibility by the student-athlete.

6. The longevity of athletic uniforms, protective clothing, supplies and teaching aids can be increased through the proper methods of storage and adequate equipment rooms.

7. The construction of athletic equipment and teaching aids can save untold dollars, thus increasing the purchasing power of athletic budget funds.

8. Sound management and initiative on the part of all those associated with individual high school athletic programs can make up for budget and equipment inadequacies.

Chapter III deals with the three major problems of class "A" Oregon high schools: budget size, athletic equipment and equipment storage, as stated by coaches, athletic directors or principals of those schools responding to the study carried out by this writer. Much of the information compiled through the survey of related literature is applicable to the needs of these responding schools which made up the following study.

CHAPTER III

THE STUDY

A questionnaire regarding interscholastic athletic programs was sent to athletic directors of 97 class "A" high schools in the State of Oregon. Forty-two (44 percent) responded, enabling this writer to acquire information concerning various phases of the interscholastic athletic programs in these schools, including home-made equipment.

Table I. Interscholastic Athletic Programs

| Response N=42 | Number of Schools Reporting |
|--------------------------------|--------------------------------|
| Participate in Baseball | 30 |
| Participate in Basketball | 42 |
| Participate in Cross Country | 10 |
| Participate in Football | 39 |
| Participate in Track and Field | 39 |
| Participate in Wrestling | 16 |
| Other | 8 |

One hundred percent of the schools returning the questionnaire indicated that an interscholastic athletic program was in operation. The only one in which all participated was basketball. The next most popular were football and track and field.

Relationship of School Size to Number of Coaches

Forty percent (17) of the 42 respondents indicated their student population to be between 50 and 99. These 17 schools accounted for 30 percent (43) of the 143 coaches employed by those schools answering the questionnaire. Note that one of these schools of less than 100

Table II. Relationship of Size of School to Number of Coaches

| Number of Coaches | School Enrollment (N=42) | | | Total Coaches |
|-------------------|--------------------------|--------------------------|--------------------------|---------------|
| | 50 - 99 | 100 - 149 | 150 - 200 | |
| 1 | 2 = 2 | | | 2 |
| 2 | 8 = 16 | 1 = 2 | 1 = 2 | 20 |
| 3 | 4 = 12 | 5 = 15 | 1 = 3 | 30 |
| 4 | 2 = 8 | 4 = 16 | 3 = 12 | 36 |
| 5 | 1 = 5 | 2 = 10 | 8 = 40 | 55 |
| Totals | 17 Schools 43 coaches | 12 Schools 43 coaches | 13 Schools 57 coaches | 143 |

students has five coaches. Twenty-nine percent (12) indicated a student enrollment between 100 and 149, accounting for another 30 percent (43) of the coaches, with 40 percent (57) involved in coaching at 13 schools with enrollments between 150 and 200.

The average number of coaches in Oregon's class "A" high schools was 3.4. For those schools with enrollments between 50 and 99, the average relationship was one coach for every 30 students. For schools enrolling 100 to 149, it was one coach for every 35 students. For those with 150-200 students it was one coach for every 40 students.

Budget

Thirty-five of the 42 schools reported on the size of their athletic budget. Budgets ranged from a low of \$0.00 in one school to \$8,000.00, also in one school. The mean budget was \$2,799.73, including that school stating zero budget. The median budget was \$2,443.50. It can be noted (Table III and IV) that 55 percent (23) of the 42 schools had less than the mean budget. The lower fourth of the budgets

Table III. Interscholastic Athletic Budgets

| Budget | Number of Schools N = 42 | Percent |
|-------------------|-----------------------------|---------|
| \$ 0 - 999.00 | 1 | 2 |
| 1000.00 - 1999.00 | 13 | 31 |
| 2000.00 - 2999.00 | 9 | 21 |
| 3000.00 - 3999.00 | 3 | 7 |
| 4000.00 - 4999.00 | 4 | 10 |
| 5000.00 - 5999.00 | 2 | 5 |
| 6000.00 - 6999.00 | 2 | 5 |
| 7000.00 - 7999.00 | 0 | |
| 8000.00 - 8999.00 | 1 | 2 |
| No response | 7 | 17 |
| Total | 42 | |

equalled \$1,595.50 or less, while the upper quartile had at least \$4,062.50. Seventeen percent (7) of respondents failed to report the size of their budgets.

Budget and Equipment Adequacy

Of the 35 schools included in Table IV, 43 percent (15) stated that their athletic budgets and equipment were adequate. Twenty-six percent (9) believed their budgets and equipment to be inadequate, while five of the schools (14 percent) stated that although their budgets were adequate, their athletic equipment was not. Six schools (17 percent) contended that even though their equipment was adequate, their budgets were not.

Forty percent (14) of the 35 schools claimed equipment inadequacy while, 60 percent (21) stated theirs to be adequate. Fifty-seven percent (20) believed their budgets to be adequate while, 15 (43 percent) said that they were not. It is interesting to note that

Table IV. Budget and Equipment Adequacy

| Budget | Adequate Budget N=35 | Pool Funds N=35 | Adequate Equipment N=35 |
|--------------|-------------------------|--------------------|-------------------------------|
| \$ 0 | yes | no | yes |
| 1000.00 | no | no | yes |
| 1000.00 | yes | no | yes |
| 1000.00 | no | no | yes |
| 1000.00 | yes | no | no |
| 1200.00 | no | no | yes |
| 1400.00 | no | yes | yes |
| 1500.00 | no | yes | no |
| 1500.00 | no | no | no |
| 1500.00 | yes | no | yes |
| 1500.00 | no | no | no |
| 1600.00 | yes | no | yes |
| 1800.00 | no | yes | no |
| 1800.00 | yes | no | no |
| 2000.00 | yes | no | yes |
| 2000.00 | no | no | yes |
| 2000.00 | yes | no | no |
| 2000.00 | yes | no | yes |
| 2000.00 | yes | no | yes |
| 2000.00 | yes | no | yes |
| 2500.00 | yes | no | yes |
| 2500.00 | no | no | no |
| 2500.00 | no | no | no |
| 2500.00 | yes | no | yes |
| 3236.00 | yes | no | yes |
| 3500.00 | no | no | no |
| 3500.00 | yes | no | yes |
| 4000.00 | no | no | no |
| 4000.00 | yes | no | yes |
| 4200.00 | yes | no | yes |
| 4200.00 | no | no | yes |
| 5000.00 | yes | yes | no |
| 5000.00 | no | no | no |
| 6000.00 | yes | no | yes |
| 6755.00 | yes | no | no |
| 8000.00 | yes | no | yes |
| No response* | | | |

* Since 7 class "A" schools did not respond to the amount of their respective budgets, they were deleted from the above table.

of the schools reporting either equipment or budget inadequacies, only seven percent (4) pooled their funds (refer to p. 11). Seventeen (85 percent) of those with inadequacies of either budget or equipment did not pool funds.

Of those 23 schools below the mean budget of \$2,799.73 (refer to p. 26), 39 percent (9) claimed that their budgets and equipment were adequate. Twenty-six percent (6) of those 23 schools stated the opposite was true. Thirteen percent of those 23 schools stated inadequate equipment in the light of adequate budgets, while 22 percent (5) contended that they had adequate equipment, even though their budgets were not (Table IV).

Forty-seven percent (11) of the below mean schools believed their budgets to be inadequate, but only 39 percent (9) of the 23 stated the same to be true of equipment. Likewise, of those schools (12) with above the mean budgets, 33 percent (4) said that their budgets were inadequate, while 42 percent (5) said the same was true for equipment.

Through the preceding examination of Table IV the following inferences can be drawn:

1. that 40 percent of the class "A" schools appear to have inadequate athletic equipment.
2. that budget inadequacy exists in 43 percent of the class "A" schools.
3. that budget related equipment problems do exist in the class "A" high schools of Oregon.
4. that in light of the budget sizes, pooling of funds could possibly increase purchasing power.

Quality Purchasing Practices

Regardless of the budget, purchasing practices 1 and 2 (Table V) show that 67 percent (28) of the responding schools (42) purchased quality, name-brand equipment. Of these schools (28) 50 percent (14) fell below the mean (Tables III and IV). This 50 percent accounted for 61 percent of the below mean schools (23). Seventy-five percent (9) of the 12 above mean schools also followed this purchasing practice, as did 71 percent (5) of those schools (7) not specifying a budget.

Purchasing practices 3 and 4 show that nine and one-half percent (4) of the 42 responding schools purchased off-brand athletic equipment they considered to be of quality. Three (13 percent) had below mean budgets, with the remaining school (eight percent) from above the mean (12) (refer to p. 13).

Sixty-six percent (21) of the schools attempting to buy quality equipment by using purchasing practices 1, 2, 3 and 4 had standardized athletic equipment. It was found in ten (43 percent) of the 23 below mean budget schools. Standardization was also practiced by eight (67 percent) of the 12 schools with above mean budgets and by three of the seven schools not reporting budgets. A total of 29 schools were using standardized equipment.

Thirty-four percent (11) of the 32 schools attempting to buy quality equipment by using purchasing procedures 1, 2, 3, and 4 had unstandardized equipment. Of these 11 schools 64 percent (7) were below the mean, two (18 percent) had above mean budgets, as did two (18 percent) of the seven schools not responding to budget size. A total of 13 schools were using unstandardized equipment (Table V).

Table V. Equipment Purchasing Practices

| Purchasing Practices | Total* | Percentage of Total Resp. Schools | Number of Above Mean | | Schools Below Mean | |
|---|----------|---|----------------------------|----------|--------------------------|----------|
| | N=42 | N=42 | N=12 | % | N=23 | % |
| 1. Standardized equip- ment of quality, name brands | 19 | 45 | 7 | 58 | 9 | 39 |
| 2. Unstandardized quality equipment, name brands | 9 | 21 | 2 | 17 | 5 | 22 |
| 3. Standardized quality equipment, off-brands | 2 | 5 | 1 | 8 | 1 | 4 |
| 4. Unstandardized quality equipment, off-brands | 2 | 5 | | | 2 | 9 |
| 5. Standardized quantity equipment, name brands | 2 | 5 | | | 1 | 4 |
| 6. Standardized quantity equipment, off-brands | 1 | 2 | 1 | 8 | | |
| 7. Standardized equip- ment of quality and quantity, name brands | 3 | 7 | | | 2 | 9 |
| 8. Standardized equip- ment of quantity and quality, off-brands | 2 | 5 | | | 2 | 9 |
| 9. Unstandardized equip- ment of quantity and quality, off-brands | <u>2</u> | <u>5</u> | <u>1</u> | <u>8</u> | <u>1</u> | <u>4</u> |
| Totals | 42 | 100 | 12 | 99.0 | 23 | 100 |

* Total includes seven schools not responding to amount of budget (Table IV), hence the difference between total (42) and number of above and below mean schools (35).

Quantity Purchasing Practices

Purchasing practices 5 and 6 show that three (seven percent) of the 42 responding class "A" schools purchased as much equipment as possible with their allotted budgets (refer to p. 15). One of these three schools had a budget which was below the mean, one was above, while the third did not state its athletic budget. Each of the three schools reported having standardized equipment, with two purchasing name-brands in quantity lots. Of these two, one was below the mean with the other not responding to budget. The remaining class "A" school purchased off-brands but claimed standardized equipment.

Quality and Quantity Purchasing Practices

Seven (17 percent) of the responding 42 schools follow purchasing practices 7, 8, or 9. Seventy-one percent (5) followed equipment standardization even though their purchases were based on quantity and quality. Four of these five schools accounted for 17 percent of the below mean group, with the remaining school not responding to budget size. The final two schools (29 percent) differed from the others through equipment unstandardization. One school had a budget above the average, while the other was below the mean.

Thirty-two (76 percent) of all responding schools (42) purchased quality athletic equipment (Table V). With the addition of the seven (16 percent) schools purchased both quality and quantity, the total percentage of the 42 respondents purchasing quality equipment, in part or completely, rose to 93 percent (39) of the 42 schools. Of these 39 schools, 79 percent (31) purchased name-brand athletic goods

(refer to p. 9), with 64 percent (27) having a program of equipment standardization in practice.

Conversely, 23 percent (10) of the respondents (42) used either quantity, or a combination of quantity and quality, as shown by purchasing practices 5 through 9 (Table V). Eighty percent (8) of the ten schools purchased off-brands of athletic equipment in quantity. Five (62 and one-half percent) of these schools were below the mean budget (23).

Only 13 (31 percent) of the respondents reported having unstandardized equipment. Of these schools, 54 percent (7) were below the mean, comprising 30 percent of that category.

Equipment Control

Table VI. Athletic Equipment Control

| Control Factor N=42 | Yes | % | No | % |
|--|-----|----|----|----|
| Does school have inventory system? | 36 | 86 | 6 | 14 |
| Is athletic equipment marked for identification? | 28 | 67 | 14 | 33 |
| Are records kept of equipment and purchases? | 41 | 98 | 1 | 2 |

Ninety-eight percent (41) kept records of athletic equipment (refer to p. 15), while 86 percent had some system of inventory control (refer to p. 18) (Table VI). However, 14 (33 percent) of the responding 42 schools did not mark their equipment for identification (refer to p. 19).

Eighty-six percent (12) of those schools which did not mark equipment had a system of inventory, even though their athletic equipment was not identified.

Industrial Arts Department

Table VII. Availability of Industrial Arts Departments for Construction of Home-made Athletic Equipment

| Question | Yes | % | No | % | Number of Schools Responding N=42 |
|---|-----|----|----|----|--------------------------------------|
| Is Industrial Arts Department available? | 31 | 74 | 11 | 26 | 42 |
| Is Industrial Arts Department able to construct home-made equipment? | 24 | 77 | 7 | 23 | 31 |
| Is Industrial Arts Department willing to assist in construction of home-made equipment? | 22 | 92 | 2 | 8 | 24 |

From Table VII it is evident that 74 percent (31) of the 42 responding schools had industrial arts departments. Seventy-seven percent (24) of those had the capability to build athletic teaching aids and equipment. Of these 24 schools, 93 percent (22) reported a willingness to aid in equipment constructions.

Equipment Construction

Table VIII indicates that coaches were involved 79 percent (24) of the time in the construction of home-made equipment. In ten schools (33 percent) the industrial arts department assisted in building athletic equipment. Athletes and/or others were involved 36 percent (11) of the

Table VIII.: Home-made Equipment Construction

| Response | Number N=30 | Percent |
|--|----------------|---------|
| Coaches | 10 | 33 |
| Coaches and Athletes | 6 | 20 |
| Coaches and Industrial Arts Department | 5 | 17 |
| Industrial Arts Department | 4 | 14 |
| Other | 2 | 7 |
| Coaches and Other | 1 | 3 |
| Coaches, Other and Athletes | 1 | 3 |
| Coaches, Other, Athletes and Industrial Arts Department | 1 | 3 |
| Totals | 30 | 99 |

time. It is worth noting that 92 percent (22) of the amply equipped industrial arts departments were willing to aid in the construction of athletic equipment (Table VII), but according to Table VIII these departments had been utilized only one-third (10) of the time in constructing equipment, with the major responsibility placed on the coaches.

Teaching Aids

Table IX represents the total responses of the 42 schools which returned the questionnaire pertaining to teaching aids. The percentages are in terms of the number responding to each question.

Baseball. The five teaching aids used by those schools which participate in baseball (Table I) can be home-made. However, just 19 percent (5) of the 27 total items used by responding schools had been home-made, with the remaining 22 items (81 percent) being purchased.

Basketball. Seven different teaching aids were used by schools reporting participation in interscholastic basketball contests (Table I). Sixteen percent (5) of the total 31 teaching aids had been home-made, while the remaining 26 (84 percent) were purchased.

Football. Thirty-nine class "A" high schools reported participation in football (Table I). All of the 18 teaching aids (Table IX) can be home-made, except for motion picture cameras, projectors and video-tape machines. However, only 24 (12 percent) of the total 193 items were home-made, with the remaining 169 (88 percent) being purchased.

Track and Field. Thirteen different competitive devices and/or teaching aids were involved in track, according to the 39 responding schools (Table I). Fifty-three (22 percent) of the total 244 items were home-made, with the remaining 191 (78 percent) being purchased.

Of the 30 schools which reported having some type of home-made equipment, 23 (77 percent) fell below the mean budget (refer to p. 26), accounting for all of that group. The remaining seven schools accounted for 58 percent of the above mean bracket (12). Seventy-one percent (30) of respondents had some home-made athletic equipment or teaching aids.

Equipment Storage

Experts previously cited stated that equipment rooms are a necessity for proper athletic equipment storage (refer to p. 19). Table X shows that 26 (62 percent) of the respondents stored their equipment in rooms designed for this purpose, 12 (28 percent) in miscellaneous space and

Table IX. Class 'A' High School Interscholastic Athletic Teaching Aids

| Athletic Activity Teaching Aid | Home-made | | Manufactured | | Total | |
|--------------------------------|-----------|------|--------------|-----|-------|------|
| | No. | % | No. | % | No. | % |
| Baseball | N=30 | | N=30 | | N=30 | |
| Base protector | 0 | 0 | 1 | 3 | 1 | 3 |
| Batting tee | 3 | 10 | 5 | 17 | 8 | 27 |
| Batting tunnel | 1 | 3 | 0 | 0 | 1 | 3 |
| Pitching machine | 1 | 3 | 17 | 57 | 18 | 60 |
| Pitching target | 0 | 0 | 1 | 3 | 1 | 3 |
| Total: | 5 | | 22 | | 27 | |
| Basketball | N=42 | | N=42 | | N=42 | |
| Ball machine | 0 | 0 | 1 | 2 | 1 | 2 |
| Blinders | 0 | 0 | 7 | 16 | 7 | 16 |
| Heavy basketball | 0 | 0 | 3 | 7 | 3 | 7 |
| Rebound rim | 2 | 4 | 11 | 26 | 13 | 30 |
| Rebound machine | 2 | 4 | 0 | 0 | 2 | 4 |
| Tip rims | 0 | 0 | 4 | 10 | 4 | 10 |
| Variable goals | 1 | 2 | 0 | 0 | 1 | 2 |
| Total: | 5 | | 26 | | 31 | |
| Football | N=39 | | N=39 | | N=39 | |
| Bags (sniel) | 3 | 8 | 31 | 79 | 34 | 78 |
| Chute | 0 | 0 | 3 | 8 | 3 | 8 |
| Dummies (body) | 2 | 5 | 35 | 90 | 37 | 95 |
| Flags | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| Goal post | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| Movie camera | 0 | 0 | 18 | 46 | 18 | 46 |
| Movie projector | 0 | 0 | 20 | 51 | 20 | 51 |
| Passing Targets | 2 | 5 | 0 | 0 | 2 | 5 |
| Reaction Machine | 0 | 0 | 4 | 10 | 4 | 10 |
| Sleds | | | | | | |
| 2-man | 2 | 5 | 27 | 69 | 29 | 74 |
| 3-man | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| 5-man | 1 | 2.5 | 1 | 2.5 | 2 | 5 |
| 7-man | 2 | 5 | 6 | 15 | 8 | 20.5 |
| Tackling machine | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| Tires/or ropes | 8 | 20.5 | 18 | 46 | 26 | 66.5 |
| Video-tape | 0 | 0 | 3 | 8 | 3 | 8 |
| Weight machine | 0 | 0 | 3 | 8 | 3 | 8 |
| Total: | 24 | | 169 | | 193 | |

Table IX (cont.). Class "A" High School Interscholastic Athletic Teaching Aids

| Athletic Activity Teaching Aid | Home-made | | Manufactured | | Total | |
|--------------------------------|-----------|------|--------------|------|-------|------|
| | No. | % | No. | % | No. | % |
| Track and Field | N=39 | | N=39 | | N=39 | |
| Batons | 2 | 5 | 34 | 87 | 36 | 92 |
| Discus circle | 10 | 26 | 20 | 51 | 30 | 77 |
| Foam-rubber pit | 1 | 2.5 | 3 | 8 | 4 | 10.5 |
| Hurdles | 1 | 2.5 | 5 | 13 | 6 | 15.5 |
| Javelin holder | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| Javelin markers | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| Shotput circle | 1 | 2.5 | 33 | 85 | 34 | 87.5 |
| Shotput and discus markers | 8 | 20.5 | 8 | 20.5 | 16 | 41 |
| Standards | 10 | 26 | 20 | 51 | 30 | 77 |
| Starting gate | 1 | 2.5 | 0 | 0 | 1 | 2.5 |
| Starting blocks | 0 | 0 | 37 | 95 | 37 | 95 |
| Take-off boards | 8 | 20.5 | 11 | 28.5 | 19 | 49 |
| Vaulting box | 9 | 23 | 20 | 51 | 29 | 74 |
| Totals | 53 | | 191 | | 244 | |

four (ten percent) in equipment lockers. Fifteen (58 percent) of those schools stating inadequate space stored their equipment in equipment rooms, nine (34 percent) in miscellaneous space and two (eight percent) in equipment lockers.

Table X. Equipment Storage

| Type of Storage Space | Total | | Inadequate Space | |
|-------------------------|-------|----|------------------|----|
| | N=42 | % | N=26 | % |
| Equipment lockers | 4 | 10 | 2 | 8 |
| Miscellaneous space | 12 | 28 | 9 | 34 |
| Equipment storage rooms | 26 | 62 | 15 | 58 |
| Totals | 42 | | 26 | |

Equipment Purchasing

Table XI shows that coaches are involved in equipment purchasing on 43 and one-half percent (19) of the occasions. The athletic director was involved in purchasing 48 and one half percent (17) of the time, with the superintendent and principal both involved 11 percent (4) of the time (refer to pp. 6-8).

Table XI. Equipment Purchasing

| Purchasing Agent | Schools N=35 | % |
|---------------------------------|-----------------|-----|
| Coach | 12 | 34 |
| Athletic Director | 10 | 29 |
| Coach and Athletic Director | 5 | 14 |
| Coach and Superintendent | 2 | 5.5 |
| Superintendent | 2 | 5.5 |
| Principal | 2 | 5.5 |
| Principal and Athletic Director | 2 | 5.5 |

Problems or Needs

Table XII indicates that 35 percent (15) of the responding 42 schools said that lack of money was their major problem. Of these 15 schools 60 percent (9) had below mean budgets. Twenty percent (3) placed above the mean, with the final three schools (20 percent) refusing to state budget size.

Table XII. Problems Involving Athletic Equipment

| Major Problem of Need | Response N=42 | Percent |
|-----------------------|------------------|---------|
| Money | 15 | 35 |
| Equipment | 13 | 31 |
| Storage | 7 | 17 |
| None | 7 | 17 |

Thirty-one percent (13) of the respondents said that lack of equipment was their most serious problem. Five of these 13 schools (38 percent) had below mean budgets, 46 percent (6) placed above the mean, with the remaining two schools (15 percent) not responding to budget size.

Seven of the schools (17 percent) believed their major problem to be storage. Of these schools four fell below the mean budget and three above.

No stated problems existed in seven of these 42 schools (17 percent). Ironically, five of these seven schools had below mean budgets (Table IV), with two giving no answer as to the amount of their funds.

A chi-square test was calculated to determine if adequacy of equipment is independent of adequacy of budget. The hypothesis tested was: There is no relationship between budgets and equipment. Calculations of a chi-square test are shown in Table XIII.

Table XIII. Chi-Square Table of a Test of Independence between Budget and Equipment

| | | Equipment | | |
|--------|------------|--------------|------------|------|
| | | Adequate | Inadequate | |
| Budget | Adequate | O=15 E=12 | O=5 E=8 | 20 |
| | Inadequate | O=6 E=9 | O=9 E=6 | 15 |
| | | 21 | 14 | (35) |

$$\Sigma = (O-E)^2$$

$$\chi^2 = 4.375$$

$$c$$

$$2$$

$$\chi_{.05,1}^2 = 3.84$$

Since the calculated χ^2 is larger than the χ^2 from the table for one degree of freedom for the .05 level of significance the null hypothesis is rejected, and it is concluded that athletic equipment is related to budget size. The chi-square test indicates a relationship exists between problems, and therefore substantiates the following percentage breakdown of Table XII.

Sixty-one percent (14) of the 23 schools with below mean budgets stated that they had money or equipment problems (Table IV). This can also be said for 75 percent (9) of those schools with budgets equal to the mean of \$2,799.73 or more. With the addition of 71 percent (5) of the schools failing to give athletic budget size, money and/or equipment accounted for 80 percent (28) of the 35 schools reporting problems or needs involving athletic equipment (Table XII). Therefore, in light of Tables III, IV, XII and XIII, it is the contention of this writer that money and equipment problems are directly related.

Time of Purchasing

Table XIV. Time of Equipment Purchase

| Time of Year | Athletic Activity | | | | | | | |
|--------------|-------------------|----|------------|----|----------|----|-------|----|
| | Baseball | | Basketball | | Football | | Track | |
| | N=30 | % | N=42 | % | N=39 | % | N=39 | % |
| Summer | 2 | 7 | 3 | 7 | 9 | 23 | 3 | 8 |
| Fall | 12 | 40 | 15 | 36 | 6 | 15 | 9 | 23 |
| Winter | 10 | 33 | 5 | 12 | 5 | 13 | 12 | 31 |
| Spring | 6 | 20 | 19 | 45 | 19 | 49 | 15 | 38 |
| Total | 30 | | 42 | | 39 | | 39 | |

Table XIV shows the consistency with which equipment is ordered just before or during the athletic season for which it is needed. Many of these purchasing procedures are contrary to those recommended by experts cited earlier in this work (p. 8).

Interview Results

The questionnaire was followed by an interview to gain additional information from the 30 high schools which identified themselves as having some type of home-made athletic equipment or teaching aids (refer to p. 35). These 30 schools were separated from the other respondents and cards were numbered in succession from one through 30, the corresponding number being placed on the upper right-hand corner of the questionnaire. The cards were next placed in a box from which ten were selected randomly. The numbers selected were 3, 5, 10, 16, 17, 19, 21, 23, 24, and 28. Questionnaires matching these numbers were set aside for a follow-up interview.

The interview was conducted via telephone with the athletic directors or coaches of the selected schools. Telephone interview was chosen over personal contact because of the widespread geographical location of the selected class "A" schools. The questions asked and responses in percentage figures are listed as follows:

| <u>Question</u> | <u>Responses</u> |
|--|---------------------|
| 1. Length of time various items have been in service. | 3 months to 8 years |
| 2. What do you believe to be your average percentage of dollars saved by making your own equipment as opposed to buying manufactured articles? | 50-95% |

| | <u>Yes</u> <u>%</u> | <u>No</u> <u>%</u> |
|---|------------------------|-----------------------|
| 3. Was money a reason for the construction of equipment? | 90 | 10 |
| 4. Was availability a reason? | 10 | 90 |
| 5. Was item used as an industrial arts class project? | 60 | 40 |
| 6. Was item built to official specifications? | 100 | 0 |
| 7. Is item considered as good as manufactured item? | 90 | 10 |
| 8. Were some materials donated? | 80 | 20 |
| 9. Has item been replaced due to wear or breakdown? | 30 | 70 |
| 10. When applicable, is the item used for physical education as well? | 100 | 0 |
| 11. If it were necessary to have additional interscholastic teaching aids, and you were able to make them, would you do so? | 100 | 0 |

Summary

The preceding study substantiated this writer's contention that there definitely were budget-related interscholastic athletic problems within class "A" high schools of Oregon. The results of this study follow.

1. Budget-related equipment problems existed in class "A" high schools (Table XIII).

2. Forty percent of these schools had inadequate athletic equipment (refer to p. 30).

3. Budget inadequacies existed in 43 percent of these schools (refer to p. 30).

4. The lack of equipment in some industrial arts departments hindered the construction of home-made athletic equipment and teaching aids (refer to p. 34).

5. Teaching aids which could be home-made were being purchased (Table IX), thereby spending money unnecessarily (refer to p. 37).

6. If home-made equipment were constructed properly it could provide years of service.

7. Athletic equipment storage was one of the existing problems and could be rectified through the construction of items necessary for proper equipment storage (refer to pp. 36, 38).

This writer contends that when the follow-up interview results (refer to pp. 42-43) were compared with the results of the questionnaire, proof was obtained supporting the claim that home-made athletic equipment can ease the burden placed upon the athletic budget. The following chapter discusses various pieces of athletic equipment, teaching aids and storage devices which can be home-made, aiding in the solution of athletic budget problems in class "A" high schools of Oregon.

CHAPTER IV

BUILDING EQUIPMENT FOR THE ATHLETIC PROGRAM

H. Meyer stated:

In equipping the playground with the proper type of apparatus, we come to a problem that is easily solved, but seems to the average citizen a terrific burden. Most people think of the playground in terms of expensive equipment. It is possible to make the playground movement in any community a fairly costly one, but it is neither necessary nor desirable. There are a number of splendid, useful and safe pieces of equipment that can be home-made. There is in every community enough material not in use that can be utilized in making the best use of this equipment (10, p. 156).

If this is the case concerning playground equipment, it must certainly be true for athletic equipment in a small high school as well. It was the contention of this writer that most of the necessary equipment for an athletic program, with the exception of protective equipment, clothing and balls, may be obtained in spite of limited financial resources through home-made items.

This chapter contains the specifications, materials, tools and comparative cost of some home-made equipment for baseball, basketball, football, track and equipment rooms. Manufacturers' and home-made prices are those effective as of February 22, 1971, and may vary according to area. Purchase prices were taken from the catalogs of Gill, Wilson, McGregor, Nissen, Leflar, Adams, Atlas, Porta Pit Incorporated, American Wire Form Corporation and Dakton Athletic Equipment.

Baseball

Baseball is in itself not an expensive sport for the average small high school. However, because admission is not charged for games, baseball is dependent upon athletic budgeted funds or the receipts of other sporting events for its support. Schools therefore usually need to be economical in the purchase of baseball equipment and teaching aids.

A. Pitch-Back*

Purpose: Allows pitcher to practice or warm-up without the aid of a catcher, nor does he have to chase the ball.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|----------------------------------|---------------|--|
| 1. Pre-threaded galvanized pipes | 3 | $\frac{1}{2}$ "x3' long |
| 2. Pre-threaded galvanized pipes | 2 | $\frac{1}{2}$ "x5' long |
| 3. Pre-threaded galvanized pipes | 4 | $\frac{1}{2}$ "x1 $\frac{1}{2}$ ' long |
| 4. El joints | 6 | $\frac{1}{2}$ "x1" long |
| 5. Unions | 2 | $\frac{1}{2}$ "x1" long |
| 6. Heavy netting | 1 | 24 sq. ft. |
| 7. Heavy twine | 1 roll | |
| 8. White paint | 1 pint | |
| 9. Welding rod | 3 | |

Tools: Pipe wrench, drill, $\frac{1}{2}$ " and $\frac{1}{4}$ " metal bits, wrench, scissors or knife, paint brush, welder, saw, metal file, measuring tape and metal punch.

Directions:

1. Attach joint (4) to end of two 3' pipes (1), and attach one joint (4) to each end of another 3' pipe (1).
2. Attach 5' pipe (2) to joint on each end of 3' pipe. Attach joint (4) to end of 5' pipe.
3. Attach 1 $\frac{1}{2}$ ' short pipe to joints on each end of long pipe.
4. Joint step 3 together through union (5).

*See Figure 1, Appendix II.

5. Attach remaining short pipes to each 3' pipe and joint (see step 1).
6. Join step 5 together with remaining union (5).
7. Measure 3' from base of rectangle and mark each 5' side at that point.
8. Saw pipe ends (step 6) at 45° angle and smooth with file to fit face of rectangle.
9. Align frame and brace, and weld at point of joining.
10. Cover frame with net, securing with twine.
11. Paint target in center.

| | | |
|--------------|------------------|------------------|
| | <u>Home-Made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$14.50 | \$114.00 |

B. Pitching Target*

Purpose: To develop both pitchers and catchers by having catcher work behind target while pitcher tosses the ball.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|----------------------------------|---------------|------------------------|
| 1. Pre-threaded galvanized pipes | 2 | 1''x7' long |
| 2. Pre-threaded galvanized pipe | 1 | 1''x5' long |
| 3. Pre-threaded galvanized pipes | 2 | 1''x2' 5-3/4'' long |
| 4. Angle iron | 2 | 1''x3' long |
| 5. El joints | 4 | 1''x1'' long |
| 6. Nylon cord | 1 | 1/4''x30' |
| 7. Eye bolts, washers and nuts | 4 | 1/4''x2'' long |
| 8. Tape | 1 roll | |
| 9. Union | 1 | 1''x1'' |
| 10. Welding rod | 3 | |

Tools: Pipe wrench, scissors or knife, tape measure, welder, wrench, drill and metal bit (17/64'' suggested).

Directions:

1. Attach one joint (4) to each end of 5' pipe (2).
2. Attach 7' pipe (1) to each joint (step 1).

*See Figure 2, Appendix II.

3. Attach remaining joints (4) to step 2.
4. Attach short pipes (3) to joints (step 3).
5. Join step 4 together with union (8) forming rectangle.
6. Mark angle iron (3) at mid-point and weld to each corner of rectangle base.
7. Drill $\frac{1}{4}$ " hole completely through each long pipe 22" and 19" above base. Attach eyes (6).
8. Cut nylon cord (5) and thread horizontally and then vertically to form strike zone.
9. Cover nylon cord with tape.

| | | |
|--------------|-----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$10.50 | <u>Purchased</u> \$67.00 |
|--------------|-----------------------------|-----------------------------|

C. Metal Batting Tee*

Purpose: Allows the coach to teach batting fundamentals without the variability of a pitched ball.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------------------|---------------|--------------------------|
| 1. Pre-threaded galvanized pipe | 1 | 1"x20" long |
| 2. Galvanized pipe | 1 | $\frac{1}{2}$ "x18" long |
| 3. Plastic irrigation tube | 1 | $\frac{3}{4}$ "x18" long |
| 4. Floor mounting flange with screws | 1 | for 1" pipe |
| 5. $\frac{3}{4}$ " plywood | 1 | 18"x18" |
| 6. $1\frac{1}{2}$ " hose clamps | 2 | |
| 7. Radiator hoses | 2 | $\frac{3}{4}$ "x6" long |
| 8. Nails | 1 | $\frac{1}{4}$ "x2" long |

Tools: Pipe wrench, drill and $\frac{3}{8}$ " bit, pliers, screwdriver, pipe punch.

Directions:

1. Drill a row of $\frac{3}{8}$ " holes 1" apart through 1" pipe (1).
2. Attach floor mounting (5) to center of plywood (6).
3. Attach 1" pipe (1) to floor mounting (5).

*See Figure 3, Appendix II.

4. Attach a radiator hose (8) to each remaining pipe (2+3), securing with clamp (7).
5. Insert pipe (2) into tube (4) and place into main support (step 3).
6. Insert nail (9) into holes for desired ball holder height.
7. Place baseball on hose and ready to use.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$3.75 | \$29.95 |

Basketball

A. Rectangle Wooden Backboard*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|----------------------------|---------------|--------------|
| 1. 2x4 boards | 2 | 4' long |
| 2. 2x4 boards | 2 | 6' long |
| 3. 3/4" plywood sheet | 1 | 4'x6' square |
| 4. 6-penny finishing nails | 1/2 lb. | |
| 5. 2" wood connector nails | 1/4 lb. | |
| 6. Wood putty | 1 pt. | |
| 7. White paint | 1 pt. | |

Tools: Saw, angle, square, hammer, putty knife, sandpaper, punch.

Directions:

1. Cut each end of framing boards (1+2) at 45° angle from one corner so that rectangle frame measures 4x6 feet.
2. Lay frame on 4-inch side. Connect joints with connection nails (5).
3. Place backboard face (3) on frame. Align and attach with finishing nails (4) each 4 inches.
4. Punch nails below surface level. Fill with putty, allow to dry, and sand.
5. Paint.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$9.50 | \$27.50 |

* See Figure 4, Appendix II.

B. Rebound Ring

Purpose: To practice shooting accuracy and retrieving the basketball as it comes off the rim.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|----------------------------------|---------------|-------------|
| 1. 3/4" plywood sheet | 1 | 19x19" |
| 2. 1/4" bolts, nuts and washers | 4 | 1 1/4" long |
| 3. 3/16 gauge sheet metal strips | 4 | 1x1" square |

Tools: Drill, 1/4" bit, keyhole saw, pencil, sandpaper, file.

Directions:

1. From plywood sheet (1) cut 19" circle.
2. At center point, drill 1/4" hole. Insert keyhole saw and cut 12" diameter hole.
3. Drill countersunk 1/4" holes 1" from edge of ring (1) each 90°.
4. Bend 1/2" of sheet metal (3) to conform with rim contour.
5. Place bolts (2) through holes. Attach metal holders (3) and secure by nut and washer.
6. Place ring stop goal, turn holders to make contact with goal and secure to maintain rebounding ring's position on goal.

| <u>Cost:</u> | <u>Home-made</u> | <u>Purchased</u> |
|--------------|------------------|------------------|
| | \$1.00 | \$5.75 |

C. Basketball Rebounder Ball (18, p. 99).

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|-----------------------|---------------|-------------|
| 1. Exer-Geni | 1 | |
| 2. Basketball | 1 | |
| 3. Metal eye-hook | 1 | 1/2"x4" |
| 4. Heavy contact tape | 1 roll | |
| 5. Wall hook | 1 | |

Tools: None.

Directions:

1. Wrap exer-geni strap (1) around ball (2).
2. Tape strap to ball securely.

3. In corner of gym 3' from wall screw eye-hook into ceiling.
4. Place exer-geni (1) cord through eye. (May be necessary to add additional cord.)
5. Attach wall hook for securing cord when not in use.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$31.00 | Not available |

Football

The greatest expense incurred by schools participating in inter-scholastic athletics is the cost of the football program. Much of this expense can be cut back by initiative and the construction of many of the teaching aids and training devices. Following are some of those items, specifications, materials necessary for construction, tools and comparative cost.

A. Passing Target

Purpose: To develop the passing accuracy of the quarterback.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------|---------------|-------------|
| 1. Hula-hoop | 1 | |
| 2. 1/8" nylon cord | 1 | 5' long |
| 3. 1/8" nylon cord | 2 | 10' long |

Tools: None.

Directions:

1. Attach cord (2) to goal post cross bar.
2. Attach hula-hoop to cord (step 1).
3. Attach remaining cords (3), one to each side of hoop and then attach remaining ends to goal post uprights.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$2.10 | Not available |

B. Secondary Dummy*

Purpose: To give passer and receiver experience in working against secondary defenders, without the necessity of taking other players from their learning situations.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|---|---------------|-------------|
| 1. 3/4" plywood sheet (exterior glue) | 1 | 4x7' |
| 2. 2x4 board | 1 | 4' long |
| 3. Heavy hinge | 1 | 5" long |
| 4. 3/8" carriage bolts, nuts and washers | 4 | 3" long |
| 5. 3/8" wood screws | 4 | 1/2" long |
| 6. Paint | 1 pt. | |

Tools: Saw, rule, drill, 3/8" bit, wrench, pliers, wood file, paint brush and pencil, screwdriver.

Directions:

1. Measure 12" in from each side of plywood (1) at 4' width, and mark with pencil. Measure down 2 1/2' from these points, mark with pencil and connect points with lines.
2. Cut out above measured area.
3. From opposite end of plywood (1) measure up 4' and in from sides 2', marking both points.
4. Place flat face of hinge (3) on the above point and center. Mark holes in hinge with pencil.
5. Next place hinge extension on 4" face of support (2) and mark holes. Drill holes completely through and attach hinge with bolts and nuts (4).
6. Attach step 5 to dummy (step 2) at marked holes (step 4) with wood screws (5).
7. Paint.

| | | |
|---------------|----------------------------|-----------------------------------|
| <u>Cost</u> : | <u>Home-made</u> \$8.50 | <u>Purchased</u> Not available |
|---------------|----------------------------|-----------------------------------|

*See Figure 5, Appendix II.

C. Air Hand Shield

Purpose: To absorb shock of blocking in practice. Held by defensive man.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------------|---------------|-------------|
| 1. Heavy fishing or tennis net | 1 yd. | 36" wide |
| 2. Inner tube | 1 | |
| 3. Heavy twine | 1 spool | |

Tools: Scissors.

Directions:

1. Fold deflated inner tube in half on upper 2/3rds of net.
2. Fold netting over tube leaving good slack.
3. Weave twine through holes in net and secure at top with knot.
4. Inflate tube until netting is taut but not tight.

| | | |
|--------------|------------------|------------------|
| <u>Cost:</u> | <u>Home-made</u> | <u>Purchased</u> |
| | \$2.50 | \$20.95 |

D. Tackling Machine*

Purpose: To give football players tackling experience on an object as close to reality as possible.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|-------------------------------------|---------------|-------------|
| 1. 3" pre-threaded galvanized pipe | 2 | 12' long |
| 2. 3" pre-threaded galvanized pipe | 1 | 10' long |
| 3. 3" el joint | 1 | |
| 4. 3" tee fitting | 1 | |
| 5. 3" pre-threaded galvanized pipe | 1 | 2' long |
| 6. 5-gallon bucket | 1 | |
| 7. Pre-mix cement | 2 | 50 lbs |
| 8. Large military duffle bag | 1 | |
| 9. Mattress stuffing | 100 lbs | |
| 10. 1/2" eyebolts, nuts and washers | 2 | 6" long |
| 11. 1/8" steel cable | 13' | |
| 12. Cable clamps | 2 | 1/4" |
| 13. Metal ring | 1 | |

*See Figure 6, Appendix II.

Tools: Large pipe wrench, drill, $\frac{1}{2}$ " metal bit, pliers, post-hole digger, shovel and cement mixing box.

Directions:

1. Attach el (3) to end of one support pipe (1), attaching top support (2), onto which is attached tee fitting (4).
2. Attach remaining support (1) to vertical base of tee fitting thus forming a "U" frame.
3. To remaining end of tee fitting attach short pipe (5).
4. Drill holes and attach eye bolts (10). One bolt should be inserted mid-way between uprights facing downward. The other bolt is inserted through the weight support bar (step 3) 6" from its end and parallel to the ground.
5. Dig post holes for pipe supports 4' deep and 10' apart.
6. Place pipes in holes, mix cement and pour.
7. Punch 2 holes in bucket (5) 3" from top opposite one another.
8. Fill bucket with remaining cement.
9. Place cable (11) through eye bolts. Thread one end of cable through holes in bucket, attaching cable end to cable at a point 9" above the top rim of the bucket with cable clamp (12).
10. Attach metal ring (13) to remaining end of cable which has been threaded through eye bolts (step 9) and secure with cable clamp (12).
11. Fill duffle bag (8) with stuffing (9). Loop duffle bag strap through metal ring (step 10) and hook strap to attachment on the bag.

| | | |
|--------------|-----------------------------|------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$29.00 | <u>Purchased</u> \$269.00 |
|--------------|-----------------------------|------------------------------|

E. Two-Man Charging Sled*

Purpose: To develop proper striking angle, foot movement, stance and take-off of offensive linemen.

*See Figure 7, Appendix II.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--|---------------|-------------|
| 1. 4x4 boards | 2 | 4½' long |
| 2. 2x4 boards | 4 | 4' long |
| 3. 2x4 boards | 2 | 50" long |
| 4. 2x4 boards | 2 | 40" long |
| 5. ½" carriage bolts, nuts and washers | | 7" long |
| 6. 12-penny nails | 1 box | |
| 7. 6" heavy foam rubber | 2 | 6x44" |
| 8. Heavy naugahyde or duck cloth | 2 yds | 48" wide |
| 9. Upholstery tacks | 1 box | ½" |
| 10. Exterior paint | 1 gal. | |
| 11. Upholsterer's glue | 1 pt. | |
| 12. 2x4 boards | 2 | 24" long |

Tools: Hammer, saw, drill, ½" bit, punch, wrenches, heavy scissors, paint brush, square, rule, angle, pencil, and metal file.

Directions:

1. Trim one end of 4" side of runner (1) to 45° angle, rounding off corners.
2. Drill sets of two vertical holes in runners (1) at 2, 24, and 52 inches from the front (the end which is square).
3. Place runner braces (2) beneath runners (1) so that the outer edge of the runners is even with the ends of brace. Mark runner holes (step 2) on the 4-inch side of the braces with a pencil. Remove runners, drill out holes marked on braces.
4. Attach braces to runners with ½-inch bolts (5) from the top. Counter-sink bolt holes, and trim excess of bolt from the lower side of runners so that none of the bolt protrudes below the runner bottom.
5. Measure from top of uprights (4) down 4 inches and mark with pencil. Lay remaining support (2) 4-inch side against uprights, making sure that top of support is even with 4-inch line drawn on upright.
6. Drill 2 vertical holes 2 inches from each end of support (2). Mark holes on uprights with pencil and drill holes in upright which match those in support brace.
7. Insert bolts through uprights, securing support to uprights by placing washers and nuts on rear face of support.

8. Place uprights in front of runners. Secure with 2 nails 1 inch above the base of the upright and 1 inch in from each side. Secure with a 3rd nail 3 inches above the base and 2 inches in from each side (mid-point). Drill 2 counter-sunk holes in each upright continuing through the front runner support brace 5 inches above the bottom of the upright and 1 inch in from each side.
9. Insert bolts through upright and support, attaching washers and nuts on rear support face.
10. Mark and cut each end of angle support braces (3) at 45° angle. Secure in front of rear running support and below top upright support with 2 nails 1 inch in from each side of upright. Nails should be hammered in from upright face. Nail lower end to rear runner support. (It may be necessary to trim the angle support to get proper fit.)
11. Mark and cut each end of lower angle support braces (12) at 45° angle. Place on runner and slide forward to uprights till ends rest against both upright and support. Secure runner face of support to runner. Secure upright face to upright with nails hammered from the face of the upright through the support.
12. Hollow out foam rubber (7) to depth of upright arm. Apply glue to upright arms and hollowed out portions of foam rubber. Attach foam rubber to each upright, applying pressure till secure.
13. Apply glue to face of upright padding (step 12). Cut covering (8) in half and apply glue to inside. Apply covering to padding, holding pressure till secure. Wrap covering around upright forming complete covering and tack onto rear of uprights with tacks.
14. Paint.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$28.95 | \$250.00 |

F. Seven-Man Charging Sled*

Purpose: To get entire offensive line firing off in unison, making contact at proper angle, keeping balance, keeping proper foot movement and developing leg drive.

*See Figure 8, Appendix II.

| <u>Materials</u> | <u>Amount</u> | <u>Side</u> |
|---|---------------|-------------|
| 1. 2x4 boards | 5 | 15' long |
| 2. 4x4 boards | 4 | 4½' long |
| 3. 4x4 boards | 7 | 3' long |
| 4. 4x4 boards | 4 | 50" long |
| 5. 12-penny nails | 1 box | |
| 6. 6" heavy foam rubber | 7 | 6x34" |
| 7. Heavy naugahyde or duck | 5 yds. | 48" wide |
| 8. Upholstery tacks | 2 boxes | ½' long |
| 9. Exterior paint | 1 gal. | |
| 10. Upholsterer's glue | 2 pts. | |
| 11. 3/8" carriage bolts, washers and nuts | 38 | 8" long |

Tools: Hammer, saw, drill 3/8" bit, wrenches, heavy scissors, paintbrush, square, rule, angle, pencil, and metal file.

Directions:

1. Trim one end of 4" side of runner (2) to 45° angle, rounding off corners.
2. Lay out runners on ground, with ends all pointing in same direction. Second runner should be 5 feet from the 1st; 3rd runner should be 6 feet from the second, and the 4th should be 5 feet from the 3rd.
3. Place 3 runner support braces (1) 4-inch face flat on top of runners. First brace face should be even with front edges of runners; 2nd brace is 20 inches from the 1st, and the 3rd brace is 50 inches from the 1st.
4. Nail support braces to runners with 1 nail in opposite corners. Drill set of 2 vertical counter-sunk holes through braces (1) and runners(2).
5. Turn sled bottom (step 4) on end. Insert bolts from top, attaching washers and nuts on bottom. Saw off excess and file till smooth. Replace sled flat on ground.
6. Lay uprights (3) flat on ground. Place 5 uprights exactly 2' 3" from the one before for a total of 6 uprights including the first.
7. Lay 1 upright support brace (1) edge 4" side down parallel to the top edges of uprights. Check upright spacing again and nail brace to uprights in succession, beginning with the first upright through the sixth. Slide remaining upright under brace till outer edge of upright is even with the end of the brace. Nail in place.

8. Measure 1 inch from each upright edge and 2 inches from top and mark with pencil. Drill 2 vertical holes at these points completely through, making sure to counter-sink holes. Lift up and insert bolts (11) from upright side, attaching with washers and nuts against the support face.
9. Lay remaining upright support brace 20: from the upper brace and repeat step 8.
10. Place uprights in front of front runner support brace. Secure with 2 nails $\frac{1}{2}$ inch above the base of each upright and 1 inch in from each side.
11. Drill 2 counter-sunk holes $1\frac{1}{2}$ inch above each upright base 1 inch in from each outer edge, drilling completely through front runner support brace. Insert bolts from face of upright, attach washers and nuts and secure against front runner support brace face.
12. Mark and cut each end of lower angle support braces (4) at 45° angle. Place on each runner, sliding them forward till they rest below upper upright support brace and are flush against uprights. Secure with nails driven from face of upright through angle support brace. Nail lower end to runner. (It may be necessary to trim the angle support to get proper fit.)
13. Follow steps 12, 13, and 14 of two-man sled construction.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$91.00 | \$575.00 |

G. Blocking Dummies

Purpose: Held by team-mate to teach line blocking techniques without having live contact.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------------|---------------|-------------|
| 1. Military duffle bag | 1 | Large |
| 2. Mattress stuffing | 75 lbs. | |

Tools: None.

Directions:

1. Fill duffle bag with stuffing, close and secure with bag strap hook.

| | | |
|--------------|------------------|------------------|
| | <u>Home-made</u> | <u>Purchased</u> |
| <u>Cost:</u> | \$3.00 | \$33.95 |

H. Temporary Goal Post*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------------------|---------------|-------------|
| 1. 2x4 board | 1 | 18½' long |
| 2. 2x4 board | 2 | 23½' long |
| 3. 90° wood strap and screws | 2 | 10" long |
| 4. 10-penny nails | 8 | |
| 5. Paint | 1 qt. | |

Tools: Post hole digger, hammer, paint brush, level, square pencil, shovel.

Directions:

1. From top of uprights (2) measure 10' and mark.
2. Nail cross bar (1) 4" side to 2" side of uprights, being sure that top of cross bar is placed at 10' mark.
3. Attach angles (3) beneath cross bar at upright joint.
4. Dig post holes 3½' deep exactly 18½' apart.
5. Insert goal post and paint.

| | | |
|---------------|-----------------------------|-----------------------------------|
| <u>Cost</u> : | <u>Home-made</u> \$14.00 | <u>Purchased</u> Not available |
|---------------|-----------------------------|-----------------------------------|

I. Permanent Goal Post**

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------------------------|---------------|-------------|
| 1. 2" pre-threaded galvanized pipe | 2 | 10' long |
| 2. 2" pre-threaded galvanized pipe | 1 | 18½' long |
| 3. 2" tee sections | 2 | |
| 4. Paint | 1 qt. | |
| 5. 50 lbs. pre-mixed cement | 2 bags | |
| 6. 2" pre-threaded galvanized pipe | 2 | 13' long |

Tools: Pipe wrench, paint brush, post hole digger, shovel, hoe and cement mixing box.

Directions:

1. Attach sections (3) to cross bar (2).

*See Figure 9, Appendix II.

**See Figure 10, Appendix II.

2. Attach uprights (1) to sections (3), tightening until exactly 10' extends from each joint.
3. Attach supports (6) to tee sections (3).
4. Dig 3' deep post holes exactly $18\frac{1}{2}$ ' apart on goal line.
5. Insert goal post, mix cement and fill.
6. Paint.

| | | |
|--------------|-----------------------------|------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$34.00 | <u>Purchased</u> \$118.95 |
|--------------|-----------------------------|------------------------------|

J. Yard Line Markers (53, p. 92)

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------|---------------|-------------|
| 1. Discarded tires | 11 | |
| 2. Paint | 1 qt. | |

Tools: Hacksaw, knife, paint brush.

Directions:

1. Cut tires in half (1).
2. Cut 6-inch wedge in ends of tire halves.
3. Turn half shells inside-out.
4. Paint yard divisions.

| | | |
|--------------|----------------------------|--|
| <u>Cost:</u> | <u>Home-made</u> \$1.00 | <u>Purchased</u> \$55.00 - \$183.00 |
|--------------|----------------------------|--|

K. Field Flags

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--|---------------|-------------|
| 1. 1" diameter plastic irrigation pipe | 8 | 15" long |
| 2. Red cloth | 1 sq. yd. | |

Tools: Ice pick, scissors, small shovel.

Directions:

1. Cut small triangles with 2" tails from (2).
2. Punch 2 holes through (1) to match tails.

3. Insert flags and tie.
4. Dig hole at corners of end zones.
5. Place flags.

| | | |
|--------------|-------------------------------------|--------------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$5.25 for 8 | <u>Purchased</u> \$25.50 for 8 |
|--------------|-------------------------------------|--------------------------------------|

L. Down Marker*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------|---------------|-------------|
| 1. 3/4" dowel | 1 | 78" long |
| 2. 1/4" plywood sheet | 6 | 14x14 |
| 3. Finishing nails | 1/2 lb. | 1 1/2" long |
| 4. Wood glue | 1 pt. | |
| 5. White and black paint | 1 pt. each | |
| 6. Finishing nails | 3 | 1" long |

Tools: Hammer, wood clamps, paint brushes (2), hatchet.

Directions:

1. Glue sides and top (2) of box together and secure with wood clamp.
2. Attach box base to end of post (1).
3. Sharpen opposite end to point.
4. Secure box together with nails.
5. Paint post and box white.
6. Paint numbers 1, 2, 3, 4 in black. One on each side of box.

| | | |
|--------------|----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$4.50 | <u>Purchased</u> \$23.60 |
|--------------|----------------------------|-----------------------------|

M. Lineman's Chain**

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------|---------------|-------------|
| 1. 3/4" dowels | 2 | 7 1/2' |
| 2. Length of light chain | 1 | 30' |

*See Figure 11, Appendix II.

**See Figure 12, Appendix II.

| | | |
|-----------------------------------|-------------------|-----------|
| 3. #5 wire staples | 2 | |
| 4. Sheet metal disc | 2 | 12" diam. |
| 5. $\frac{1}{4}$ " nuts and bolts | 2 | 1" long |
| 6. White paint | $\frac{1}{2}$ pt. | |

Tools: File, hammer, wrench, saw, drill, $\frac{1}{4}$ " bit, wood and metal.

Directions:

1. Saw $1\frac{1}{2}$ inches into each post (1).
2. One inch from top of cut end drill $\frac{1}{4}$ -inch hole. Match disc (4) to holes and drill.
3. Insert bolts (5) through holes and secure disc.
4. Place staples (3) through end loop on chain (2). Place end loop against post and secure with staple, making sure not to allow chain ending to crimp.
5. Repeat procedure for other end.
6. Paint.

| | | |
|--------------|------------------|------------------|
| <u>Cost:</u> | <u>Home-made</u> | <u>Purchased</u> |
| | \$6.00 | \$43.95 |

Track and Field

Track and field is not an overly expensive activity. A majority of the items necessary for this athletic event can be home-made, decreasing the investment of athletic budget funds. Following are a number of such items.

A. Hurdles (lows)*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------------------------|---------------|---|
| 1. $\frac{3}{4}$ " aluminum tubing | 2 | 50" long (lows) 67" long (highs) 70" long (combo) |
| 2. 1x3 boards | 2 | 44" long |
| 3. 1x3 boards | 2 | 18" long |

*See Figure 13, Appendix II.

- | | | |
|--|-------|-----------------------|
| 4. $\frac{1}{4}$ " stove bolts, washers and nuts | 12 | $2\frac{1}{4}$ " long |
| 5. White paint | 1 pt. | |

Tools: Drill, metal and wood $\frac{1}{4}$ " bits, pipe bender, vise, saw, wrench, marking pencil, square and paint brush.

Directions:

1. Bend both pipes (1) to 90° angle at a point 1" less than desired height of hurdle as measured from upper ends of pipes.
2. Drill two $\frac{1}{4}$ " holes in each board (2) in a perpendicular line 3" from each end of board.
3. Bolt the pipes to the boards at pipe tops and at curve.
4. Determine best position for balance boards (3) by placing them on bars till you locate best position for pull-over force. Drill holes and attach at that point.
5. Paint boards.

| | | |
|--------------|------------------|------------------|
| <u>Cost:</u> | <u>Home-made</u> | <u>Purchased</u> |
| | \$8.10 | \$19.95 |

B. Starting Blocks (Adjustable)*

Purpose: To give the runner leverage for start.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------------------|---------------|--------------------------|
| 1. 2x4 board | 1 | 32" long |
| 2. 4x4 board | 2 | 5" long |
| 3. Bolts, washers, wing nuts | 2 | $\frac{1}{2}$ "x8" long |
| 4. Large nails | 2 | $\frac{3}{8}$ "x10" long |

Tools: Saw, drill, $\frac{1}{4}$ + $\frac{1}{2}$ " bits, keyhole saw, hammer, straight edge measuring device, angle and pencil.

Directions:

1. 3" from each end of board on 4" side drill $\frac{1}{2}$ " hole completely through. Cut $\frac{1}{2}$ " slot connecting holes.
2. Cut face of blocks (2) at 60° angle.

*See Figure 14, Appendix II.

3. Drill $\frac{1}{2}$ " hole through blocks (2) $\frac{3}{4}$ " from base.
4. Bolt blocks to each side of beam.
5. Drill $\frac{1}{4}$ " hole vertically through the beam (1) 2" from each end, inserting spikes.

| | | |
|--------------|----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$1.35 | <u>Purchased</u> \$36.00 |
|--------------|----------------------------|-----------------------------|

C. Vaulting Box*

Purpose: To provide stable planting surface for vaulter's pole.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|-------------------------------|---------------|---|
| 1. $\frac{1}{8}$ " sheet iron | 1 | 24" front 48" long tapering to 6" at rear. |
| 2. $\frac{1}{8}$ " sheet iron | 2 | Tapering from 8" to 0". |
| 3. Flux and welding rods | | |

Tools: Welding machine, tin snips, ball pein hammer, vise and file.

Directions:

1. Bend narrow part of sheet metal (1) 8" from its end to 90° angle. Upturned lip should be 8" long.
2. Butt 8" ends of sides (2) to each side of lip and parallel to base (step 1). Weld sides to lip and base.

| | | |
|--------------|----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$6.00 | <u>Purchased</u> \$40.50 |
|--------------|----------------------------|-----------------------------|

D. Bang-board (20, p. 85)**

Purpose: Used in place of starter's gun.

| <u>Material</u> | <u>Amount</u> | <u>Size</u> |
|------------------------|---------------|------------------------|
| 1. 1x4 hardwood blocks | 2 | 6" long |
| 2. Metal hinge | 1 | 6" long |
| 3. Wood screws | 8 | $\frac{1}{2}$ " long |
| 4. Leather straps | 2 | $\frac{1}{2}$ x3" long |
| 5. Small tacks | 4 | $\frac{1}{2}$ " long |

* See Figure 15, Appendix II.

** See Figure 16, Appendix II.

Tools: Screwdriver and hammer.

Directions:

1. Place blocks (1) together and attach with hinge (2).
2. Attach straps (4) to blocks with tacks (5) forming handles on each side.

| | | |
|--------------|----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$1.00 | <u>Purchased</u> \$12.95 |
|--------------|----------------------------|-----------------------------|

E. Shot-put and Discus Circle Marker (20, p. 85)

Purpose: To show limits of throwing or putting areas.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------|---------------|-------------|
| 1. 2x6 board | 1 | 4½' long |
| 2. Ice picks | 3 | |

Tools: Drill, ¼" bit, measuring tape and pencil.

Directions:

1. Drill vertical hole 2" from end of board.
2. Drill another hole 49½" from first hole (step 1).
3. Drill a third hole 42" from first hole (step 1).
4. Insert ice picks.

| | | |
|--------------|----------------------------|----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$2.75 | <u>Purchased</u> \$6.00 |
|--------------|----------------------------|----------------------------|

F. Discus, Shot-put and Javelin Markers**

Purpose: To mark landing spot of put or thrown object.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------|---------------|-------------|
| 1. ¾" dowel | 12 | 6" long |
| 2. ¼" plywood | 12 | 2x2 |
| 3. Small finishing nails | 24 | ½" long |
| 4. Glue | 1 pt. | |
| 5. Slating paint | 1 pt. | |

*See Figure 17, Appendix II.

**See Figure 18, Appendix II.

Tools: Saw, hammer, paint brush, rule, pencil and sanding wheel.

Directions:

1. Mark each dowel (1) $\frac{1}{4}$ " across top and draw line 1" long.
2. Saw out area marked in step 1, forming $\frac{1}{4}$ " flat face.
3. Apply glue to flat areas on dowels, attach signs and secure with finishing nails.
4. Sand opposite end of dowel to a point.
5. Paint both sides with slating paint.

Cost: Home-made Purchased
 \$2.00 per dozen \$7.20 per dozen

G. Baton

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------|---------------|----------------------|
| 1. Aluminum tube | 1 | 12" long |
| 2. Adhesive tape | 1 roll | $\frac{1}{2}$ " wide |

Tools: Scissors.

Directions:

1. Wrap 2" of each end of tube with tape.

Cost: Home-made Purchased
 40¢ each \$1.15 each

H. Pole-vault Standards*

Purpose: To support crossbar for pole vaulter.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|-----------------------------------|---------------|------------------------------------|
| 1. Wheel rim | 2 | |
| 2. $1\frac{1}{4}$ " pipe | 2 | 7' long |
| 3. $\frac{3}{4}$ " pipe | 2 | 7' long |
| 4. Lengths of angle iron | 4 | $1\frac{1}{2}$ "x $2\frac{1}{2}$ " |
| 5. Pieces of 16 gauge sheet metal | 2 | 2"x2" |
| 6. 10-penny nails | 2 | |
| 7. Welding rods | 2 | |

*See Figure 19, Appendix II.

Tools: Welding machine, drill 3/16" metal bit, tape measure and pencil.

Directions:

1. Weld two lengths of angle iron (4) inside each wheel rim, forming cross.
2. Weld one 1¼" pipe (2) to each base (step 1).
3. Mark each support (step 2) at 1¼" intervals, drilling holes completely through upright.
4. Weld one pad (5) to top of insert (3).
5. Place insert into lower upright.
6. Insert nails with blunted ends to set desired height.

| | | |
|--------------|------------------------------------|-------------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$14.00 a pair | <u>Purchased</u> \$149.95 a pair |
|--------------|------------------------------------|-------------------------------------|

1. High Jump Standards*

Purpose: To support cross bar for jumper.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|-----------------------------------|---------------|-------------|
| 1. Wheel rim | 2 | |
| 2. 3/4" pipe | 2 | 40" long |
| 3. 1¼" pipe | 2 | 30" long |
| 4. Lengths of angle iron | 4 | 1½"x2½" |
| 5. Pieces of 16 gauge sheet metal | 2 | 2x2" |
| 6. 10-penny nails | 2 | |
| 7. Flux and welding rods | | |

Tools: Welding machine, drill, 3/16" metal bit, tape measure and pencil.

Directions:

Same as for pole vault standards.

| | | |
|--------------|-----------------------------------|------------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$8.00 a pair | <u>Purchased</u> \$71.00 a pair |
|--------------|-----------------------------------|------------------------------------|

*See Figure 20, Appendix 11.

J. Foam Rubber Landing Pit

Purpose: To absorb shock of landing for jumpers.

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------|---------------|-------------|
| 1. Old tires | 140 | |
| 2. Foam rubber | 800 lbs. | |
| 3. Discarded tennis nets | 4 | |
| 4. 2x4 post | 4 | 5' long |
| 5. Single bed mattresses | 4 | |
| 6. Nylon rope | 4 | 1/8"x10' |

Tools: Shovel and post-hole digger.

Directions:

1. Dig 16x16' pit 30" deep.
2. In each corner dig post hole 12" deeper.
3. Insert post (4) angling away from pit.
4. Wrap post with mattresses (5) and tie with rope (6).
5. Insert tires (1) in 3 layers.
6. Fill pit with foam rubber (2).
7. Attach netting (3) to post.

| <u>Cost:</u> | <u>Home-made</u> | <u>Purchased</u> |
|--------------|-------------------|------------------|
| | \$25.00 - 100.00 | \$970.00 - |
| | depending on | 1769.00 |
| | materials donated | |

Equipment Room

The major complaint of respondees regarding interscholastic athletic problems was the lack of equipment storage space. Excluding the heavy teaching aids and apparatus, the main concern was centered around the proper storage of uniforms and protective clothing. This concern arises from the lack of adequate storage space and the necessity of storage methods which will insure proper airing of materials. This writer has

proposed a "hanging" type of equipment storage which will facilitate maximum usage of all available space, adequate circulation of air and individual storage that allows for ease of equipment inspection and inventory.

A. Hanging Shoulder Pad Storage Pole*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|---------------------|---------------|-------------|
| 1. 2x4 board | 1 | 8' long |
| 2. 3/4" dowels | 16 | 26" long |
| 3 1/4" hook and eye | 1 | 1" long |

Tools: Drill, 3/4" bit, tape measure and pencil.

Directions:

1. Mark board (1) each 6 inches at narrowest point on both sides.
2. Drill 3/4" holes through board on 6 inch marks.
3. Insert eye (3) in ceiling.
4. Insert hook (3) in top of board.
5. Insert dowels (2) into holes so they slide freely.
6. Hook onto eye.

Space: Storage pole with shoulder pads mounted takes up 6 square feet of floor to ceiling space.

| | | |
|--------------|----------------------------|-----------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$4.55 | <u>Purchased</u> Not available |
|--------------|----------------------------|-----------------------------------|

B. Hanging Helmet Storage Pole (stores 28 helmets)**

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|----------------------|---------------|-------------|
| 1. 2x2 board | 1 | 8' long |
| 2 3/4" dowels | 14 | 24" long |
| 3. 1/4" hook and eye | 1 | 1" long |
| 4. Glue | 1 pt. | |

*See Figure 21, Appendix II.

**See Figure 21, Appendix II.

Tools: Drill, 3/4" bit, tape measure and pencil.

Directions:

1. Mark both sides of board (1) 12" from its base. Turn and mark board 14" from base on two sides not previously marked. Alternate sides on pole, continuing to mark each 12", placing mark 1" in from each edge of board (mid-point).
2. Drill 3/4" holes through board on marks.
3. Insert eye (3) in ceiling.
4. Insert hook (3) in top of board.
5. Hang pole. Insert dowels (2) beginning at topmost hole and work downward. Insert dowel through hole until 9" protrudes from opposite side. Apply glue (4) to 2" of dowel closest to board (1) and continue to slide through hole until the dowel extends 11" on each side of the board.
6. Mount helmets by sliding ear-holes over dowels. Will hold 28 helmets.

Space: Requires 4 square feet floor to ceiling.

| | | |
|--------------|----------------------------|-----------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$4.00 | <u>Purchased</u> Not available |
|--------------|----------------------------|-----------------------------------|

C. Clothes Pole*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|-------------------------|---------------|-------------|
| 1. 1/2" galvanized pipe | 1 | 12' long |
| 2. 1/8" wire | 3 | 2' long |
| 3. 1/4" eyes | 3 | 1 1/2' long |
| 4. Coat hangers | | |

Tools: Drill, 1/8" bit, pliers.

Directions:

1. Drill 1/8" hole completely through 12" from each end of pipe and at pipe's mid-point.
2. Place eyes in ceiling at same spacing as pipe holes.
3. Fold wire in half, insert through hole in pipe, looping around long strand of wire and pulling tight. Repeat for each hole.

*See Figure 22, Appendix II.

4. Loop wire attached to poles through eyes in ceiling and tighten.

5. Place coat hangers on pole.

Space: Square footage used depends upon type of garments hung on storage rod.

| | | |
|--------------|----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$4.50 | <u>Purchased</u> \$17.50 |
|--------------|----------------------------|-----------------------------|

D. Storage Container for Footballs*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|---------------------------|---------------|-------------|
| 1. 1/32" sheet metal | 1 | 86" x 5' |
| 2. Metal straps and nails | 2 | 1/2" x 32" |
| 3. Rivets | 15 | 1/4" long |
| 4. Cardboard circles | 5 | 42" diam. |

Tools: Ball pein hammer, metal punch, tin snips, 2 saw-horses, 6' long board, scribe, metal roller and file.

Directions:

1. Measure in 1/4" from each edge of 5' side of sheet metal (1) and mark. Draw line length of metal.
2. Mark each 4" along lines.
3. Punch each 4" mark along lines.
4. Roll 86" metal into 42 1/2" cylinder.
5. Place board through cylinder and rest on holes on board.
6. Insert rivets into holes one at a time, being sure that hole is directly over board, and flatten rivet with hammer until all holes are riveted.
7. Measure 12" above base and 180° around cylinder. Mark and cut out, smoothing rough edges.
8. Place against wall opening facing out and attach with straps (2).
9. Insert 2 balls tips down, cardboard circle (4), repeating this procedure until full. Holds 10 balls.

*See Figure 23, Appendix II.

Space: Requires approximately $3\frac{1}{2}$ square feet.

| | | |
|---------------|-----------------------------|-----------------------------|
| <u>Cost</u> : | <u>Home-made</u> \$10.75 | <u>Purchased</u> \$32.10 |
|---------------|-----------------------------|-----------------------------|

E. Storage Container for Basketballs*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|--------------------------------|---------------|-------------|
| 1. $1/32$ " sheet metal | 5 ft. | 30" wide |
| 2. Lengths metal strap 1" wide | 2 | 38" long |
| 3. Rivets | 15 | |

Tools: Sheet metal roller, hammer, metal punch, long metal tube, tin snips.

Directions:

1. Roll 30" sheet metal (1) into $29\frac{1}{2}$ " cylinder.
2. Overlap edges 1". Punch holes through edges at 4" intervals $\frac{1}{4}$ " from edges, being sure to match hole alignment.
3. Insert rivets one at a time. Insert metal tube in cylinder against rivet head and pound rivet stem flat against outside face. Repeat procedure until remaining 1 foot is left.
4. Cut 180° 12" high semi-circle from base.
5. Place against wall in storage room, attaching to wall with straps (2).

This dispenser can be modified for baseball and football storage by modifying the width of sheet metal (1) used. All else remains the same.

| | | |
|---------------|----------------------------|-----------------------------|
| <u>Cost</u> : | <u>Home-made</u> \$5.00 | <u>Purchased</u> \$32.10 |
|---------------|----------------------------|-----------------------------|

F. Shoe Storage Rack (Stores 12 pairs of shoes)*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|------------------------|---------------|-----------------|
| 1. 1x2 board | 1 | 6' long |
| 2. $3/8$ " wood screws | 8 | 1- $3/4$ " long |

*See Figure 24, Appendix II.

**See Figure 25, Appendix II.

3. 1/4" dowels 24 9" long
 4. Glue 1 pt.

Tools: Drill, 1/4" wood bit, screwdriver, angle, rule and pencil.

Directions:

1. Beginning at end of 1x2 (1) measure and mark each 3 inches.
2. Drill holes at 45° angle at each mark to depth of 3/4 of an inch.
3. Apply glue to one end of dowel (3) and hole, inserting dowel into hole. Repeat procedure until all dowels attached to board.
4. Drill 1/4" vertical hole 1/4" in from upper and lower edges of 2" side of board at 2-foot spaces beginning at one end.
5. Attach to wall with screws (2).
6. Slip shoes over dowels for storage.

Space: 12 square feet of wall space.

| | | |
|--------------|----------------------------|-----------------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$3.20 | <u>Purchased</u> Not available |
|--------------|----------------------------|-----------------------------------|

G. Wall Bat Rack*

| <u>Materials</u> | <u>Amount</u> | <u>Size</u> |
|---------------------------------------|---------------|-------------|
| 1. 1x4 board | 1 | 5' long |
| 2. 4" shelf braces with screws to fit | 3 | |

Tools: Saw, drill, 1 1/2" bit, screwdriver, sandpaper.

Directions:

1. Drill line of holes (1 1/2") in board (1) 1/2 inch from edge.
2. Cut a slot (1 1/4") wide into holes.
3. Sand rough edges.
4. Attach to wall with braces (3).

| | | |
|--------------|----------------------------|-----------------------------|
| <u>Cost:</u> | <u>Home-made</u> \$1.15 | <u>Purchased</u> \$20.30 |
|--------------|----------------------------|-----------------------------|

*See Figure 26, Appendix II.

Summary

The preceding chapter has presented directions for construction of different types of athletic teaching aids, game equipment, storage racks, and containers which can be home-made. This list is by no means complete, but it does provide some ideas for the reader to explore.

Even though this equipment is neither extensive nor elaborate, it is practical and less expensive than manufactured goods. The small school with limited finances can save money by constructing many of these specialized items and involve various segments of the school in their construction.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The purposes of this study were:

1. to determine the budget, equipment and storage problems of the class 'A' Oregon high schools.
2. to explore those factors which could enable the small high school with limited resources to solve budget related problems concerning the purchase, care and construction of athletic equipment.
3. to provide a means of constructing some inexpensive interscholastic athletic equipment and teaching aids.
4. to recommend ways and means of overcoming some of the equipment problems in the small high school.

The chief emphasis was placed on those problems which resulted from budget inadequacies and which could be partially remedied through the construction of home-made athletic equipment and related teaching aids. However, the money saved through building, as opposed to purchasing, equipment will be rendered meaningless without the sound business practices of purchasing quality official equipment for a program of standardized athletic equipment, maintaining adequate management procedures regarding athletic equipment retention and off-season equipment storage methods which will insure equipment preservation. The combination of savings resulting from home-made items and sound business practices will allow the class 'A' high school to reap the economic benefits of additional purchasing power for the small athletic budget.

The analysis of budget-related equipment problems in the class 'A' high schools of Oregon led to the following recommendations that would help solve the problem of adequate equipment on an inadequate budget, thereby improving the interscholastic athletic programs of these schools.

Budget

Data in this study indicated that a majority of class 'A' Oregon high schools had budgets under \$2,800.00.

Recommendation. It is recommended that athletic equipment and teaching aids which could be home-made be so constructed, thus aiding athletic budget funds. It is also recommended that class 'A' schools join together, forming an athletic purchasing organization. Through the pooling of funds, purchasing power would be increased.

Equipment

Data compiled through this study indicated that 40 percent of the Oregon class 'A' high schools had inadequate athletic equipment or teaching aids.

Recommendation. It is recommended that before equipment is bought the feasibility of constructing that which would otherwise be purchased be studied. Equipment should be constructed when money can be saved, with the savings being used to purchase uniforms, protective clothing and those other items or supplies necessary for player participation and for the administration of scheduled athletic events or practices.

The above will result in the total up-grading of athletic equipment and student-athlete performance levels.

Athletic Equipment Control

The study revealed that a system of inventory and equipment record keeping was in force at class "A" high schools (Table VI). However, a large percentage of these schools failed to mark their equipment for identification. The failure to mark equipment often results in inaccurate inventory count, causing difficulty in planning the budget and locating lost or stolen equipment.

Recommendation. It is recommended that all equipment be identified with an inventory number and the initials of the school in a permanent manner. This simple method of marking can bring additional savings of athletic funds, which otherwise would have to go into equipment replacement of lost or stolen unidentifiable athletic equipment.

Construction of Equipment

The study indicated that a majority of the schools spent money needlessly on purchasing items which could be home-made.

Recommendation. It is recommended that where applicable, industrial arts departments be fully utilized in the construction of home-made athletic equipment. The inclusion of the industrial arts department in the construction of athletic-related teaching aids and equipment will decrease athletic expenses and give educational benefit to the students involved in the project. It might also unify departments of

the school in a project for the students and provide items that will be in usage even after those who have assisted in their construction are graduated.

In those cases where an industrial arts department is unavailable, equipment can still be constructed with initiative on the part of the athletic department, administration and student body. It is further recommended that whenever possible labor, material and tools be donated, insuring still greater savings.

Equipment Storage

Data resulting from the study indicated that half of the schools had inadequate space for equipment storage.

Recommendation. It is suggested that any equipment room or space used for the storage of athletic items can be made adequate through initiative on the part of the person delegated this responsibility. Equipment storage poles suspended from the ceiling should be used in place of racks, bins and shelves whenever possible. This method allows for greater usage of available space, insures the free circulation of air around and upon the equipment, while storing it in such a manner as to alleviate much of the equipment breakdown caused by improper storage methods. The result is longer life of equipment and additional dollar savings.

This study has been an attempt on the part of the author to examine the budget-related equipment problems of Oregon class "A" high schools and to show how, through the construction of items which would otherwise

be purchased, savings can be realized. These savings can then be re-directed into other athletic needs, thereby upgrading the total program.

Recommendations for Further Study

1. Comparison of athletic cost per student in class "A" schools, with that of "AA" and "AAA" high schools of Oregon.
2. Comparative study of class "A", "AA" and "AAA" high school athletic budgets.
3. Percentage of budgeted funds for interscholastic athletics used for actual purchasing of equipment.
4. Feasibility of interscholastic athletic programs on the class "A" level funded solely through gate receipts.
5. Number of Oregon high school athletic programs subsidized by school district budgets and number dependent on paying their own way.
6. Comparative study of class "A", "AA" and "AAA" high school athletic equipment.
7. Feasibility of an athletic equipment purchasing association of small high schools.

BIBLIOGRAPHY

BOOKS

1. Bourquardez, V., and Heilman, C. Sports Equipment, Selection, Care, and Repair, New York: A. S. Barnes and Company, 1950, p. 358.
2. Carter, J. How to Make Athletic Equipment, New York: Ronald Press Company, 1960, p. 390.
3. Forsythe, C. Administration of High School Athletics, 3rd. edition; New York: Prentice-Hall Incorporated, 1954, p. 462.
4. _____ . The Athletic Director's Handbook, New York: Prentice-Hall Incorporated, 1956, p. 193.
5. George J. and Lehmann, H. School Athletic Administration, New York: Harper and Row Publishing Company, 1966, p. 435.
6. Griffin, J. Handbook for Student Athletic Managers, Danville, Ill.; Interstate Printing Company, 1961, p. 94.
7. Healy, W. Coaching and Managing High School Basketball, Danville, Illinois: Interstate Printing Company, 1942, p. 214.
8. Hixon, C. The Administration of Interscholastic Athletics. New York: J. Lowell Pratt and Company, 1967, p. 192.
9. Howard, G., and Masonbrink, E. Administration of Physical Education, New York: Harper and Row Publishing, 1963, p. 462.
10. Meyer, H. Financing Extra-Curricular Activities. New York: A. S. Barnes and Company, 1949, p. 132.
11. Meyer, K. The Purchase, Care and Repair of Athletic Equipment. St. Louis: Educational Publishers, 1948, p. 158.
12. Michigan State University. National Workshop on Equipment and Supplies for Athletics, and Physical Education and Recreation. Chicago: American Athletic Institute, 1960, p. 97.
13. Shepard, G., and Jamerson, R. Interscholastic Athletics. New York: McGraw Hill Book Company, 1953, p. 267.
14. Voltmer, E., and Esslinger, A. The Organization and Administration of Physical Education, New York: S. F. Crafts and Company, 1942, p. 419.
15. _____, and Brownell, C. The Administration of Health and Physical Education, Philadelphia: W. B. Saunders Company, 1951, p. 439.

16. _____, and Hughes, W. Athletic in Education. Philadelphia: W. B. Saunders Company. 1946, p. 403.

ARTICLES

17. Ahern, T. "Financing the Interscholastic Athletic Program", National Association of Secondary Schools Bulletin, 44:36, May, 1960.
18. "Aids to Winning Basketball Games", Athletic Journal, 49:99, January, 1969.
19. "Athletic Purchases Need Close Attention:", ed., Athletic Journal, 49:99, January, 1969.
20. Babjak, T. "Five Track and Field Devices that are Easy to Make", Athletic Journal, 42:85, February, 1962.
21. Baldwin, K. "Take Care of your Athletic Equipment", American Association of Health, Physical Education and Recreation Journal, December, 1956, p. 12.
22. Batterman, M. "Win the Battle of the Budget", Athletic Journal, 38:10, November, 1957.
23. Behtendt, O. "Beginning a High School Football Program", Athletic Journal, 39:52, April, 1959.
24. Bergeman, B. "Asphalt Runways and Approaches at No Cost", Athletic Journal, 49:86, May, 1969.
25. Boenheim, J. "Football Equipment System for the Small High School", Scholastic Coach, 28:34, January, 1969.
26. Castle, A. "Buyers Beware", American Association of Health, Physical Education and Recreation Journal, May, 1956.
27. Chiappy, J. "Clean Basketballs", Athletic Journal, 39:89, September, 1958.
28. Corlis, G. "Managing the Football Equipment", Scholastic Coach, 38:38, May, 1969.
29. Duncan, R. "A War-time Physical Conditioning Program for the Small High School", Athletic Journal, 16:72, November, 1942.
30. Fagan, C. "Misconcepts About Protective Equipment and Procedures in Athletics", Journal of School Health, 34:168, April, 1964.

31. Godfrey, P. "Equipment Care and Handling", Scholastic Coach, 28:24, January, 1959.
32. Greer, H. "Build Your Own Indoor Vaulting Box", Scholastic Coach, 34:44, January, 1965.
33. Griffin, J. "Organization and Administration", Athletic Journal, 4:13, March, 1924.
34. Harris, H. "Tension Machine for Developing Sure-Fingered Rebounders", Scholastic Coach, 27:24, January, 1958.
35. Hatfield, W. "The Present Need for the Proper Handling of Athletic Equipment", Athletic Journal, 22:36, March, 1942.
36. Irwin, A. "Put Your Equipment on Wheels", Scholastic Coach, 35:10, January, 1966.
37. Johnson, J. "Hay-Feeder Storage", Athletic Journal, 41:46, January, 1961.
38. Kaczmarek, J. "Equipment Care: Cardinal Obligation", American School Board Journal, 153:29, August, 1966.
39. Kilmer, H. "Fiberglass Vaulting Pits", Scholastic Coach, 35:42, January, 1966.
40. "Laundering Your Gear", Scholastic Coach, 28:64, January, 1959.
41. Murry, F. "Perpetual Inventory", Scholastic Coach, 31:20, 1962.
42. "Ordering Your Equipment", Scholastic Coach, 30:64, January, 1961.
43. Palmer, L. "Vertical Jump Boards", Athletic Journal, 49:53, October, 1968.
44. Pease, J. "Tips on Purchasing Your Equipment", Journal of Health, Physical Education and Recreation, 28:27, December, 1957.
45. Perrin, J. "All Purpose Training Device", Athletic Journal, 44:70, April, 1964.
46. Ross, W. "Inexpensive High Jump Standard", Athletic Journal, 41:62, February, 1961.
47. Schnase, W. "So You Want a Leg Press Machine", Athletic Journal, 48:54, May, 1968.
48. Shragg, M., and Stites, O. "Make Your Own Basket Indicator", Athletic Journal, 49:51, November, 1968.

49. Slee, O., and Pote, P. "Make Your Own Baseball Visual Aids", Scholastic Coach, 38:34, January, 1969.
50. Smarks, P. "Constructed a Helmet Rack", Athletic Journal, 38:27, December, 1957.
51. Smith, W. "Athletic Equipment" It's Purchase and Care", Catholic Schools Journal, 62:97, April, 1962.
52. Sullivan, K. "The Equipment Problem", Scholastic Coach, 17:38, January, 1948.
53. Tupper, R. "Build Your Own Yard Markers", Athletic Journal, 45:92, September, 1964.
54. Vernier, E., and Tebbs, M. "Be Specific", Journal for Health, Physical Education and Recreation, 29:9, December, 1958.
55. Whited, C. "These Purchasing Pointers Help Cut Sports Supply Cost in New York State", American School and University, 40:31, August, 1968.
56. Wolford, H. "Foul-a-cator", Industrial Arts and Vocational Education, 49:36, January, 1970.
57. Zirbes, K. "Storing Football Shoulder Pads", Athletic Journal, 39:58, September, 1958.

APPENDIX I

QUESTIONNAIRE

Class "A" Secondary School Boys' Interscholastic Athletics

| | |
|------|--------|
| NAME | SCHOOL |
|------|--------|

Instructions: Please check or circle answer.

- | | |
|--|--|
| <p>1. What is your enrollment? <input type="checkbox"/> 50- 99 <input type="checkbox"/> 100-149 <input type="checkbox"/> 150-200</p> <p>2. Interscholastic sports in which school participates? <input type="checkbox"/> Football <input type="checkbox"/> Basketball <input type="checkbox"/> Baseball <input type="checkbox"/> Track <input type="checkbox"/> Wrestling <input type="checkbox"/> Other _____</p> <hr/> <p>3. Circle number of coaches in athletic department. 1 2 3 4 5</p> <p>4. What is the size of your athletic budget? _____</p> <p>5. Do you consider this amount adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>6. Do you pool funds with other schools to increase purchasing power? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>7. Is your equipment adequate for training and participation in athletics? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>8. Is there adequate equipment storage space? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>9. Are off brands of equipment purchased? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>10. In space provided mark time of year equipment is purchased. Football _____ Basketball _____ Baseball _____ Track _____ Wrestling _____</p> | <p>11. What teaching aids does your school possess? (Circle if home-made)</p> <p><u>FOOTBALL</u> <input type="checkbox"/> Bags <input type="checkbox"/> 2 man sled <input type="checkbox"/> 7 man sled <input type="checkbox"/> Movie camera <input type="checkbox"/> Movie projector <input type="checkbox"/> Chute <input type="checkbox"/> Passing targets <input type="checkbox"/> Dummies <input type="checkbox"/> Tires or ropes <input type="checkbox"/> Reaction machine <input type="checkbox"/> Other _____</p> <hr/> <p><u>BASEBALL</u> <input type="checkbox"/> Pitchback <input type="checkbox"/> Pitching targets <input type="checkbox"/> 1st + 3rd protectors <input type="checkbox"/> Pitching machine <input type="checkbox"/> Batting tees <input type="checkbox"/> Other _____</p> <hr/> <p><u>BASKETBALL</u> (Please list) _____ _____</p> <hr/> <p><u>TRACK AND FIELD</u> <input type="checkbox"/> Batons <input type="checkbox"/> Starting blocks <input type="checkbox"/> Takeoff boards <input type="checkbox"/> Vaulting box <input type="checkbox"/> Discus circle <input type="checkbox"/> Shot circle <input type="checkbox"/> Vaulting poles Standards (Please list) _____ <input type="checkbox"/> Shot and discus markers <input type="checkbox"/> Other _____</p> <hr/> |
|--|--|

12. Do you have an industrial arts department? Yes No
13. Is the industrial arts department equipped to assist in the construction of equipment? Yes No
14. Would the industrial arts department be willing to help? Yes No
15. Who constructed most of this type of equipment?
 Coaches Industrial arts department
 Athletes Other _____
16. Do you have an equipment room inventory system? Yes No
17. Is your equipment standardized? Yes No
18. Are records kept of all purchases? Yes No
19. Is all equipment marked for identification? Yes No
20. Who orders athletic equipment? _____
21. Do salesmen call on your school? Yes No
22. Does quantity or quality determine type of equipment purchased?
 Quantity Quality
23. What do you consider your equipment (or lack of equipment) problems or needs?
24. Please explain how equipment is stored in the off-season.
25. Please return to: Robert B. Martin
1920 S. W. "A" Street
Corvallis, Oregon 97330

2 February, 1971

Dear Athletic Director:

I am presently working on the completion of a Master of Science Degree in Education at Oregon State University, where I also served as an assistant football coach in the football program. My thesis is entitled, "Home Made Equipment as a Possible Solution to Athletic Budget Problems in Small Oregon High Schools". I need your help.

Attached you will find a brief questionnaire and self-addressed stamped envelope. Would you please fill out and return the questionnaire so that the information can be used in a survey related to my work? Should you wish to add anything, please feel free to use the back side of the form.

It would be appreciated if you would return this questionnaire by the 18th of February, 1971. Should you wish a copy of the results, I would be more than happy to forward it to you upon your request. Thank you for your assistance and prompt consideration of this request.

Sincerely,

Robert B. Martin
Assistant Coach

Return to:

Robert B. Martin
1920 Southwest "A" Street
Corvallis, Oregon
97330

1920 S. W. "A" Street
Corvallis, Oregon 97330
12 March 1971

Editor
Athletic Journal Publishing Company
1719 Howard Street
Evanston, Illinois

Dear Sir:

I am requesting your permission to include excerpts from your article on "Aids to Winning Basketball Games", January, 1969, in my thesis.

Your prompt response to this request would be appreciated.

Sincerely,

Robert B. Martin

1920 S. W. "A" Street
Corvallis, Oregon 97330
12 March 1971

Mr. R. Tupper
c/o Athletic Journal Publishing Company
1719 Howard Street
Evanston, Illinois

Dear Mr. Tupper:

I am requesting your permission to include construction specifications of yard markers from your September, 1964, "Athletic Journal" article in my thesis.

Your prompt response to this request would be appreciated.

Sincerely,

Robert Martin

APPENDIX II

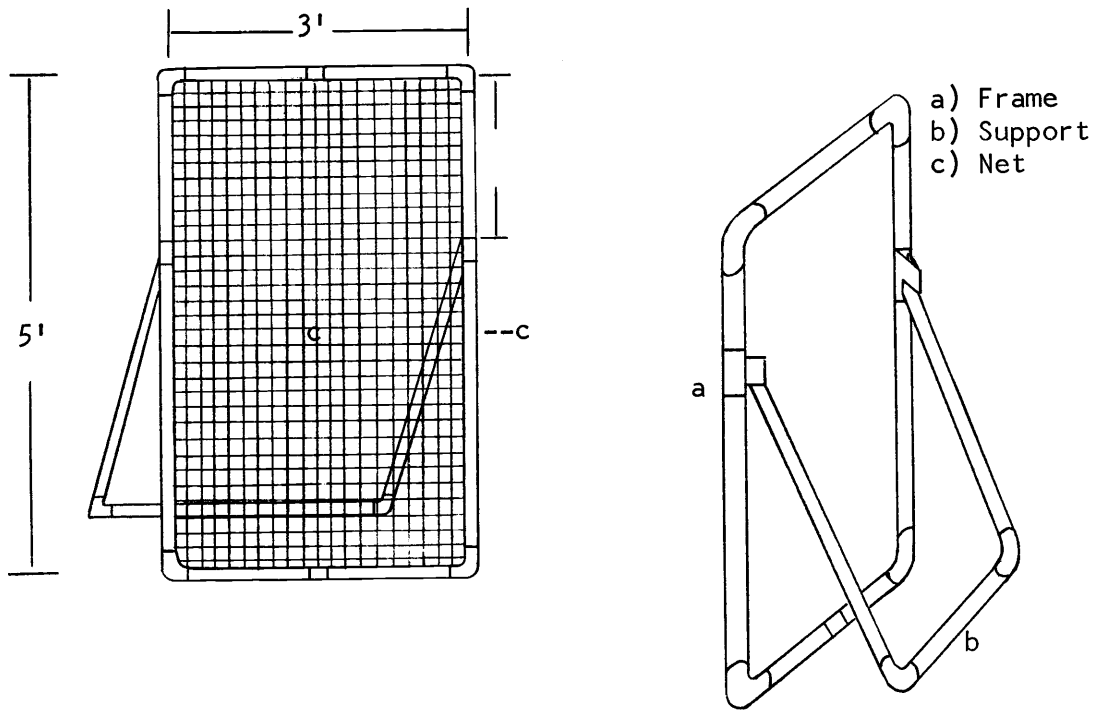


FIGURE 1. Pitch Back

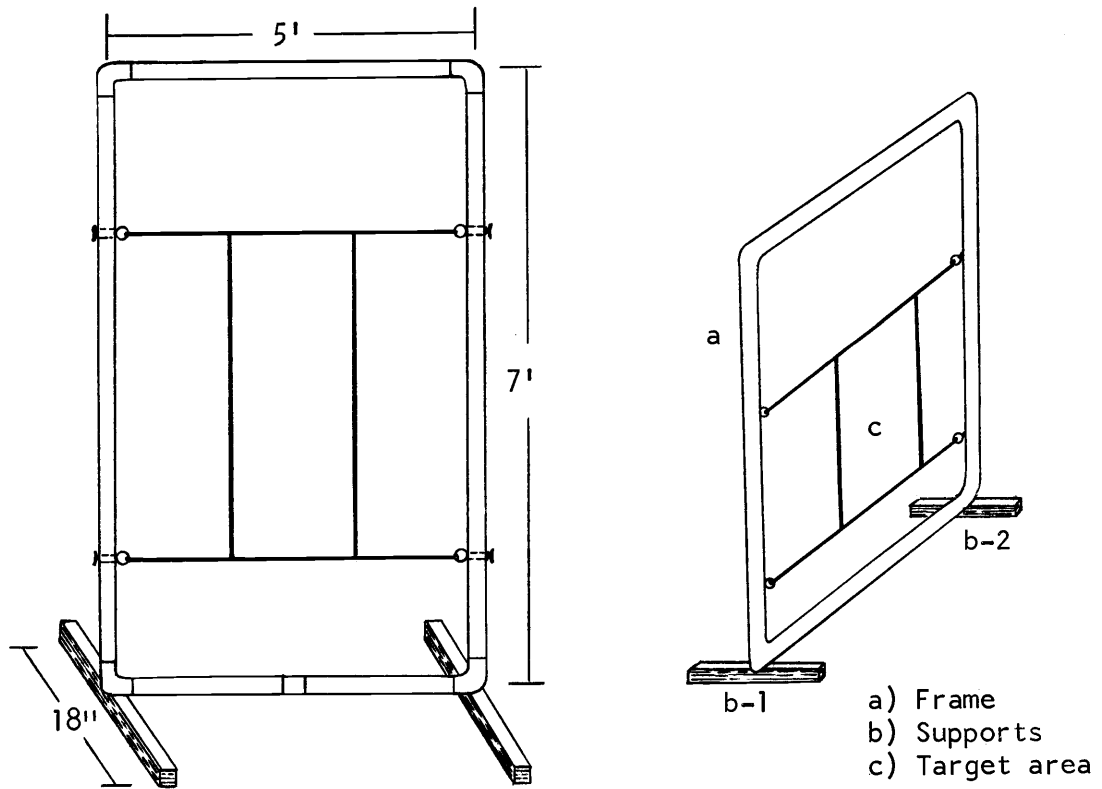


FIGURE 2. Pitching Target

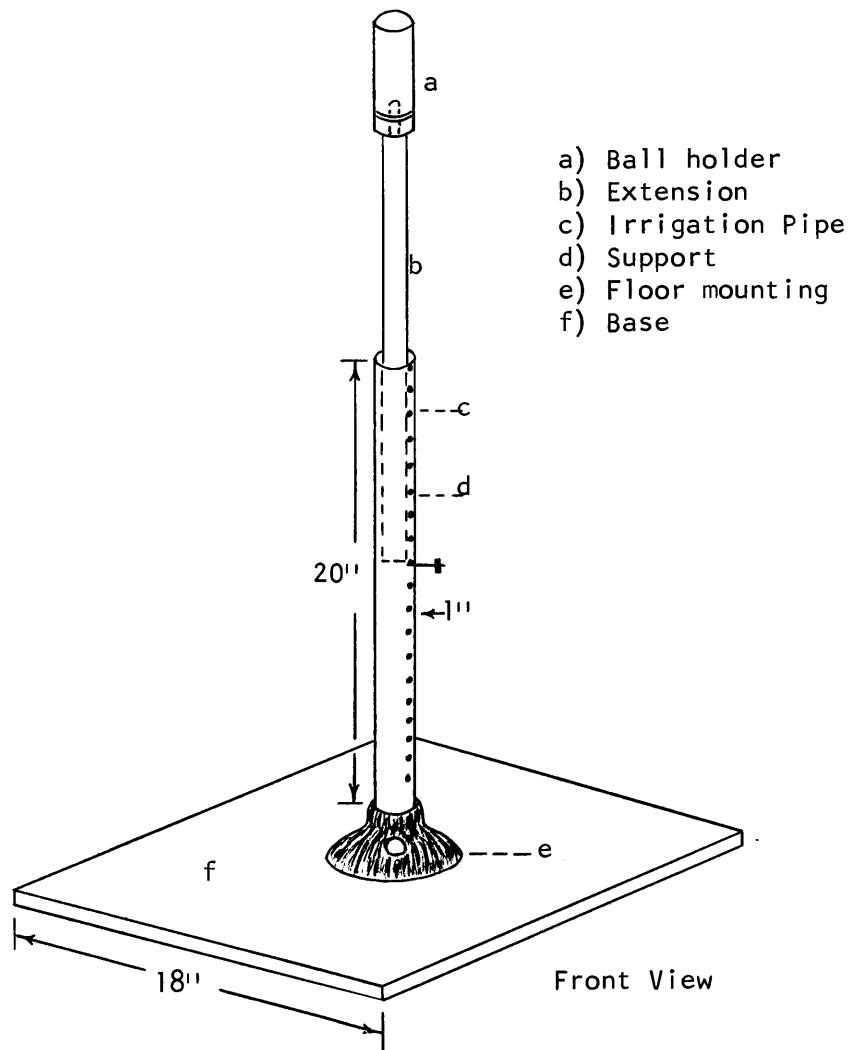


FIGURE 3. Batting Tee

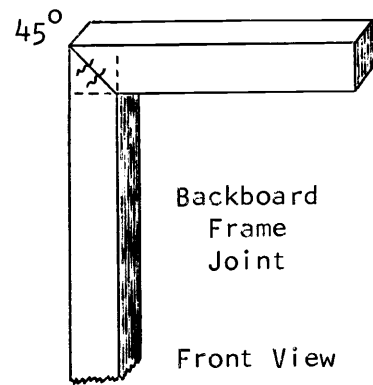
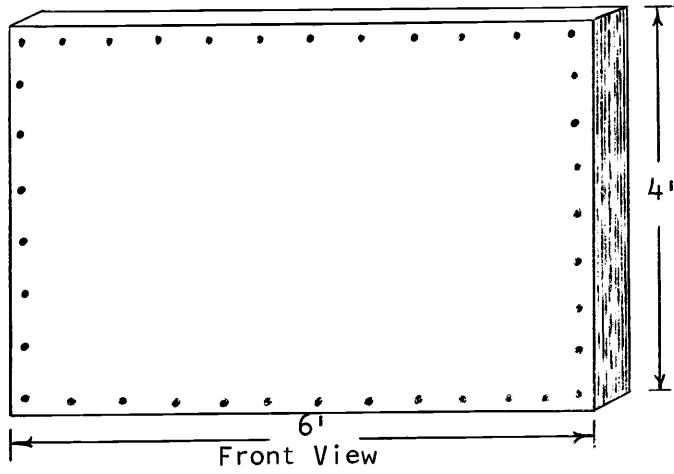
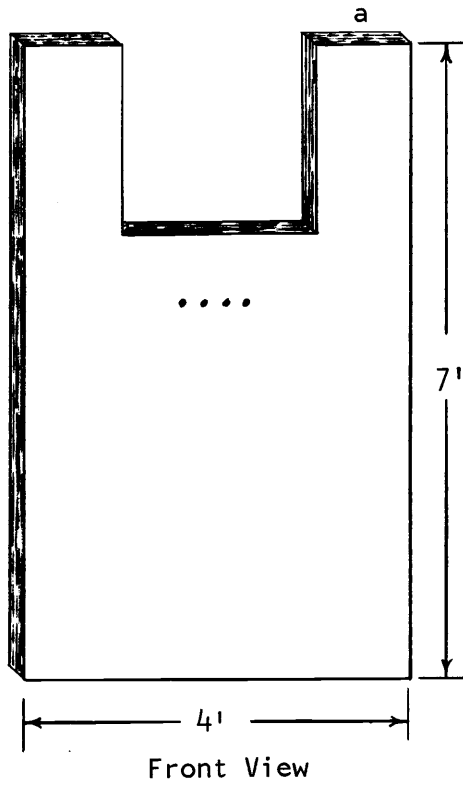


FIGURE 4. Backboard



- a) Dummy
- b) Support
- c) Hinge

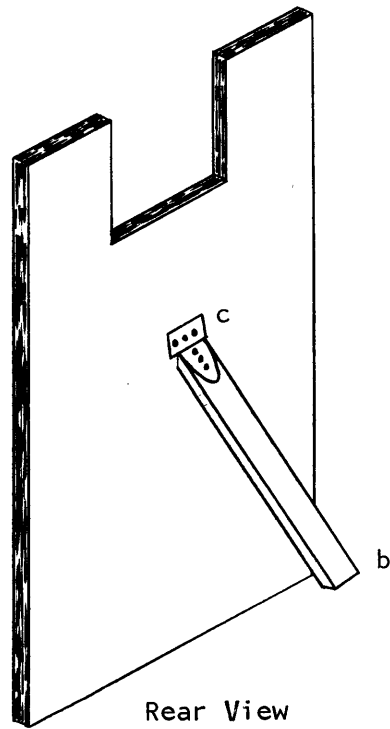
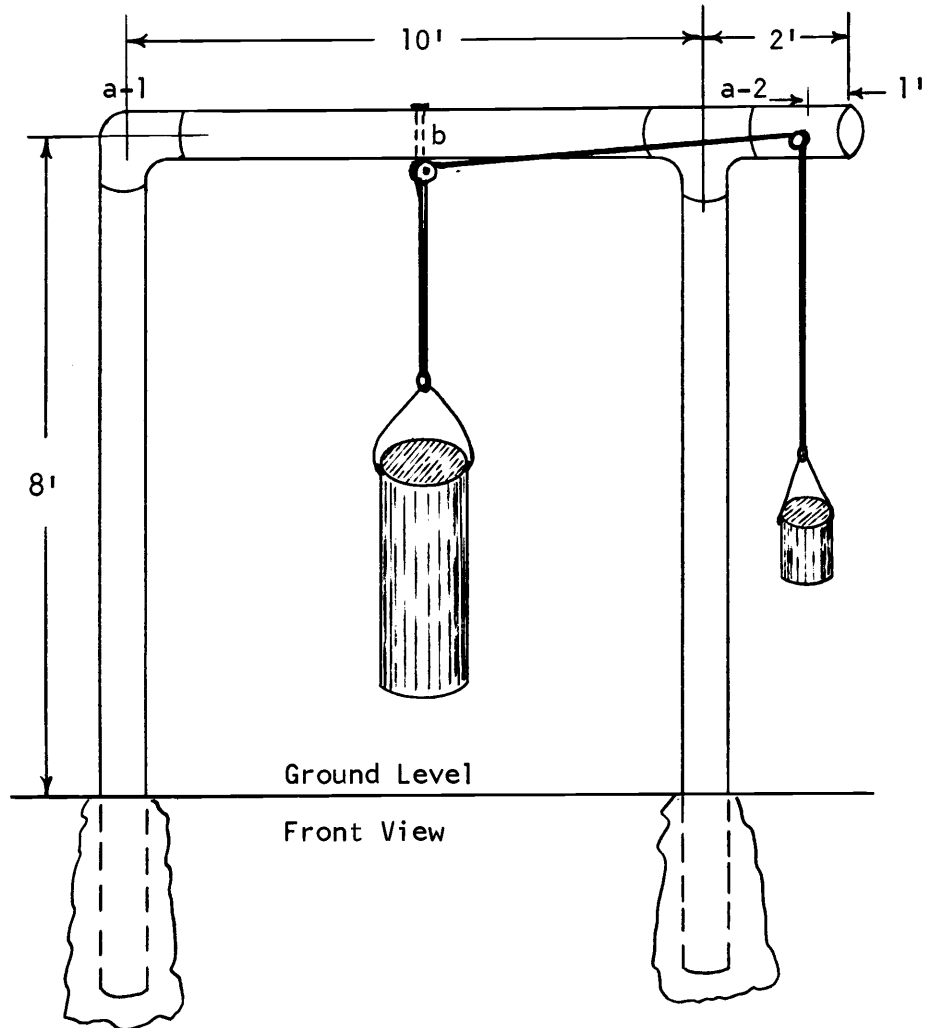


FIGURE 5. Secondary Dummy



- a) Supports
- b) Cross bar

FIGURE 6. Tackling Machine

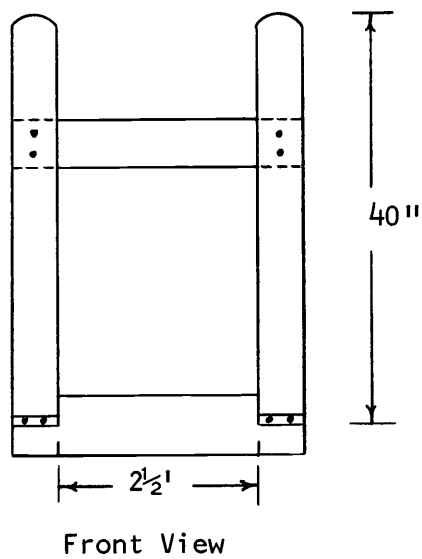
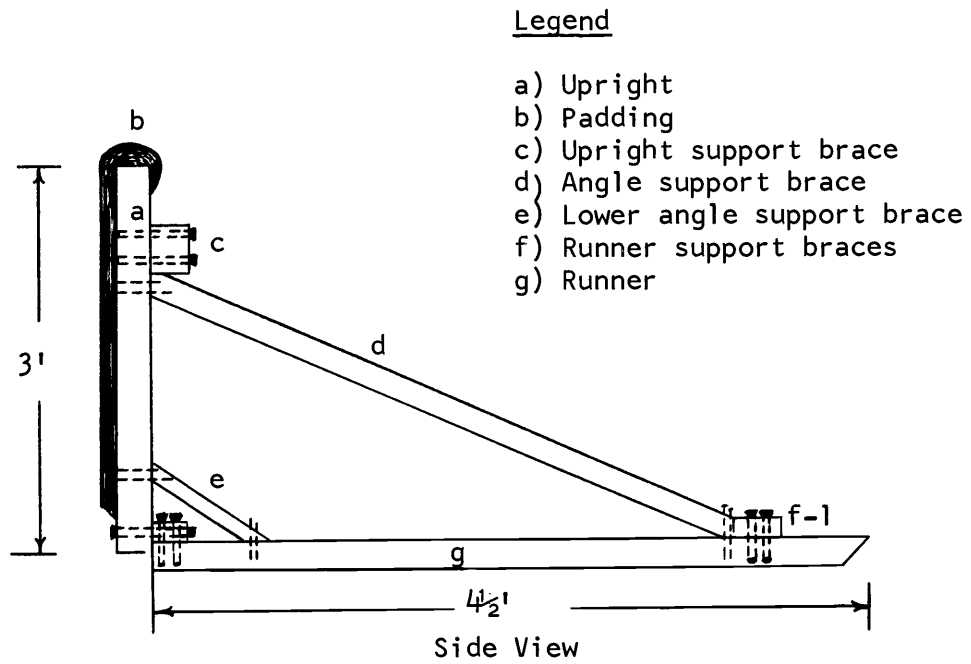
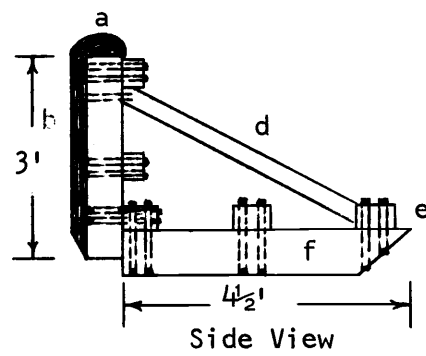
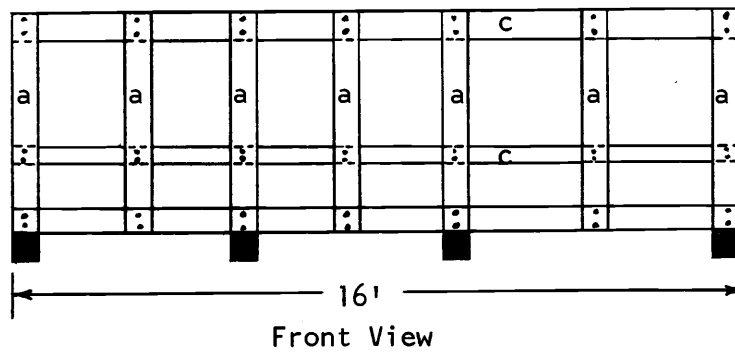


FIGURE 7. Two Man Charging Sled



- a) Uprights
- b) Padding
- c) Upright support braces
- d) Angle support brace
- e) Runner support braces
- f) Runners

FIGURE 8. Seven Man Charging Sled

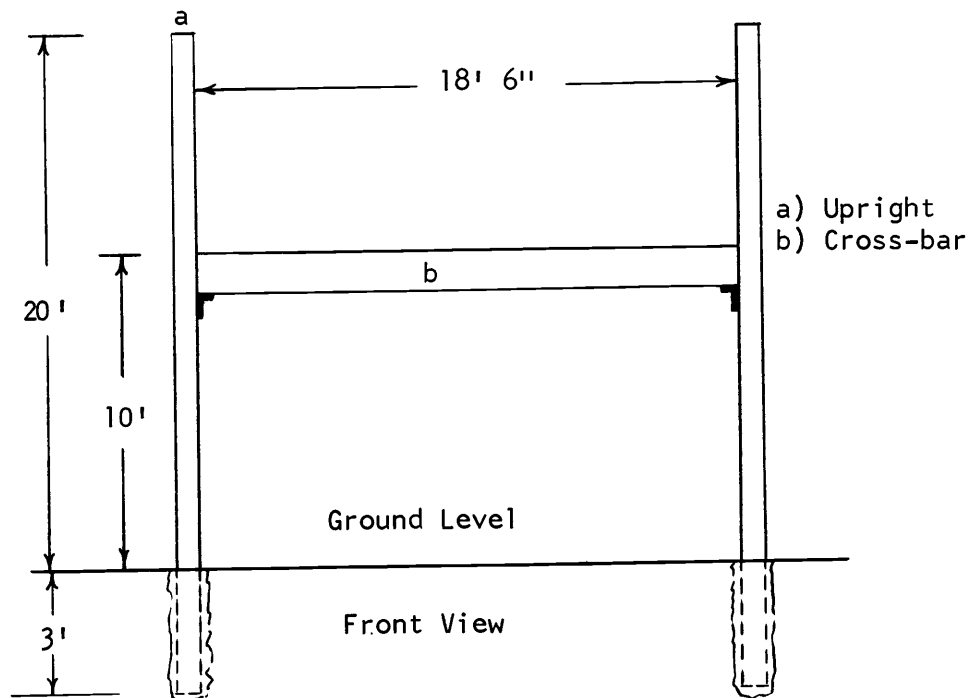


FIGURE 9. Temporary Goal Post

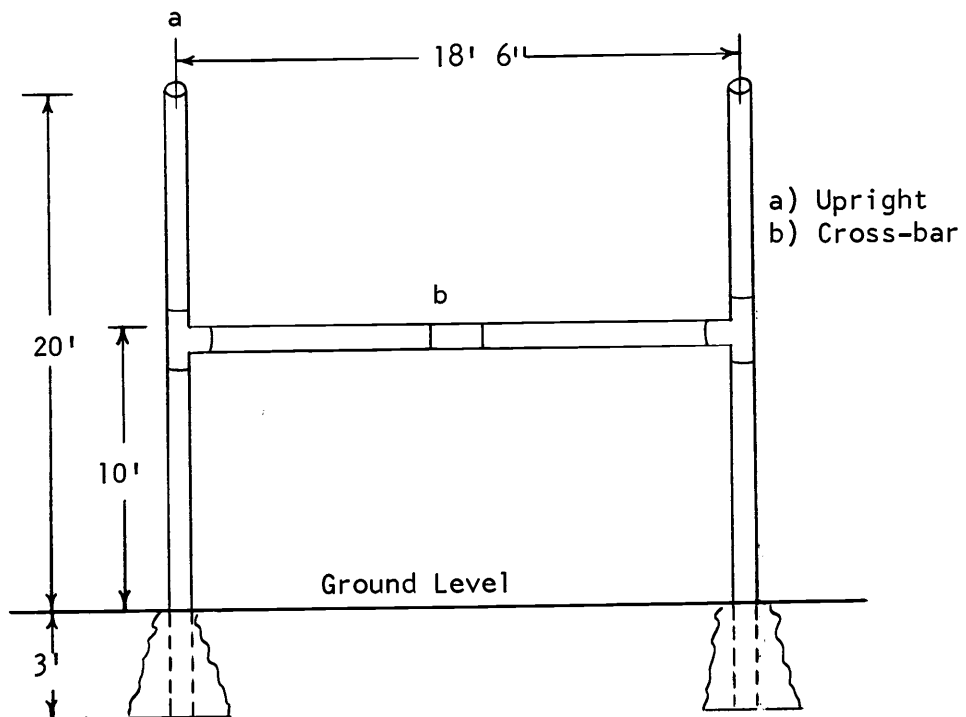


FIGURE 10. Permanent Goal Post

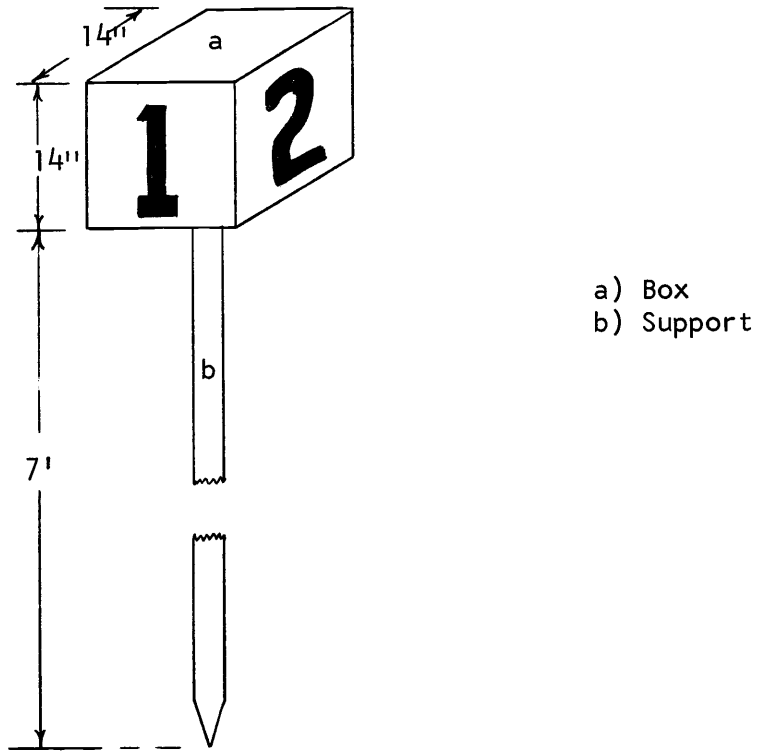


FIGURE 11. Down Marker

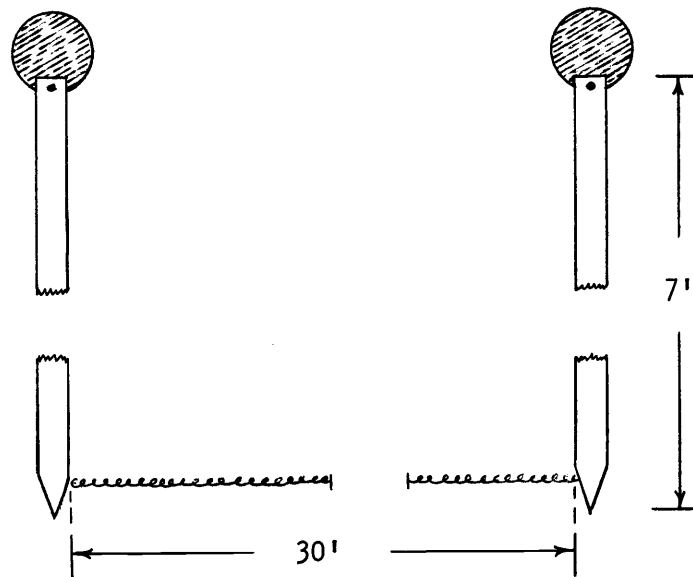


FIGURE 12. Linerman's Chain

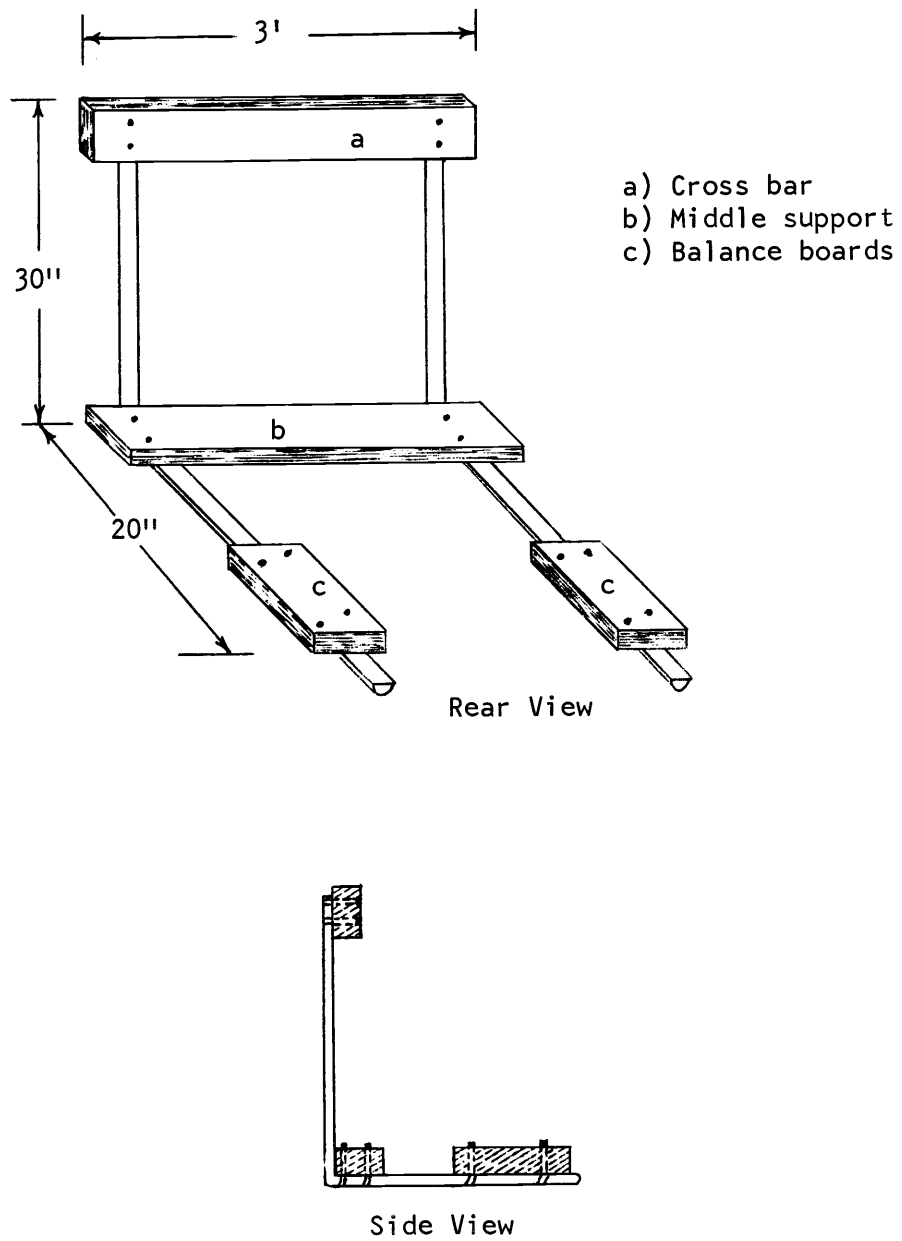


FIGURE 13. Hurdle (Low)

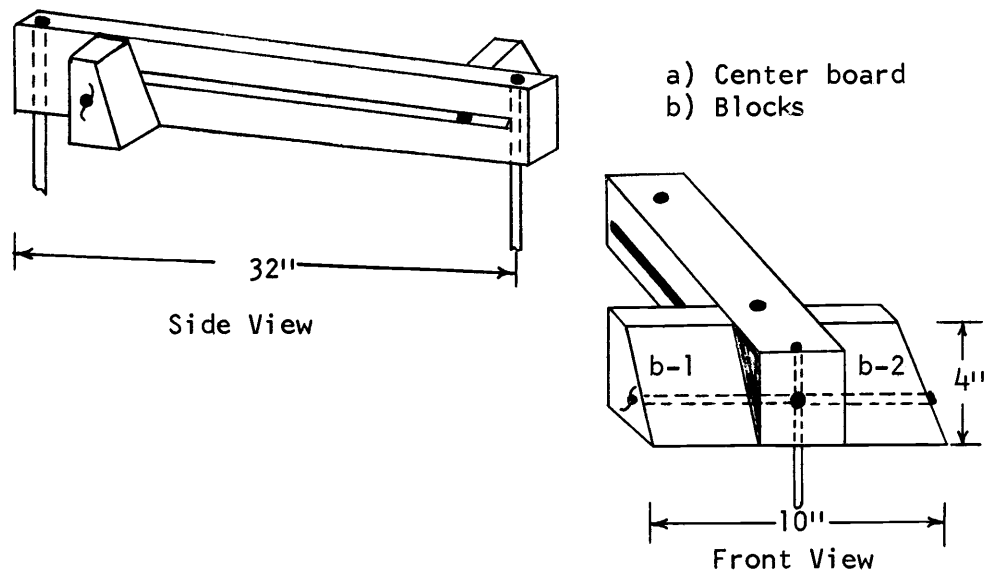


FIGURE 14. Adjustable Starting Blocks

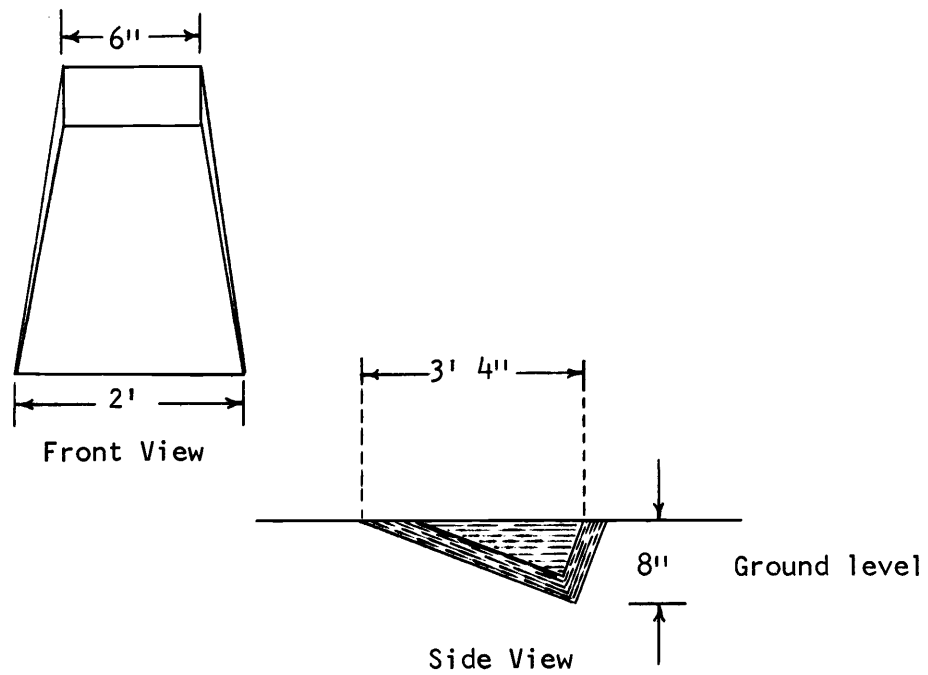


FIGURE 15. Vaulting Box

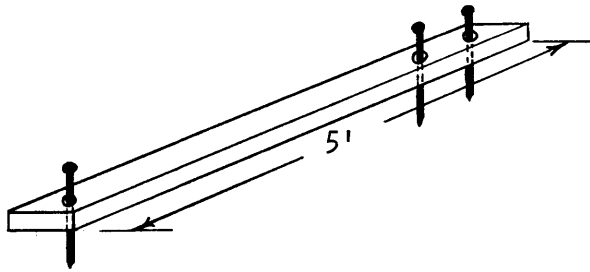


FIGURE 17. Shot-put and Discus Circle Marker

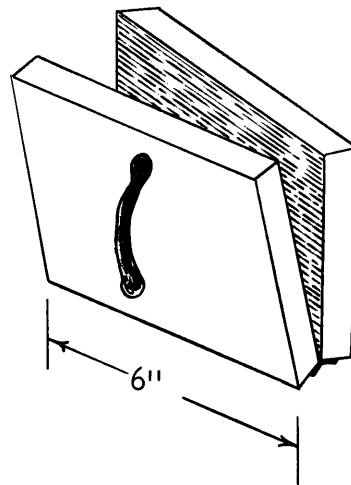


FIGURE 16. Bang-Board

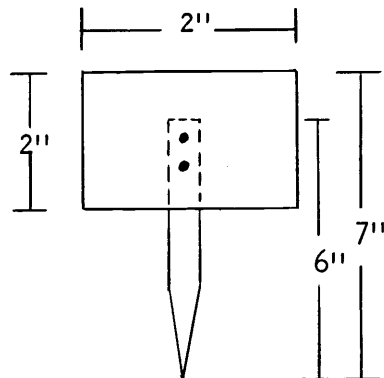


FIGURE 18. Shot-put and Discus Marker

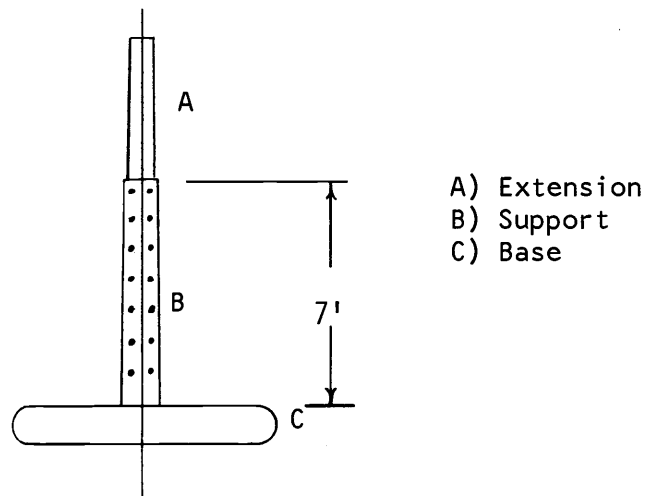


FIGURE 19. Pole-Vault Standard

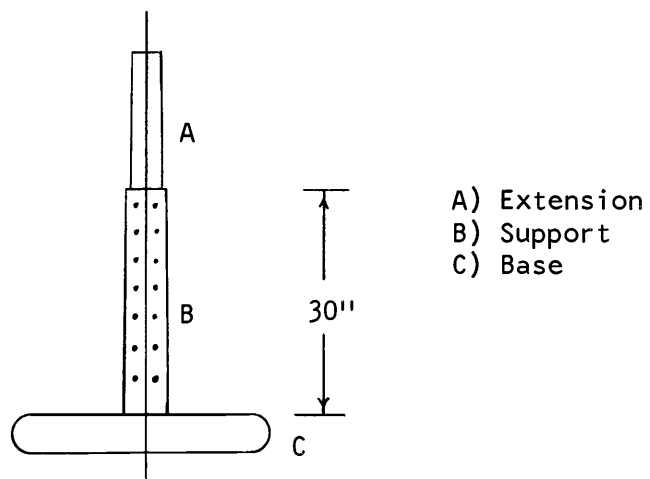


FIGURE 20. High Jump Standard

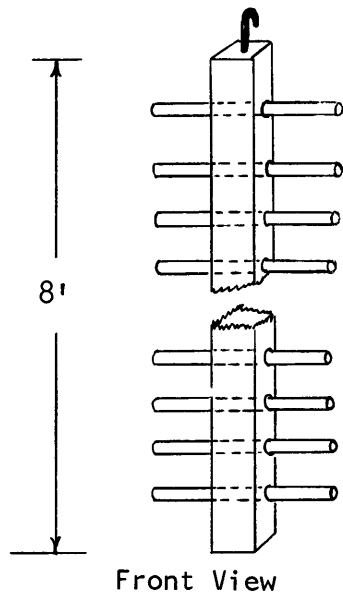


FIGURE 21. Shoulder Pad/or Helmet Storage Pole

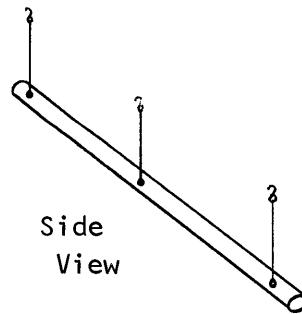


FIGURE 22. Clothes Pole

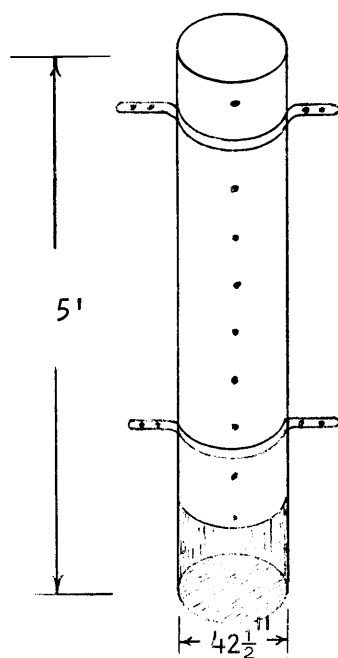


FIGURE 23. Storage Container for Footballs

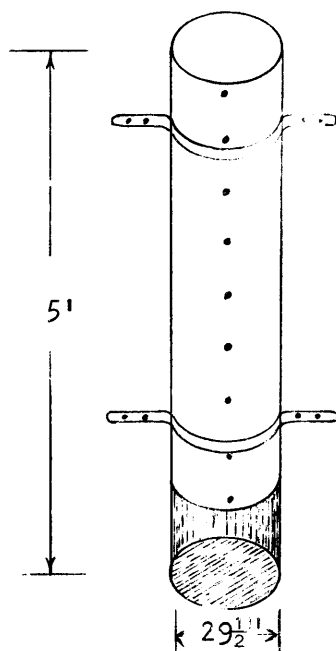


FIGURE 24. Storage Container for Basketballs

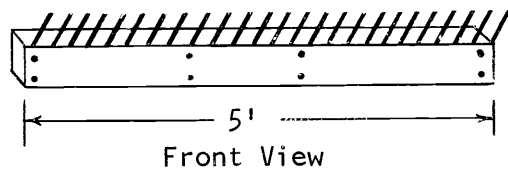


FIGURE 25. Shoe Storage Rack

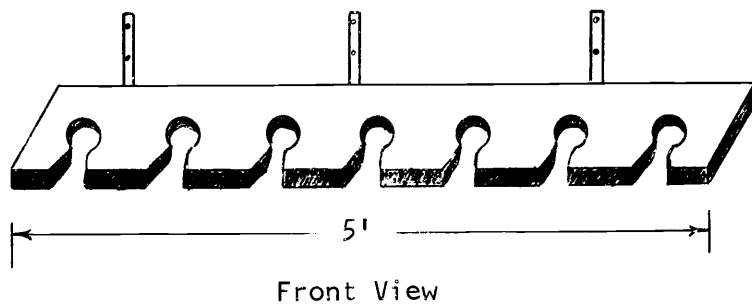


FIGURE 26. Wall Bat Rack