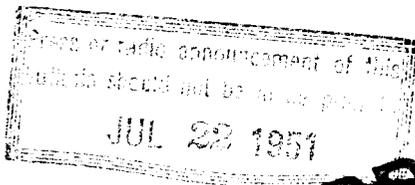


030.1
Or3200
no. 428
C.3

A Hoof-Trimming Chute for Cattle

H. B. Howell
W. E. Dent
H. D. Dorman



DISCARD

Agricultural Experiment Station
Oregon State College
Corvallis

Circular of Information 498

June 1951

A Hoof-Trimming Chute for Cattle

H. B. Howell, W. E. Dent, and H. D. Dorman
*John Jacob Astor Branch Experiment Station
Astoria, Oregon*

The Need

Dairy owners, beef owners, and herdsman have recognized for many years the necessity for proper care and trimming of the hooves of their animals. Many different methods have been used to trim the feet of cattle, including picking them up by sheer strength, throwing the animals, or trimming the outer shell with special hoof trimmers and then using a rasp, hoof nippers, and knife on them.

Where animals are confined over long winter periods or under conditions found along the Pacific coast where the rainfall is heavy and pastures are soft, the feet do not wear down naturally to keep them at proper length. See Figure 1.



Figure 1. An extreme condition of elongated toes on rear feet. Note attempt of farmer owner to cut ends off with wood chisel. It generally requires two or more trimmings to bring feet like these back to normal.

Acknowledgments: Many ideas have been combined in the development of this chute. An article in the *Guernsey Breeders' Journal* describing one at Happyholme Farms in California and another article in the *Western Livestock Journal* about a chute and rotary trimming device gave valuable help. Later, suggestions offered by Mr. Hay of Carnation Stock Farms in Washington were very helpful in regard to the lifting mechanism. All actual construction was done and many helpful ideas were supplied by Mr. H. D. Dorman of the staff.

This results in elongated toes and in many cases where the feet are neglected, the outer shell of the hoof grows underneath so that the animals do not walk naturally. This also brings about a weakened pastern joint, makes feet and pasterns sore so that the animals do not travel on pasture to get enough feed, and provides an excellent place for foot rot to start. See Figure 2.

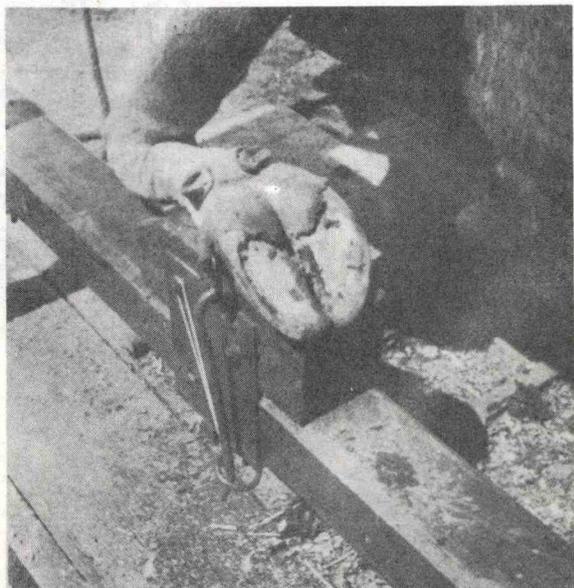


Figure 2. Front foot fastened in hoof block showing elongated outer shell and heel tissue. Note quick release device operated by moving lower ring down by stretching rubber band and removing curved iron from upper hole. Also holes in side of rail allowing adjustment forward and back by pulling out bolt just under rubber band.

In recent years, several ingenious herdsmen have devised chutes of various types for holding the animals while the feet were trimmed and a great deal of credit is given to these people for valuable ideas. A number of these were examined by the authors and several herdsmen contacted on their ideas as to improvements they would desire. These ideas seemed to present the following points to be desired:

- ▶ It should be strong enough to properly restrain any animal put in it.
- ▶ It should be light enough to permit reasonable portability.
- ▶ It should provide some means of easily supporting the animal's weight so that it cannot lie down while one foot is being worked on.
- ▶ It should be so designed that injuries to animals and men could be held to a very minimum.
- ▶ It should be of such construction so one or two men may operate the device.
- ▶ It should have some adjustable features to permit working on animals of various sizes.

- ▶ It should provide an adjustable but very rigid block for each foot so that trimming can be quickly and easily done.
- ▶ It should provide a method for careful removal of the harder hoof material in a quick but controllable nature.

Construction

With the foregoing requirement in mind, and with the usual farm shop equipment, the construction of such a chute was started. After about a year's practical operation and many changes, a satisfactory chute was developed. Construction plans may be found on the last page of this report.

The main frame is built of 2" steel pipe and heavy angle iron properly electrically welded and braced. It is mounted on 4" x 12" plank skids on which it may be moved about. Total weight is under 1,000 pounds. By using short pieces of 2 $\frac{1}{2}$ " pipe and drilling them and then welding on a $\frac{1}{2}$ " nut, it is possible to use $\frac{1}{2}$ " set screws for adjustment purposes.

The lifting device is made of an 11 to 1 worm reduction gear (steering column from World War I Packard truck) with a 24" hand wheel. This turns a 1 $\frac{1}{2}$ " double-strength pipe fitted into pipe bearings at the top. Two old 8-tooth binder sprockets connected by chain turn both top pipes. The three lifting cables on each side were then attached to these pipes by tapping and studs. Wrapping one pipe one way and the other pipe the other gives proper lifting action. Cable length is adjustable by taking additional turns on the pipe. By lifting on both sides at the same time, previous objections of the animal turning when only a one side lift was used are overcome.

A 2" wood floor with cross cleats nailed on is used to prevent the animal from slipping.

A heavy, quick-closing stanchion was made for the animal's head but any rigid type of a stanchion can be used provided it properly secures the animal.

A 4" x 4" foot rail, adjustable for both height and width, has $\frac{1}{2}$ " holes in the side for adjustment of the hoof blocks. The hoof blocks, also made of 4" x 4", are then quickly adjustable up or down, sideways, or lengthwise. The blocks are hollowed out so that the ankle joint and pastern are in a slight depression and when strapped in are very rigid.

Slings are made of six thicknesses of heavy canvas sewed together with irons on each end for attaching to the lifting hooks. The two slings are fastened together with heavy leather straps and thus are adjustable. This seems to prevent the rear sling from slipping backwards and possibly damaging front udder attachment on dairy cows. To prevent the animal slipping back and assuming a "sitting down" position, a piece of $\frac{1}{4}$ " airplane-type cable inside 5/8" hose is fastened to one of the iron "D's" in the end of the canvas and this is run down under the flank and inside of rear leg (between udder and rear leg on cows) and up near tail head, quite similar to a rear blanket strap.

Operation

The animal is led into the chute and stanchion closed. The slings are then placed under the animal and attached to the lifting cables on the opposite side. See Figure 3.

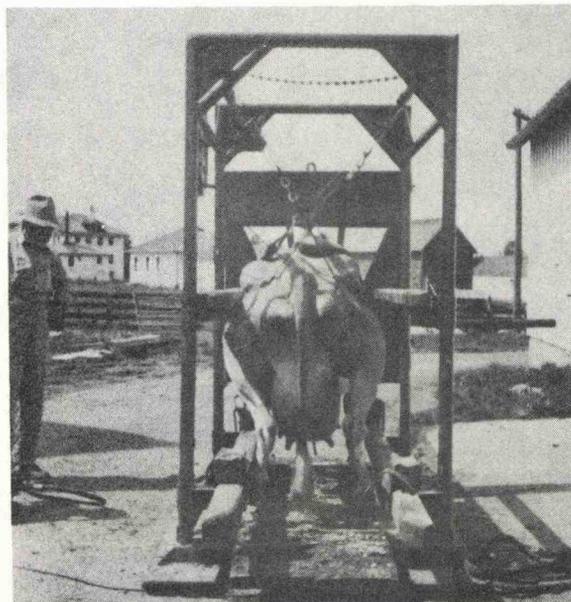


Figure 3. Rear view showing cow in place and crossed cables. This cow has entire weight in slings, usually they will stand more erect.

When the lifting wheel is operated, this crossing of the cables together with the lift on both sides prevents the animal from turning in the sling.

Actually the animal is not lifted off the floor but the slings are made just tight enough to hold the weight.

The hoof-trimming blocks are then adjusted to position and the feet are lifted one at a time and securely strapped below the dewclaws into the slightly recessed hoof block. The bottom of the hoof is then up toward the operator with the feet just over the end of the block. It is then ready for trimming. As an aid to lifting rear feet, it has been found that a leather strap and buckle placed tightly around the leg just above the hock, so as to draw down on the tendon, will prevent much of the kicking. Then using a $3/4$ " rope and a clove hitch just above the dewclaws, the hind leg can be drawn back and up easily by one person and placed on the hoof block and then strapped or tied on the block by the assistant. See Figure 4.

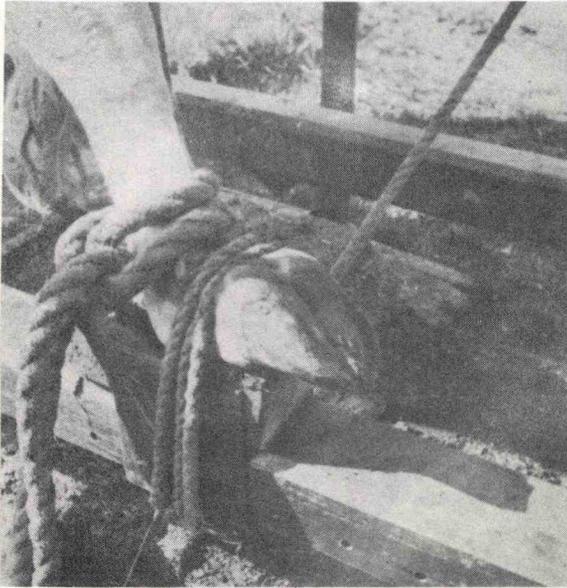


Figure 4. Rear foot to trim on rear hoof block and hitch used to pull back and up on rear leg. Note holes and quickly removed bolt with no nut just to left of rope holding leg to block.

The Hoof-Trimming Device

Considerable experimental work was done before finding a suitable hoof-cutting tool. A hoof rasp is too slow and hoof nippers are slow and apt to cut too deep. A rotary rasp on a flexible shaft is unwieldy and hard to control. Finally a suitable tool was found in use in the tire repair business and has proved to be very satisfactory. This is known as an R5 Rocket rasp and is really five small saws about $1\frac{1}{4}$ inches in diameter spaced with washers. This operates on the end of a $\frac{1}{2}$ " flexible shaft 60 inches long connected to a $\frac{1}{2}$ horsepower, 3,400 r.p.m. motor. It does not work well at lower speeds such as the usual motor speed of 1,700 r.p.m. See Figures 5 and 6.

This tool must be held firmly as it cuts very quickly and is easily controlled as to depth. The same tool was used in hollowing out the hoof blocks during construction of the chute.

Care must be taken not to trim too deeply and many animals with long feet are better corrected in two or three trimmings than to try and do it all at once. The rotary cutter does not work well on the softer heel tissue. This may easily be cut with a sharp hoof knife.

It is advisable for the operators to wear heavy leather gloves while using this cutting tool, as it might slip in use and seriously cut a hand or finger.

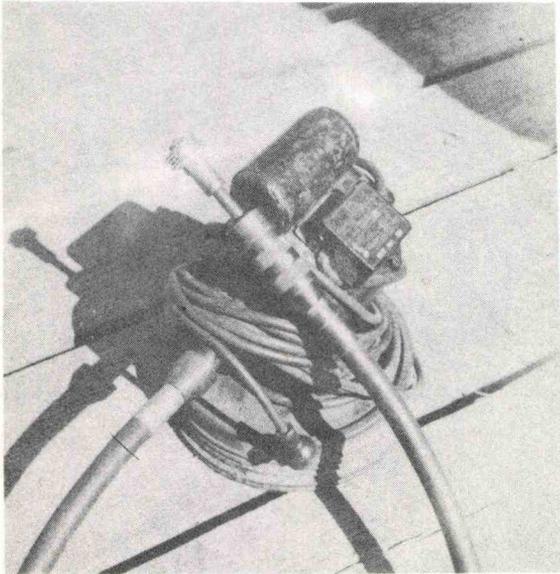
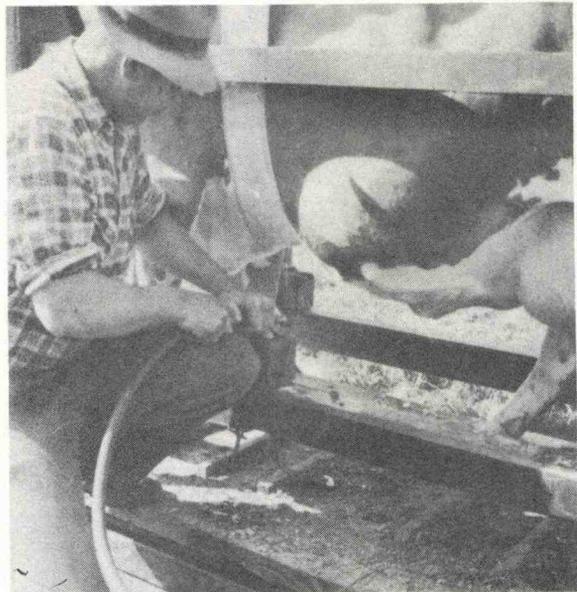
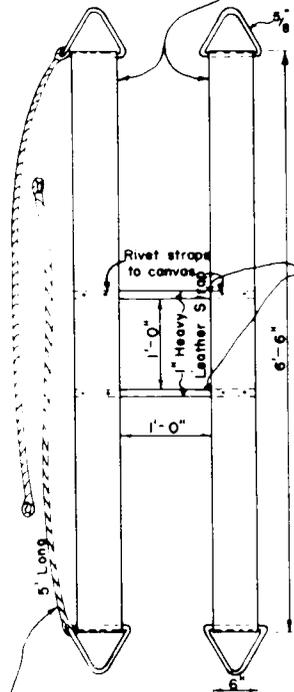


Figure 5. For removing the hard hoof tissue a standard $\frac{1}{2}$ h.p. 3,400 r.p.m. motor and flexible shaft. Shown on the end is an R5 Rocket rasp, a device generally used in the automobile tire repair industry. Motor base is old car brake drum to prevent motor turning over.

Figure 6. Hoof trimming on a front foot. Since only front feet on this cow required work, only one sling was used.

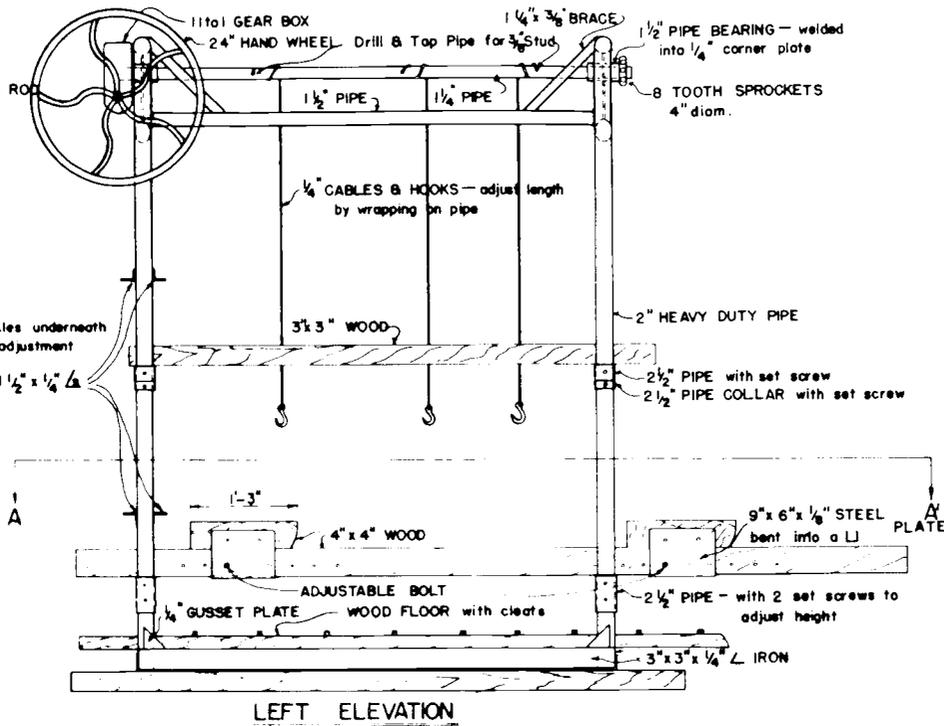


CANVAS BELT made of 6 plys of heavy canvas sewn together with end irons sewn in

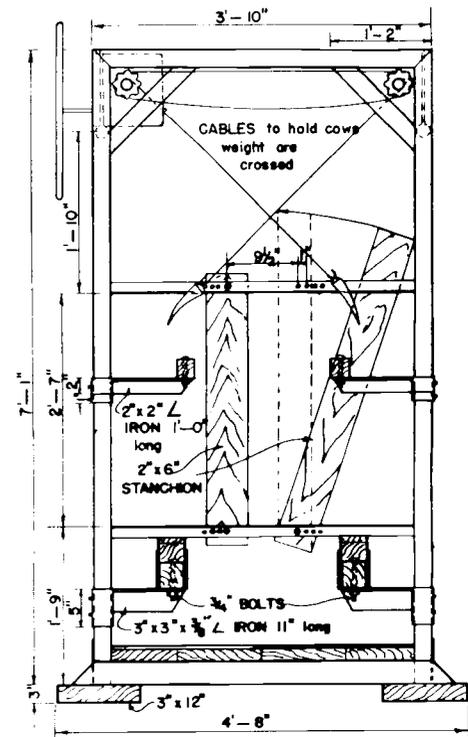


CANVAS SLING DETAIL

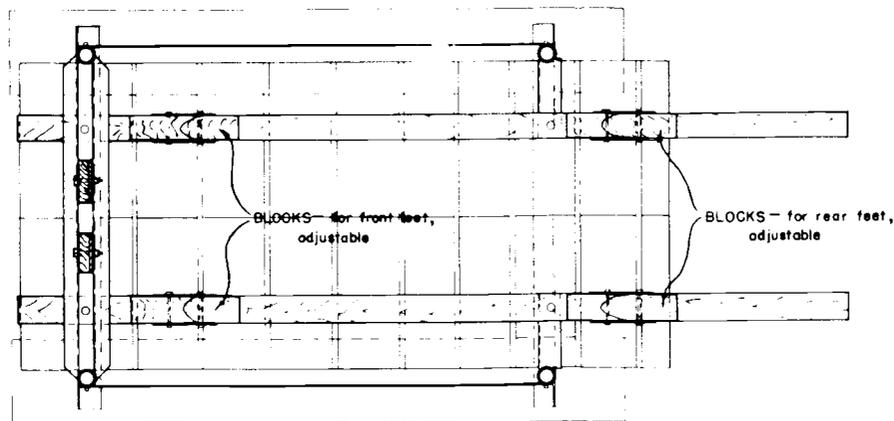
CABLE— with loops in end first covered with 1/2 hose and then 1" hose. These cables are put inside of each hind leg from flank to tail and then attached to rear hoisting cable.



LEFT ELEVATION



REAR VIEW



PLAN at AA'



COOPERATIVE RESEARCH & EXTENSION WORK IN
 AGRICULTURE & HOME ECONOMICS
 OREGON STATE COLLEGE
 CORVALLIS OREGON
 J. J. ASTOR EXPERIMENT STATION & DEPT.
 OF AGRI. ENGR. USDA COOPERATING

HOOF TRIMMING CHUTE

OREGON PLAN NUMBER 6-67 SHEET 1 OF 1

H. B. HOWELL, SUPERINTENDENT