

MAY, 1910.

## Special Circular, No. 25

OF

# CANE MILLS and EVAPORATORS

**FISHER & DAVIS MANUFACTURING CO.,**

No. 936 North First Street

**ST. LOUIS, MO.**

### NOTE:

In the first six pages of this pamphlet we have given reduced list prices on **Cane Mills** and **Evaporators**, on which a **liberal cash discount** will be made on inquiry. We know the **net prices** will be better than ever before offered you on guaranteed goods of the best make.

We are also Makers and Distributors of Engines, Boilers and Saw Mill Machinery and General Machinery Supplies. Saw Mills are our specialty in manufacturing, and we are prepared to furnish at a reasonable price the **Best Saw Mill** in our market, size ranging from 3,000 to 40,000 feet capacity per day.

**YOUR CORRESPONDENCE IS SOLICITED**

# ST. LOUIS CANE MILL.

For Sorghum or Sugar Cane.

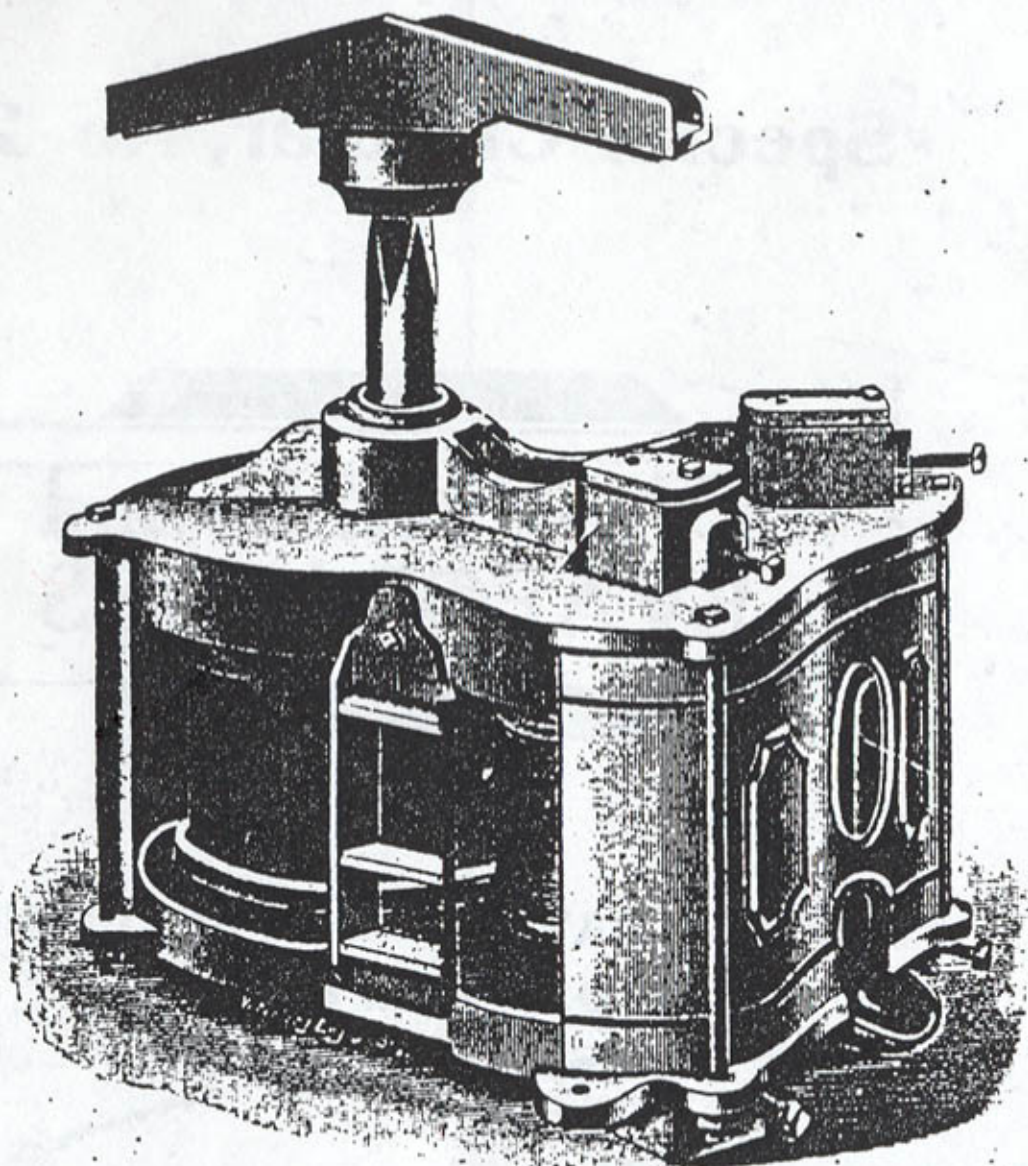


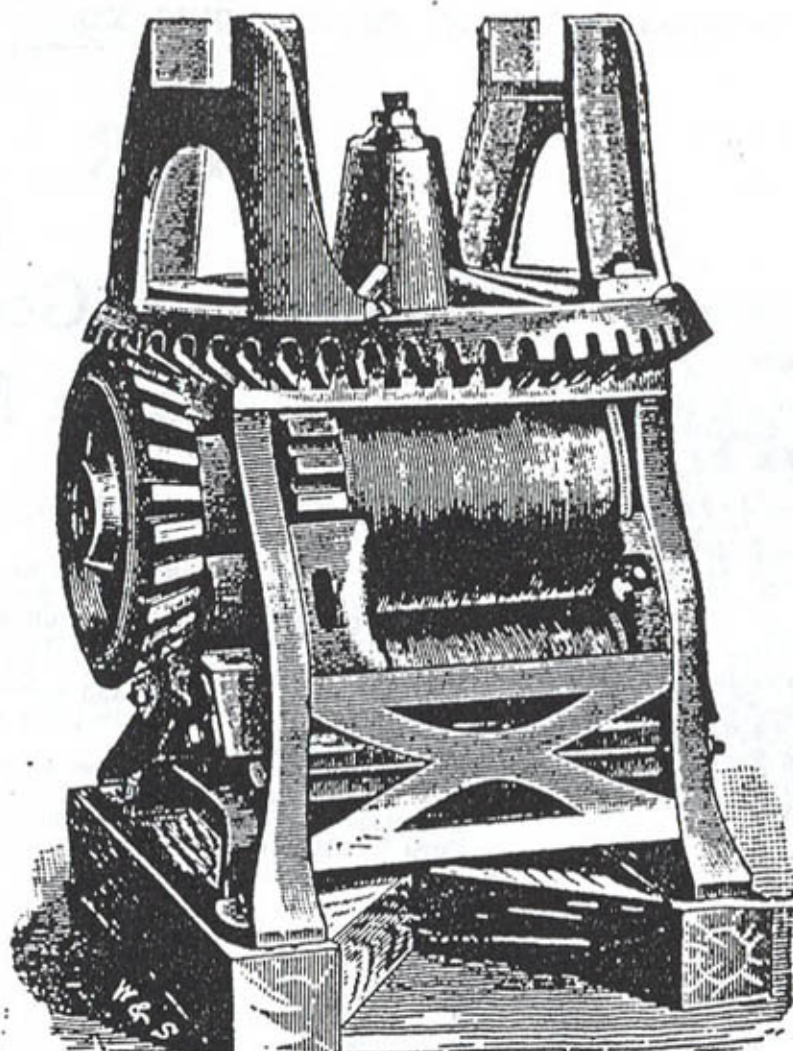
FIG. 1

The ST. LOUIS MILLS have Steel Shafts, Brass Bearings, Cog Wheels cast separate from the rolls, so when gears are worn out, they can be quickly and cheaply replaced. The gears are not keyed on the shafts, but are held in position by a clutch cast on the gear to fit in a corresponding clutch cast on the top of the roller, so requiring very little labor to replace gears. The gears are encased, and will not clog or harm the operator. The main rollers are flanged at top and bottom, preventing the cane from passing up or down.

These Mills are made strong and light of draft. Be sure and investigate the merits of the "St. Louis" before buying.

### SIZE, CAPACITY, WEIGHT AND PRICE

No.	Power.	Size of Rolls			Estmtd Capacity Gallons per hour	Shipping Weights	List Price
		Diam. Large	Diam. Small	Length			
0	Light One Horse	8½	5½	5¾	30 to 45	400	\$19.00
1	One Horse	10	6	6½	45 to 60	515	24.00
2	One Horse	11½	6¾	6¾	60 to 75	600	29.00
3	Two Horse	13⅝	7½	7½	75 to 90	800	38.50
4	Two Horse	13⅝	7½	8½	90 to 100	850	39.50
5	Two Horse	13¾	7½	9	100 to 120	1000	43.00
6	Heavy Two Horse	13¾	7½	12	120 to 145	1250	52.50



# STAR

# CANE

# MILL

## For Sweep

The Star is the best horizontal Cane Mill made. Several thousand are in successful operation, giving the best satisfaction.

The main, or upper roller, is stationary. The feed, or lower front roller, is self-adjusting, allowing it to adjust itself to the different sizes of cane, and to uneven feeding, while the crushing or lower back roller is adjustable and can be set firmly against the main or upper roller, or at any desired distance from it, and held firmly in the position set, so that if the mill does not press the juice from the bagasse as completely as desired, all that is necessary is to set the lower back roller nearer to the main roller, adjusting it so that it will do its work thoroughly. Our Sweep or Top Geared Mills are no higher in price than the same sized vertical mill, while in consequence of their being geared their rollers make two revolutions to one of the horses. By this means these mills will grind nearly twice as fast as any mill of the same price, making it the most desirable mill on the market.

No. 1. Star sweep mills are for one or two horse power. One horse can do as much work on it as he can do on any other mill, while the mill is strong enough for two horse power. No. 2 mill is suitable for two or four horses. The crushing rollers have steel shafts, which make the mills very strong and durable.

The estimated capacity given is for first-class cane, but is not guaranteed, as much depends upon the quality of cane, the speed of the mill and regularity of feeding.

### PRICES

No.	Horse Power	Size of Rolls			Estimated Capacity Per Hour		Weight	Price
		Length	Diam. Large Roll	Diam. Small Roll	Tons	Gallons		
1	1 to 2 Horse	10 in.	10 in.	6 in.	$\frac{3}{4}$	150 to 200	900 lbs.	\$54.50
2	1 to 2 Horse	16 in.	10 in.	6 in.	1	200 to 250	1100 lbs.	67.50

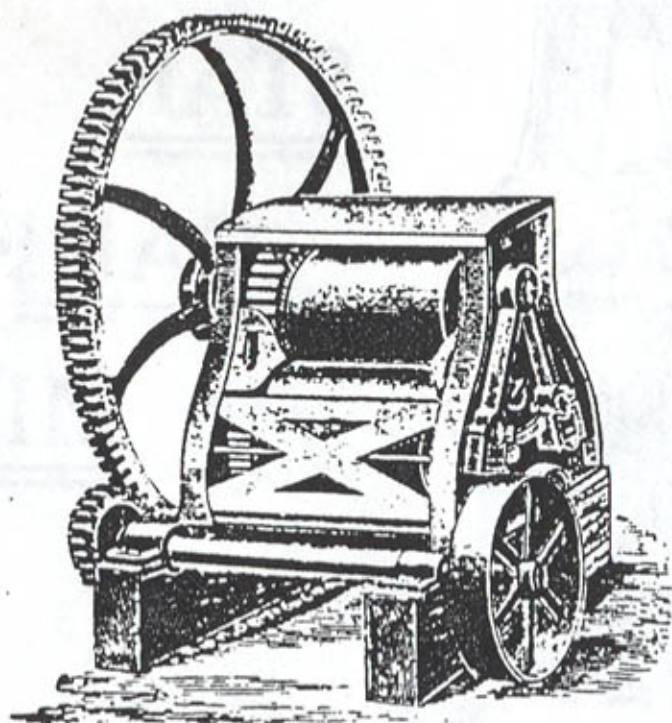


FIG. 3

# STAR

## Single Back-Gear Power Mills

4 TO 6 HORSE-POWER

Fig. 3 represents our Single Back-Geared Star Cane Mills, suitable for power, either belt or tumbling rod. The pulley shaft of this mill should make 75 revolutions per minute to give proper speed. This mill is calculated for slow speeded power. Price, including pulley or coupling for tumbling-rod, as ordered:

No. 1—Capacity, 1½ tons per hour....	\$73.50
No. 2—Capacity, 2 tons per hour....	84.00
Bagasse Carrier, No. 1, 10 feet long..	26.00
Feed Table, No. 1.....	2.75

## Double Back- Gear Mills

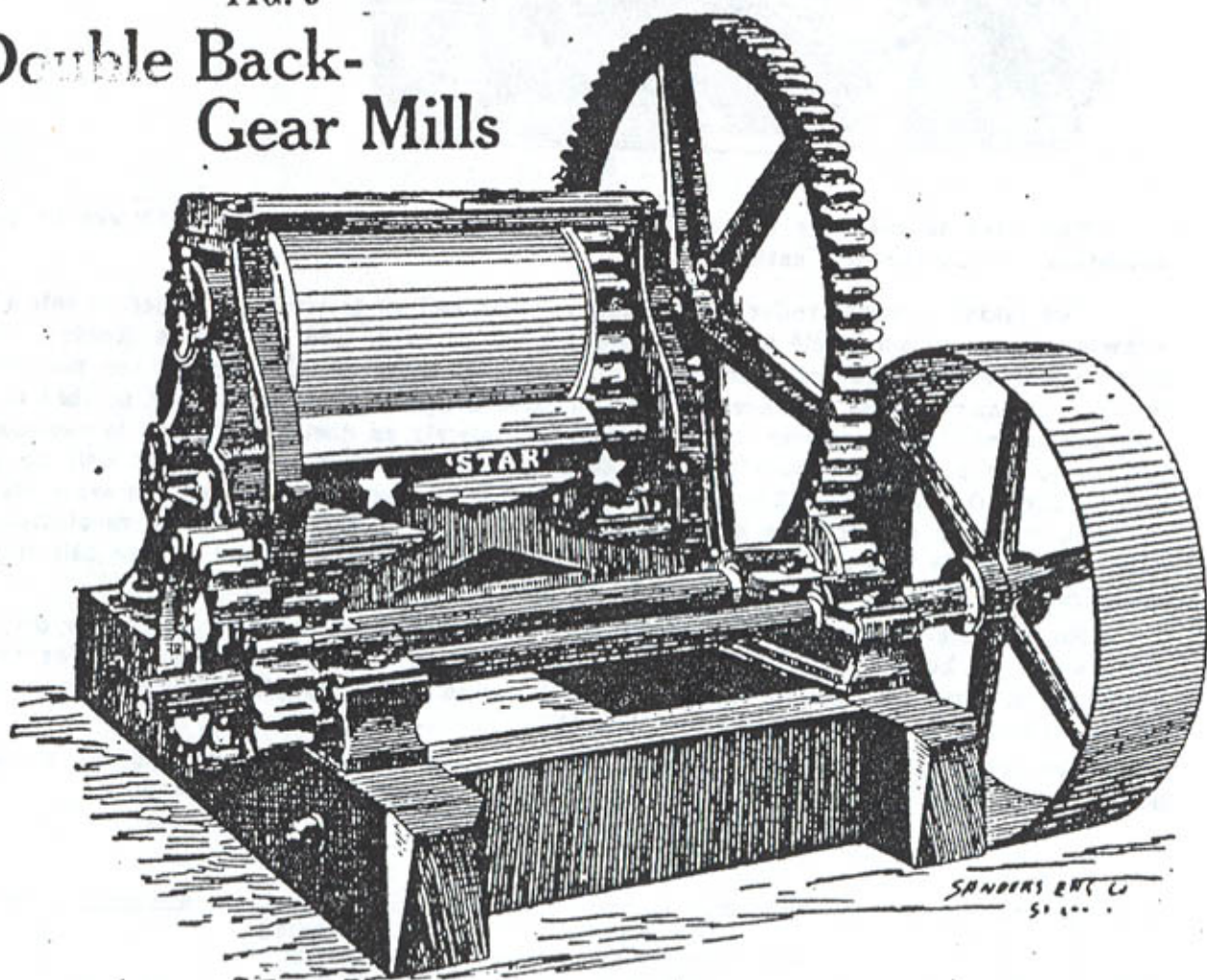


FIG. 4

The above cut shows our Nos. 1 and 2 Double Back-Gear Star Cane Mills. The driving shaft should make 150 revolutions, and is suitable for fast, speedy power, or an ordinary farm engine. The rollers in these back-gear mills are same size as Nos. 1 and 2 Sweep Mills, see Page 3. Price including pulley or knuckle, as required.

No. 1 Size. Capacity 1½ tons per hour. Weight 1150 lbs. Price.....	\$ 84.00
No. 2 Size. Capacity 2 tons per hour. Weight 1200 lbs. Price.....	112.00
Bagasse Carrier, No. 2, ten feet long, \$21.50. Feed Table.....	3.75

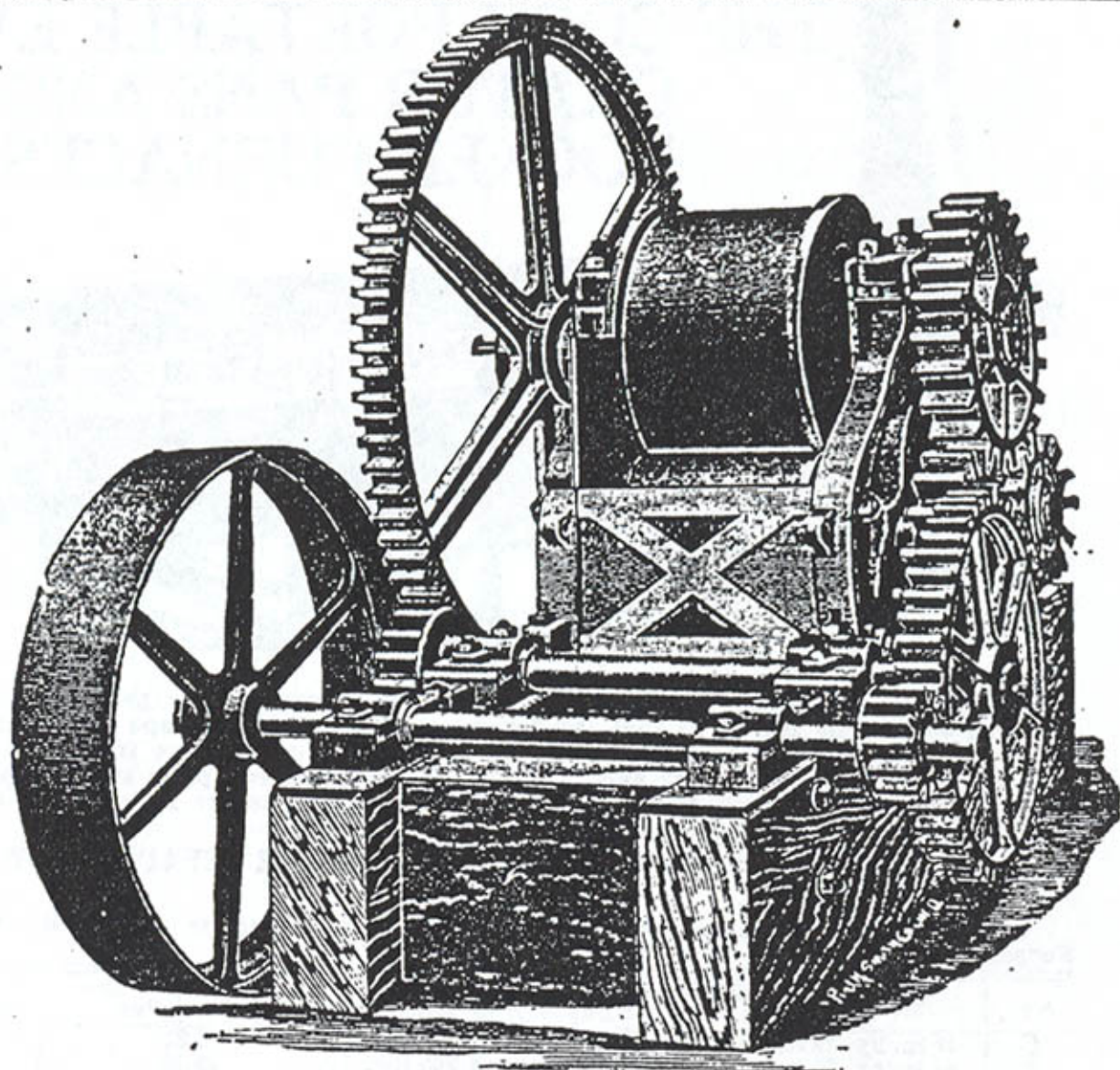


Fig. 5

## Star Geared Cane Mills

Arranged for Steam or Water Power. Requiring from 8 to 15 Horse Power.

These Mills are built extra heavy and strong, are substantial and will last.

The No. 3 Mill has rollers 12 inches wide; diameter of main roller 16 inches, lower rollers 10 inches. Capacity, two tons of cane per hour. Weight, about 2,800 pounds.

Price .....	\$160.00
Bagasse Carrier .....	38.50
Feed Table .....	4.50

The No. 4 Mill has rollers 18 inches long; diameter of main roller 16 inches, lower rollers 10 inches. Capacity,  $3\frac{1}{2}$  tons per hour. Weight, about 3200 pounds.

Price .....	\$224.00
Bagasse Carrier .....	48.00
Feed Table .....	6.00

WRITE FOR DISCOUNTS.

# THE COOK PORTABLE EVAPORATOR PANS AND ROCKER FURNACES

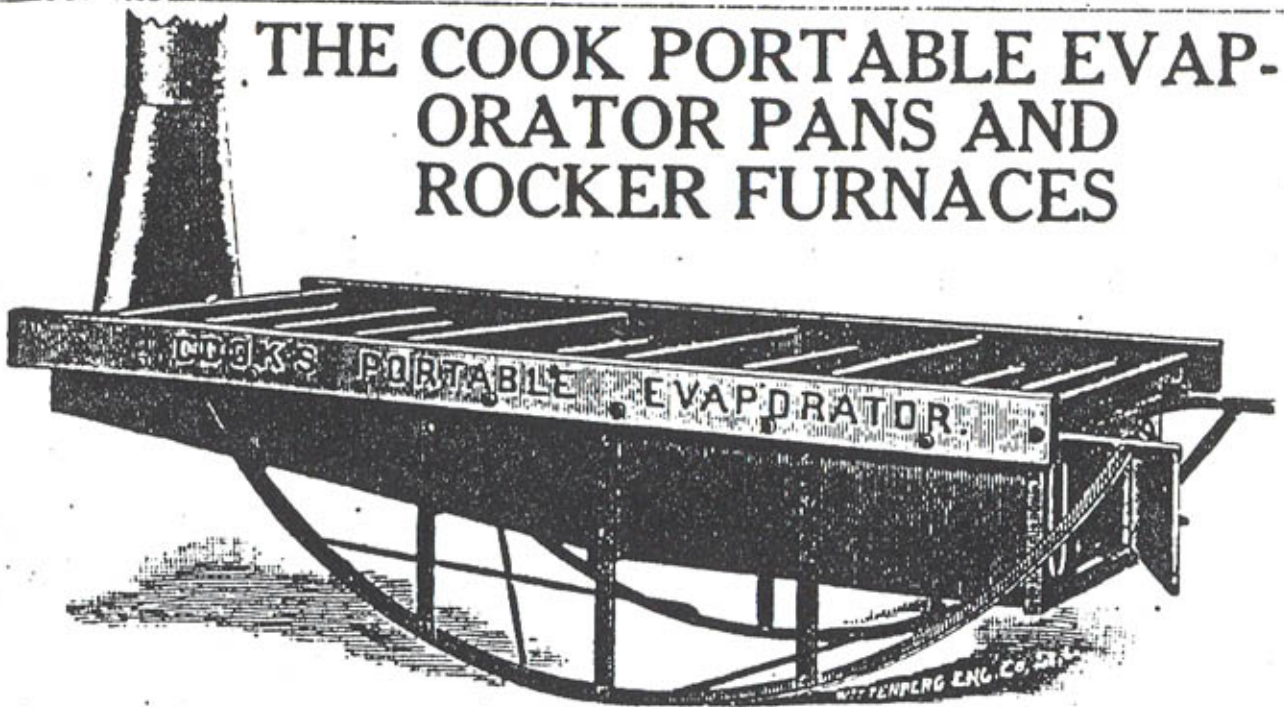


FIG. 6

Our Improved Cook's Portable Rocker Furnace is improved over the old pattern in many respects, one special feature is that the furnace will not lose its shape by rough handling or use; to overcome this we use heavy angle steel in making our furnace frames. The sides, bottom and pipe are made of heavy sheet steel; the front plate, end plate and flue plate are made of heavy casting. The grate is full size and strong. Each furnace is furnished complete with pipe and grate. Price and size of pans only, see page 7.

## THE IMPROVED "COOK'S" PORTABLE EVAPORATOR (FURNACE AND PAN)

All Steel Furnace—Galvanized Steel or Copper Pan. Complete with Pan, two Skimmers, Furnace, Grate and Pipe.

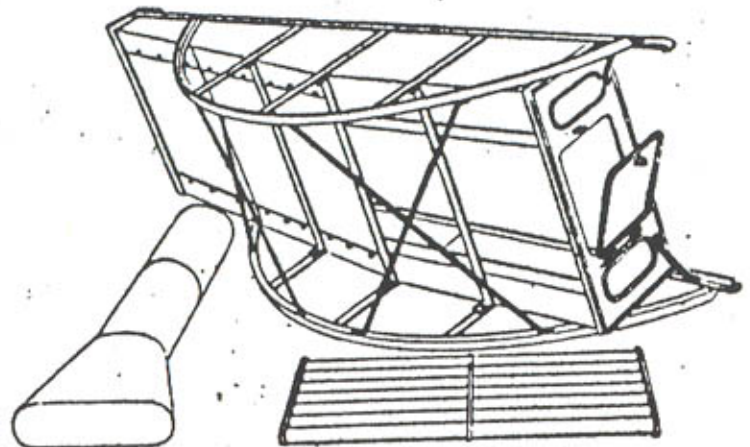
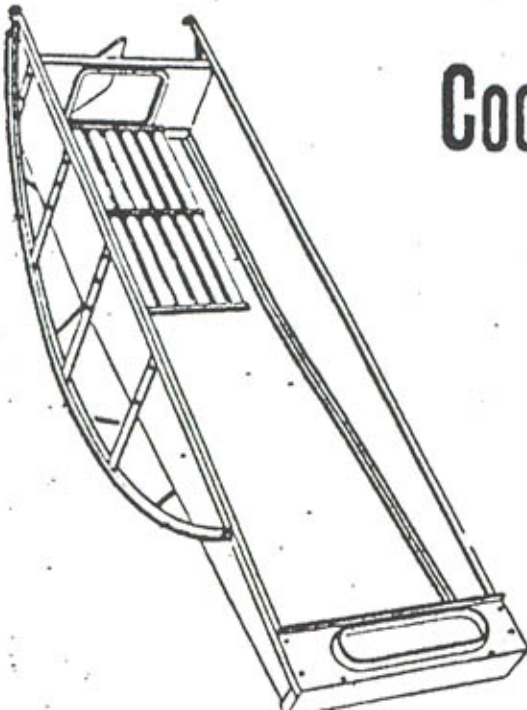
No.	Size of Pan	Estimated Capacity Per Day	Actual Weight	Price with Galvanized Steel Pan	Price with Copper Pan
2	44 in. by 72 in.	36 to 40 gallons	210 lbs.	\$15.85	\$ 20.35
3	44 in. by 90 in.	40 to 50 gallons	265 lbs.	19.15	32.25
4	44 in. by 108 in.	50 to 80 gallons	290 lbs.	21.95	37.65
5	44 in. by 126 in.	80 to 120 gallons	315 lbs.	24.80	43.15
6	44 in. by 144 in.	100 to 140 gallons	350 lbs.	29.55	50.55

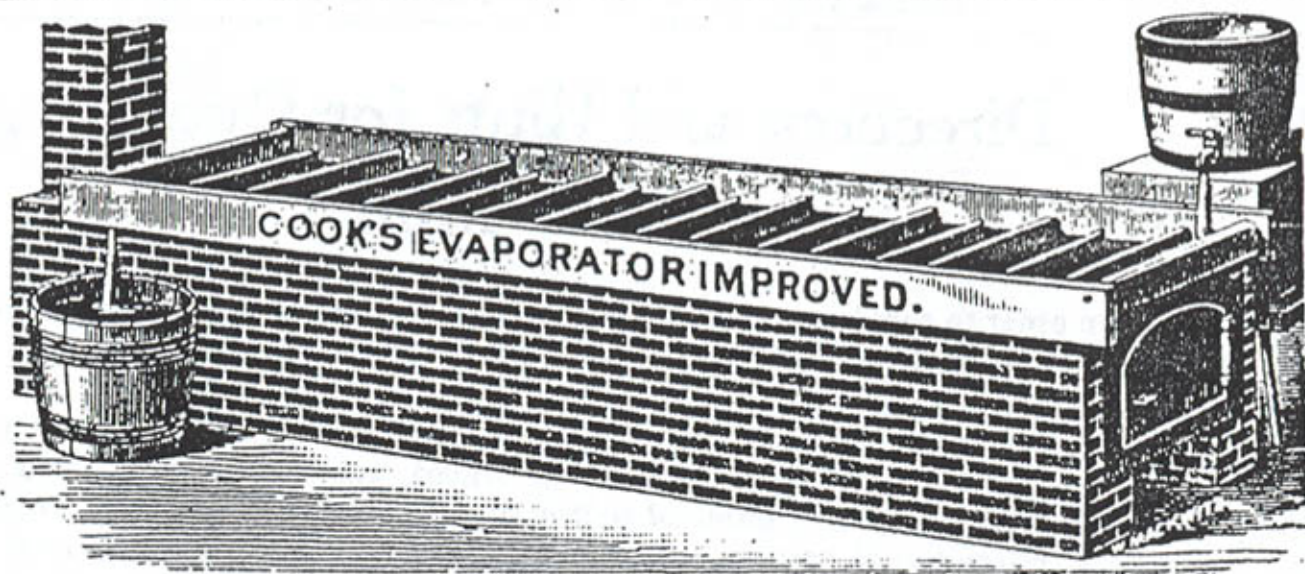
The advantage of a Portable Evaporator is well known; with it the operator can move from farm to farm and thus avoid the labor and expense of hauling cane.

### Price of Rocker Furnace Only, with Grate and Chimney (See Cuts below)

No.	Size, inches	Weight, lbs.	Price
2	44x72	150	\$10.30
3	44x90	190	\$12.25
4	44x108	200	\$13.75
5	44x126	215	\$15.30
6	44x144	240	\$18.75

## Cook Portable Furnaces.





# Cook's Improved Evaporator Pan

FOR STATIONARY FURNACES

Prices, Capacity and Weights.

No.	Size of Pan	Estimated Capacity Per Day	Actual Weight	Price, Galvanized Steel	Price, Copper
2	44x 72 inches	30 to 40 gallons	60 lbs.	\$5.25	\$15.75
3	44x 90 inches	40 to 50 gallons	75 lbs.	6.56	19.70
4	44x108 inches	50 to 80 gallons	90 lbs.	7.88	23.60
5	44x126 inches	80 to 120 gallons	100 lbs.	9.20	27.55
6	44x144 inches	100 to 140 gallons	110 lbs.	10.50	31.50
7	44x180 inches	120 to 180 gallons	150 lbs.	13.12	39.40

The capacity of an Evaporator Pan depends upon the quality of the juice and skill and industry of the operator.

In ordering, please state kind of Pan wanted, whether Galvanized Steel or Copper.

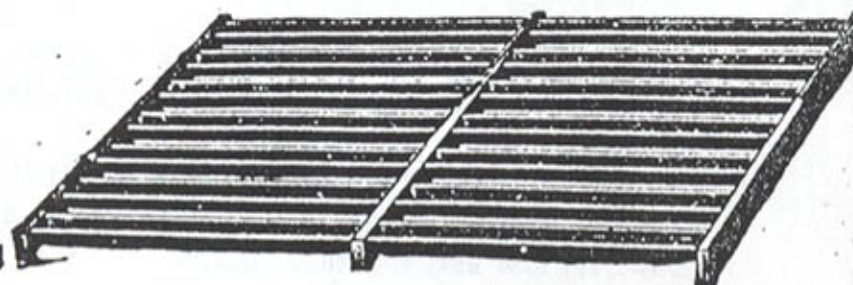
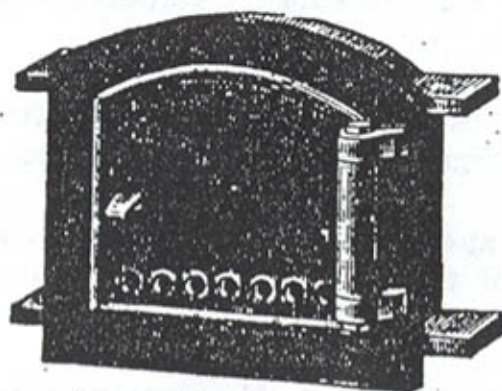
### Extra Parts

No.	Description	Size of Door	Extreme Size	Weight	Price
1	Light Frame and Door	11½x11¼ in.	14½x16 in.	35 lbs.	\$1.75
1	Furnace Grate		18 x30 in.	35 lbs.	1.75
2	Heavy Frame and Door	12x13 in.	16 x14 in.	55 lbs.	2.80
2	Furnace Grate		18 x36 in.	40 lbs.	2.00
5	Extra Heavy Double Door and Frame	9½x21 in.	16½x36 in.	100 lbs.	4.70
5	Ex. Heavy Grate, 6 pieces & bearing bar		27 x35 in.	100 lbs.	4.70

Skimmers, each.....\$0.16. Cast Collar or Flue Plate for Pipe.....\$1.00  
 Furnace Pipe, per joint, 24 inches long.....\$0.75

### LIGHT SUGAR KETTLES Blacked on Outside.

Size, Gallons	10	12	15	20	25	30	35
Average Weight	24	28	35	42	60	76	86
Balled	\$1.45	\$2.05	\$2.35	\$2.70	\$3.40	\$4.25	\$4.75
Unballed	1.20	1.75	2.00	2.45	3.15	4.00	4.50



Figs. 12 and 13 show the No. 2 Frame and Door, and Furnace Grate.

# Directions and Hints for Operating Cane Mills

In order to successfully operate a Cane Mill, it must be rigidly secured in position, properly adjusted, oiled freely, bolts kept tight, and fed regularly.

1. **The Mill must be level and rigid.** To secure it in position, posts six feet long, set three feet in the ground, thoroughly braced, and the earth rammed very hard around them, or a heavy frame of timber properly joined together and staked to the ground, offers a good support. Whatever the means, the Mill must be level and rigid.

2. **To secure a proper adjustment.** Adjust the rolls parallel to each other, the feed roll from one-quarter to one-half inch from the main roll; the other should slightly touch the main roll when empty; after trial, the proper adjustment can be made. Do not try to force the set screws up when there is cane in the Mill.

3. **Oil regularly and freely.** The vertical Mills have oil tubes passing down through the rolls, and by using fluid lard oil freely on the upper journals, the oil flows to the lower journals; see that these tubes are kept open and that the oil is applied regularly and freely. Never use mineral oils on a cane mill.

4. **Feed evenly and constantly.** Regular feeding is necessary, in order to get the best results; when all the space of the rolls is properly filled with cane, a greater per cent of the juice is extracted than when there are unfilled spaces, or spaces only partially filled. Use the feed box, and in addition place a board, about three feet long, on a level with the bottom plate to rest the cane on as it enters the Mill—feed butts foremost.

5. **Keep all the bolts screwed up tight.** Owing to the constant wrenching of the Mill, the stay bolts are liable to become loosened, and this throws the Mill out of line, and the cogs begin to cut and the Mill run hard. One hour's use in this way is more destructive than a whole season's use, if properly cared for; therefore, see to it that the bolts are kept tightened up all the time.

6. The circle where the horse walks should be level, the sweep 12 to 13 feet from the center of the Mill and extend beyond, to partially balance.

7. These directions must be observed, in order to hold the manufacturers under the warantee.

8. To avoid delays in ordering repairs: Give the name of the Mill, its number and the year of its manufacture. All these things are cast on the end plates.

At the close of the season take the Mill apart and thoroughly clean every part, see that the oil tubes in rolls are open, oil the journals and place all together properly, and bolt together tightly.

If this is neglected the accumulated fibers will form solid cakes and give trouble when starting up. It will also prevent rust and preserve the Mill.



# Directions for Using Cook's Portable Evaporator

1. Place the furnace on a firm and level foundation, with the mouth toward the prevailing winds. Set the grate in its place, with the hollows up, and fill the hollows with clay. Fill the spaces between the grate and the sides of the furnace, and for a distance of six inches back of the after end of the grate with brick and mortar, tapering to a row of brick laid edge at the top; the remaining length of furnace line up with clay, tapering to the top. Cover the bottom of the furnace smoothly and thinly with ashes or sand.

2. Invert the pan, and if there are any indentations or uneven places in the bottom hammer them out with a wooden mallet, then fill the openings and crimps outside the fire-guard with clay, letting the crimps between the fire-guards remain open. Place the pan on the furnace with finishing end at the chimney; by springing the sides of the furnace out, little the fire-guards will drop into the space between the sides and the brick lining; stop the outlet with a cloth-covered plug, and level from side to side with water.

3. Dig an ash-pit under the grate and fill with water. See that the furnace be true and not in a twist. Protect your pan from the wind, as by so doing you will increase evaporation.

4. Provide a juice-tank with a faucet for regulating the flow of juice into the pan. Provide plenty of good dry wood, two feet long, within easy reach. Finally adjust the rockers so that the pan may be nearly level.

5. Being now ready to commence operations, fill the channels of the pan half full of water; build a hot fire, and keep it hot; and when the water commences to boil freely, let a small stream of juice from the tank, at the same time partly opening the plug at the outlet of the pan, and, as the water disappears through the outlet and by evaporation, so adjust the rockers that, when the first channel is two-thirds full, the last or finishing channel may be but barely covered—that is to say, have the pan lowest at the FORWARD end where the juice enters. So equalize, with the aid of the faucet and plug, the flow of the juice through the pan that it may be reduced, on its arrival at the outlet, to the right consistency. Never allow the channels, except at the front end of the pan, to be more than half full of juice—a less quantity is better—since a shallow body of juice will evaporate more rapidly, securing more perfect freedom from impurities, and a syrup of a lighter color.

6. Avoid changing the inclination of the pan or exhausting the finishing channel by raising the plug too suddenly, since flooding, in any of the apartments, produces a mixture of juice which retards evaporation and darkens the color of the syrup. Do not let the partitions be covered at the sides, as they hold the scum. Be careful to keep up a regular bright heat, and never let boiling cease through the center of the pan. Regular heat saves change of pan and much trouble.

7. When the operation is perfect the green scum will form in the first channels, and gradually becomes lighter in color and less in quantity as the juice flows through the channels, until it disappears entirely. Impurities should be skimmed off as they collect at the side of the pan, and not from the center. Do not skim until the scum becomes thick. In closing for the day, let water follow the juice until the latter is reduced to syrup. Finally, wash the pan, and, filling it with clear water, let it stand over night, and commence in the morning as before.

8. Clean your juice-tank, receiver, skimmer and pan thoroughly every evening. Change the straw in the tank as often. It is essential to the successful working of the pan that cleanliness and regularity be observed throughout. The rapidity of the evaporating process necessitates careful attention on the part of the operator.

9. The above directions are explicit, and, if carefully followed, will insure success. The Cook Evaporator is simple as well as scientific in construction, and is not difficult to manage. If you do not succeed at first, review directions, and you will find that you have neglected part of them. To secure the best results you must have good juice; sour juice may be worked, but not to advantage. It is especially important that you use a shallow body of juice and keep up constantly a high heat. A hot fire will keep the juice in the center of the pan agitated, and prevent the scum from passing from one side to the other. A shallow body will boil more rapidly; consequently, more work will be done and free the impurities more perfectly, and the syrup, being a less time over the fire, will be of a lighter color. (Great depths of juice prevent impurities from raising from the bottom, and retard evaporation. Scum and bubbles may flow over the ledges, yet the current follows the channels, impurities are thrown to the side in a straight line, and not towards the outlet, over the ledges. (Throw a light substance on the pan and try it.) Endeavor to have the heat as regular as possible. If your pan is too hot in the center, you will find a pile of coals underneath. If the syrup finishes before reaching the last channel, it is because you have not properly regulated the flow of the juice, too much heat under the center of the pan, or you have given the pan an inclination contrary to directions Five. If green scum follows the syrup through the pan, it is caused either by changing the inclination of the pan too suddenly, or want of a hot and regular fire. If the back end of the pan should flood, close the faucet and lower the front end so that you have but little juice in the last channel, and get up a hot fire; as soon as the difficulty is removed, adjust your furnace as before.

# Directions for Building Arches for and Using Stationary Pans

1. In building Furnaces for the Cook Sorgo Pans Nos. 2, 3, 4, 5, 6 and 7, lay out the foundation (so that the mouth of the furnace will face the prevailing winds) 40 inches wide and as long as necessary for the pan and chimney, and also for an allowance of not less than 12 inches between the after-end of the pan and the chimney. Start the wall at the front end of the furnace, which forms the sides of the ash-pit, 12 inches thick, leaving a space for the ash-pit 16 inches wide. Continue these 12-inch walls, and also a cross-wall to support the after-end of the gate, up to the height of 16 inches. The side wall, back of the ash-pit, and the portion above the level of the grate need not be more than 8 inches thick.

Carry the 8-inch wall up 12 inches; draw in 3 inches on the inside, and build up 6 inches more, making the top of the wall 18 inches above the level of the grate, or 34 inches above the ground.

As the wall goes up, set the fire-door in the front, and provide for an opening in the chimney, at the after-end.

2. Place the grate with hollows up, and fill with clay, first removing the ground beneath for an ash-pit. For the inner arrangement of the furnace for Nos. 2, 3, 4 and 5, fill in back of the grate with earth, and cover with a floor of brick so inclined as to leave a space of 4 inches in depth under the after-end of the pan.

3. For Nos. 6 and 7, build a cross-wall 6 feet from the door to within 8 inches of the top walls. Fill in, in front, so as to form a regular slope from the end of the grate to the top of this wall. At the end of the pan build a second cross-wall, the inside of the wall being even with the end of the pan to within 4 inches of the pan; and, commencing midway between the cross walls, fill in so as to make a slope to the top of this second wall.

The side walls should extend beyond the end of the pan far enough to give ample room for the chimney.

4. From the last cross-wall the flue should slope downward under the mouth of the chimney, so as to allow ample space for the draught. Cover over between the pan and chimney. If brick is used build the mouth of the chimney flat, and as nearly the width of the furnace as possible. Three feet above the pan construct the flue to 9 by 18 inches (inside measurement, which will require a course of 8 bricks), and build up to a height exceeding the length of the pan by a half.

5. Invert the pan and fill the openings or crimps that will be on and outside the walls with clay, having those between the walls open. Place the pan on the walls, and level from side to side with water. The receiving end should be over the fire—the finishing end next the chimney. Adjust the pitch of the pan by wedges placed under the end. The smaller pan should be about level, and the larger have a slight inclination towards the finishing end. The pitch thus being determined, remove the pan, and, using the wedges as guides, spread mortar on the wall and set permanently.

6. Before commencing, provide juice-tanks, having a faucet, with straw or hay for filtering. Cover the plug of the outlet of the pan with cloth. Provide good, dry wood, three feet long. For the larger pans, troughs or pipes for conveying the juice to the tanks will save labor. A supply of clean water should be kept near the works.

7. To secure a continuous process, let in enough water to protect the pan from burning until boiling shall commence all over the pan. Then partly open the faucet at the tank and plug in the pan, and letting the juice slowly follow the water through the channels so equalize the flow with evaporation that the syrup, on arriving at the outlet, may be finished. The juice should be kept below the tops of the ledges in front end, and as shallow as possible at the finishing end. As the juice becomes more dense, the foam will rise so as to cover the ledges and fill the pan, but the mass of the liquid, in an undercurrent and unmixed, continues its regular onward flow through the channels. If a regular heat is kept up, and the flow of the juice is properly regulated, no change of gates, faucet or plug need be made during the day, and the syrup may be made to flow off uniformly at any density desired.

8. Use the gates to regulate the flow of the juice, so that, in the finishing department, there may be the smallest quantity possible. Let the supply from the faucet and gates be equal to evaporation, and no more. In using this process be careful not to change the gates suddenly and guard against flooding in any of the departments, as it causes a mixture of juices and requires a longer exposure to heat, thereby rendering the syrup dark in color and impure.

9. In drawing off the syrup, care should be taken not to allow the last channel to become exhausted suddenly, without a supply to follow. Regulate the supply by the gates and faucet, keeping up hot, regular fire. Aim constantly to have the operation continuous. As long as boiling is kept up through the center of the pan there can be no mixture of scum and juices. Foam and bubbles may be thrown over the crimps through the center; but if a high heat is kept up, they will remain on the sides until taken off. In closing for the day, let water follow the juice until all the latter is reduced to syrup; then wash the pan, and filling it with clear water, let it stand over night, and use to commence next day's operations.

10. The use of a shallow body of juice with a high heat will insure the greatest speed and purest sugar and syrup. High heat keeps up boiling through the center of the pan, removes impurities from the center to the sides, and, if kept up, will hold the scum for removal. Impurities should be taken off only as they form on the sides of the pan. Prevent the wind from blowing on the pan, else evaporation will be retarded. Ashes accumulated under any part of the pan endanger burning. Clean pans, tubs and skimmers, and renew straw in the juice tank every evening. Keep ash-pit filled with water. For using pans with the Iron Furnace, see directions for working the Evaporator.

11. To insure success, it is highly necessary that the above rules be followed. If you should fail in obtaining the best results, let us know the fact, and we will assist you, with pleasure. Study the principles of the pan, and post yourself thoroughly. A letter from you at the close of the season, giving us a history of your success, would be thankfully received.

Any ordinary unevenness or indentation in the pan can easily be remedied by inverting the pan and hammering with a wooden mallet, having a flat end. No iron hammer should be used. A piece of smooth, flat plank should be used to hammer on