M. A. FOOS.

DRY CELL TAMPER.

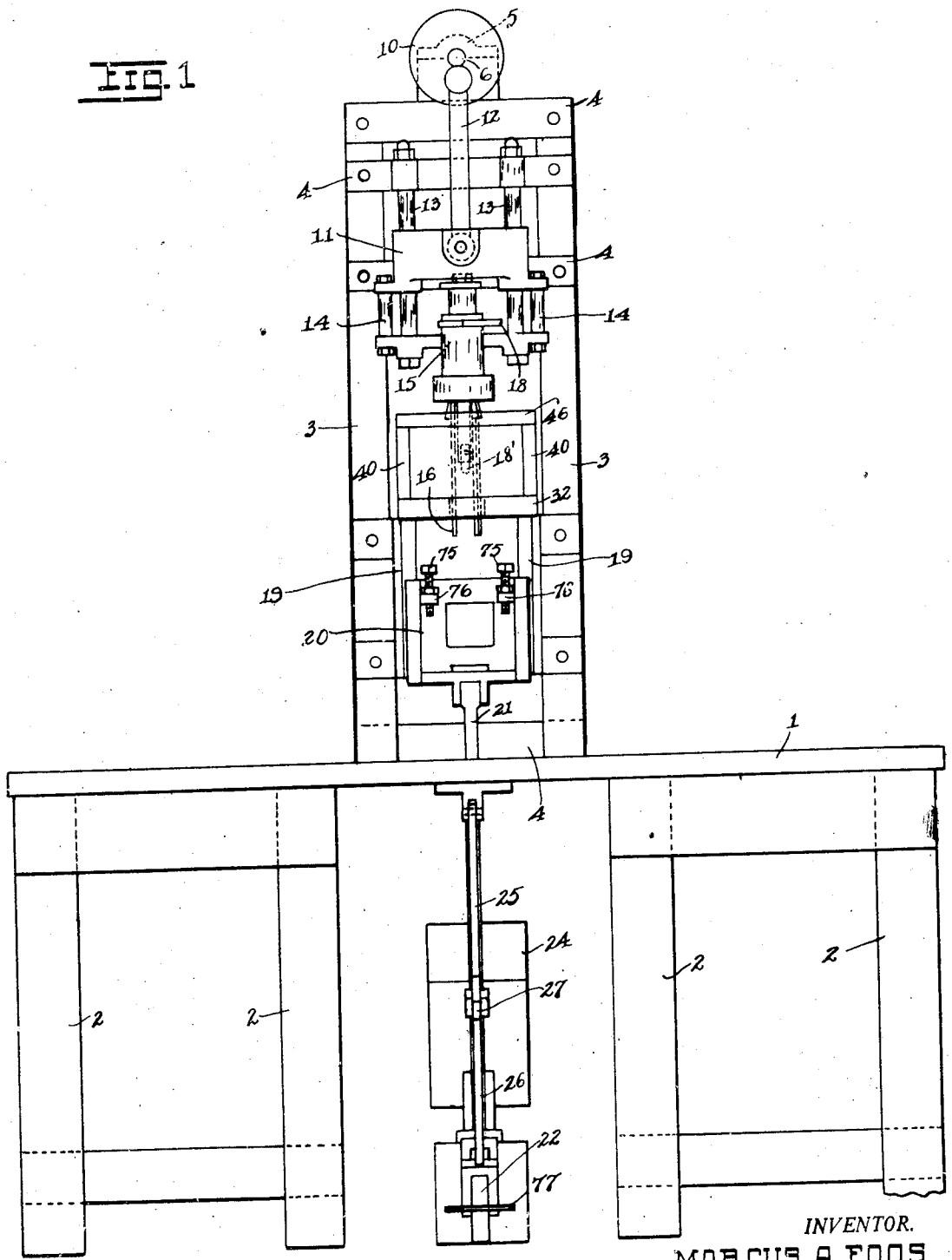
APPLICATION FILED MAY 22, 1918.

1,329,965.

Patented Feb. 3, 1920.

4 SHEETS—SHEET 1.

Fig. 1



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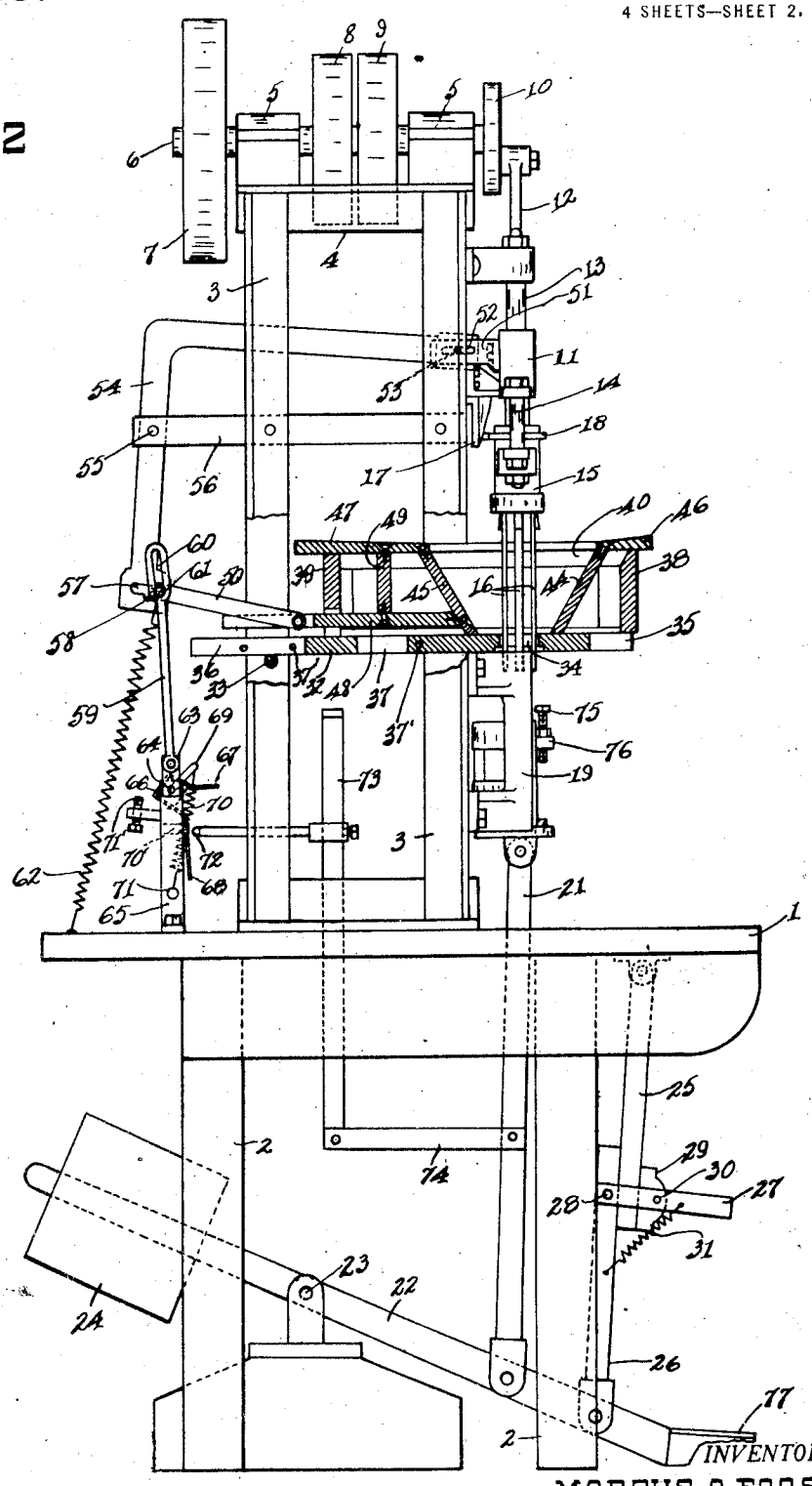
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4 SHEETS—SHEET 2.

Fig. 2



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4 SHEETS—SHEET 3.

FIG. 3

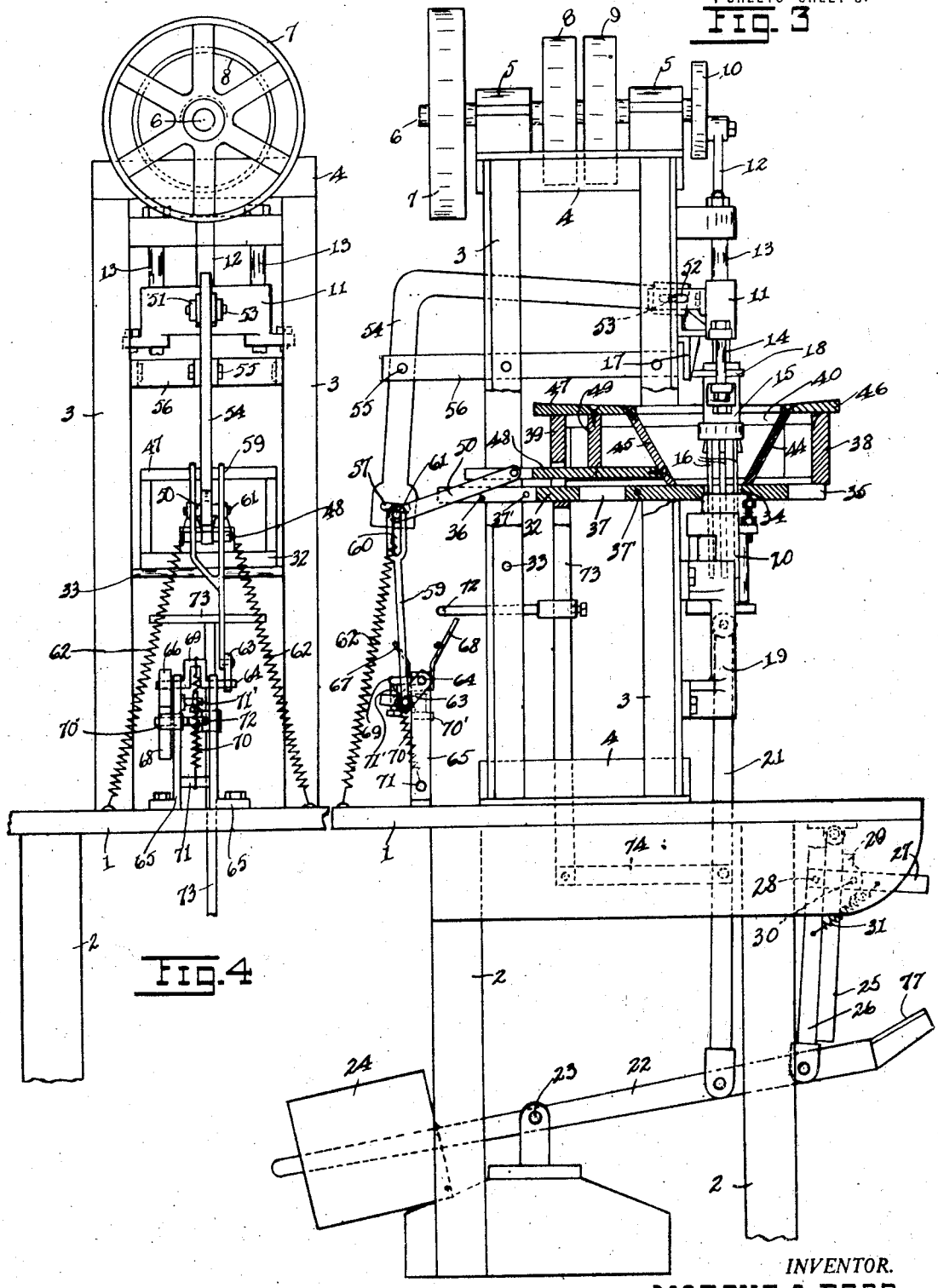


FIG. 4

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APPLICATION FILED MAY 22, 1918.

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Patented Feb. 3, 1920.

4 SHEETS—SHEET 4.

FIG. 5

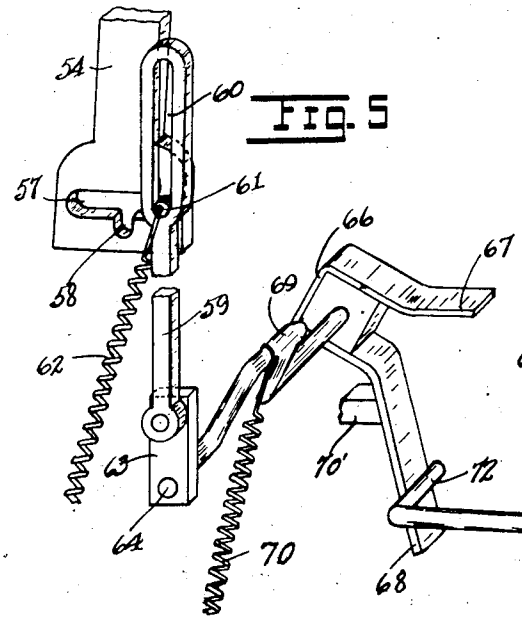


FIG. 6

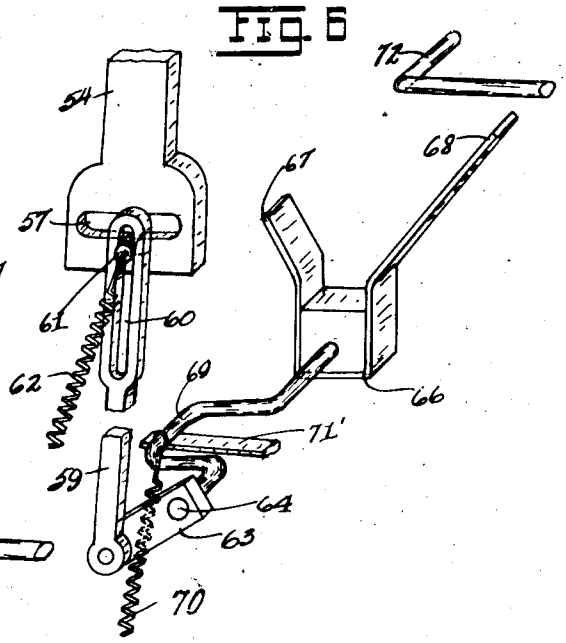


FIG. 7

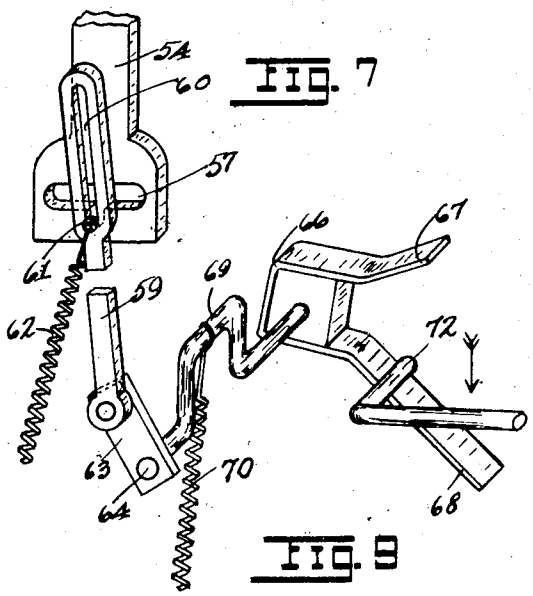


FIG. 8

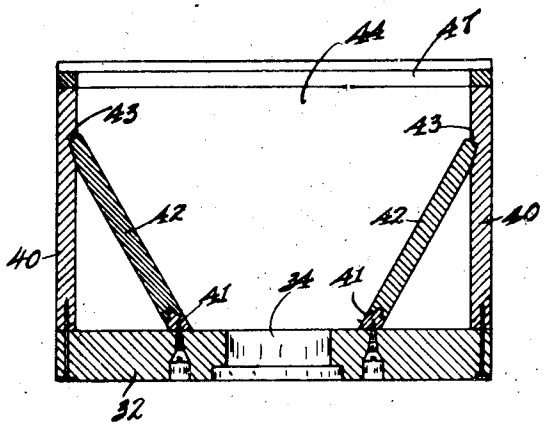
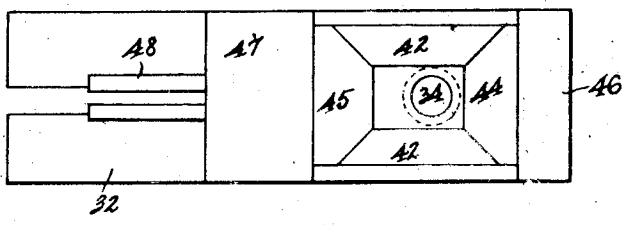


FIG. 9



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UNITED STATES PATENT OFFICE.

MARCUS A. FOOS, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO NATIONAL CARBON COMPANY, INC., A CORPORATION OF NEW YORK.

DRY-CELL TAMPER.

1,329,965. Specification of Letters Patent. Patented Feb. 3, 1920.

Application filed May 22, 1918. Serial No. 236,030.

To all whom it may concern:

Be it known that I, MARCUS A. FOOS, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Dry-Cell Tampers, of which the following is a full, clear, and exact description.

This invention relates to an improvement in apparatus for tamping the mix into the container of a dry cell. The invention more particularly consists of means for feeding the mix into the can and is especially adapted for use in connection with a tamping machine of the type shown in the patent to C. T. Richmond and M. M. Zellers, No. 641,546. Although the device will be described as applied to this type of tamper it is not necessarily limited thereto, as it may be used with other kinds of tampers.

One object of the invention is to eliminate hand feeding of the mix from the mix tray to the can. This will permit the use of unskilled and inexperienced help for tamping cells without decreasing the output of the machine. The operation is also rendered considerably less laborious.

Another object of the invention is to produce a more uniformly tamped product than is possible with hand feeding.

Other objects will appear in the following description and drawings in which:—

Figure 1 is a front view of the apparatus.

Fig. 2 is a side view with parts in section, the can carriage being in its lowermost position.

Fig. 3 is a side view similar to Fig. 2 with the carriage raised.

Fig. 4 is a rear view of the upper parts of the apparatus.

Fig. 5 is a somewhat diagrammatic skeleton view showing the position of the mix feed controlling mechanism when the can carriage is in the lowermost position.

Fig. 6 is a view similar to Fig. 5 when the can carriage is in the uppermost position.

Fig. 7 is a view similar to Fig. 6, showing the position of the parts on the down stroke of the can carriage just before the feeding of the mix is stopped.

Fig. 8 is a cross section of the mix tray perpendicular to the section shown in Figs. 2 and 3.

Fig. 9 is a plan view of the mix tray.

The tamping apparatus consists of a bench 1 supported by a suitable number of legs 2. On the bench a tamping frame is mounted having four uprights 3 made of angle irons and joined at the top, bottom and intermediate points by horizontal connecting members 4. At the top of the frame suitable bearings 5, 5 are fastened and the shaft 6 is fitted therein. At the rear end of the shaft a fly wheel 7 is placed and between the bearings pulleys 8 and 9 are arranged, one of which, 8, is an idler and the other, 9, is the drive pulley through which the shaft 6, fly wheel 7 and a disk 10 are rotated. The disk is located at the front of the shaft and through its rotation operates a reciprocating tamping head 11 to which it is connected by means of a link 12. The tamping head moves on guides 13 and is connected by rods 14 to a holder 15 for the tamping sticks 16 which are reciprocated continuously by the rotation of disk 10. The tamping sticks are also intermittently rotated by means of a cam 17 acting on a spring actuated plate 18 in a manner fully described in the Richmond and Zellers patent referred to. The holder 15 for the tamping sticks also has spring clips 18′ centrally located therein for holding the carbon electrode, said clips also being shown in the earlier patent.

Near the lower end of the tamping frame a pair of guides 19 are fastened and between these is placed a movable can carriage 20. The can carriage is connected by means of a rod 21 to a lever 22 pivoted at 23 and having a counterweight 24 fastened on the lever on the opposite side of the pivot point from the carriage. When the cell is being tamped the tamping sticks pack the mix in the cell against the force of the counterweight which provides a yieldingly resisting pressure. A clutch mechanism prevents upward movement of the can carriage during the tamping of the can, but is adapted to permit the can carriage to be raised when desired. The clutch consists of a depending strip 25 suspended from the bench 1 and an upwardly extending strip 26 pivoted on the counterweight lever 22. A forked handle 27 is pivoted at 28 on the strip 26 so that the forked end incloses the strip 25 and a clamping shoe 29 pivoted at 30. The three members are normally held together by a spring 31. When the carriage tends to move upward due to the force of the counterweight, the handle 27 is drawn into an in-

clined position in relation to strip 26 and the three members 25, 26 and 30 are pressed together unless the operator pulls the handle upward to release the spring pressure. When the carriage moves down the handle tends to assume a horizontal position which releases the pressure on the members 25, 26 and therefore does not prevent downward movement. The apparatus thus far described is essentially the same as the prior art and the invention is adapted to feed the mix into the can, when combined with and connected to this mechanism, although, as previously stated, it is not necessarily limited thereto.

The mix tray consists of a base board 32 which in its lowermost position (Fig. 2) rests on a rod 33 fastened between the rear uprights 3 and in the front rests on the top of the can carriage guides 19, 19. The base board has a circular hole 34 which at the bottom is slightly larger in diameter than a can and at the top is smaller, so that when a can is fitted in the bottom opening, its upper edge abuts against the flat surface of the reduced hole.

The base board also has three slots 35, 36 and 37 located respectively at the front, rear and between the circular hole 34 and the rear slot 36. A pair of rods 37′ passing through the board engage the inner edges of the uprights 3 and prevent the mix tray from sliding back and forth. The ends 38 and 39, the sides 40, 40 and the guide strips 41, 41 are attached to the base board as shown in Figs. 2 and 8, thus forming a box. This box receives a reciprocating feeder which moves back and forth therein and consists of inclined sides 42, 42 adapted to coöperate with the guides 41, 41 and to fit into grooves 43, 43 near the top of the stationary sides 40. Between the sides are attached the inclined front and rear ends 44, 45, which slide on the base board. At the top the ends of the tapered mix holder are fastened to a frame movable on the top edges of the outer box. The frame consists of a front board 46 attached to the front end 44 and projecting over the end 38 of the box sufficient to allow the movable feeder to be moved back and forth without uncovering the top edge of the end 38. A rear board 47 is similarly fastened to the rear end 45 and projects over the stationary box end 39. The tapered mix holder has a member 48 fastened to the rear end 45 and braced by an intermediate strip 49 attached to the top board 47. The member 48 projects through an opening in the end piece 39 and is slotted at the end to receive a connecting link 50 having a forked end.

The mix holder is reciprocated by means of connecting levers coöperating with a U-shaped member 51 bolted to the tamping head which has slots 52 in each of the arms. Pins 53 which move in the slots 52 project from a two-armed lever 54 pivoted on a pin 55 which passes between two strips 56 bolted to the frame. The other end of the lever 54 is placed between the forked end of the connecting link 50 and is provided with a slot 57 having a depression or a deep notch 58 therein. A second forked link 59 has slots 60 in the forked end, which are approximately at right angles to slot 57 and parallel to the direction in which the notch 58 is cut. A pin 61 passes through the slots 57 and 60 and through the holes in the forked end of connecting link 50. A tension spring 62 is fastened at one end to bench 1 and at the other end to the pin 61 which it draws downward and thus tends to pull into the notch 58 unless the pin is held up by link 59 on account of resting on the bottom of the slots 60. The width of slot 57 is somewhat greater than the diameter of pin 61.

The link 59 is connected to a crank arm 63 fastened on one end of a crank shaft 64 mounted in standards 65 bolted to the bench. On the other end of the crank shaft a member 66 is attached which has two arms 67, 68. The portion of the crank shaft between the standards consists of an offset crank arm 69 having a tension spring 70 connected thereto, the other end being fastened to a rod 71 placed between the standards vertically below the crank shaft bearings. The crank arm 63 and the crank arm 69 are preferably spaced apart angularly, in the present case the crank arm 69 is about 30° to the right of the crank arm. A stop 70′ which is engaged by arm 68 limits the rotation of the shaft in a clockwise direction, and a stop 71′ attached to standard 65 limits counterclockwise rotation by engaging the crank arm 69.

The mix feed is controlled by a rod 72 fastened to a tray elevator 73 joined to the link 21 by an arm 74. The upper end of the tray elevator engages the base board and elevates the tray when the carriage is raised. The front end of the tray is also engaged on the upstroke of the carriage by the heads of bolts 75 fastened in projections 76 of the can carriage.

The operation of the apparatus is as follows: When the carriage is down as shown in Fig. 2 the operator will insert an electrode in the electrode holder 18′ located between the tamping sticks. A can will then be placed on the can carriage and then the handle 27 will be raised to release the clutch which then allows the counterweight to raise the can carriage. The controlling mechanism moves from the positions shown in Fig. 5 to those shown in Fig. 6. After the can carriage has moved part of the way up, the tray elevators 73 and 75 engage the base board 32 of the mix tray and then raise it, the pins 37′ pre-

venting any back or forward movement. At about the same instant that the mix tray is engaged the rod 72 engages the arm 67 and turns the crank shaft 64 until the pins are in alinement with the center of the shaft 64.

The spring 70 will then turn the shaft further until the crank arm 69 strikes the stop 71'. The crank arm 63 will also be moved through the same angle and will draw the link 59 downward, thus lowering the position of the slot 60. The spring 62 will simultaneously draw the pin 61 downward in the slot 60 until the lower edge of slot 57 is reached. Inasmuch as the tamping frame reciprocates continuously the two-armed lever 54 will be rocked back and forth, the pins 53 moving in the slots 52 to take care of the horizontal component of the movement of the pins. The end of lever 54 containing the slot 57 is therefore rocked back and forth continuously. When link 59 is lowered so that the bottom of slot 60 does not support the pin 61, the pin will be drawn into the notch 58 by the spring 62 as soon as the slot 57 is moved forward due to the rocking of the two-armed lever 54. The shape and depth of the notch 58 is such that the pin 61 is readily held therein by the spring 62 until the link 59 raises it out of the notch. It will be understood that the can carriage changes from the lowermost position to the uppermost position very quickly when the clutch is released and the change of the controlling mechanism from the positions of Fig. 5 to those of Fig. 6 also occurs in the same time. In fact, the upward movement of the rod 72 is sufficient to turn the shaft 64 over on the up stroke without the aid of the spring 70.

As soon as the pin is drawn into the notch 58 the movable tapered mix holder is set in motion within the box and shakes the mix into the can by pushing it back and forth over the opening 34. The operator places the mix in the holder by means of a scoop as soon as the carriage is raised. The moist condition of the mix prevents it from falling through the opening until the mix feed is placed in operation. The mix feed shakes the mix back and forth over the opening and pushes it into the can in a rapid and uniform manner.

As the mix is tamped into the can by the tamping sticks, the carriage recedes against the yielding pressure applied by the counterweight. On the upward stroke of the tamping sticks the carriage is prevented from similar upward movement by the clutch as previously described. During the tamping the controlling mechanism gradually moves downward due to rod 72 engaging the arm 68 and turning the crank shaft 64 until when the cell is tamped to the proper height these parts assume the position shown in Fig. 7. It will be noted in this figure that crank arm 69 has been raised until the bottom of slot 60 is just in engagement with pin 61, and the offset crank arm 69 of the crank shaft 64, the bearings of the crank shaft and the spring 70 are in alinement and in a vertical position. A slight movement of the crank arm 69 toward the right due to the rod 72 moving further down will place the crank arm over the dead center and spring 70 will then quickly turn the shaft over until the arm 68 strikes the stop 70'. This will produce simultaneously a quick upward movement of crank arm 63 and link 59 which will raise the pin 61 out of the notch 58. The pin will then move back and forth in slot 57 and the reciprocating movement of the mix holder will be discontinued so that mix will no longer be fed into the can.

The operator will then immediately lower the tamped cell out of range of the tamping sticks by pressing on the foot lever 77 and then remove the cell. The operation is then ready to be repeated.

It has been found that as the mix shaker moves back and forth in the guide box, mix gradually works under the lower edge of the ends 44 and 45 into the guide box, and if not removed it becomes packed very tightly therein. The shaker would then be forced out of the box and the apparatus would have to be repaired. To eliminate this, slots 35 and 37 are provided which allow the mix to drop out of the box as fast as it accumulates therein.

My invention is not limited to the specific controlling mechanism shown, as it will be evident that other mechanical equivalents may be used for throwing out the mix feed.

Having described my invention, what I claim is:—

1. In apparatus for tamping dry cells, a can carriage, a mix holder communicating with the top of the can, means for tamping the mix in the can and means for shaking the mix back and forth to feed it into the can.

2. In apparatus for tamping dry cells, a can carriage, a mix holder having an opening over the top of the can, means for tamping the mix in the can, means adapted to separate the can carriage and tamping means as the mix is tamped into the can and means for reciprocating the mix over the opening to feed said mix into the can.

3. In apparatus for tamping dry cells, a can carriage, means for tamping the mix in the can, means adapted to separate the can carriage and tamping means as the mix is tamped into the can, a mix platform having an opening communicating with the top of the can, and a mix holder slidably mounted thereon adapted to slide the mix back and forth over the opening to force it into the can.

4. In apparatus for tamping dry cells, a can carriage, means for tamping the mix in the can, means adapted to separate the can carriage and tamping means as the mix is tamped into the can, a mix platform having an opening adapted to register with the top of the can, a mix holder open at the base and surrounding said opening in the platform, and means for reciprocating the holder to feed mix through the opening while the cell is being tamped.

5. In apparatus for tamping dry cells, a movable can carriage, means for tamping the mix into the can, means for yieldingly resisting the movement of the can carriage, a mix platform having an opening in communication with the top of the can, a mix holder open at the base and surrounding said opening in the platform, means for reciprocating the holder to shake mix through the opening, and means for stopping the reciprocating movement of the mix holder when the cell is tamped, whereby further feeding of the mix is prevented.

6. In apparatus for tamping dry cells, a movable can carriage, reciprocating means for tamping a mix in the can, a mix platform having an opening in communication with the top of the can, a mix holder open at the base and surrounding said opening in the platform, means for connecting said holder with the reciprocating tamping means to impart a similar movement to the holder whereby the mix is fed through the opening, and means adapted to disconnect said holder when the cell is tamped.

7. In dry cell tampers, a movable can carriage, reciprocating means for tamping a mix into the can, a mix platform having an opening adapted to register with the top of the can, a mix holder open at the base adapted to surround the opening in said platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means and adapted to be connected at the other end to said holder, and means for disconnecting said mix holder and lever when the cell is tamped to the proper height.

8. In dry cell tampers, a movable can carriage, reciprocating means for tamping mix into the can, a mix platform having an opening adapted to register with the top of the can, means adapted to elevate the platform with the can carriage, a mix holder open at the base adapted to surround the opening in the platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means and adapted to be connected at the other end to the holder, means for disconnecting said holder and lever when the cell is tamped to the proper height and means adapted to support the platform after the cell is tamped to the proper height.

9. In dry cell tampers, a movable can carriage, reciprocating means for tamping the mix into the can, a mix platform having an opening adapted to register with the top of the can, a mix holder open at the base adapted to surround the opening in said platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means, said lever having a slot in the other end, a link pivoted at one end to the mix holder, a pin fitted in the other end of the link and movable in the slot, said lever having a notch adjoining the slot, means adapted to move the pin into the notch to connect the tamping means and holder, and means for holding the pin in the slot to disconnect said tamping means and holder.

10. In dry cell tampers, a movable can carriage, reciprocating means for tamping mix into the can, a mix platform having an opening adapted to register with the top of the can, a mix holder open at the base adapted to surround the opening in said platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means, said lever having a slot in the other end, a link pivoted at one end to the holder, a pin fitted in the other end of the link and movable in the slot of the pivoted lever, said lever having a notch therein adjoining the slot, means adapted to draw the pin into the notch to connect the tamping means and holder, and means operated from the can carriage adapted to move said pin into the slot to disconnect the tamping means and holder when the cell is tamped to the proper height.

11. In dry cell tampers, a movable can carriage, reciprocating means for tamping mix into the can, a mix platform having an opening adapted to register with the top of the can, means connected to the can carriage for moving the mix platform therewith during a part of the movement of the carriage, a mix holder open at the base adapted to surround the opening in said platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means, said lever having a slot in the other end, a link pivoted at one end to the holder, a pin fitted in the other end of the link and movable in the slot of the pivoted lever, said lever having a notch therein adjoining the slot, means adapted to draw the pin into the notch to connect the tamping means and holder, means adapted to move said pin into the slot and an arm connected to the carriage adapted to operate said last mentioned means when the cell is tamped to the proper height.

12. In dry cell tampers, a movable can carriage, reciprocating means for tamping mix into the can, a mix platform having an opening adapted to register with the top of

the can, a mix holder open at the base adapted to surround the opening in said platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means, said lever having a slot in the other end, a link pivoted at one end to the holder, a pin fitted in the other end of the link and movable in the slot of the pivoted lever, said lever having a notch therein adjoining the slot, means adapted to draw the pin into the notch to connect the tamping means and holder, means for removing the pin from the notch and maintaining it in the slot when the tamping is complete, consisting of an arm connected to the movable can carriage, a shaft, a lever projecting therefrom into the path of the arm and adapted to be engaged thereby on the downward stroke, a crank connected to the shaft and a link having a slot for receiving the pin, said link being connected to the crank and adapted to raise the pin when the arm engages the lever and rotates the shaft on the downward stroke of the carriage.

13. In dry cell tampers, a movable can carriage, reciprocating means for tamping mix into the can, a mix platform having an opening adapted to register with the top of the can, a mix holder open at the base adapted to surround the opening in said platform and slidably mounted thereon, a pivoted lever connected at one end to the tamping means, said lever having a slot in the other end, a link pivoted at one end to the holder, a pin fitted in the other end of the link and movable in the slot of the pivoted lever, said lever having a notch therein adjoining the slot, means adapted to draw the pin into the notch to connect the tamping means and holder, means for removing the pin from the notch and maintaining it in the slot until the tamping is complete, consisting of an arm connected to the movable can carriage, a shaft, a lever projecting therefrom into the path of the arm and adapted to be engaged thereby on the downward stroke, a crank connected to the shaft and a link having a slot for receiving the pin, said link being connected to the crank and adapted to raise the pin when the arm engages the lever and rotates the shaft on the downward stroke of the carriage, and means for turning the shaft quickly through an angle sufficient to raise the pin out of the notch quickly when the cell is tamped to the proper height.

14. In apparatus for tamping dry cells, a movable can carriage, means for tamping the mix in the can, a mix platform movable with the can carriage while the mix is being tamped, said platform having an opening communicating with the top of the can, a mix holder open at the base and surrounding said opening in the platform, means for reciprocating the holder to shake the mix through the opening and means dependent on the position of the can carriage for stopping the shaking of the mix.

15. In apparatus for tamping dry cells, a movable can carriage, means for tamping the mix in the can, a mix tray having guides therein, said tray having an opening communicating with the top of the can, a tapered mix holder fitted in the tray and movable between the guides, said holder being open at the base and slidable on the bottom of said tray, and means for reciprocating the holder to shake the mix through the opening.

16. In apparatus for tamping dry cells, a movable can carriage, means for tamping the mix in the can, a mix tray having guides therein, said tray having an opening communicating with the top of the can, a tapered mix holder fitted in the tray and movable between the guides, said holder being open at the base and slidable on the bottom of said tray, means for reciprocating the holder to shake the mix through the opening, and means for removing mix entering between the tray and the holder.

17. In apparatus for tamping dry cells, a movable can carriage, means for tamping the mix in the can, a mix tray having guides therein, said tray having an opening communicating with the top of the can, a tapered mix holder fitted in the tray and movable between the guides, said holder being open at the base and slidable on the bottom of said tray, means for reciprocating the holder to shake the mix through the opening, and an opening in the bottom of the tray on each side of the slidable mix holder for the removal of mix entering between the tray and holder.

In testimony whereof, I hereunto affix my signature.

MARCUS A. FOOS.