C. McCORKELL.

BARREL PACKING MACHINE.

APPLICATION FILED MAR. 13, 1920.

1,359,082.

Patented Nov. 16, 1920.

3 SHEETS—SHEET 1.

Fig. 3.

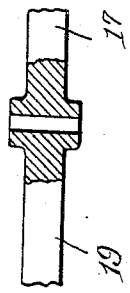


Fig. 4.

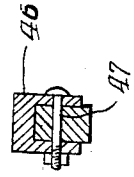


Fig. 1.

Witness

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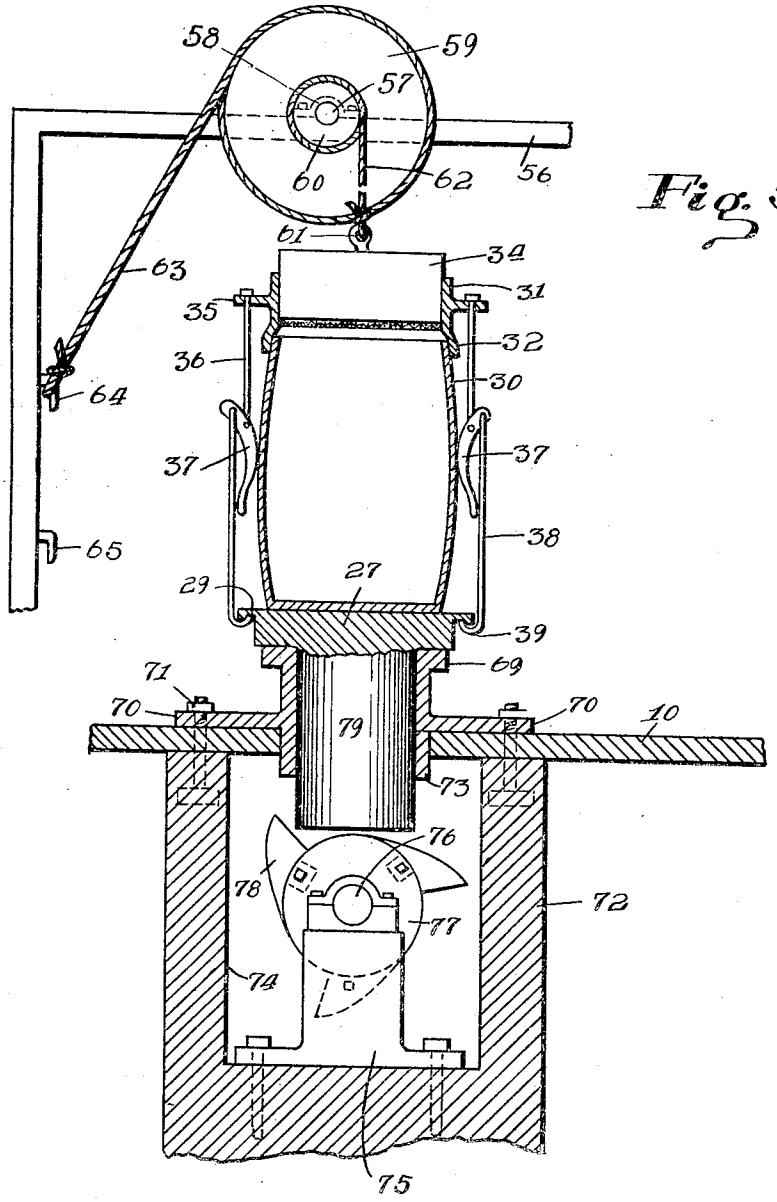


Fig. 5.

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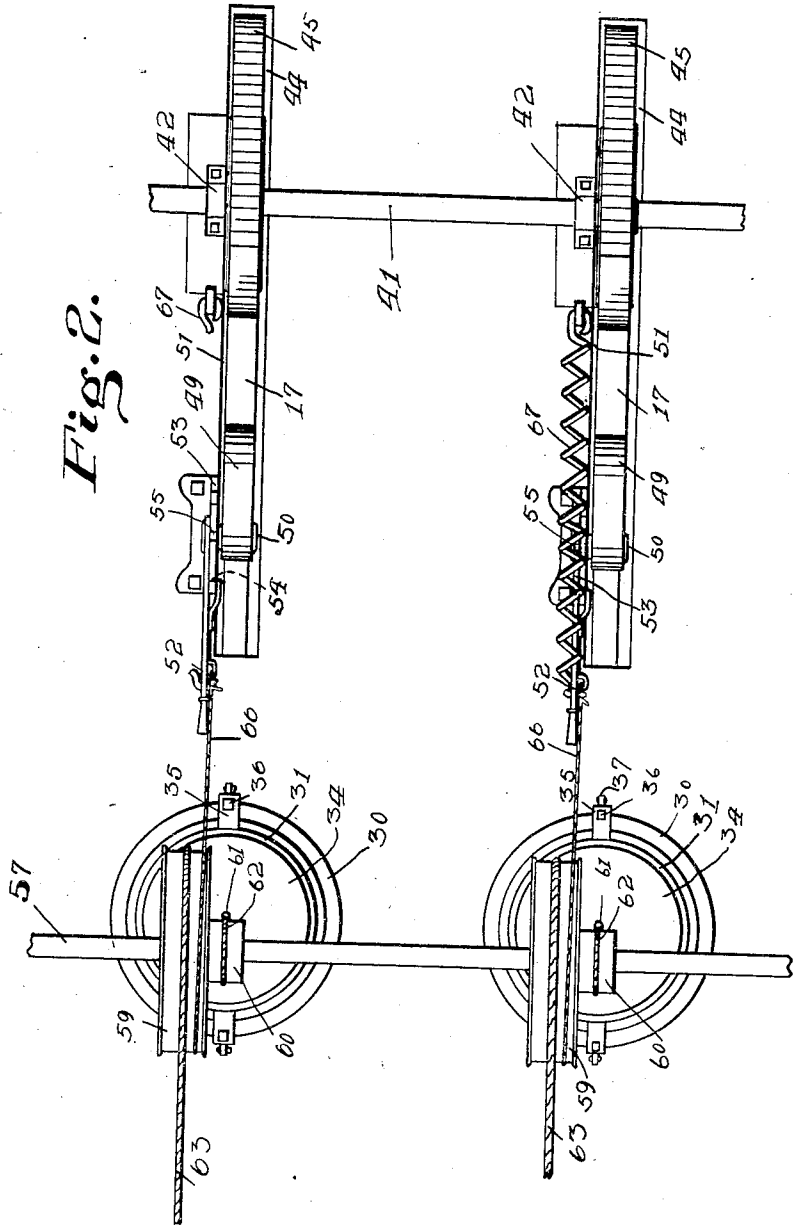
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3 SHEETS—SHEET 2.

Fig. 2.



Witness

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UNITED STATES PATENT OFFICE.

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BARREL-PACKING MACHINE.

1,359,082. Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed March 13, 1920. Serial No. 365,570.

To all whom it may concern:

Be it known that I, CHARLES McCORKELL, a citizen of the United States, residing at Phillipsburg, in the county of Warren and State of New Jersey, have invented a new and useful Barrel-Packing Machine, of which the following is a specification.

This invention relates to a new and improved barrel packing machine, for the purpose of packing barrels with fine or granular material, such as cement, and for causing the contents thereof to be thoroughly packed in order that a given quantity or volume of material may be packed in a barrel or the like, and obviate the necessity of handling the same manually for this purpose, in addition to avoiding destruction of the barrel and constructing the device in a novel, strong and simple manner whereby unnecessary strain or jar is avoided and insuring ease of operation and durability in use.

A further object of the invention is to provide a mechanical cement barrel packing machine, by which a series or plurality of barrels can be packed by vertical reciprocation or jar from a common drive shaft, requiring but low horse power to operate the same, thus permitting the machine to be operated in a battery of 4, 6, 9 or other number so that one or more barrels are raised and released at the same time while the others are operated alternately therewith, so that a given weight of cement or the like, may be packed in a barrel of certain volume and also to obviate manual or skilled labor in the packing of the barrels and in the repair of the machine.

A still further object of the invention is to provide improved means for supporting and holding the barrels and actuating or raising the same, to provide improved means whereby the material will be prevented from being spilled from the barrel when it is raised and to insure packing thereof when dropped, as well as to prevent the escape of the dust incident to the packing or shaking action; to permit operation of any one or all, or any series or plurality of the devices of a battery, independently or simultaneously, whereby when one device is inoperative or stationary to permit the removal of one barrel and the replacing of a new one, the other barrels are being packed, thus saving time, and finally to provide improved means whereby the means for preventing the spilling of the cement or escape of dust, can be raised out of the way and in direct vertical alinement with the barrel, so as to be readily replaced with but slight exertion and so as not to interfere with the action of removing a packed barrel or replacing a new one to be packed.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that within the scope of what is claimed, changes in the precise embodiment of the invention shown can be made without departing from the spirit of the invention.

In the accompanying drawings:

Figure 1 is a vertical sectional view of the barrel packing machine in accordance with the invention; one of the elements of the series of battery being shown;

Fig. 2 is a plan view thereof;

Fig. 3 is a detail bottom view of one of the levers for elevating the barrels by cooperation with its supporting structure;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 1, and

Fig. 5 is a vertical sectional view of a modification.

Referring to the drawings in detail, in which like reference characters designate corresponding parts throughout the several views, and in the construction and application of my improved barrel packing machine for cement or the like, the numeral 10 designates the floor line or floor, beneath which is disposed the cement or other foundation or base 11 for a base plate 12, which is secured or anchored thereto in any manner shown at 13, and which is provided with an upstanding bracket or stand portion 14. The anchoring means 13, may consist of bolts or other securing means embedded in the base and passed through suitable apertures in the base plate 12 of the stand, the stand proper 14 being cylindrical or other desired shape, and having a vertical slot 15 at one side remote from the end of the base plate provided with a pair of upstanding bearings 16 in which is pivoted a lever 17, as indicated at 18 on a horizontal pivot permitting vertical swinging of the arms of the lever. The arm which extends outwardly from the stand

is horizontally disposed and slightly offset upwardly adjacent to the pivot, said arm being also longer than the cam-like lifting arm 19 at the other end, which has a reduced portion disposed through the slot 15 and the enlarged end thereof disposed within the stand proper 14 at the center or axis thereof.

Mounted upon the stand proper 14 is a cylinder 20 which is preferably provided with an extension 21 fitting inside of the upper end of the same, the stand having an outstanding or circumscribing flange 22 cooperating with a flange 23 of similar formation at the lower end of the cylinder, whereby the parts may be bolted together or otherwise detachably connected as indicated at 24. The cylinder projects through an opening in the floor 10, as indicated at 25 and receives for vertical reciprocation therein, a plunger 26 which projects from the lower end of the cylinder within the stand 14 for contact with the camming end 19 of the lever 17 when the plunger or piston 26 is downwardly displaced or at its lower limit, so that the head plate or flange 27 thereof is disposed adjacent to the circumscribing flange 28 at the upper end of the cylinder. Of course, the plate or head 27 may contact with the upper end of the cylinder to limit the downward movement of the latter during its vertical reciprocation and to support the plunger or piston if desired. The flange or head plate constituting the head of the piston is provided with an under cut annular groove 29 adjacent to the peripheral edge thereof and said plate is adapted to receive thereon a barrel or other receptacle 30 adapted to be packed with the cement or other material, while engaged on the open upper end of the barrel is a sheet metal top or rim 31 having an offset enlargement 32 at its lower end adapted to rest on the upper edge or ledge of the barrel at the mouth thereof. This top or rim is adapted to accommodate the cement which is to be packed into the barrel. A pad 33 of two or three thicknesses of canvas or muslin is laid on top of the cement under a large weight 34 snugly fitting in the rim or top and bearing down on the pad, so that its weight rests on the cement, the purpose of the pad being to prevent the cement or dust therefrom, from escaping while the weight remains stationary, that is, it does not work up and down except with the barrel as the latter is agitated or reciprocated vertically, the weight therefore keeping the cement positively in position in the top or rim. This rim or top which constitutes an extension for the barrel for receiving the surplus material to be packed therein, is provided with a plurality of outstanding apertured lugs or ears 35, from which are suspended links or rods 36 connected intermediately to levers 37 constituting tightening or camming levers which have the inner extremities thereof pivoted likewise to the upper ends of links or rods 38 extending downwardly and having hooks 39 curved inwardly and upwardly to engage the groove 29. Thus, the levers may be raised to extend the articulated connection constituted by the levers and links or may be swung downwardly to cause the connected ends to be separated in overlapping relation and shorten or tighten the connections whereby the rim or top is held tight on the barrel. It is to be understood that when the levers are raised, the barrels may be placed in position before packing or may be removed after packing, the levers serving to secure the top in position during the packing operation.

In order to impart the necessary oscillating movement to the lever for the purpose of raising the barrel with its contents and at the desired degree, preferably about two inches, the camming arm or end 19 of the lever 17 is disposed in contact with the projecting lower end of the piston or plunger 26 and supported adjacent to the outer end of the long arm of the lever 17 is a drum 40 which is rotatably mounted on a suitably driven shaft 41, it being understood that such shaft may be driven from an electric motor or other prime mover and is rotatably mounted in bearings 42 supported upon a cement or other foundation 43, so as to project through an opening 44 in the floor. The drum is provided with a series of removable cams or camming arms 45 which as the drum rotates with its shaft, engage the lever so as to depress the same, thereby raising the arm 19 to elevate the plunger and the barrel supported thereon. As the outer end of the lever is released, the barrel under its weight and load, will drop and strike the cylinder with a hard jar or blow which packs the cement or other material therein, this operation being continued until the proper packing is acquired, it being understood that a speed of 300 reciprocations may be imparted to the piston and the barrel, by the proper speed of rotation to the shaft and the number of cams on the drum, it being understood that this operation is carried on without extraordinary jar or wear on the parts, while the long arm of the lever serves to reduce the amount of force required to raise the load. The cams or arms of the drum may be straight on one side and curved on the other to a proper degree to reduce the friction between the parts, the arms being preferably removable so that they can be readily replaced and bolted in position when worn, for renewal purposes, while the lever 17 is provided with a removable contact portion or end 46 comprising a channel-shaped member straddling the lever as indicated and bolted at a plurality of space points

therethrough, as indicated at 47, so as to be rigid therewith and fit in a recess 48 in the lever so as to be slightly elevated above the normal top edge or surface of the lever. This end is obviously capable of being readily applied or removed and replaced with a new contact portion, which in conjunction with the cams or arms of the drum, constitute the portions of the device which are mainly subject to wear except the camming arm 19, which may be constructed in a suitable manner to compensate for wear, while the plunger or piston and the cylinder, may be suitably ground and bushed to insure proper operation thereof, it being understood that parts subject to wear, may be suitably lubricated to reduce wear and friction.

In order to hold the device inoperative, there is provided a cam or an eccentric 49 pivoted in suitable bearings as indicated at 50 above the floor and operable through a slot 51 therein, the eccentric being capable of operation through the medium of a throw lever 52, while one of the bearings may constitute a notched segment as indicated at 53 provided with notches 54 and 55 to accommodate the lever 52, and by means of which the eccentric 49 may be held in an adjusted position. When the lever 52 is engaged with the notch 54, the eccentric will be held elevated whereby the lever 17 may be operated but when the throw lever is raised to a vertical position from the horizontal position and is engaged with the notch 54 to engage the latch in the notch 55, the eccentric will be swung downwardly to depress the adjacent end of the lever whereby the piston will be raised together with the barrels and parts thereon, so that the arms or cams 45 will pass the lever without striking the same. By this means, a battery or plurality of the devices driven from a common shaft, may be independently or simultaneously actuated in any desired arrangement or relation or held inoperative, that is thrown out of operation, it being understood that the disks or drums 40 are preferably so arranged that a staggered operation or alternate contact of the cams with the levers is caused, thereby relieving the prime mover of unnecessary load during the operation. That is, if a battery of four of the devices is provided, two may be operated at a time, or successively in alternation and so on with 6, 9 or any number of the devices.

As a means for lowering the weight 34, and permitting the necessary vertical movement or reciprocation thereof with the barrel, as well as to permit raising of the weights when it is desired to place a barrel in position or remove the same, and replace the same with another barrel to be packed, there is provided in the beams or other suitable supports 56, a shaft 57 mounted in bearings 58, each device having a large drum 59 and a small drum 60. Connected to the weight as indicated at 61 and made fast to the small drum 60 is a flexible connection in a form of a cable or the like 62, while made fast to the large drum 59 is a cable or the like 63, the cables being wound in opposite directions and so arranged that when one is wound on its drum, the other is unwound from its respective drum. Thus, when the weight 34 is engaged in the top or rim 31, the cable 63 is released to wind on the drum 59 and the cable 62 is unwound from the drum 60 to lower the weight and to permit free reciprocation thereof vertically. However, the differences in the diameters of the drums is such that a very large leverage is produced whereby a heavy weight may be raised with a small expenditure of force or manual power so as to wind the cable 62 on the drum 60 and unwind the cable 63 from the drum 59, the cable 63 being adapted to be connected to a hook or the like 64 at an adjacent upright or wall, when the weight is lowered and to engage with a projection or hook 65 when the weight is elevated, so as to hold the latter in this position out of the way. The advantage of this device over a lever is that the weight is always maintained directly above the barrel and its rim or top 31 and is therefore in a position to readily enter the same without difficulty, while the arm of a lever would move off center and require such a large application of force as to render the same objectionable. With this device, the weight may be easily and readily elevated clear of the rim to facilitate application and removal of the barrel. Of course, when the throw lever is operated in conjunction with the segment or quadrant 53, the weight is preferably first raised though this is not imperatively necessary, and it will be seen that a single attendant can watch and control the operation of a large battery of the packing devices. It is also to be understood that the lever 17 and the cylinder as well as the piston or plunger, can be renewed conveniently when found necessary or desirable. Obviously by the arrangement shown, a considerable saving in horse power for driving the machine is effected and there is also a saving of skilled labor for repairs, there being nothing to wear out except the adjustable arms of the drums or crank shaft, it being understood that such latter device is the mechanical equivalent of the drum and cams and may be so provided, while the adjustable or movable shoes or contact portions 45 may also be readily applied and removed by ordinary labor.

In addition, the device may be made or set to stop automatically when the weight reaches the downward limit of its movement at the top of the barrel, by means of a cable 66 attached to the larger drum 59

at one end and adapted to wind thereon, the opposite end of the cable or rope being connected to the lever 52 which is employed for actuating the cam or eccentric 49 constituting a part of the throw-out mechanism or means for holding the machine inoperative. The lever has connected thereto, one end of a retractile spring 67 which is suitably anchored at its opposite end and adapted to pull the lever in such a position as to depress the lever 17. The segment 53 is provided with a stop 68 designed to limit the throw of the lever 52 and owing to the length of this lever, the tension of the spring need not be very great in order to pull the lever, assisted by the overhanging of the portion of the cam which is the part of the greatest eccentricity. Thus, it will be seen that when the barrel is packed, the cable will be released, the spring then acting to depress the lever 17 through the medium of the eccentric or cam. That is, when the barrel is packed and the weight has gone down in the barrel, the cable subsequently comes up and engages in the latch on the quadrant so as to release the lever and allow the spring to pull the same against the stop, thus stopping the machine. I desire to have it understood that the piston is preferably provided with a stroke of about two inches so that the barrel and weight may be correspondingly raised and allowed to drop with a hard jar against the cylinder, so as to thoroughly pack the barrel. In addition, the device serves to save material or staves, as about one-quarter less material or a barrel about one-quarter size smaller may be used to contain a given volume or weight of cement, than ordinarily where a screw or other type of packer is used.

In the operation of the device the barrel is placed in position and the rim clamped thereon, the material being also placed in the rim to a point near the top thereof. The pad is laid over the cement and the weight lowered or let down on the pad and cement to remain stationary during the reciprocation of the plunger and barrel. As the shaft is operated to rotate the drum, the lever is oscillated to reciprocate the plunger or piston and the barrel, the weight moving therewith but remaining stationary with respect to its position relative to the barrel except to its movement downwardly as the latter is packed in the barrel. The continued reciprocation of the barrel packs the material therein, the weight serving to keep the dust from arising therefrom, from escaping, in connection with the pad and preventing the cement from being precipitated or thrown from the barrel and the creating of dust, at least to an excessive degree. This operation is continued until the barrel is packed, thus expediting the packing of a large number of barrels. In Fig. 2 of the drawings I have shown two of the devices connected in battery formation, but it is to be understood that the number may be increased or varied as desired.

In the form of the invention shown in Fig. 5 of the drawings, the cylinder 69 is provided with a flange 70 bolted or otherwise anchored as shown in 71 to the concrete base or foundation 72, said anchoring means consisting of headed bolts or the like suitably embedded in the base and projecting above the same for detachable connection of the cylinder flange thereto. It is of course, to be understood that any number of cylinders may be provided, and each cylinder is formed to extend below the flange as indicated at 73, the foundation being open beneath to form a tunnel as shown at 74 for supporting therein at the bottom, a bearing 75 for the shaft 76 carrying the drum 77 provided as heretofore described with the removable cams or camming arms 78 for direct engagement with the lower ends of the plungers or pistons 79 in order that the piston may be raised and lowered or permitted to drop to shake or agitate the cement or other material in the barrels or other receptacles mounted thereon, ıor thoroughly packing the cement. The other parts are the same as described in connection with the first form and since the operation of the device has been clearly set forth, further description is deemed unnecessary. However, it may be stated that this form of the invention is for the purpose of saving space or allowing the installation of the machine in less space than the machine shown in the first form and employing the lever 17 although in the former case, less horse power is required to operate the machine.

Having thus described the invention what I claim is:

1. In a barrel packing machine, a movable support for the barrel, means for reciprocating the same, said means serving to elevate the barrel to permit dropping thereof under its weight, means for retaining a surplus amount of material in and above the barrel and preventing displacement thereof, said means being adapted to move with the barrel, and means to displace said last-named means from upon the material in the barrel.

2. In a barrel packing machine, a movable support for the barrel, means for reciprocating the same, said means serving to elevate the barrel to permit dropping thereof under its weight, means for clamping the barrel in position, means for supporting and retaining a quantity of material to be packed into the barrel, above the same, means for throwing the reciprocating means out of operation manually and holding the same inoperative, and means to automatically op-

erate the last-named means when the barrel is packed.

3. A barrel packing machine comprising a cylinder suitably supported, a plunger operable therein and having a head plate, said head plate being designed to support a barrel or the like thereon, clamping means for retaining said barrel in position and including a rim resting on the open end of the barrel, a lever pivotally supported and having an arm engaging the lower end of the plunger, an operating means including a shaft provided with a series of camming devices to oscillate the lever, said camming devices being removable, said lever having a removable contact portion and means to hold the lever depressed and out of the path of the camming devices.

4. A barrel packing machine comprising a cylinder suitably supported, a plunger operable therein and having a head plate, said head plate being designed to support a barrel or the like thereon, clamping means for retaining said barrel in position and including a rim resting on the open end of the barrel, a lever pivotally supported and having an arm engaging the lower end of the plunger, and operating means including a shaft provided with a series of camming devices to oscillate the lever, an eccentric mounted adjacent to the lever, means to move the eccentric out of the path of the lever to permit oscillation thereof and adapted to hold the eccentric in position to depress the lever out of the path of the camming devices, said clamping means for the barrel permitting the displacement thereof, a weight supported in the rim of the barrel to move therewith, and means for raising and lowering the weight.

5. A barrel packing machine for cement, comprising a base, a stand mounted on said base, a cylinder detachably supported on said stand, a piston operable in said cylinder to extend beneath the same, said cylinder having a head plate provided with an annular groove at the bottom thereof, a rim adapted to engage upon the upper edge of a barrel or the like supported on said head plate, a series of clamping members connected to the rim and detachably engageable in the groove to removably secure the barrel in position, means for raising the piston, and a weight adapted to be supported in the rim and to be displaced upwardly therefrom.

6. In a barrel packing machine, the combination with a plurality of plungers and means for raising the same, said plungers being adapted to support the barrels thereon; of means for clamping the barrels in position, means to weight the material in the barrels, means for raising the plungers, and means for raising or lowering the weights.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES McCORKELL.

Witnesses:
J. S. BOWERS,
FRANKLIN R. HINSMAN.