

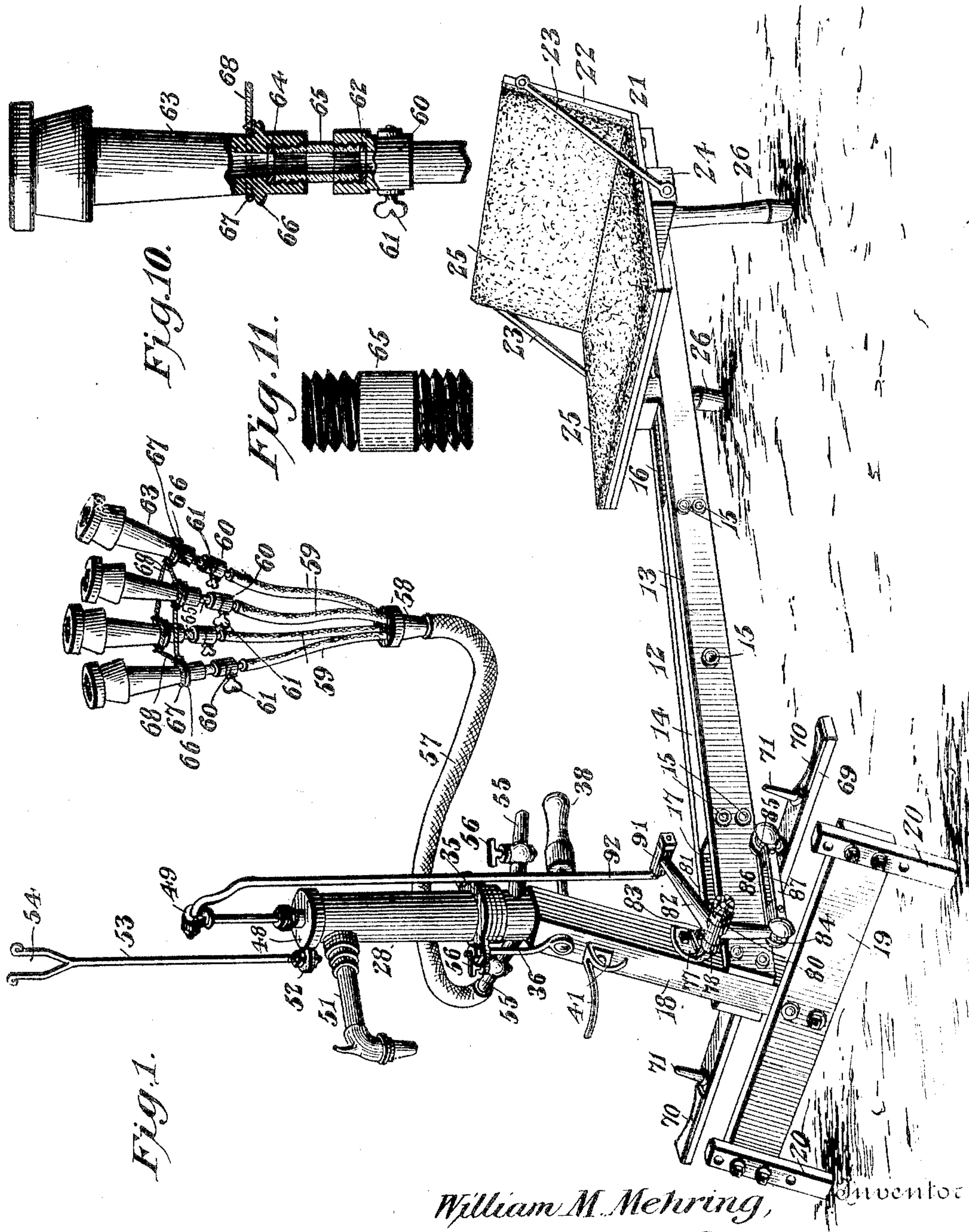
No. 797,592.

PATENTED AUG. 22, 1905.

W. M. MEHRING.
MILKING MACHINE.

APPLICATION FILED MAY 12, 1904.

3 SHEETS—SHEET 1.



William M. Mehring,

Inventor

By

E. G. Siggers

Attorney

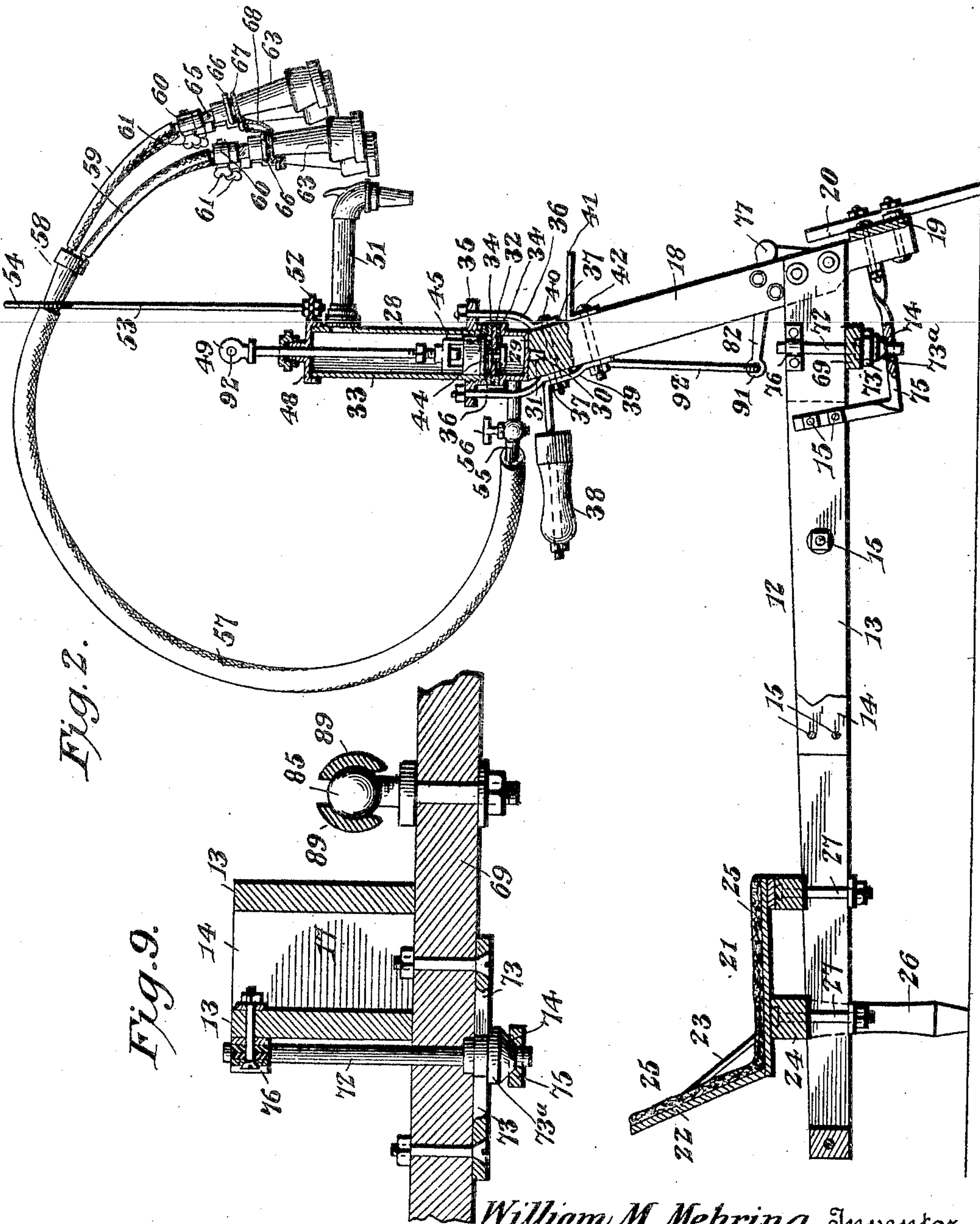
Witnesses
Jas. E. McEachran
B. H. Foster

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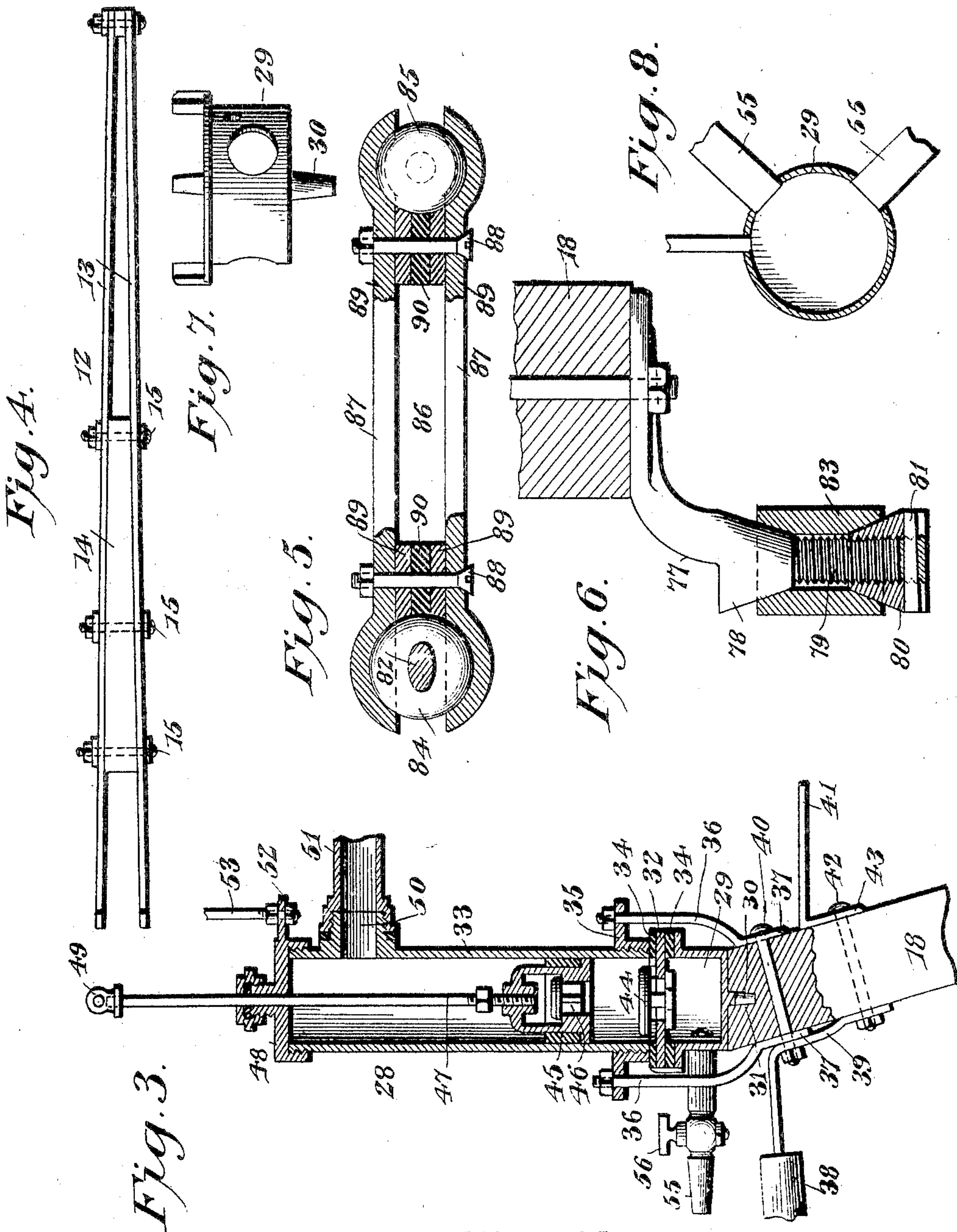
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WILLIAM MARSHALL MEHRING, OF YORKROAD, MARYLAND.

MILKING-MACHINE.

No. 797,592.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed May 12, 1904. Serial No. 207,624.

To all whom it may concern:

Be it known that I, WILLIAM MARSHALL MEHRING, a citizen of the United States, residing at Yorkroad, in the county of Carroll and State of Maryland, have invented a new and useful Milking-Machine, of which the following is a specification.

This invention relates to improvements in cow-milking machines of that character set forth in prior patents granted to me as follows: No. 488,282, dated December 20, 1892; No. 571,573, dated November 17, 1896; No. 638,640, dated December 5, 1899. In this type of machine the suction of a pump is employed for withdrawing the milk from the cow's udder.

The aim in the present case is more particularly to improve the structure of the machine illustrated in Patent No. 638,640, whereby the same is materially simplified in construction, is lighter in weight, and the parts are capable of adjustment for the purpose of taking up wear, thus avoiding lost motion and prolonging the life of such parts.

An embodiment of the invention which is at present considered the preferable one is illustrated in the accompanying drawings and is described in the following specification. An inspection of the claims hereto appended will clearly show, however, that the structure is open to changes and modifications without departing from the spirit or scope of the invention.

In the drawings, Figure 1 is a perspective view of the machine complete with the exception of one set of teat-engaging means, which have not been shown in order to avoid confusion. Fig. 2 is a vertical longitudinal sectional view through the machine. Fig. 3 is a detail sectional view, on an enlarged scale, through the pump. Fig. 4 is a top plan view of the base-frame. Fig. 5 is a detail sectional view, on an enlarged scale, through the link connection between the treadle and bell-crank lever. Fig. 6 is a detail sectional view of the pivotal support for the bell-crank lever. Fig. 7 is a detail view in elevation of the milk-receiving cup of the pump. Fig. 8 is a detail horizontal sectional view through the same. Fig. 9 is a detail cross-sectional view, on an enlarged scale, showing the pivot-support for the treadle. Fig. 10 is a detail sectional view showing the connection between one of the conducting-tubes and a teat-receiving cup. Fig. 11 is a detail elevation of the connecting device.

Similar reference-numerals refer to similar parts throughout the several figures of the drawings.

In the embodiment illustrated a suitable supporting-frame is employed comprising a base-arm 12, which consists of spaced strips 13, held in spaced relation by a block 14, located between and secured to said strips by bolts or other fastenings 15. The spacing-block 14 terminates short of the ends of the strips, whereby slots 16 and 17 are formed. Secured in the slots 17 and embraced by the strips 13 is an upwardly-extending standard 18, that inclines upwardly and rearwardly toward the opposite end of the base-arm. The lower end of the standard projects below the strips 13, and secured thereto is a cross-piece 19, supported by feet 20, adjustably secured to the ends of the same. To the opposite end of the base-frame is attached a seat 21, having a back 22, made rigid by braces 23, connected to the same, and a cross-beam 24, located beneath the seat. Said seat and back are preferably covered with felt, as 25, forming comfortable cushions for the operator. The cross-piece 24, to which reference has already been made, carries depending legs 26, constituting the supporting means for this end of the frame, and the seat is attached to the base-arm by bolts 27, adjustably fastening through the slot 16 in said arm.

The upper end of the standard 18 is made substantially horizontal and constitutes the support for a pump, (designated, generally, by the reference-numeral 28.) The lower end of the pump is in the form of a milk-receiving cup 29, that rests flat upon the upper end of the standard 18 and has a depending lug or projection 30, fitting in a recess 31, formed in said upper end of the standard. This lug therefore acts as an axis or pintle that permits the cup to rotate without becoming detached from the standard. As clearly shown in Fig. 3, a valve-carrying disk 32 is supported upon the cup and constitutes the bottom of a pump-barrel 33, that is in turn supported on the disk 32, washers 34 being interposed between the lower end of the barrel, the cup, and the disk. A flanged collar 35 is threaded upon the lower end of the barrel 33, and through the same are passed clamping-bolts 36, having at their lower ends eyes 37, resting flat against the opposite sides of the standard 18. A carrying-handle 38, located at one side of the upper portion of the standard, is provided with an offset shank 39, that overlaps one of the

eyes 37, and through the same is passed a bolt 40, that extends through the said eyes and also through the said standard, constituting securing means for fastening these various parts together. On the opposite side of the standard to the shank 39 is located a pail-positioning device 41, and another bolt 42, passing through the lower end of the shank 39, also passes through the offset ear 43 of said device, thereby constituting common means for fastening these parts to the standard.

The disk 32, already mentioned, has an inlet-opening therethrough constituting means of communication between the cup 29 and the interior of the barrel 33, this opening being controlled by an inwardly-opening valve 44. A reciprocatory plunger 45 is located within the barrel 33 and has therein an upwardly-opening valve 46. The plunger is carried by a stem 47, projecting through a head 48, closing the upper end of the barrel and having an eye 49 at its upper exposed end. The barrel is also provided contiguous to its upper end with an offset outlet-nipple 50, to which is secured a spout 51, preferably located above the pail-positioning device 41. The head 48 is provided at one side with an offset lug 52, supporting a standard 53, that has a forked upper end 54, constituting a receiving-support for the teat-engaging mechanism.

The milk-receiving cup is provided with a plurality of inlet-nipples 55, two being shown in the present case, though a greater or less number might be employed. These nipples have turning-valves 56 and are adapted to have attached thereto conducting-tubes 57, to which the sets of teat-engaging devices are connected. As the sets are duplicates, but one is shown in the present instance. A coupling 58 is attached to the free outer end of the tube 57, and connected therewith are a plurality of smaller tubes 59. These tubes carry at their outer ends socket members 60, containing valves 61 and threaded sockets. Each socket preferably contains a gasket 62, located at the inner ends of the same. By means of the valves 61 each device can be cut off from the action of the pump as desired. The devices are each in the form of a cup 63, the structure of which is very similar to that shown in the Patent No. 638,640—that is to say, they have tapered bodies and at their inner or smaller ends are formed threaded sockets. The sockets in this instance are provided with gaskets 64. The connecting device between each cup and its tube 59 is in the form of a transparent sleeve 65, preferably of glass, having its opposite ends threaded and screwed into the respective sockets. As illustrated in Fig. 11, the threaded portions of the sleeves which are received in the sockets are painted black or are coated by some suitable opaque substance. It will be observed that the inner ends of the cups have outstanding annular flanges 66, which are preferably,

though not necessarily, integral. These flanges constitute retainers for the loops 67 of cords 68, that connect the various cups and prevent their abnormal separation.

The means for operating the pump will now be described.

A treadle 69 is located beneath the base-arm 12 contiguous to the standard and projects on opposite sides of the same, said treadle thus constituting a lever and having foot-receiving seats 70 in its ends, together with stop-pins 71, located at the inner ends of the seats. A pivot 72, passing through the central portion of the treadle, has outstanding integral ears 73, that are secured to the under side of said treadle, and thus said pivot turns with the same. The lower end of the pivot has a cone enlargement 73^a, seated in a cone-socket 74, formed in an angle-bracket 75, one arm of which is attached to the lower end of the standard 18, the other arm of said bracket being secured to the base-arm 12. The upper end of the pivot 72 operates in a bearing-box 76, attached to one of the strips 13 of the base-arm.

Secured to one side of the standard 18 just above the base-arm 13 is a pivot-stem 77, having a cone enlargement 78 and a threaded portion 79 projecting beyond the smaller end thereof. A cone bearing-nut 80 is threaded on said portion in opposition to the enlargement 78 and can be held against rotation by means of a suitable locking-pin 81, which passes through the outer end of the stem and is arranged to engage in sockets formed in the outer end of the nut. The stem and the cone-bearings 78 and 80 constitute the support for a bell-crank lever 82, having a hub 83, which receives the stem and the inner portions of the cones. The lower depending arm of the bell-crank lever has a ball 84, and secured to the treadle 69 in line with the ball 84 is another ball 85. The balls 84 and 85, and consequently the treadle and bell-crank lever, are connected by a link 86, comprising socketed members 87, the sockets of which receive the balls, as illustrated in Fig. 5. The members 87 are held together by bolts 88, that pass through the same and also through washers 89 and 90, the outer washers 89 being preferably formed of leather, while the central washer 90 of each set is of some compressible yielding material, such as rubber, that always exerts an outward pressure against the members 87, thereby holding the bolts tight. The upper arm of the bell-crank lever 82 has at its free end an eye 91, in which is secured the offset end of a pitman 92, said pitman having its upper end offset in an opposite direction and pivotally secured in the eye 49 of the pump-plunger rod.

The operation of the machine is substantially the same as that illustrated in the former patent. The teat-engaging devices are applied to the cow in the usual manner, and the oper-

ator seated upon the machine upon operating the treadle will create suction in the cups, thereby withdrawing the milk from the udder. This milk will pass through the conduit 57 into the milk-receiving cup, thence through the pump, and from the spout thereon into a pail suspended from said spout.

Among the various advantages which the improved structure has the following may be noted: The cord connection between the cups prevents the abnormal separation of the same and yet permits their relative movement and adjustment, the flanges thus preventing the detachment of the cords. The packing-gaskets, located in the sockets, prevent leakage at the joints thereof and afford simple means for this purpose. The coating of the threaded portions of the glass sleeves 65 is also an improved feature. Heretofore plaster-of-paris has been employed in the joints, and when the cups are examined during the cleansing operations the appearance of the white plaster-of-paris through the glass is apt to mislead persons into thinking that milk has become lodged therein. While this plaster-of-paris may be colored to obviate this appearance, I find it more satisfactory to coat or paint the glass with an opaque substance, which thus eliminates entirely the objectionable appearance.

Coming now to the pump structure, it is found that the new arrangement and mounting upon the upper end of the standard not only eliminates considerable weight, but it also places the pump in a position whereby access may be gained to all sides of the same for cleaning. Moreover, the milk-receiving cup constitutes, in effect, a turn-table, so that the nipples 55 may be adjusted to practically any point desired upon loosening the clamping-bolts which connect the pump-barrel and the standard. When said bolts are tightened, however, the various elements are securely held against relative movement. Besides the advantages for turning the pump, as set forth above, it may also be stated that with the structure described it is very easy to adjust the revolving pump, and particularly the discharge-spout, with respect to the pail-positioning device 41. Moreover, a pump constructed in the manner described is cheaper to manufacture and can be more readily assembled and secured upon the standard. The employment of a revoluble milk-receiving cup is important, as it often becomes necessary or desirable to turn the inlet-nipples and hose more nearly toward one cow than the other. This arrangement permits an adjustment of the parts to suit the convenience of the operator. It is to be observed also that several of the features here employed perform double functions, particularly the securing-bolts.

The pivotal support for the bell-crank lever has very great advantages, as the cone-bearing secures easier movement and the wear

may be taken up, thus avoiding lost motion. Another feature is the link connection between the treadle and the bell-crank lever. The leather washers by themselves will for a time properly hold the socket members of this link in spaced relation; but in time they become shrunken, so that they will not properly perform their function. By interposing the central rubber blocks the proper yielding effect is secured at all times, and thus an objectionable feature has been obviated. The pivotal support for the treadle is also advantageous because of the cone-bearing, which also permits easy movement and with which wear may be taken up. The construction of the base-arm 12 is improved, not only because it may be made more conveniently and cheaper, but also in that it is lighter in weight and is entirely sufficient in strength.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a milking-machine, the combination with a base-frame having a seat and supporting-standard, of a pump having its lower end resting directly upon the upper end of the standard, means for securing the pump upon the standard, means mounted on the frame and connected with the pump for operating the same, and teat-engaging means connected to the pump.

2. In a milking-machine, the combination with a supporting-standard, of a pump supported at its lower end upon the upper end of the standard and capable of being revolved thereon on a substantially longitudinal axis, teat-engaging means connected to the pump, and operating means for the pump.

3. In a milking-machine, the combination with a supporting-standard, of a pump having its lower end resting upon the upper end of the standard, a substantially longitudinal pin carried by one, the other having a socket to receive the pin, said pump having a revoluble movement upon the standard, with the pin as an axis, and means for clamping the pump against rotation.

4. In a milking-machine the combination with a base-frame, including an upwardly-extending standard having a substantially longitudinal socket in its upper end, of a pump revolubly mounted on the upper end of the standard, and having a depending substantially longitudinal pin that engages in the socket thereof, means for clamping the pump against rotation, and means for operating the pump.

5. In a milking-machine, the combination with a support, of a milk-inlet cup rotatably mounted on the support, a pump-barrel fitted on the cup, and clamping means connecting the barrel and support for holding said barrel and cup against rotation on said support.

6. In a milking-machine, the combination with a supporting-standard, of a milk-receiv-

ing cup rotatably mounted on the standard, teat-engaging means having a connection with the cup, a pump-barrel supported on the cup, clamping means connecting the standard and pump-barrel, a piston operating in the pump, and means for operating the piston.

7. In a milking-machine, the combination with a base-frame, having a standard, of a milk-receiving cup revolubly mounted on the upper end of the standard, teat-engaging means having a connection with the cup, a pump-barrel supported on the cup and having an outstanding flange, clamping-bolts connecting the flange and standard, a piston operating in the barrel, and means for operating the piston.

8. In a milking-machine, the combination with a base-frame having an upwardly-extending standard, of a pump mounted on the upper end of the standard, teat-engaging means having a connection with the pump a handle located at one side of the standard, clamping-bolts for securing the pump to the standard, and a fastening device passing transversely through the standard, said fastening device engaging the clamping-bolts and the handle for securing the same to said standard.

9. In a milking-machine, the combination with a base-frame, comprising a base-arm and an upwardly-extending standard that projects below the arm, of a pump mounted on the upper end of the standard, teat-engaging means connected with the pump, a bracket connecting the base-frame and the lower portion of the standard beneath the same, said bracket having a cone-socket, a substantially horizontal treadle, a connection between the treadle and the pump, said treadle being located between the bracket and the base-arm, and an upright pivot secured to the treadle between its ends, the upper end of said pivot having a bearing on the arm, the lower portion of said pivot having a cone enlargement that is seated in the cone-socket.

10. In a milking-machine, the combination with a supporting-frame, of a pump mounted thereon, teat-engaging mechanism connected with the pump, a treadle pivoted upon the frame, a lever, a pivot-support for the lever attached to the frame and passing through said lever between its ends, cone-bearings carried by the support and bearing against opposite sides of the lever, one of said bearings being adjustable toward and from the other, a connection between the treadle and one end of the lever, and a connection between the other end of the lever and the pump.

11. In a milking-machine, the combination with a base-frame including an upwardly-extending standard, of a treadle pivoted between its ends upon the frame, a pump mounted on the upper portion of the standard, teat-engaging means connected with the pump, a pivot-stem rigidly attached to the standard and having a stationary cone enlargement, a bell-crank

lever loosely journaled on the stem and fitted against the enlargement, a cone-bearing nut threaded on the upper end of the stem and bearing against the opposite side of the lever, means for holding said nut against rotation on the stem, a connection between one arm of the bell-crank lever and the treadle, and a connection between the other arm of the bell-crank lever and the pump.

12. In a milking-machine, the combination with a support, of a pump mounted thereon, teat-engaging mechanism connected with the pump, a lever having a ball, a connection between the lever and the pump, a treadle having a ball, a link connection between the treadle and lever, said connection comprising socket members, the sockets thereof receiving the balls, connections between the members, and yielding spacing-blocks located between said members.

13. In a milking-machine, the combination with a frame including an upwardly-extending standard, of a pump mounted on the standard, teat-engaging means connected with the pump, a bell-crank lever pivoted upon the standard and having a depending arm provided with a ball, a connection between the other arm and the pump, an operating-lever pivotally mounted on the frame and carrying a ball, a link connection between the operating-lever and bell-crank lever, comprising socketed members that engage opposite sides of the balls, connections between the members, and yielding spacing-blocks located between said members.

14. In a milking-machine, the combination with pumping mechanism, of a plurality of tapered teat-receiving cups having connections with said pumping mechanism, said connections including a separate flexible tube leading from each cup, annular flanges carried by the smaller ends of the cups, and cord connections between the cups, said flexible cord connections surrounding the tapered portions of the cups and being held against displacement thereon by the flanges.

15. In a milking-machine, the combination with a pumping mechanism, of a conducting-tube having a socket, a teat-receiving cup having a socket, a glass tube connecting the tube and cup and secured in the socket thereof, and opaque coatings applied to the portions of said tube that are located in the sockets.

16. In a milking-machine, the combination with a pumping mechanism, of a conducting-tube connected therewith and having a threaded socket, a teat-receiving cup having a threaded socket, resilient gaskets located in the inner ends of the sockets, a glass tube threaded into said sockets and abutted against the gaskets, and opaque coatings applied to the portions of said tube that are located in the sockets.

17. In a milking-machine, the combination with a frame including a base-arm and a stand-

ard secured to one end of the same, said base-arm comprising spaced strips that embrace the standard and are secured thereto, a spacing-block located between and secured to the strips, said block terminating short of the ends of the strips, a seat located over the arm and having a back, a cushion covering the seat and back, adjustable connections between the seat and arm, said connections passing through the space between the ends of the strips, a pump mounted upon the upper end of the standard, a treadle pivotally connected to the arm contiguous to the lower end of the standard, connections between the treadle and pump, and teat-engaging means connected with the pump.

18. In a milking-machine, the combination with a frame comprising a base-arm that is composed of spaced strips, a seat having depending legs, said seat being adjustably secured to one end of the base-arm, an upwardly-extending standard secured to the other end of the arm between the strips thereof, and having a cross-bar at its lower end, said standard inclining rearwardly and upwardly toward the seat, a substantially vertical pump mounted at its lower end upon the upper end of the standard, a bell-crank lever pivoted between

its ends to the standard, a treadle pivotally supported beneath the base-arm, a link connection between the treadle and bell-crank lever, said link connection comprising spaced members, and yielding washers interposed therebetween, a pitman connection between the bell-crank lever and the pump, a conducting-tube connected to the lower end of the pump above the standard, and a plurality of teat-engaging cups connected to the tube.

19. In a milking-machine, the combination with a base-arm, of a standard mounted on the base-arm and located at an inclination thereto, said standard being provided with a substantially horizontal upper surface, a substantially vertical pump having its lower end resting upon said surface, means for securing the pump upon the standard, teat-engaging devices carried by the pump, and a treadle having connections with the pump for operating the same.

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

WILLIAM MARSHALL MEHRING.

Witnesses:

FRANK J. SHRINER,
C. E. GRAY.