(No Model.)

L. STEENSTRUP.

MILKING MACHINE.

No. 510,449. Patented Dec. 12, 1893.

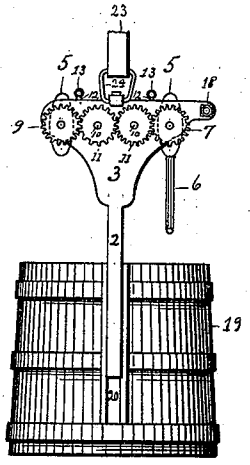

Fig. 1.

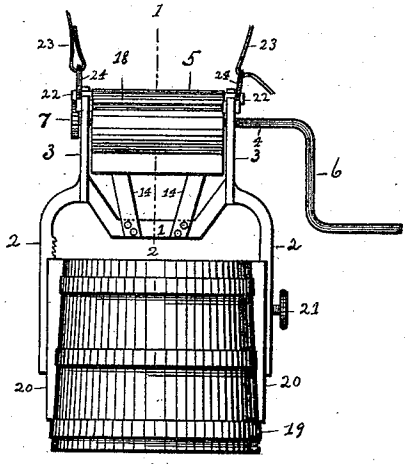

Fig. 2.

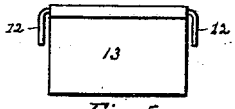

Fig. 5.

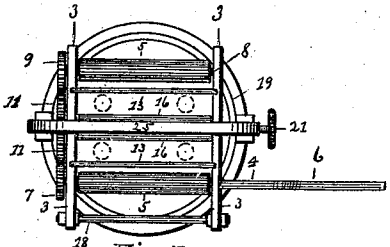

Fig. 3.

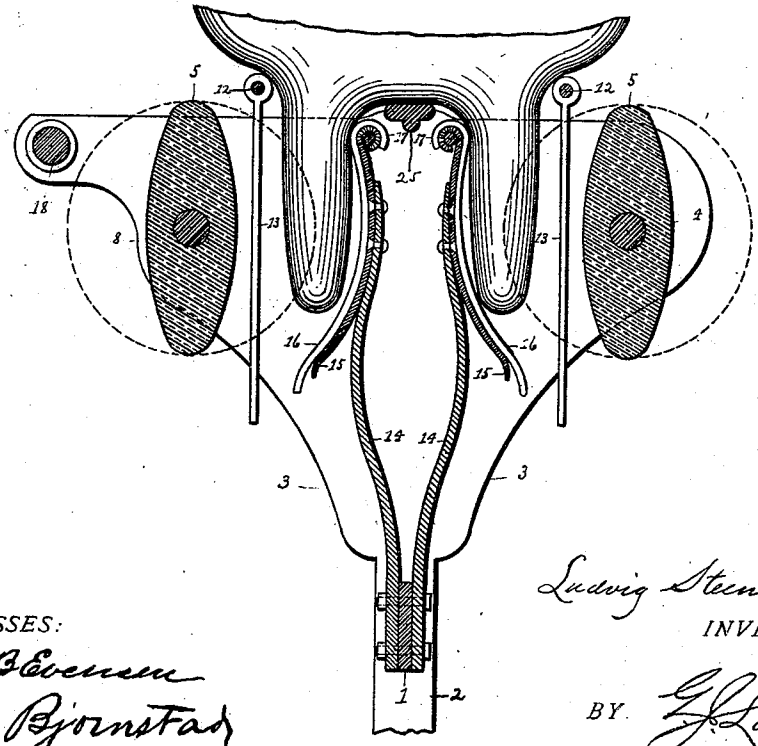

Fig. 4.

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LUDVIG STEENSTRUP, OF AALBORG, DENMARK, ASSIGNOR TO ENGEBRETH H. HOHE, OF ST. PAUL, MINNESOTA.

MILKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,449, dated December 12, 1893.

Application filed April 29, 1893. Serial No. 472,430. (No model.)

To all whom it may concern:

Be it known that I, LUDVIG STEENSTRUP, a subject of the King of Denmark, residing at Aalborg, in the Province of Jutland, in the Kingdom of Denmark, have invented a new and useful Machine for Milking Cows, of which the following is a specification.

My invention relates to improvements in milking machines, in which rotating cams or ovals operate in conjunction with rubber pads, rubber cushioned steel plates and steel springs, to produce pressure on the teats; and the objects of my improvement are, first, to provide a frame for the machinery with standards adjustable to a pail or bucket; second, by means of shafts and gearing, supported by a framework, and operated by a crank or handle, to provide facilities for rotating cams or ovals, and thereby, in conjunction with pressure plates, producing lateral and downward pressure upon the teats; third, by means of intervening rubber pads, to reduce and prevent friction by the ovals upon the teats; fourth, by means of steel plates attached to steel springs, to regulate the lateral counter-pressure upon the teats, when pressed by the rotating cams or ovals; fifth, by means of rubber pads or cushions covering the steel plates, to reduce friction and soften the pressure upon the teats; sixth, to afford facilities for the proper and easy adjustment of the rubber pads and cushions and thus facilitate their washing; seventh, by means of frame-work, shafting, gearing and ovals, operated by a crank or handle, and rubber pads and cushions, steel springs and plates, to provide facilities for milking cows in the shortest possible time, and without injury or annoyance to the cows; eighth, by means of a strap, properly adjusted to the framework of the machine, to provide facilities for hanging the machine on the cow. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the entire machine. Fig. 2 is a front view of the entire machine. Fig. 3 is a top view of the machine. Fig. 4 is a vertical section of the machine on the line 1—2, in Fig. 2. Fig. 5 is a view in detail of one of the rubber pads and its hanger.

Similar figures refer to similar parts throughout the several views.

The tie-rod or bar 1, rigidly connecting the standards 2, 2, at the point of their upward projection into the side-plates or supports 3, 3, forms the framework of the machine. Journaled in the side-plates 3, 3, turns the horizontal shaft 4, carrying, between said plates, a cam or oval 5, and carrying, on the outside of said plates, at one end, a crank or handle 6, and, at the other end, a drive- or spur-wheel 7. Journaled in the side-plates 3, 3, in line with and parallel to said shaft, turns another horizontal shaft 8, carrying, between said plates, a cam or oval 5, and, at one end, in line with spur-wheel 7, a spur-wheel or transmitter 9. Between the spur-wheels 7 and 9, and revolving on studs 10, 10, which are rigidly attached to the side-plate adjoining, are two intermediate spur-wheels 11, 11, all of said spur-wheels meshing with, and being held in gear, one with the other, whereby, when the crank is turned, the shafts, and the cams and ovals thereon, are made to turn and revolve. Parallel to and between said shafts are two staples or hangers 12, 12, extending from side-plate 3 to the other side-plate 3, and detachably connected therewith by means of holes bored into the top of said plate, into which the ends of the staples are made to fit. Each of said staples supports a rubber pad 13, 13, depending therefrom, against and upon which pads the said cams or ovals, in revolution, are made to press and slide.

Riveted or bolted to the cross-tie or bar 1, two on each side, and extending upward between said rubber pads, are four steel springs 14, 14, 14, 14, each pair of said springs supporting and having riveted thereto a curved steel pressure-plate 15, 15, the curvature being toward said rubber pads. Said pressure-plates are faced or covered on the inside by rubber pads or cushions 16, 16, detachably hung on the plates by over-laps 17, 17. Said springs and pressure-plates, so faced, and the rubber pads and shafts, are adjusted and

hung so as to allow the fore-teats of the cow to pass between a rubber pad and pressure-plate, and the hind-teats of the cow to pass between the other rubber pad and pressure-plate, and so that the pressure upon the teats, when the cams or ovals are in revolution, may be normal. Through the plates 3, 3, is a rod or handle 18, serviceable in moving the machine. Between the standards 2, 2, is a pail or bucket 19, having, on either side, a slightly corrugated groove or slot 20, 20, into which the standards, which are also slightly corrugated on the inside, are made to fit, and, by means of a set-screw 21, adjusted and held in place, and whereby the machine may be raised or lowered as required. Near the top and on the outer-side of the plates 3, 3, are two hooks 22, 22, to which may be attached a strap or girth 23, having rings at either end 24, 24, also a loop and buckle, by which the machine may be hung upon the cow. Extending from side plate to side plate and fastened thereto at its ends is a horizontal brace 25 forming the center top of the framework.

To use the machine, grasp the rod or handle 18 with the left hand, and place the machine in position under the cow; loosen the set-screw 21, and raise the machine up against the udder. Then tighten the set-screw. Observe that the teats are placed between the rubber pads 13, 13, and cushions 16, 16. Throw the strap or girth 23 over the cow's back, reach the farther end of same and attach it by ring to hook 22. Then attach the near end by ring to the other hook 22, and buckle the strap, so that, should the cow move, the machine will be carried thereby. The milking is done by turning the crank or handle 6, thus operating the shafts, and cams or ovals 5, 5, and causing the latter, by rotation, to press against and slide upon the rubber pads 13, 13, and thereby, in conjunction with the cushioned pressure-plates, held normally against the cow's teats by the steel springs 14, 14, 14, 14, milking the four teats at one time. Continue to turn the crank as long as the milk continues to flow between the rubber pads and cushions into the pail or bucket attached to the standards.

Milking by this machine is not injurious, but on the contrary quite agreeable, to the cow, by reason of the fact that the udder is at rest upon the top of the machine, and by reason of the further fact that there is nothing to produce friction upon or pulling of the teats—only a gentle sliding pressure downward along the teats. The counter-pressure is regulated by the steel springs 14, 14, 14, 14, which are of sufficient length to adapt themselves to teats of all sizes. Nor does it injure or annoy the cow to continue the milking longer than necessary, as the pressure, after the teats are empty, is very slight.

Only the rubber pads and cushions and the pail need be washed, as the other parts of the machine do not come in contact with the milk. Being detachable, they are easily removed for the purpose.

What I claim as my invention herein is—

1. In a milking machine, the combination of a tie-rod rigidly connecting two standards having, above the point of their connection, projections forming side-plates for supporting the operating machinery, a horizontal shaft journaled in the side-plates, and bearing, between the latter, a cam or oval, and bearing at one end thereof a crank or handle for operating the machine and at the other end thereof a drive-spur-wheel, a parallel horizontal shaft journaled in the side-plates, and bearing between the latter a cam or oval, and at one end thereof, on a line with the drive-spur-wheel, a spur-wheel or transmitter, two intermediate spur-wheels revolving on studs in one of the side-plates, in line with said other spur-wheels, all of said wheels being in gear one with the other, steel springs bolted or riveted to the tie-rod and supporting curved steel pressure-plates, whereby, when the crank is turned, the ovals are made to revolve and press against the teats held normally against them by the springs and pressure-plates, substantially as set forth.

2. In a milking machine, the combination of a frame-work consisting of two standards connected by a tie-rod and side-plates projecting above the tie-rod at the points of connection, two horizontal parallel shafts journaled in the side-plates, each shaft bearing between the side-plates a cam or oval, a spur-wheel on the end of each shaft, two intermediate spur-wheels hung on studs in one of the side-plates, and rubber pads depending from rods or staples detachably connected to the tops of the side-plates, each adjoining and between a cam or oval on one side and a pressure plate on the other, whereby, the machine being operated by means of a crank attached to one of the shafts, the ovals are made to turn in opposite directions and press against and slide upon the rubber pads, and whereby, the cow's teats being inserted between the rubber pads and pressure-plates, a downward sliding pressure upon the teats may be exerted without friction upon or pulling of the teats, substantially as set forth.

3. In a milking machine, the combination of two standards connected by a tie-rod and having side-plates projecting upward above the tie-rod, horizontal parallel shafts journaled in the side-plates, each shaft bearing between the side-plates a cam or oval, a spur-wheel on the end of each shaft, two intermediate spur-wheels hung on studs in one of the side-plates, all of said spur-wheels meshing the one into the other, rubber pads, depending from rods detachably connected to the tops of the side-plates and adjoining and parallel to the shafts and ovals, steel springs, attached to the tie-rod, a pair on each side thereof, and each pair supporting curved steel pressure-plates, and rubber cushions detachably hung upon the pressure-plates,

whereby, the cow's teats being inserted between the rubber pads and cushioned pressure-plates, the teats may be normally held against the rubber pads, and whereby counter-pressure upon the teats is produced and regulated when the cams or ovals in revolution press against and slide upon the rubber pads, substantially as set forth.

In witness whereof I have hereunto set my hand this 16th day of February, A. D. 1893.

LUDVIG STEENSTRUP.

Witnesses:
E. HERSKIND,
I. STOCHHOLM,
Advokat.

Correction in Letters Patent No. 510,449.

It is hereby certified that the name of the assignee in Letters Patent No. 510,449, granted December 12, 1893, upon the application of Ludvig Steenstrup, of Aalborg, Denmark, for an improvement in "Milking Machines," was erroneously written and printed "Engebreth H. Hohe," whereas said name should have been written and printed *Engebreth H. Hobe*, and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 16th day of January, A. D. 1894.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

JOHN S. SEYMOUR,
Commissioner of Patents.