No. 862,526. PATENTED AUG. 6, 1907.

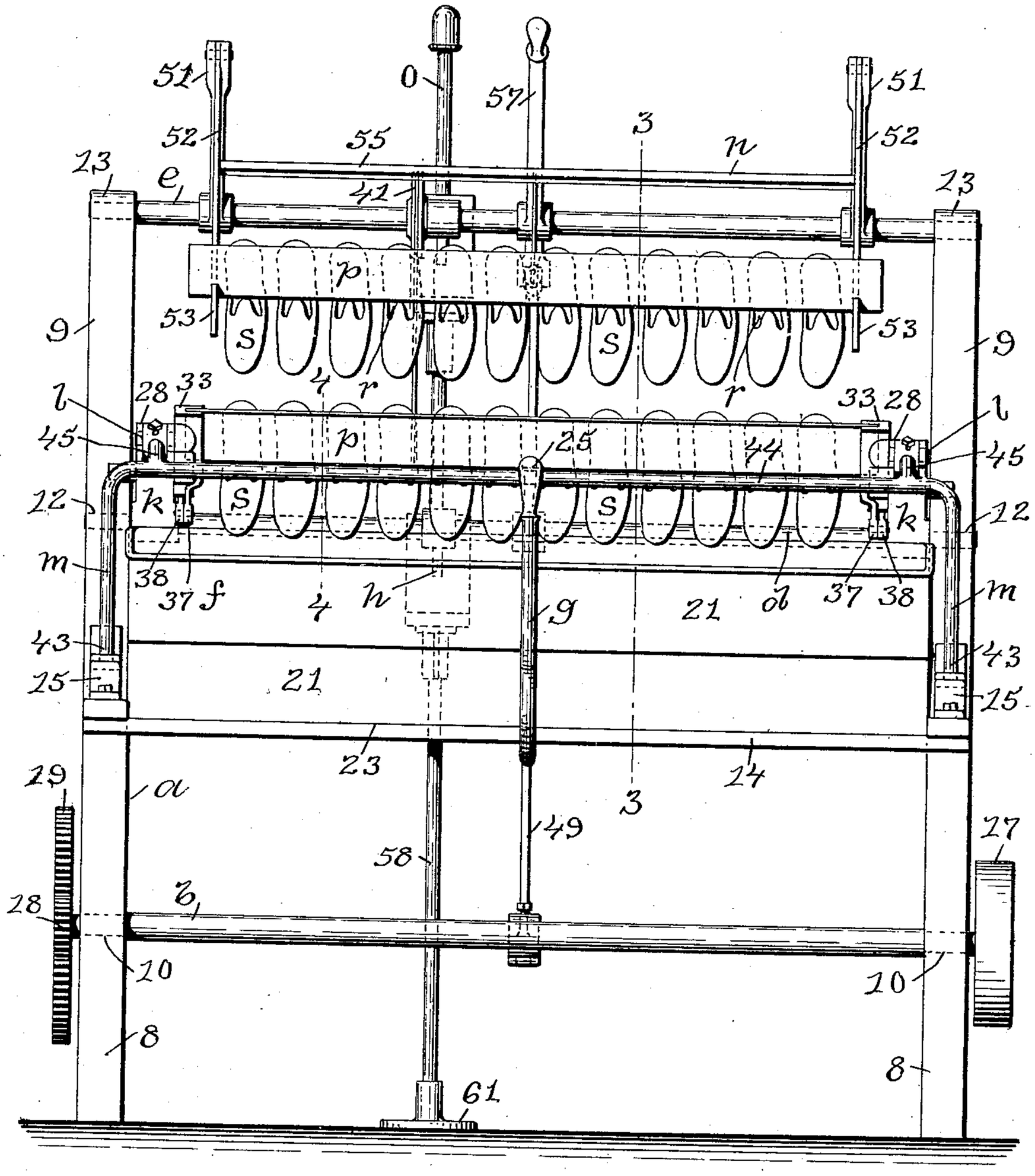
J. H. WALL.

SHOE DIPPING MACHINE.

APPLICATION FILED NOV. 7, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



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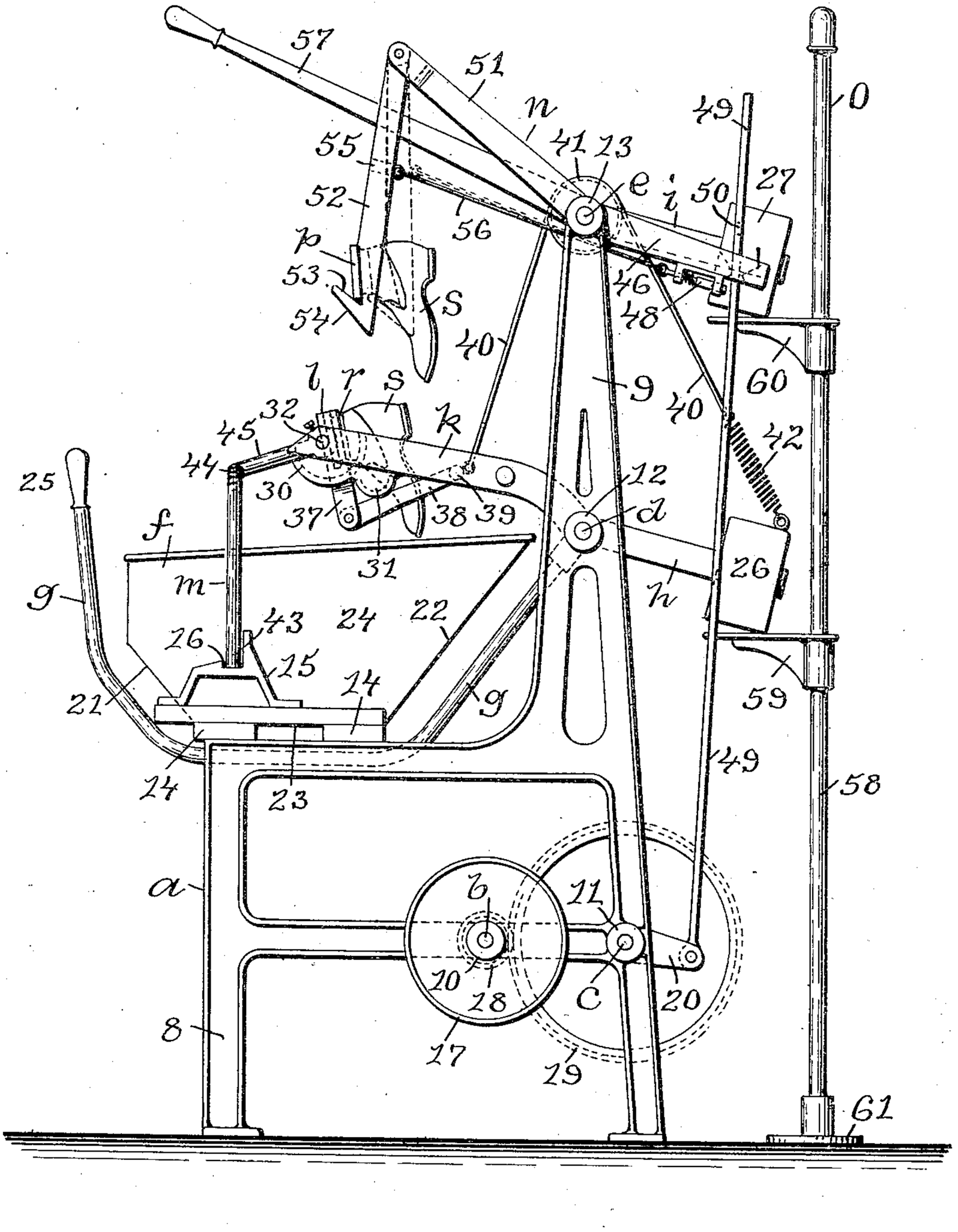
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

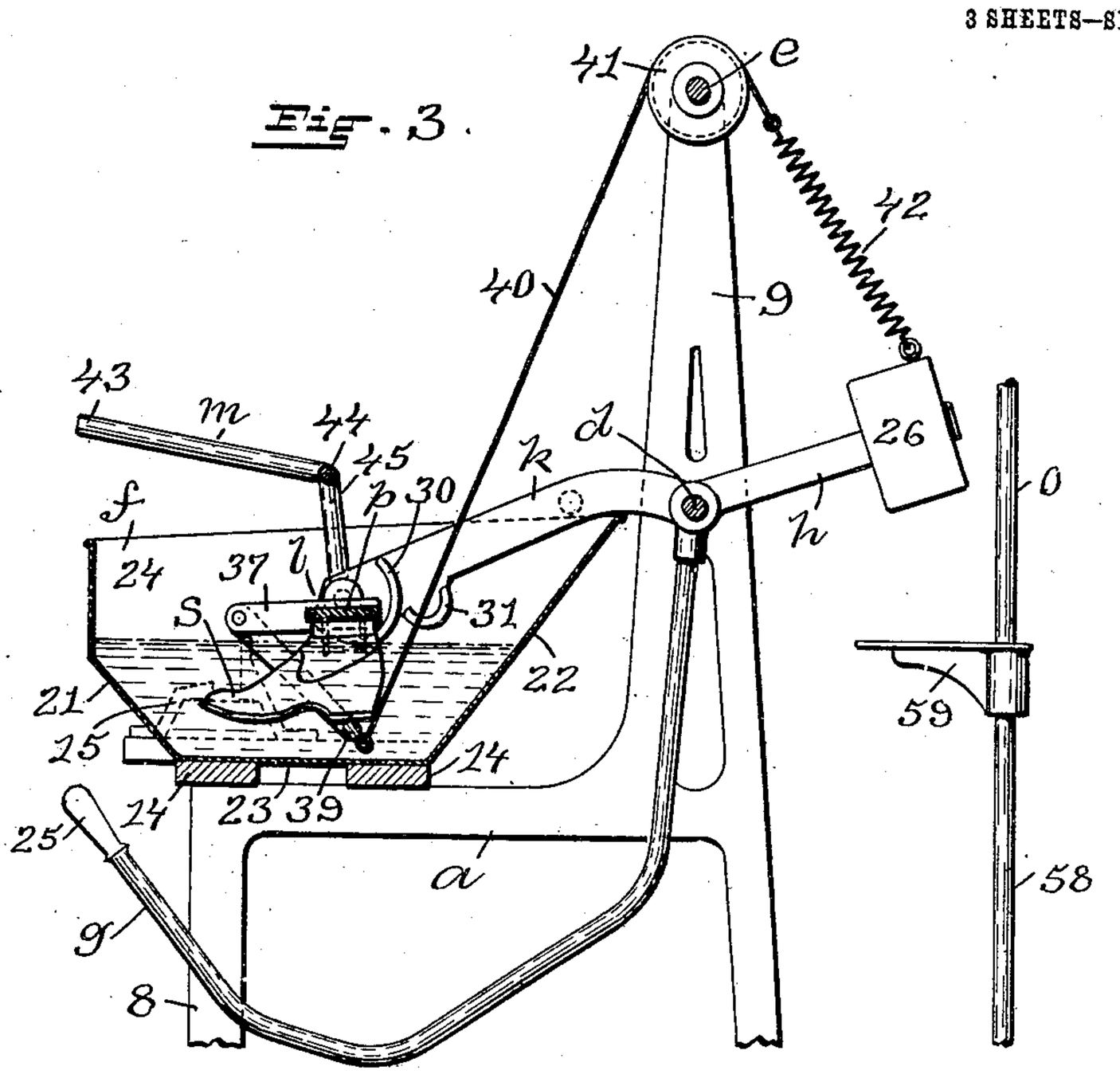


Fig. 4.

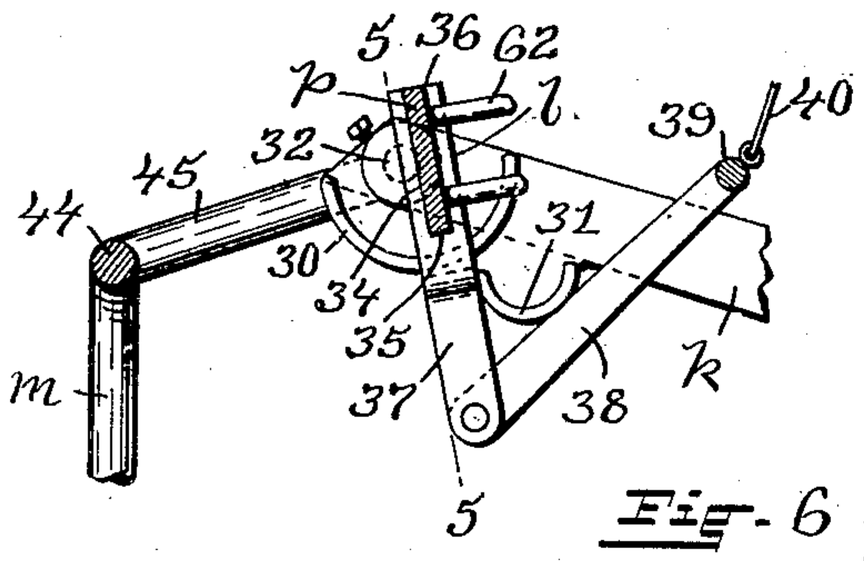


Fig. 5.

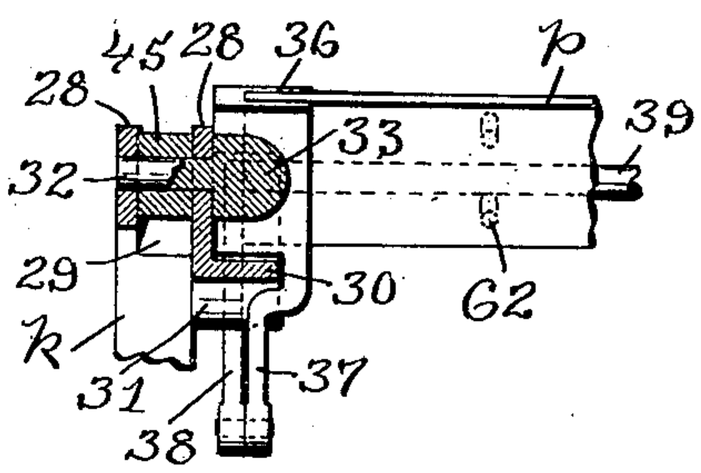
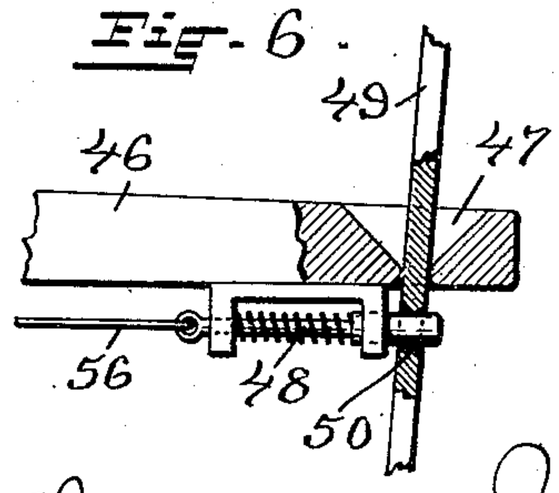


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN H. WALL, OF BRISTOL, RHODE ISLAND.

SHOE-DIPPING MACHINE.

No. 862,526. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed November 7, 1906. Serial No. 342,382.

To all whom it may concern:

Be it known that I, JOHN H. WALL, a citizen of the United States, residing at Bristol, in the county of Bristol and State of Rhode Island, have invented a new and useful Improvement in Shoe-Dipping Machines, of which the following is a specification.

This invention has reference to an improvement in machinery used in the process of manufacturing rubber shoes and more particularly to an improvement in machines adapted to dip or varnish rubber shoes.

The object of my invention is to improve the construction of a shoe dipping or varnishing machine whereby the operation of dipping or varnishing a plurality of rubber shoes and the handling of the same are facilitated.

A further object of my invention is to increase the product of a shoe dipping or varnishing machine and simultaneously to allow the shoes to drip the required length of time before removal from the machine.

My invention consists in the peculiar and novel construction of a shoe dipping machine adapted to dip or varnish a plurality of rubber shoes, to automatically hold the shoes in the machine the required length of time to drip, and having details of construction as will be more fully set forth hereinafter and claimed.

Figure 1 is a vertical front view of my improved rubber shoe dipping or varnishing machine, showing a plurality of shoes in the machine ready to be dipped or varnished and a plurality of varnished shoes held in the automatic dripping mechanism. Fig. 2 is a vertical end view of the machine looking at the right hand end of Fig. 1. Fig. 3 is a vertical sectional view taken on line 3 3 of Fig. 1, showing the dipping mechanism in the position it would assume in dipping or varnishing the shoes. Fig. 4 is an enlarged detail sectional view taken on line 4 4 of Fig. 1, showing the peg bar and its rotating mechanism in their normal positions, with the lasts and shoes removed from the bar. Fig. 5 is an enlarged detail sectional view taken on line 5 5 of Fig. 4 through the peg bar rotating mechanism, and Fig. 6 is an enlarged detail view partly in section of the locking lever in the dripping mechanism.

In the drawings, *a* indicates the frame of the machine, *b* the driving shaft, *c* the crank shaft, *d* and *e* rock shafts, *f* the varnish tank, *g* the lowering and elevating lever, *h* and *i* weight levers, *k k* the rotating mechanism supporting arms, *l* the rotating mechanism, *m m* the rotating levers, *n* the automatic dripping mechanism, *o* the weight standard, *p p* the peg bars, *r r* a plurality of lasts on the peg bars, and *s s* a plurality of rubber shoes on the lasts.

The frame *a* consists of the end frames, 8 8, having the vertical extensions 9 9 at the rear, the bearings 10 10 and 11 11 in the lower portion of the frame for the driving and crank shafts *b* and *c*, the bearings 12 12 placed centrally in the vertical extensions 9 9 for the rock shaft *d*, the bearings 13 13 at the top of the vertical extensions 9 9 for the rock shaft *e*, the cross struts 14 14 on the end frames supporting the varnish tank *f*, and the fixed brackets 15 15 at each end of the tank, each bracket having a notch 16, as shown in Figs. 1 and 2.

The driving shaft *b* is rotatably supported in the bearings 10 10 and has a driving pulley 17 and a pinion 18 meshing with a gear 19 on the crank shaft *c* which has a crank 20, as shown in Fig. 2.

The varnish tank *f* is rectangular in form. It extends the length of the frame on the cross struts 14 14 and has an inclined front and back 21 and 22; a flat bottom 23 and the ends 24 24 shaped to conform to the front, back and bottom, as shown in Figs. 2 and 3.

The lowering and elevating lever *g* is secured at its rear end centrally to the rock shaft *d*. This lever extends under and then upward in front of the varnish tank *f* to bring the handle 25 in a convenient position for the operator and is bent to conform to the shape of the tank, as shown in Fig. 2.

The weight lever *h* is secured to the rock shaft *d* and has a weight 26, as shown in Fig. 2, adapted to slightly overbalance the weight of the arms *k k*, the rotating mechanism *l*, the rotating levers *m m*, the lowering and elevating lever *g*, the peg bar *p*, the lasts *r r*, and the shoes *s s* on the lasts.

The weight lever *i* is secured to the rock shaft *e* and has a weight 27 adapted to slightly overbalance the weight of the automatic dripping mechanism *n* with the peg bar *p*, the lasts *r r* and the shoes *s s* on the lasts, as shown in Fig. 2.

The rotating mechanism supporting arms *k k* are secured to the rock shaft *d* at each end and extend over the varnish tank *f*, as shown in Fig. 2.

The rotating mechanism *l* consists of bearings 28 28 formed on the forward ends of the arms *k k*, an opening 29 in the end of each arm extending through the bearing 28, a semicircular lip 30 on the inner face of each arm formed slightly eccentric with the bearing and with the ends in an upward position, a curved lip on the inner face of each arm adjacent the semi-circular lip 30 and forming a stop 31, a shaft 32 in each bearing 28 and having formed on its inner end a member 33 constructed to have an elongated transverse recess 34 with the closed end 35 and the open end 36 for the ends of the peg bar *p* and an arm 37 extending downward from the member in a position to engage with the stop 31, when the rotating mechanism is in its normal position, an arm 38 pivotally secured to the end of each of the arms 37 37, a round locking bar 39 secured at each end to the free ends of the arms 38 38 or formed integral therewith, a flexible cord 40 secured to the bar and extending upwards over a grooved pulley 41 rotatably supported on the rock shaft *e*, and then down to a coiled

spring 42 secured at one end to the cord 40 and at the other end to the weight 26, the tension of the coiled spring 42 holding the arms 38 38 in contact with the stops 31 31 and the locking bar 39 out of engagement with the heels of the shoes, with the mechanism in its normal position, as shown in Fig. 2.

The rotating levers *m m* each have the end 43 and are placed at each end of the machine in a vertical position (when in their normal position) and are connected to a cross bar 44 having the rearwardly-extending arms 45 45, the ends of which are secured to the shafts 32 32 of the rotating mechanism *l* in the openings 29 29 in the ends of the arms *k k*. The rotating levers *m m*, the cross bar 44 and the arms 45 45 are all formed integral, as shown in Figs. 1 and 4. The fixed brackets 15 15 are placed at each end of the machine in a position for the ends 43 43 of the rotating levers to enter the notches 16 16 in the brackets and hold the operative mechanism in its raised or normal position, as shown in Fig. 2.

The automatic dripping mechanism *n* consists of a locking lever 46 secured centrally to the rock shaft *e* in approximately a horizontal position and having a beveled vertical hole 47 adjacent its free end, a spring bolt 48 secured to the underside of the lever in a position for the end of the bolt to extend across the hole 47, as shown in Fig. 6, a vertical rod 49 having the transverse hole 50 adjacent its upper end for the bolt 48 and pivotally secured at its lower end to the crank 20 in a position for the rod to extend upward through the hole 47 in the lever 46, as shown in Fig. 2, two end levers 51 51 secured to the rock shaft *e*, vertical arms 52 52 each pivotally secured at its upper end to the end of each of the levers 51 51 and each having a hook-shaped lower end 53 forming a beveled edge 54 on the lower end of the arm, a cross bar 55 connecting the arms 52 52, a cord 56 connecting the bar 55 with the spring bolt 48 and a hand lever 57 secured to the rock shaft *e* and extending forward over the varnish tank *f* in a convenient position for the operator, as shown in Fig. 2.

The weight standard *o* consists of a vertical rod 58 having the brackets 59 and 60 and secured to the floor at the rear of the machine by the base 61 in a position for the bracket 59 to support the weight 26 on the lever *h* and for the bracket 60 to support the weight 27 on the lever *i*, as shown in Fig. 2.

The peg bar *p* has a series of pegs 62 62 extending outward from the rear face of the bar in sets of two, one set for each last. These pegs enter coinciding holes in the top of the lasts (not shown) and hold the lasts on the bar.

In the operation of my improved shoe dipping or varnishing machine, the tank *f* is filled with varnish or a similar liquid to approximately a height, as shown in Fig. 3. Power is applied to the driving pulley 17 in the usual way to revolve the crank 20 and give a constant reciprocating motion to the vertical rod 49 through the hole 47 in the locking lever 46 of the dripping mechanism *n*. The weight of the varnished shoes and lasts in the dripping mechanism *n* moves the arms 52 52 forward into the position as shown in full lines in Fig. 2, and through the cord 56 holds the bolt 48 out of engagement with the rod 49 against the tension of the spring on the bolt. A peg bar *p* with the lasts and shoes is placed in the machine with the ends of the bar in the recesses 34 34 in the rotating mechanism *l* with the shoes in a position intermediate the peg bar *p* and the locking bar 39 and with the toes of the shoes extending downward, as shown in Fig. 2. The operator now grasps the handle 25 of the lowering and elevating lever *g* with his left hand, a rotating lever *m* with his right hand and by a slight upward movement of his right hand releases the end 43 of the rotating lever from the notch 16 in the bracket 15. The lowering and elevating lever *g* is now depressed and simultaneously the rotating lever *m* given a forward and upward movement, thus operating the rotating mechanism *l* to partly revolve the peg bar *p*, the lasts *r r*, and the shoes *s s* to submerge the shoes in the varnish in the tank *f*, as shown in Fig. 3. As the rotating mechanism *l* starts to revolve the locking bar 39 comes into engagement with the heels of the shoes by the tension of the spring 42 on the cord 40, and the arms 38 38 leave the stops 31 31. The locking bar 39 is now held against the heels of the shoes by the tension of the spring 42, thereby locking the lasts and shoes to the peg bar in the operation of dipping the shoes. The peg bar *p* is locked when in the dipping position in the recesses 34 34 by the semi-circular lips 30 30 on the arms *k k* closing over the open ends 36 36 of the recesses 34 34, as shown in Fig. 3. On the reverse movement of the levers *g* and *m* the mechanism resumes its normal position, the ends 43 43 of the levers *m m* are snapped into the notches 16 16 in the brackets 15 15 and the locking bar 39 leaves the heels of the shoes by the arms 38 38 coming into engagement with the stops 31 31 on the arms *k k*. The operator now removes the peg bar with the varnished shoes from the dripping mechanism *n* by an upward and a forward movement of the peg bar. When the bar and shoes are removed from the arms 52 52, these arms move back by the force of gravity and the tension of the spring on the bolt 48 into the position as shown in broken lines in Fig. 2, releasing the bolt 48, which on the downward movement of the rod 49 enters the hole 50 in the rod and locks the arm 46 to the rod 49. The next upward movement of the rod 49 depresses the levers 51 51, the beveled edges 54 54 on the ends of the arms 52 52 strike the upper edge of the peg bar *p* in the rotating mechanism *l*, forcing the hook-shaped ends 53 53 back of the peg bar and allowing the same to come under the ends of the peg bar when, on the next downward movement of the rod 49, the peg bar and shoes are lifted out of the rotating mechanism by the arms 52 52 into the position, as shown in full lines in Fig. 2, when the weight of the shoes and lasts moves the arms 52 52 forward and through the cord 56 pulls the bolt 48 out of engagement with the rod 49. The shoes are now held in the dripping mechanism *n* for a sufficient length of time and in a position for the excess of varnish to drip off the toes of the shoes into the varnish tank *f*. The operator now places a peg bar *p* with the lasts and shoes into the recesses 34 34 in the rotating mechanism and these operations may be repeated indefinitely, the dripping mechanism *n* acting automatically while the operator is removing the varnished shoes and placing the shoes to be varnished in the machine.

It is evident that the dripping mechanism *n* may be operated by the hand lever 57 if desired, thereby eliminating the driving mechanism without materially affecting the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent;—

1. In a shoe dipping machine, a tank adapted to hold varnish or a similar liquid, a dipping mechanism adapted to dip a plurality of shoes in the liquid in the tank, and means for holding a plurality of shoes over the tank.

2. In a shoe dipping machine, a tank adapted to hold varnish or a similar liquid, a dipping mechanism adapted to dip a plurality of shoes in the liquid in the tank, and means for removing the shoes from the dipping mechanism and holding the shoes over the tank.

3. In a shoe dipping machine, a tank adapted to hold varnish or a similar liquid, a dipping mechanism adapted to dip a plurality of shoes in the liquid in the tank, and mechanical means for automatically removing the shoes from the dipping mechanism.

4. In a shoe dipping machine, a tank adapted to hold varnish or a similar liquid, a dipping mechanism operated by hand and adapted to dip a plurality of shoes in the liquid in the tank, and mechanism operated by power adapted to automatically remove the shoes from the dipping mechanism and to hold the shoes in a dripping position over the tank.

5. In a shoe dipping machine, a frame, a tank supported on the frame, and adapted to hold varnish or a similar liquid, a dipping mechanism operated by hand and adapted to dip a plurality of shoes in the liquid in the tank, and mechanism operated by hand adapted to remove the shoes from the dipping mechanism and to hold the shoes in a dripping position over the tank.

6. A shoe dipping machine comprising a frame, a tank adapted to hold varnish or a similar liquid supported on the frame, arms pivotally supported on the frame, a dipping mechanism supported on the arms over the tank and adapted to dip a plurality of shoes in the liquid in the tank, a dripping mechanism supported on the frame over the tank, means for lowering and raising the arms by hand, means for rotating the dipping mechanism by hand, and means for operating the dripping mechanism by power whereby the shoes are automatically removed from the dipping mechanism, and held by the dripping mechanism over the tank.

7. A shoe dripping machine comprising a frame having vertical extensions, a tank adapted to hold varnish or a similar liquid supported on the frame, a lower rock shaft supported in bearings in the vertical extension of the frame, arms on the rock shaft extending over the tank, a rotating mechanism on the arms, means for rotating the mechanism, means for partly rotating the rock shaft, means for counter-balancing the arms and rotating mechanism consisting of a weighted lever on the rock shaft, means for supporting the weighted lever with the rotating mechanism in the normal position, a peg bar, means in the rotating mechanism for detachably securing the peg bar to the rotating mechanism, a plurality of lasts on the peg bar adapted to hold a plurality of shoes, an upper rock shaft supported in bearings on the vertical extension of the frame, levers on the upper rock shaft extending over the varnish tank, vertical arms pivotally secured at the upper ends to the levers and having hook-shaped lower ends, means for counter-balancing the levers and arms, consisting of a weighted lever on the upper rock shaft, means for supporting the weighted lever, and means for partly rotating the upper rock shaft, as described.

8. The combination with the varnish tank, dipping mechanism and peg bar of a shoe dipping machine, of an automatic dripping mechanism comprising a rock shaft *e*, a locking lever 46 secured to the rock shaft and having a vertical hole 47, a spring bolt 48 secured to the lever in a position for the end of the bolt to extend across the hole 47, a vertical rod 49 extending through the hole 47 and having a transverse hole 50 for the bolt 48, two end levers 51 51 secured to the rock shaft *e*, vertical arms 52 52 pivotally secured at their upper ends to the levers 51 51 and having hook-shaped lower ends 53 53 forming beveled edges 54 54 on the lower ends of the arms, a cross bar 55 connecting the arms 52, a cord 56 connecting the bar 55 with the bolt 48, and means for giving a constant reciprocating motion to the rod 49, whereby a plurality of shoes are automatically removed from the dipping mechanism and held over the varnish tank, as described.

9. The combination with the varnish tank, dipping mechanism and peg bar, of a shoe dipping machine, of a dripping mechanism comprising a rock shaft *e*, two end levers 51 51 secured to the rock shaft *e*, vertical arms 52 52 pivotally secured at their upper ends to the levers 51 51 and having hook-shaped lower ends 53 53 forming beveled edges 54 54 on the ends of the arms, a hand lever 57 secured to the rock shaft *e*, and means for counter-balancing the weight of the dripping mechanism, whereby on operating the hand lever 57 a plurality of shoes are removed from the dipping mechanism and held over the varnish tank to allow an excess of varnish on the shoes to drip into the tank, as described.

10. In a shoe dipping machine, the combination of a frame *a*, a driving shaft *b*, a crank shaft *c*, and rock shafts *d* and *e* supported in bearings in the frame, a varnish tank *f* supported on the frame, a lowering and elevating lever *g* secured to the rock shaft *d*, weight levers *h* and *i* secured to the rock shafts, arms *k k* secured to the rock shaft *d* over the tank, a rotating mechanism *l* on the arms *k k*, rotating levers *m m* connected to the rotating mechanism *l*, an automatic dripping mechanism *m* supported on the rock shaft *e* and operatively connected with the crank shaft *c*, a weight standard *o* supported on the floor, peg bars *p p*, and a plurality of lasts *r r* on the peg bars adapted to hold a plurality of shoes *s s*, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. WALL.

Witnesses:
ADA E. HAGERTY,
J. A. MILLER.