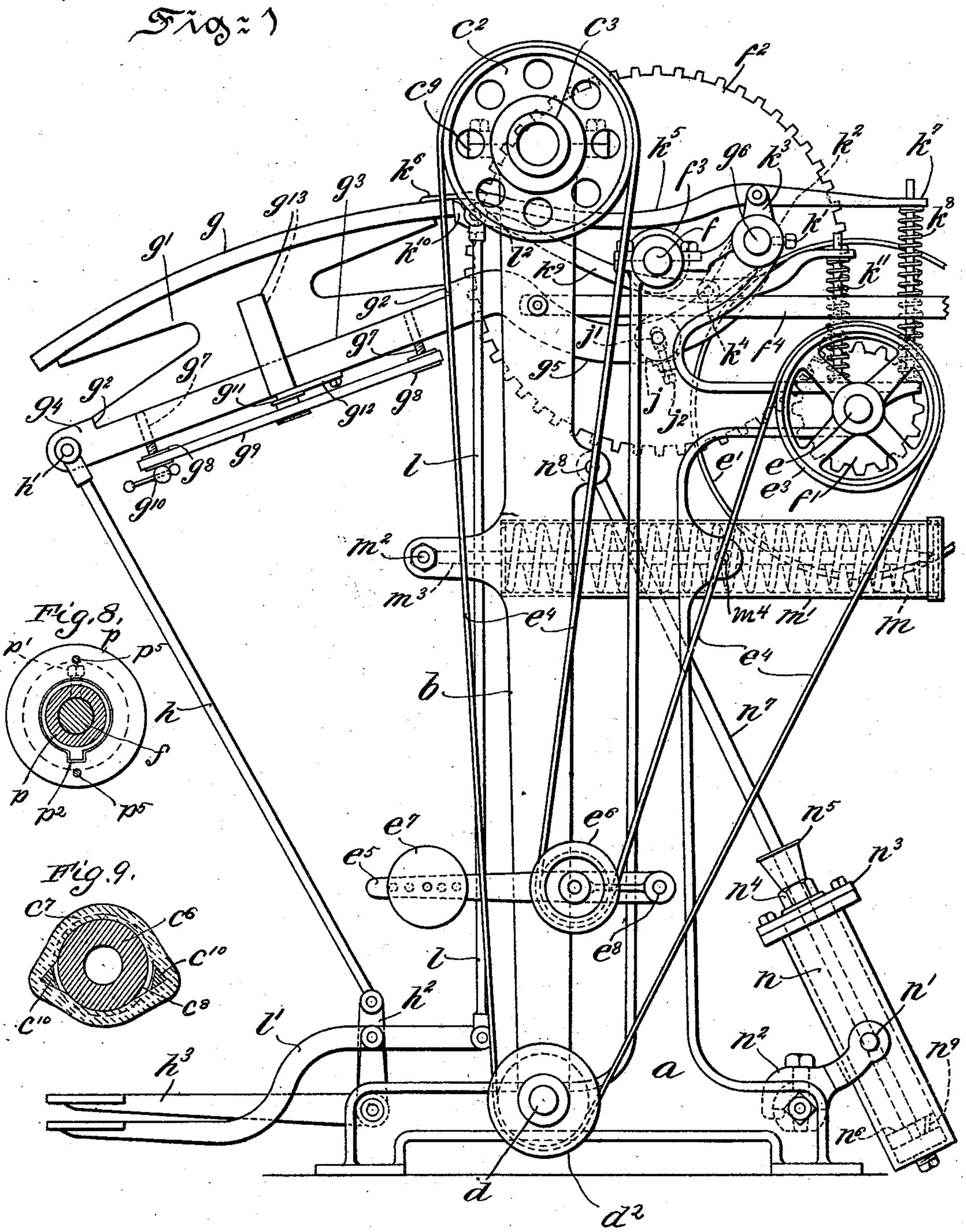
(No Model.) 3 Sheets—Sheet 1.

G. BINDER.

IRONING MACHINE.

No. 542,233. Patented July 9, 1895.

Fig. 1.



Witnesses:
Thomas M. Smith.
Richard C. Maxwell.

Inventor.
Gottlob Binder,
By J. Wallis Douglass
Attorney.

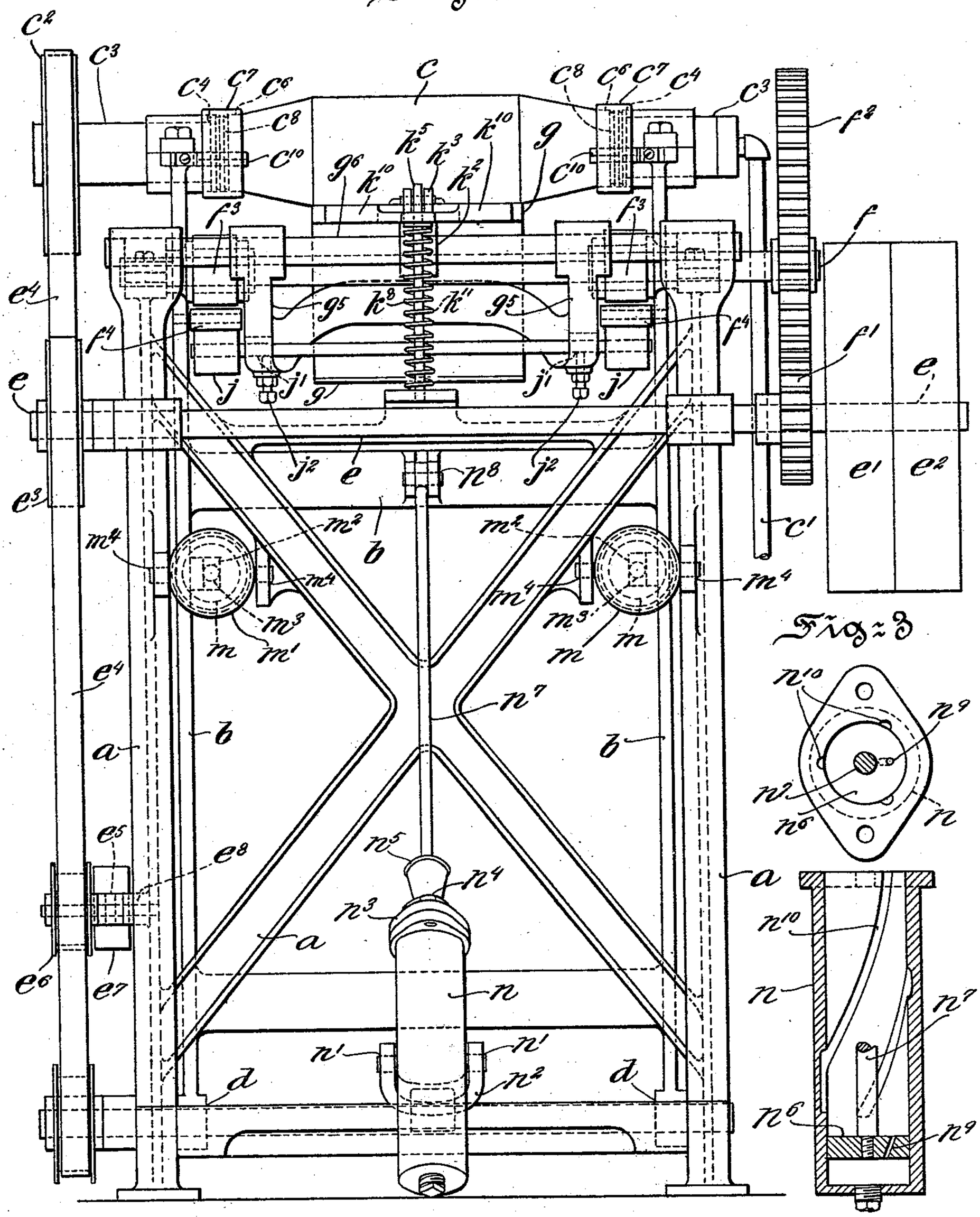
(No Model.) 3 Sheets—Sheet 2.

G. BINDER.

IRONING MACHINE.

No. 542,233. Patented July 9, 1895.

Fig: 2



Witnesses
Thomas M. Smith.
Richard C. Maxwell.

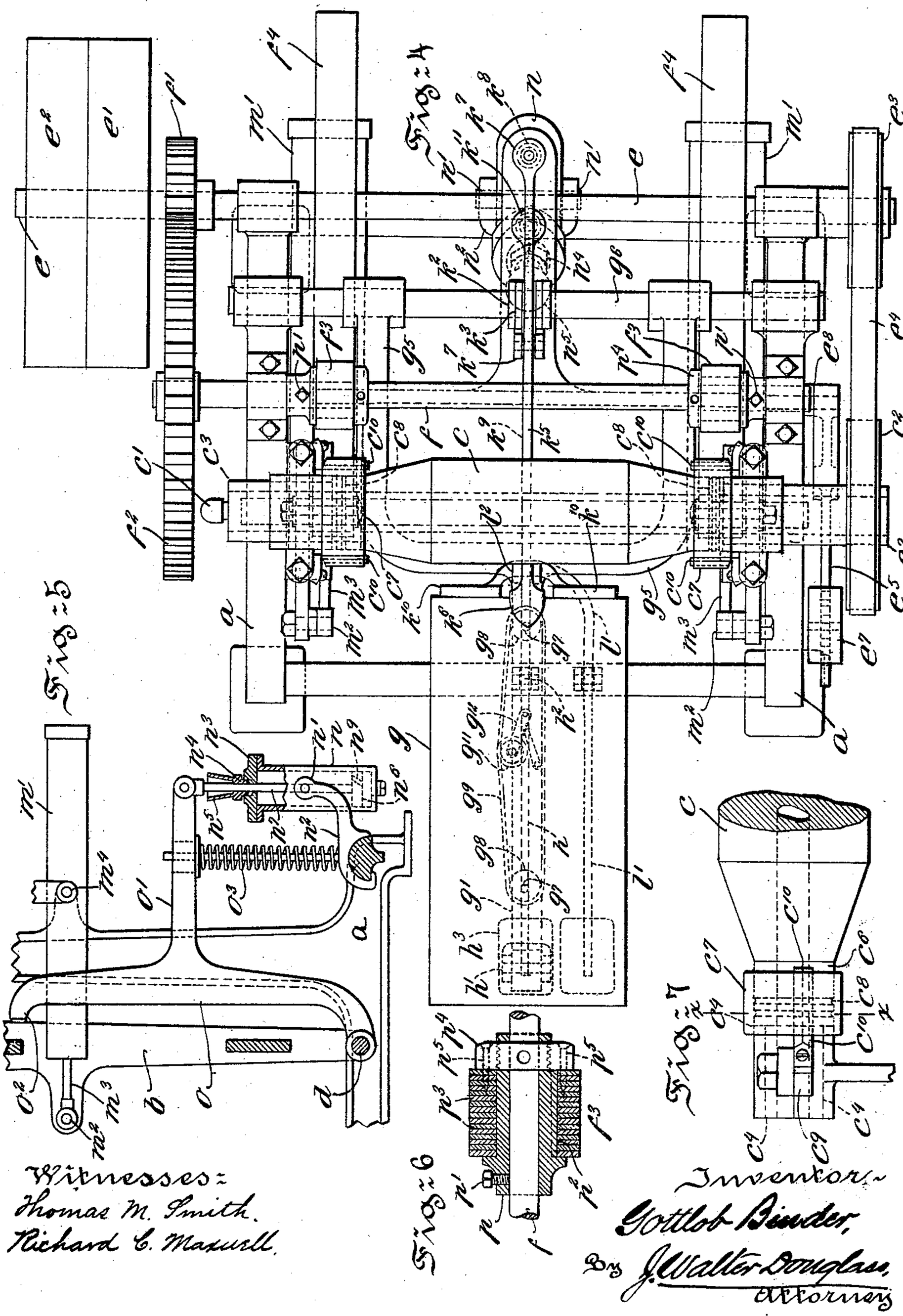
Inventor.
Gottlob Binder,
By J. Walter Douglas
Attorney.

(No Model.) 3 Sheets—Sheet 3.

G. BINDER.

IRONING MACHINE.

No. 542,233. Patented July 9, 1895.



Witnesses:
Thomas M. Smith.
Richard C. Maxwell.

Inventor:
Gottlob Binder,
By J. Walter Douglass,
Attorneys

UNITED STATES PATENT OFFICE.

GOTTLOB BINDER, OF PHILADELPHIA, PENNSYLVANIA.

IRONING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,233, dated July 9, 1895.

Application filed January 17, 1895. Serial No. 535,294. (No model.)

To all whom it may concern:

Be it known that I, GOTTLOB BINDER, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ironing-Machines, of which the following is a specification.

My invention has relation to ironing-machines of that class designed for ironing the bosoms of shirts and in which an iron is caused to traverse a table or board; and it relates more particularly to the construction and arrangement of parts of such a machine.

The principal objects of my invention are, first, to provide an ironing-machine which shall be comparatively simple, durable, and efficient in action, and, second, to provide an ironing-machine having parts thereof, as well as the actions or operations of said parts, simplified, so as to readily permit the introduction or removal of an article to be ironed, and to insure thorough treatment of the article by the iron in action.

My invention consists of an ironing-machine constructed and arranged as hereinafter more fully described, and pointed out in the claims.

The nature, characteristic features, and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a side elevational view of an ironing-machine embodying features of my invention. Fig. 2 is a rear elevation thereof. Fig. 3 is an enlarged top plan and central section of one form of a fluid-check embodying features of my invention. Fig. 4 is a top or plan view of the machine. Fig. 5 is a side elevation of a modified form of check for use in an ironing-machine for checking the retrograde movement of parts of the machine and thereby reducing shock or jar on such parts to a minimum. Fig. 6 is an enlarged longitudinal section of one of the friction-rolls of the machine. Fig. 7 is an enlarged side elevation, partly in broken section, showing in detail the oil-collecting device disposed between the traveler-iron and its bearings for preventing spread of oil onto the working-surface of the iron in action. Fig. 8 is an end view of Fig. 6 with the nut p^4 removed, and Fig. 9 is a section on the line $x\,x$ of Fig. 7.

Referring to the drawings, a is the main frame of the machine.

b is the frame of the traveler revoluble iron c. This frame b is pivoted, as at d, to the main frame a, and the iron c has its hollow interior supplied with air and gas, steam, other or heat through the pipe c'.

The main or driving-shaft e, is journaled in the main-frame a, and is provided at one end with tight and loose pulleys e' and e^2, and at the other end with a pulley e^3. This pulley e^3 is connected by a belt e^4, passing around a pulley d^2, loosely mounted on a shaft d, with a pulley c^2, secured to the shaft c^3, of the revoluble iron c. Through this connection the iron c is rotated, when the shaft e has motion imparted thereto from any suitable source of power. The tension on the belt e^4 is regulated by the lever e^5, carrying the tension-roll e^6 and weight e^7, and pivoted, as at e^8, to the main-frame a, as clearly illustrated in Fig. 1. This tension device compensates for the motion imparted to the iron c and its pulley c^2 by the movement of the frame b, and serves to keep the belt e^4 taut, no matter what may be the position of the said frame b. The main-shaft e imparts motion to the counter-shaft f through suitable gear-wheels f' and f^2. This shaft f is provided with friction-rolls f^3, of peculiar construction, which are normally out of engagement with the roller arms or boards f^4, but adapted to advance the arms f^4, pivotally connected with the frame b of the iron c, when the arms f^4 are brought into close contact with the friction-rolls f^3, to be hereinafter more fully explained.

The ironing-table g is preferably provided with a foot g', fitting a recess g^2, of a forked downwardly-curved arm g^4, the fork g^5 of which arm is pivoted to a shaft g^6. The table g is adapted to be vertically raised or lowered in its bed g^3 by means of the following mechanism: At the forward and rear ends of the bed g^3, and extending through the arm g^4, are the adjusting-screws g^7, each of which is provided below the floor of the bed g^3 with a pulley g^8. These pulleys are united with each other by a belt g^9. One or both of the pulleys g^8 may be provided with a lever g^{10}, by means of which the screws g^7 may be se-

cured farther into or retracted from their position in the plate g^4, and thus a corresponding rotary motion given to the respective pulleys g^8, through the belt g^9, and the screws to raise or lower the table or board g from its seat in the recessed plate g^4. A tension-roll g^{11}, depending from a ratchet or otherwise controlled arm g^{12}, pivoted or secured to the arm g^4, serves to take up slack in the belt g^9, and the ends of the screws g^7 bear against the base of the foot or support g', and thus elevate the table or board g and its support g', to bring the table closer to or farther from the traveler-iron c, to increase or decrease the bearing friction of one onto the other. The arm g^4 is provided with upwardly-extending parallel vertical projections g^{13}, into which the foot or support g' of the table fits to lock the table against lateral movement in its bed g^3.

The board g may be raised or lowered through its end pivotal connections with the shaft g^6 by means of the rod h, pivoted at h' to the outer end of the arm g^4. This rod h is raised or lowered by the arm h^2, pivoted thereto and connected with a treadle h^3, as clearly illustrated in Fig. 1 of the drawings.

It is obvious that in place of belts and pulleys, as hereinbefore explained and illustrated in the drawings, chains and sprocket-wheels, if preferred, may be substituted therefor.

Adjustably secured in slotted bearings j' of each fork g^5 of the arm g^4, and carried thereby, are rolls j, on which the roller arms or boards f^4 rest. The adjustment of the bearings j' of the rolls j in said slots is effected by means of the set-screws j^2, as illustrated in Fig. 1. Upon the shaft g^6 is secured, by a screw k', the collar k^2, having two arms or lugs k^3 and k^4. Pivoted to one arm k^3 is a lever k^5, carrying at its forward end the neckband-clamp k^6, and at the other end k^7 it is normally held in a raised position by means of a helical or coiled spring k^8. The other arm k^4 of said collar k^2 is pivoted to a lever k^9, the forward end of which carries the yoke-clamp k^{10}, and the rear end is held in an elevated position by means of the coiled or spiral spring k^{11}, as illustrated in Figs. 1. and 4.

To the yoke-clamp end k^{10} of the lever k^9 is pivotally secured the upper end of a rod or arm l, which is pivotally attached at its lower end to a treadle-arm l', and provided at its upper end with the rounded projection l^2, resting normally under the neckband-clamp k^6 of the lever k^5.

The frame b of the traveling iron is advanced to traverse the ironing-table g against the retracting force of the springs m, mounted in hollow casings m', which are pivotally connected, as at m^2, to the frame b of the iron c by means of the rods m^3. The casings m' are pivoted, as at m^4, at or about their center, to the main frame a, as illustrated in Figs. 1 and 2, and have a slight oscillatory movement on said pivots or trunnions m^4 when the frame b is advanced or retracted. The retracting force of these springs m on the frame b is checked by means of the following mechanism, of which two modifications are shown.

In Figs. 1, 2, 3, and 4 the mechanism consists of a cylinder n, pivoted, as at n', to brackets n^2, secured to the main frame a, in the manner fully illustrated in Fig. 1. The cylinder n has a cap n^3, packing-box n^4, and funnel n^5, and these instrumentalities are traversed by a piston n^6, the rod n^7 of which is pivotally connected to the iron frame b, as at n^8. The piston-head n^6 may be provided with an oblique orifice or vent n^9, for a purpose to be hereinafter fully explained. With reference to Fig. 3, it will be observed that in this check, in which oil or thick liquid is used and the piston-rod n^7 is connected directly with the oscillating frame b, the interior wall of said cylinder is rifled—that is to say, provided with spiral channels n^{10}, extending from the top to a point some distance above the bottom of the cylinder n'. The oil or heavy fluid escapes, during part of the downward stroke of the plunger or piston n^6, through the channels n^{10}, and the oil thereby offers a certain resistance to the plunger and its rod during the first part of the return movement of the frame b under the retracting force of the springs m. When, however, the piston or plunger n^6 has traversed the lower end of the channels n^{10}, the oil escapes through the orifice n^9 to afford an increased resistance of the piston and its rod to the frame b at or near the end of its return stroke, thereby appreciably lessening jar or shock on the working parts of the machine.

The vent n^9 is drilled through the piston n^6 obliquely—that is to say, in a line from the center of the piston toward the wall of the cylinder n—or so that the oil spurting out of this vent orifice is thrown against the wall of the cylinder obliquely and not upward against the cap, as would be the case if the orifice was vertically arranged.

With reference to Fig. 5, in which a modification of the check is shown, it will be seen that the piston-rod n^7 is pivoted at its upper end to an arm o', projecting from a spanner or buffer o, one end of which spanner or buffer is loosely pivoted to a shaft d, forming the pivot of the iron frame b, and the upper end o^2 of said buffer abuts against the iron frame b. The arm o' is held upward normally by a coiled or spiral spring o^3. In this form of check the interior wall of the cylinder n is preferably not rifled, as a vent in the piston-head n^6 will afford sufficient opening for the passage of the oil above and below the same in the working of the same within the cylinder n. It may, however, be here remarked that the cylinder, as illustrated in Figs. 1, 2, 4, and 5, may be internally rifled, as illustrated in Fig. 3, if so desired. When the frame b moves forward in its initial stroke against the force of the springs m, the arm o', of the spanner or buffer o, is caused to move therewith, by means of the spring o^3, and carry the piston-rod n^7 therewith, and hence the piston to

the upper end of the cylinder n, and during such movement the cylinder n will oscillate in the bearings n' thereof. The spanner or buffer o will also be moved forward on the shaft d, with its abutting arm o^2 projected forward in the path of the frame b. When the iron frame b returns in the direction of its usual position under the influence of the springs m, it strikes against the abutting arm o^2, which is thrown back against the force of the spiral or coiled spring o^3, and the projecting arm o' of the spanner or buffer supported by said spring is depressed gradually, thereby moving the piston n^6, by means of its rod n^7, downward in the cylinder n. The iron frame b thus has a gradual check through the buffer, its spring, and the oil-check and piston The friction-rolls f^3 on the shaft f are preferably constructed as illustrated in Fig. 6. The shaft f is provided with a collar or boss p, secured by a screw p' to the shaft f and rotating therewith. The boss p is provided with a feather or key p^2. The friction-surface of the roll is built up of superposed disks or washers p^3, of leather, wood, hard rubber, or other suitable material, which disks are slipped onto the collar or boss p, being provided with a central opening and keyway for that purpose. After a sufficient number of these washers or disks have been slipped onto the boss, they are compressed together to the required extent by screwing down a nut p^4 on the boss p, in order to provide an efficient or reliable bearing-surface, as practice has fully demonstrated. To prevent the nut p^4 from turning, screws or pins p^5 extend through the nut into certain of the disks, thereby securely fastening the nut to the disks and preventing any turning separately of the nut from the disks in position. The screws or pins p^5 are shown in dotted lines in Fig. 6. The bearing-surface of the disks may be trimmed by a lathe or in any preferred manner. To change the friction-surface of the rolls—as, for instance, when the same is worn down too close—the nut is taken off and the old disks removed and new ones readily substituted.

The device for preventing the transmission or leakage of oil from the bearing c^4 to the working-surface of the iron c is illustrated in detail in Figs. 7 and 9 of the drawings. Between the bearing c^4 and the end c^6 of the revoluble iron c is wrapped felt, linen, or other absorbent material c^7. This wrapping is held from moving laterally by grooving the end c^6, as illustrated by the dotted lines at c^8 in Fig. 7, and a rotary motion is prevented by securing on either side of the bearing c^4 a plate or lug c^{10}, around which the wrapping c^7 is wound. Any oil escaping from the bearing c^4 is absorbed by the linen or felt wrapping, and when the same becomes saturated with oil, such may be removed and a new material readily substituted therefor.

The mode of operation of the hereinbefore-described ironing-machine is as follows: The table g in its normal position is depressed and the iron frame b is at its extreme right-hand movement, or clear of the table. The neckband and yoke-clamps rest on the end of the table nearest the revoluble iron. The treadle l' is now depressed, lifting the clamps k^6 and k^{10} from the board g. The shirt is then slipped on in its right position, the treadle l' released, and the clamps k^6 and k^{10} firmly press the neckband and yoke of the shirt to the table under the tension of the vertical coiled or helical springs k^8 and k^{11}. The treadle h^3 is now depressed, elevating the table g into operative position—that is, in the path of the revoluble iron c. The forked arms g^5 of the support g^4 of the table g are thereby raised, carrying with them the rolls j, which elevate the roller boards or arms f^4 into frictional contact with the rollers f^3, which, being secured to the counter-shaft f, are constantly rotating. The boards or arms f^4 are pushed from right to left by said rollers f^3, moving the frame b and the revoluble iron in an outward direction, whereby the iron c will traverse the bosom of the shirt or other article. The springs m retract the frame b when the table is lowered through releasing the foot from the treadle h^3. The return movement of the frame b is checked by the mechanism, as hereinbefore fully explained, so that it reaches its normal position without jar or shock or undue strain upon the several working parts of the machine. When the shirt or other article is to be removed from the board or table, the treadle l' is depressed by the foot, whereby the clamps k^6 and k^{10} will be raised out of contact with the table or board g, and the machine then brought into a condition for a similar ironing operation of an article.

It will be manifestly obvious that, as to details, modifications may be made in many of the parts constituting features of my invention and still be within the scope of my invention; and hence I do not wish to be understood as limiting myself to the exact details of construction and arrangement of all the parts as illustrated; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an ironing machine, a main frame, a table, a traveler iron-frame, a coiled spring, an operating rod connected with said iron frame and with said spring, a buffer pivoted to said main-frame and normally engaging said iron-frame, said buffer provided with an arm, a liquid check connected with the arm of said buffer and a spring interposed between said buffer-arm and main-frame, substantially as and for the purposes described.

2. In an ironing machine, a main-frame, a traveler iron-frame, a buffer pivoted to said main-frame and engaging said traveler frame, said buffer provided with an arm, a liquid check pivoted to a bracket of said main-frame and the piston-rod thereof connected with the

arm of said buffer and a spring interposed between said arm and bracket, substantially as and for the purposes described.

3. In an ironing machine, a reciprocating frame held under spring tension, means for actuating the same, a buffer pivoted to the main-frame and normally engaging said reciprocating frame, said buffer provided with an arm, a spring controlled liquid cylinder check pivotally connected with said main-frame and the piston-rod thereof pivotally connected with the arm of said buffer, substantially as and for the purposes described.

4. In an ironing machine, a main-frame, a traveler-frame, a buffer pivoted to the main-frame and engaging said traveler-frame, said buffer provided with a projecting arm, a liquid check, comprising a cylinder rifled or provided with spiral channels extending from about the top to a point some distance from the bottom thereof, a rod having a piston with an oblique orifice or vent therein, a packing box mounted in a funnel-shaped cap connected with the top of said cylinder, and a spring interposed between said buffer-arm and main-frame, substantially as and for the purposes described.

5. In an ironing machine, a main-frame, a table, a traveler iron frame, hollow casings provided with internal springs having an operating rod connected therewith for compressing the same, one end of said rod being connected with the traveler iron frame, a buffer provided with an arm having a liquid check connected therewith and a spring interposed between said arm and main-frame, substantially as and for the purposes described.

6. In an ironing machine, a main-frame, a table, an iron, a traveler-frame, a pivotally supported liquid cylinder check having internal channels, a rod having a perforated piston movable in said cylinder by the movement of said traveler-frame, said cylinder provided with a removable cap having a funnel-shaped end, a buffer pivoted to said main-frame and engaging said traveler-frame, said buffer having an arm engaged by said piston-rod and a spring interposed between said buffer-arm and main-frame, substantially as and for the purposes described.

7. An ironing machine provided with a main-frame, a traveler frame pivoted therein, a movable iron carried by said traveler frame, a hollow casing pivoted at about its center to the main frame and having an oscillatory movement therein, a coiled spring mounted in said casing, a rod secured at one end to said spring and pivoted at the other end to the traveler-frame, a buffer, a liquid check, the cylinder of which is pivoted in the main frame, and a piston rod pivotally connected with said buffer, and a spring interposed between said buffer and main-frame, substantially as and for the purposes described.

8. An ironing machine provided with a main-frame, a traveler frame pivoted therein, a revoluble iron carried by said traveler-frame, a casing pivoted at about the center to the main-frame and having an oscillatory movement therein, a spring mounted in said casing, a rod secured at one end to said spring and pivoted at the other end to said traveler-frame, a pivoted buffer provided with a projecting-arm, a liquid check comprising a cylinder and piston rod, said cylinder being pivotally connected with the main frame and said rod with the arm of said buffer, and a coiled spring interposed between the arm of said buffer and main-frame, substantially as and for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

GOTTLOB BINDER.

Witnesses:
THOMAS M. SMITH,
RICHARD C. MAXWELL.