No. 645,593. Patented Mar. 20, 1900.

L. R. HEIM.

HAT IRONING MACHINE.

(Application filed Sept. 16, 1899.)

(No Model.) 3 Sheets—Sheet 1.

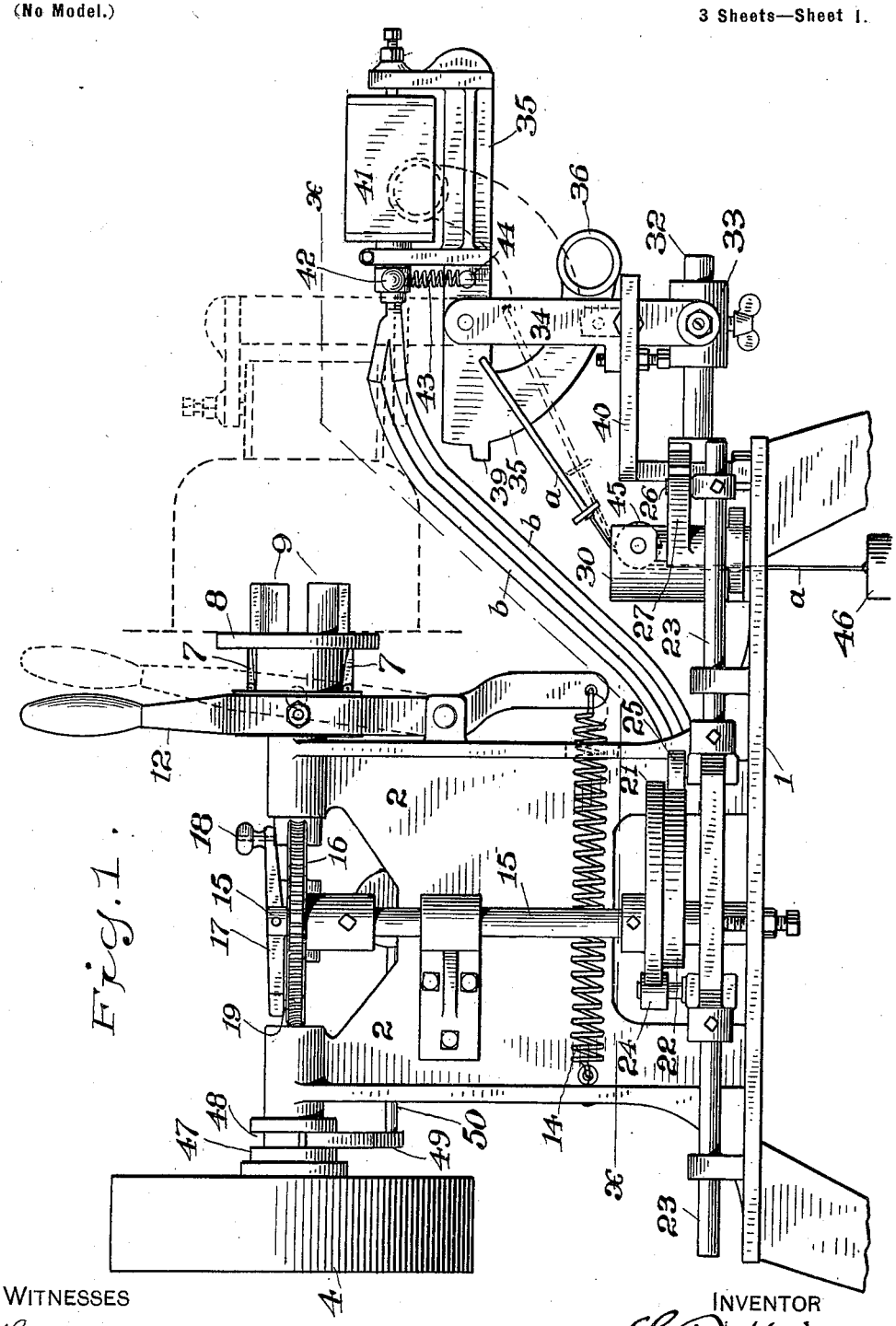

Fig. 1.

WITNESSES

H. A. Lamb

M. I. Longden

INVENTOR

By L. R. Heim

D. Whitcher

Atty

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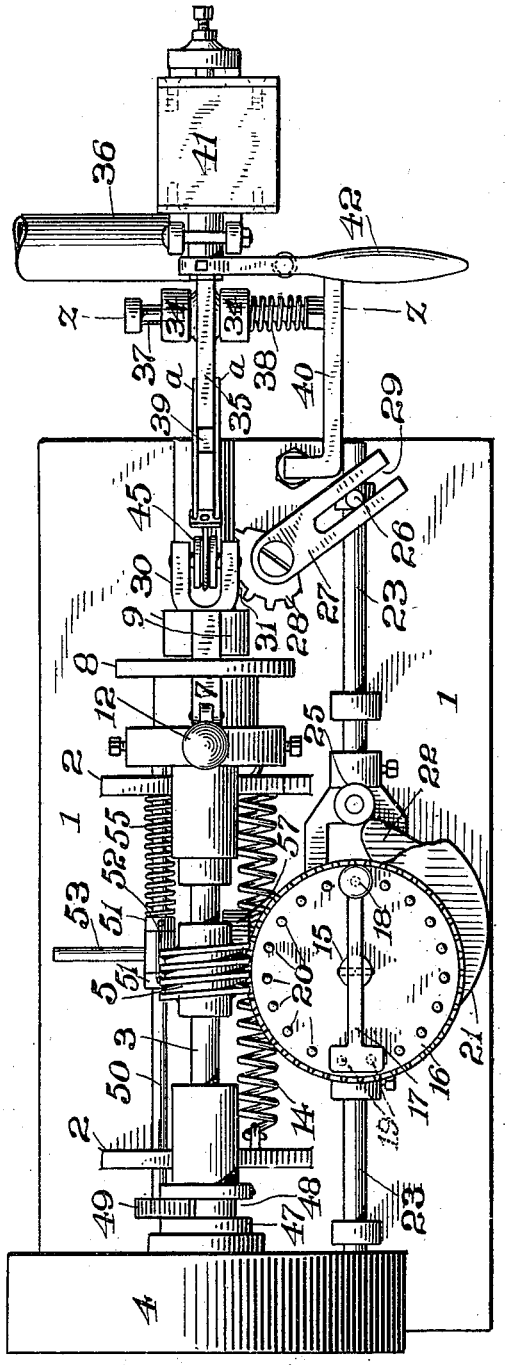

Fig. 2.

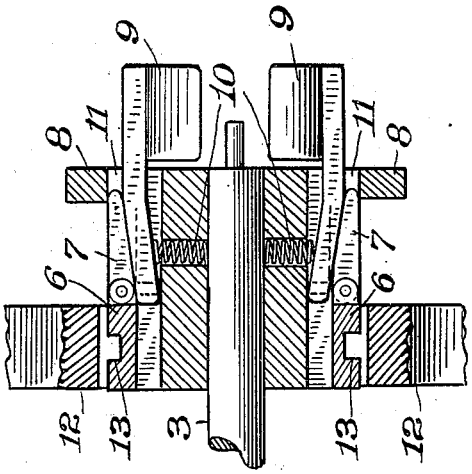

Fig. 7.

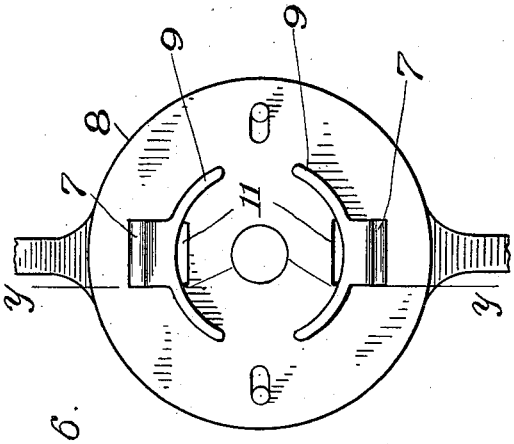

Fig. 6.

WITNESSES

H. A. Lamb

W. T. Longden.

INVENTOR

By L. R. Heim

Atty

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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

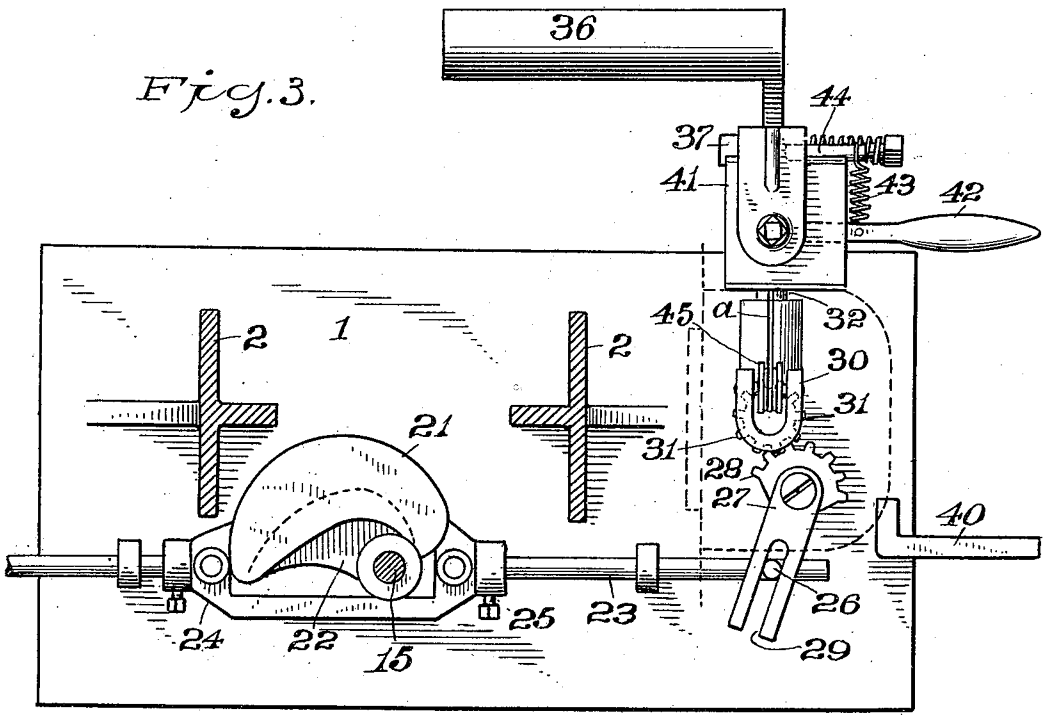


Fig. 4.

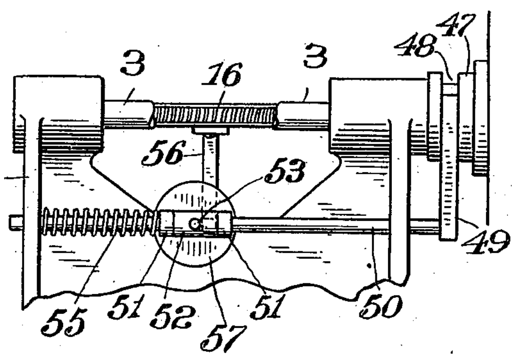


Fig. 8.

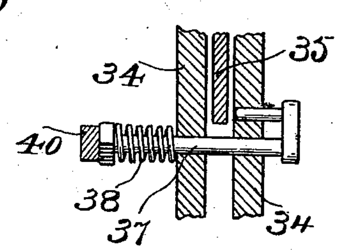
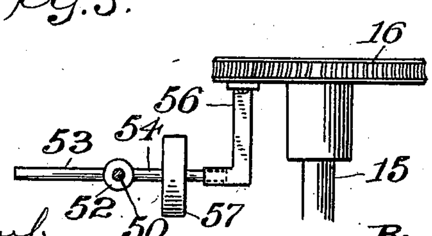


Fig. 5.



WITNESSES
H. A. Lamb
M. I. Longden

INVENTOR
L. R. Heim
By J. W. Smith Jr.
Atty

UNITED STATES PATENT OFFICE.

LEWIS R. HEIM, OF DANBURY, CONNECTICUT.

HAT-IRONING MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,593, dated March 20, 1900.

Application filed September 16, 1899. Serial No. 730,733. (No model.)

To all whom it may concern:

Be it known that I, LEWIS R. HEIM, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Hat-Ironing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to certain new and useful improvements in machines for ironing hats, and has for its object to provide a machine of this description which shall perform its work in a very efficient manner and which shall not be likely to get out of order; and with these ends in view my invention consists in certain details of construction and combination of parts, such as will be hereinafter fully set forth and then specifically designated by the claims.

In the accompanying drawings, which form a part of this application, Figure 1 is an elevation of my improved machine; Fig. 2, a plan view thereof; Fig. 3, a section at the line *x x* of Fig. 1, but showing the position which the several parts assume when the hat-iron is at or near the band-line of the hat; Fig. 4, a detail broken elevation showing particularly the automatic stop mechanism which I employ; Fig. 5, a detail broken elevation of such stop mechanism; Fig. 6, a detail front elevation of the hat-block chuck; Fig. 7, a section at the line *y y* of Fig. 6, and Fig. 8 a detail section at the line *z z* of Fig. 2.

Similar numbers and letters of reference denote like parts in the several figures of the drawings.

1 is the bed of the machine, from which rises a web-like standard 2, and 3 is the power-shaft, suitably journaled at the upper end of said standard and carrying the power-pulley 4. 5 is a worm carried by said shaft, and 6 is a sleeve splined on one end of this shaft, to which sleeve are pivoted wedge-shaped dogs 7.

8 is the chuck-head, secured to the extremity of the shaft 3, and 9 are the chuck-jaws confined between said shaft and dogs and held in normally-distended condition by means of springs 10. These jaws 9 extend through suitable openings 11 in the chuck-head 8, and the wedge-shaped dogs 7 also extend within these openings immediately outside of the jaws, so that it will be readily understood that when said dogs are moved outwardly they will act against the jaws to force the latter inwardly.

12 is the chuck-operating lever, pivoted to the standard 2 and having a suitable and ordinary connection within an annular groove 13 in the block 6, so that it will be clearly understood that any outward movement of this lever will force this block forward to cause the dogs 7 to wedge against the jaws 9 for the purpose presently to be explained. 14 is a spring whose ends are respectively connected with the standard 2 and the lower end of this lever 12, whereby said block 6 will be normally projected forward. I have not illustrated in detail the hat-block, but would say that the same is of ordinary construction and that the jaws 9 are adapted when they are contracted to grasp the central portion or hub of said block to hold the same firmly in position.

15 is a vertically-disposed shaft suitably journaled, and 16 is a worm-wheel which is loose around the upper end of this shaft and meshes with the worm 5.

17 is a lock-lever which is pivoted within the upper end of the shaft 15 and is provided at one end with a knob-like handle 18, while depending from the other extremity are one or more pins 19, which engage with holes 20 in the upper face of the wheel 16, so that it will be readily understood that when this lock-lever is engaged with said wheel the latter will be revolved in harmony with the shaft 15, but that when the pins of said lever are disengaged from said wheel said shaft may be revolved independent of said wheel for the purposes presently to be explained. Secured to the lower extremity of this shaft 15 are two separate cams 21 22, arranged one above the other, while supported within suitable bearings on the bed 1 is a rod 23, which is capable of a free lengthwise movement. 24 25 are friction-rolls, which are carried by this rod in horizontal planes which correspond with the planes of the cams 21 22, and at the outer end of this rod is rigidly secured an upwardly-projecting pin 26.

27 is a link which is pivoted to the bed 1 and which carries a gear 28 at its inner end and is provided with an elongated gate 29 at its outer end, within which gate the pin 26 extends, so that it will be clear that when the rod 23 is reciprocated it will swing said link back and forth.

Swiveled upon the bed 1 is a post 30, which carries a gear 31, with which the gear 28 meshes, and 32 is a crank-pin which extends from said post and has secured around its outer end a sleeve 33. 34 is a standard which is pivoted to said sleeve, and 35 is the hat-iron lever, which is pivoted to the upper extremity of said standard and is provided at its lower end with a handle 36. The upper end of this standard 34 is forked, and the lower portion of the hat-iron lever below the pivotal point of the latter extends between the members of such fork.

37 is a latch-pin which extends through the standard 34, is headed at both ends, and is provided with a spring 38, confined between one of the heads and the standard, so as to normally keep said latch in closed position. A lug 39 is formed on the inner end of the hat-iron lever 35, and when this pin 37 is pressed against the resiliency of its spring and the hat-iron swung to its upward or operative position this lug 39 will pass said latch-pin, so that when the latter is allowed to return to normal position by reason of the spring element it will shoot across said lug, and thereby hold the hat-iron lever, so that the iron cannot accidentally drop back. I provide an angle-lever 40, which rises from the bed of the machine, so that when the standard is swung to its normal position, as will be hereinafter explained, one of the heads of the pin 37 will strike against such lever, and thereby compress the spring and release the hat-iron lever, so that the latter can drop down out of operative position.

41 is the hat-iron, which is mounted in any suitable and ordinary manner at the upper end of the lever 35, and 42 is an ordinary handle secured to the frame of the hat-iron or any part moving in harmony therewith, this handle being for the convenience of the operator in following around the contour of the hat. 43 is an ordinary coil-spring whose ends are connected, respectively, with the shank of this handle and with a pin 44, which projects from the lever 35, so that the hat-iron will be normally forced against the hat, especially when it is occupying a position near the band-line or the junction between the crown and brim.

45 is a pulley which is journaled within the post 30, and *a* is a cord, the upper extremity of which is secured to the lever 35, while from the lower extremity depends a weight 46, the object of which weight is to preserve the position of the hat-iron against the hat, while at the same time a general rocking movement of the standard 34 will be permitted.

It will be observed that there can be no straining or unequal pull upon the lever 35, since the cord 46 always occupies the same plane with respect to this lever, owing to the fact that the post 30 always turns in harmony with said lever.

From the foregoing description it will be clear that the carriage which supports the hat-iron is composed of the post 30, the crank-pin 32, the standard 34, and the lever 35 and that this carriage will be swung around in opposite directions by the forward and backward movements of the rod 23.

The lower cam 22 operates to throw the rod 23 forward to effect the movement of the hat-iron from the band-line of the hat to the tip thereof, while the upper cam 21 operates to effect the reverse movement of said iron.

A single cam operating upon the rolls 24 25 in the same horizontal plane would not be advantageous, for the reason that exactly the same speed from start to finish would be caused in moving both from the band to the tip and from the tip to the band of the hat, such a speed being undesirable, for the reason that the iron must not dwell so long upon the tip of the hat as it does upon the band of the hat, owing to the tendency to burn the former. I have therefore provided two cams, the upper one of which causes a rapid initial movement from the tip toward the band, so that the iron will not dwell long upon the tip, this movement becoming slower as the iron approaches the band, so that the extended surface of the hat at the latter point may receive a sufficient ironing. The lower cam is so laid out that it will cause a comparatively-slow speed at the start when the band is being ironed on the return operation, while the finish of the speed of such cam is quite rapid, so that the iron will travel quickly over the tip until the pin 37 strikes against the angle-iron 40 to release the lever 39 and permit the iron to drop down out of operation.

It frequently becomes desirable to iron a portion of a hat more than once, or, in fact, several times, and I can readily accomplish this by simply releasing the lock-lever 17 from the worm-wheel 16 and then operating said lever to turn the cams around, so as to bring the hat-iron at the desired point on the hat, and in this connection I would state that the cams can of course be made of any suitable contour, so as to effect any variable speed of the hat-iron sought for.

I have provided mechanism for automatically stopping the revolution of the power-shaft at the completion of each hat-ironing operation, which mechanism I will now describe.

Without going into details I will simply say that I employ a clutch device 47, which is splined upon the power-shaft and which is capable of engaging the power-pulley 4, which latter is loose upon said shaft. Around this clutch device is an annular groove 48, within which extends a shoe 49, which latter is secured to the end of a rod 50, suitably sup-

ported by the standard 2 and capable of a lengthwise movement. Secured upon this rod 50 are collars 51, and loose upon this rod and confined between these collars is a sleeve 52, from opposite sides of which project pins 53 54.

55 is a coil-spring which is confined between the wall of the standard 2 and one of the collars 51, the resiliency of which spring causes the shoe 49 to be thrown toward the power-pulley 4 to effect the engagement of the clutch member 47 with said pulley.

56 is a finger which depends from the worm-wheel 16, and when said wheel has completed one revolution, so as to effect the movements of the hat-iron from tip to band and on the return from band to tip, said finger will strike against the pin 54, and thereby force the rod 50 against the resiliency of the spring 55, so as to disengage the clutch member and cause the power-shaft to stop. I provide a weight 57 upon the end of the pin 54, and when it is desired to start the machine the operator simply swings the pin 54 clear of the finger 56, thereby allowing the clutch to engage with the power-pulley, the weight 57 serving to return the pin to normal position.

The hat-iron is heated by any suitable agent, such as gas, which latter is conducted through ordinary pipes *b*.

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

1. In a hat-ironing machine, the combination of the hat-iron carriage, the rotary element which supports said carriage, the rod capable of lengthwise reciprocation and carrying friction-rolls, means for imparting rotary reciprocations to said element from said rod, the shaft carrying separate cams which are intermediate of said rolls and operate respectively against the same, and means for applying power to said shaft, substantially as set forth.

2. In a hat-ironing machine, the combination of the rotary carriage, the hat-iron suitably mounted thereon, the rod capable of lengthwise movements and carrying friction-rolls, means intermediate of said carriage and rod whereby the lengthwise reciprocations of the latter are converted into rotary reciprocations of the former, the shaft carrying separate cams which act respectively against said rolls, the worm-wheel carried by said shaft, and the power-shaft carrying a worm which engages said wheel, substantially as set forth.

3. In a hat-ironing machine the combination of the rotary carriage, the hat-iron suitably mounted thereon, the rod capable of lengthwise movements, the friction-rolls carried by said rod in different planes, means intermediate of said carriage and rod whereby the lengthwise reciprocations of the latter are converted into rotary reciprocations of the former, the shaft carrying similar cams one above the other and in abutment respectively with said rolls, and means for applying power to said shaft, substantially as set forth.

4. In a hat-ironing machine, the combination of the rotary post carrying a gear, the link carrying a gear which meshes with the first-named gear, the rod capable of lengthwise movements and loosely connected with said link, means for reciprocating said rod, the crank-pin extended from said post, the standard supported on said pin and capable of a rocking movement, and the iron-carrying frame pivoted to said standard, substantially as set forth.

5. In a hat-ironing machine, the combination of the rotary post carrying a gear and having the pulley journaled therein, the link carrying a gear which meshes with the first-named gear, the hat-iron carriage supported by and moving in harmony with said post, the weighted cord passed over said pulley and having its upper extremity secured to said carriage, and means for reciprocating said link, substantially as set forth.

6. In a hat-ironing machine, the combination of the rotary post carrying a gear and having the pulley journaled therein, the link carrying a gear which meshes with the first-named gear, the rod capable of lengthwise movements and loosely connected with said link, means for reciprocating said rod, the crank-pin extended from said post, the standard supported on said pin and capable of a rocking movement, the iron-carrying frame pivoted to said standard, and the weighted cord passed over said pulley and having its upper end secured to said frame, substantially as set forth.

7. The combination of the rotary post, the crank-pin extending therefrom, the standard pivoted around said pin, the spring-actuated latch-pin carried by said standard, the hat-iron lever pivoted to said standard and having a locking-lug capable of engaging with said latch-pin, and an abutment against which said pin strikes to effect the withdrawal of said latch-pin and the consequent dropping of the hat-iron, substantially as set forth.

8. The combination of the vertical shaft carrying the operating-cams, the worm-wheel loose around the upper end of said shaft and provided with perforations in its upper face, and the locking-lever pivoted to the upper end of said shaft and provided with pins adapted to engage with said perforations, substantially as set forth.

9. The combination of the power-shaft carrying a worm, the vertical shaft having secured to its lower extremity two separate cams and having loose around its upper end the worm-wheel provided in its upper face with perforations and adapted to engage with said worm, the reciprocatory rod suitably supported and carrying friction-rolls which are engaged by said cams, the rotary system which supports and carries the hat-iron, connections between said rod and system where-

by lengthwise reciprocations of the former are converted into rotary reciprocations of the latter, and the locking-lever pivoted to the upper end of said vertical shaft and provided with pins capable of engaging the perforations in said worm-wheel, substantially as set forth.

10. The combination of the power-shaft having the power-pulley loosely mounted thereon, the clutch device splined upon said shaft, the rod capable of lengthwise movements and carrying at one extremity a shoe which is suitably connected with said clutch device, the spring element whereby said rod is operated to normally effect the clutch engagement, the sleeve loose around said rod and having pins extending therefrom, the weight at the end of one of said pins, the worm carried by said power-shaft, the vertical shaft carrying at its upper extremity the worm-wheel adapted to engage with said worm, and the finger depending from said worm-wheel and adapted to strike against said weighted pin to withdraw the clutch from the power-pulley, substantially as set forth.

11. The combination of the power-shaft, the sleeve splined on the outer end thereof and having an annular groove, the operating-lever having connection with said groove, the jaws carried at the end of said shaft, the springs acting against said jaws to normally distend the same, the chuck-head having openings through which said jaws extend, and the wedge-shaped dogs against said jaws and having their extremities extended with said openings, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS R. HEIM.

Witnesses:
CHRISTIAN QUIEN,
LUCIUS H. HOYT.