Aug. 16, 1932. L. ANGELUS ET AL 1,872,631

HAT IRONING MACHINE

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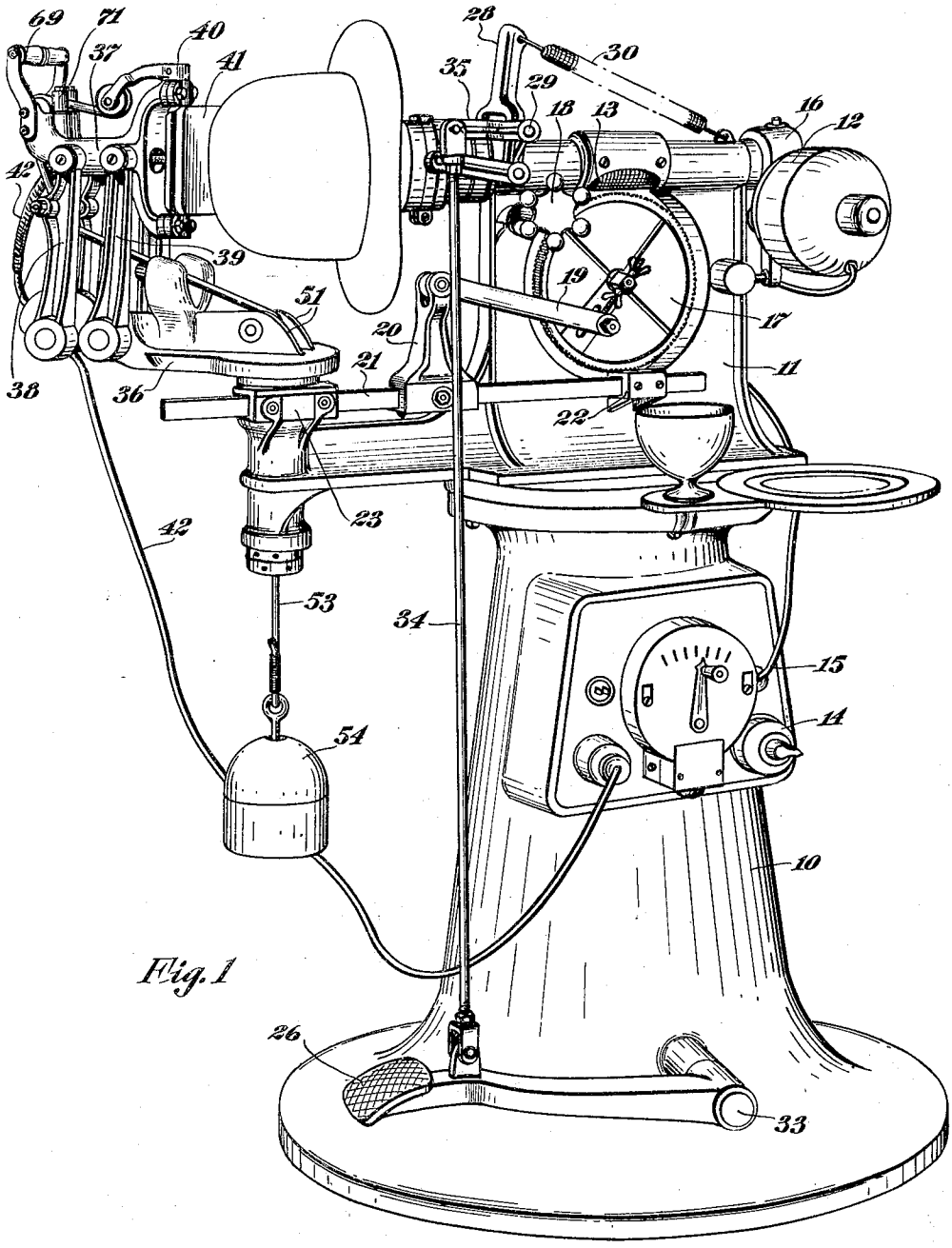


Fig. 1

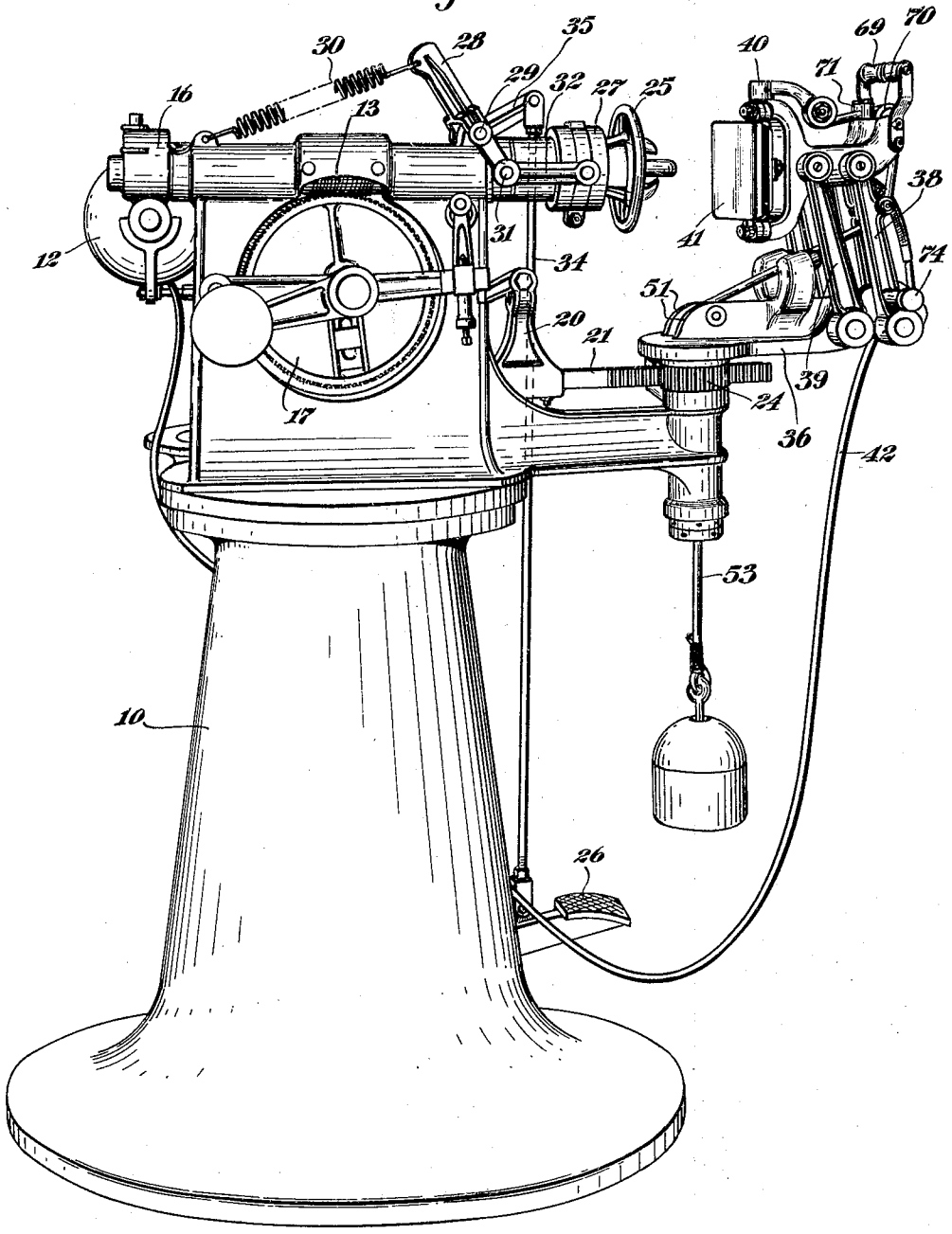
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Fig. 2



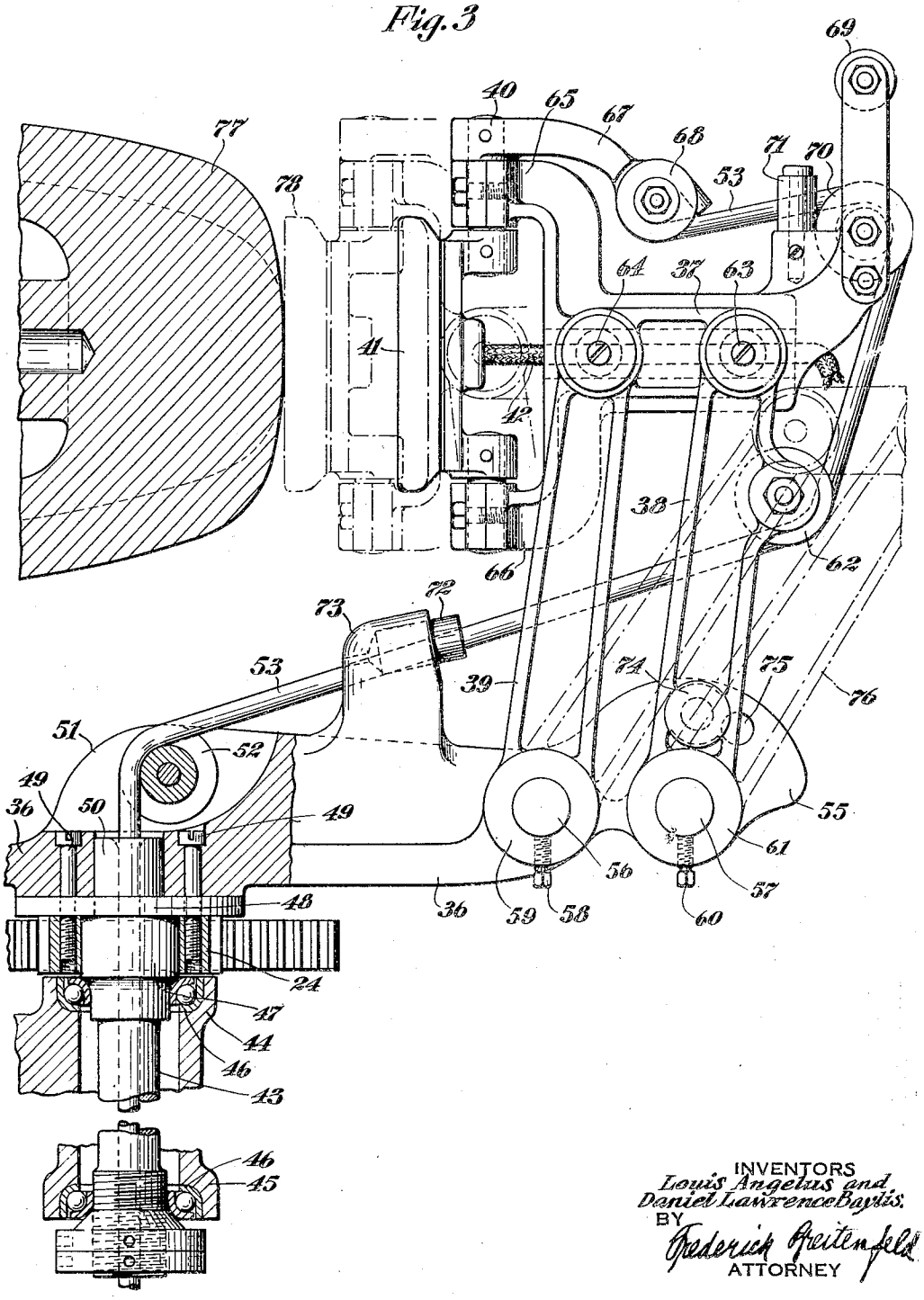
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Fig. 3



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Fig. 4

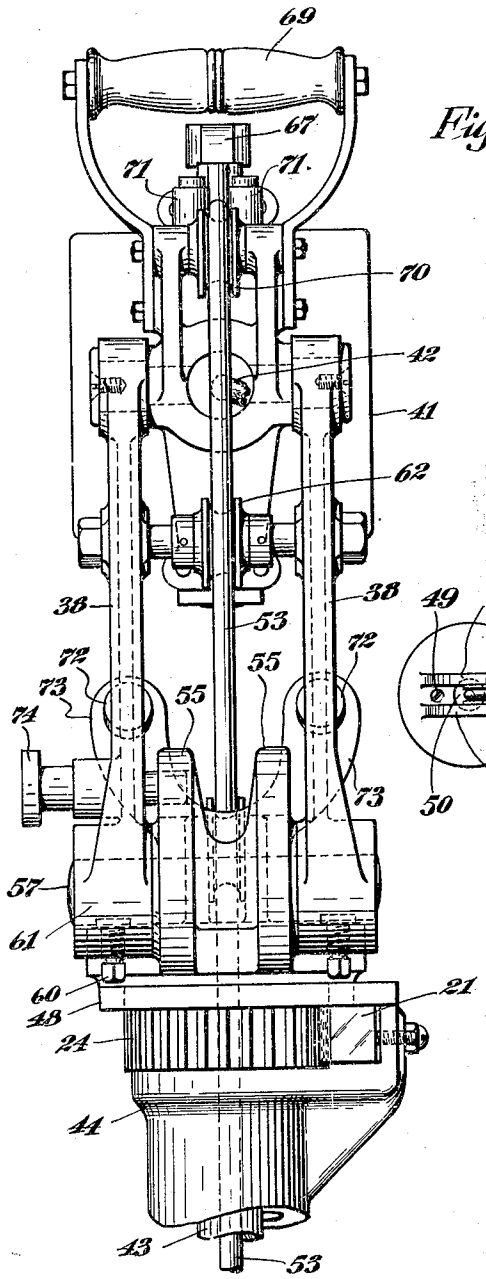
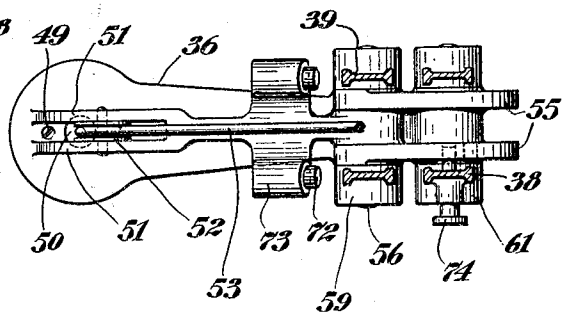


Fig. 5



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UNITED STATES PATENT OFFICE

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HAT IRONING MACHINE

Application filed February 21, 1930. Serial No. 430,169.

Our present invention relates generally to ironing machinery, and has particular reference to a machine for ironing hats.

The type of machine to which our invention has reference is usually employed during the renovation of soft hats such as those which are made of felt or the like, and is designed to iron the crown of a hat after the latter has been placed upon a suitable hat block. The block is applied to a suitable rotatable chuck and the machine is provided with an iron, usually heated electrically, which oscillates in an arcuate path back and forth over the crown of the hat.

It is a general object of our present invention to provide an improved machine of the foregoing character, and more particularly, to provide a machine which is of simplified construction and which operates with greater efficiency than those heretofore employed in practice.

A more particular object of our invention has reference to the manner of constructing and mounting the iron and its carrier, and resides in providing a novel and improved means for mounting the iron and controlling its movement.

In machines of this character, the iron is usually caused to oscillate by mounting the same upon a spindle which is caused to rotate first in one direction and then in the other. In view of the elliptical contour of a hat crown, the iron must embody a movability relative to the spindle which carries it. A feature of our present invention lies in providing for this relative movement in an improved manner which renders the structure more firm and staunch, less likely to vibrate and chatter, and capable of performing its contemplated function in a reliable and smoothly operating manner.

A more specific feature lies in providing a radial arm upon the aforementioned spindle and in mounting an iron carrier upon this arm in such a manner that its movement relative to the spindle is limited to movement in a plane passing through the axis of the spindle.

Another feature of our invention lies in pivotally mounting an iron upon the carrier in a manner which restricts the pivotal movement to a single pivot axis.

A still further feature of our invention lies in an arrangement of parts which causes the single pivot axis of the iron to move parallel to itself at all times.

The foregoing features will be more fully appreciated after this specification has been read, and the conjoint action of the several portions of our improved machine in the manner outlined above results in increased efficiency of manufacture and operation and obviates many disadvantages heretofore encountered.

Other features of our invention, predicated upon the general object to provide a machine of improved character will be set forth in greater detail hereinafter.

For the attainment of the foregoing objects and such other objects as may hereinafter appear or be pointed out, we have constructed a device embodying the features of our invention and illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of our improved machine with the iron shown in operative position with respect to a hat;

Figure 2 is a similar perspective view taken from the opposite side of the machine, the hat in this figure being omitted;

Figure 3 is a greatly enlarged side view, partly in section, of the ironing portion of the machine, this view being taken substantially in the same direction as Figure 2;

Figure 4 is an end view of the same portion of the machine as viewed from the right of Figure 3; and

Figure 5 is a plan view, on a reduced scale, taken substantially along the line 5—5 of Figure 4.

Figures 1 and 2 illustrate the general nature of our present machine. Mounted on a suitable base 10 is a casting or framework 11 suitably constructed to provide the necessary bearings and guideways for the movable parts presently to be described. An electric driving motor 12 is preferably mounted upon the framework 11 in the manner shown and is suitably geared to a worm 13 to drive the latter when the switch 14 is turned on and

the plug 15 is connected. The gearing from the motor 12 to the worm 13 is contained within the housing at 16.

Mounted beneath the worm 13 is a worm wheel 17 which is carried by a horizontal bearing which is adjustable by a slight degree in a vertical manner, so that when the control knob 18 is turned the entire wheel 17 may be withdrawn downwardly from engagement with the worm 13. Under normal running conditions, the wheel 17 is held upwardly in meshing engagement with the worm 13. This particular assembly is not broadly new, except that the provision of a hand knob 18 in place of a longer and more easily moved lever arm reduces the possibility of too suddenly shifting the wheel 17 upwardly into engagement with the rotating worm 13.

The wheel 17 serves as a crank, and a connecting rod 19 is associated therewith for the purpose of reciprocating, in a horizontal direction, the block 20 which carries the rack 21. The inner end of the connecting rod 19 may be adjusted radially with respect to the wheel 17 to vary the effective crank arm and, accordingly, to vary the stroke of the rack 21.

The rack 21 is guided in horizontal guideways 22 and 23 and meshes with a gear 24 mounted adjacent to the guideway 23. The slow reciprocation of the rack 21 causes the gear 24 to rotate slowly in one direction and then in the other direction, and thereby causes rotative oscillation of a spindle to which the gear 24 is attached, and which will be presently described in greater detail.

Mounted upon the shaft which carries the worm 13 is a chuck 25 adapted to be opened and closed and designed to receive any selected one of a series of hat blocks. The chuck may be of any suitable or customary construction and its manner of opening and closing to disengage and engage a hat block is immaterial.

One of the features of our invention lies, however, in the provision of a foot treadle 26 whose operation effects the opening and closing of the chuck. For the purpose of explaining this feature of our invention, it will suffice to point out that the collar 27, forming part of the chuck, is shiftable axially. In its extreme outward position, as shown in Figure 2, the chuck is closed, and in its shifted position, shown in Figure 1, the chuck is open and adapted to receive or release the hat block. A lever 28 is mounted upon a fixed pivot 29 and is normally held in the position of Figure 2 by means of the tension spring 30. The opposite end of the lever is pivoted at 31 to a link 32 extending forwardly to the collar 27. By stepping upon the treadle 26, which is pivoted at its rear end 33, a tie rod 34 is caused to move downwardly, and inasmuch as the upper end of the tie rod is pivotally connected by the link 35 with the pivot 29, the latter will be rotated to swing the lever 28 against the action of the spring 30. When the treadle 26 is released, the spring 30 will shift the lever 28 to its normal position and advance the collar 27, thereby closing or locking the clutch 25.

In Figure 2, the treadle is shown in its normal position, and in Figure 1 it is shown depressed. Provision of this treadle greatly facilitates the efficient operation of the machine because it leaves the two hands of the workman entirely free for purposes of handling the hat and the hat block.

The most important features of our invention reside in the construction and manner of controlling the operation of the iron which is caused to oscillate with the gear 24. In a general way, this iron and its associated parts are shown in Figures 1 and 2. A radial arm 36 is mounted for rotation with the oscillating spindle above referred to, and this arm has mounted thereon the iron carrier 37. This iron carrier is pivotally supported upon two sets of parallel links 38 and 39 and is thereby permitted to move relatively to the spindle, but only in a plane passing through the axis of the spindle. The carrier 37 is provided with the iron pivot 40, which is shown vertical and hence parallel to the axis of the spindle. This pivot is therefore movable toward and away from the hat and is constrained to move parallel to itself at all times. An iron 41, preferably heated electrically (through the cable 42), is mounted upon the iron pivot 40 and is in this way constrained to pivot only about a vertical axis.

We shall now proceed to describe the above construction in greater detail. Referring to Figure 3, it will be noted that the spindle 43 is hollow and is journaled in the main housing or framework at the bearing portions 44 and 45, in each of which a roller bearing 46 is arranged. Immediately above the bearing portion 44, the spindle enlarges in diameter, as at 47, and upon this enlarged diameter the gear 24 is mounted. Above the portion 47 the spindle enlarges further to provide the disk-like portion 48 which overlies the gear 24 and underlies the inner end of the radial arm 36. A set of bolts or studs 49 extend downwardly through the arm 36 and through the portion 48 into firm threaded engagement with the gear 24, in this way securely holding the gear, the spindle, and the arm 36 in firm unitary relationship. This construction is such, however, that removal of parts or disassembly is comparatively simple for purposes of repair or inspection. Above the portion 48 the spindle has a journal portion 50 which extends through the arm 36.

Immediately above the axis of the spindle, the arm 36 is channeled to provide the upstanding parallel walls 51, and journaled between these walls is the guide pulley 52. This

pulley is one of several which serve to guide a cable 53 extending downwardly through the spindle 43 and terminating in a weight 54, the purpose of which is to urge the iron and the iron carrier constantly toward the axis of the spindle 43.

At the rear or free end of the arm 36, the latter is again channeled to provide the two parallel upstanding walls 55, and between these walls are the bearings for the two parallel horizontally arranged pivots 56 and 57. Secured to the pivot 56 by means of set screws 58 is the lower end 59 of each of the upwardly extending links 39; and similarly secured to the pivot 57, as by means of set screws 60, is the lower end 61 of each of the links 38.

Between the upper end portions of the links 38 is an additional guide pulley 62 around which the cable 53 passes.

The iron carrier 37 is articulated to the upper ends of the links 38 and 39 along the horizontal parallel pivot axes 63 and 64. The distance between these pivots is the same as the distance between the pivots 56 and 57 and, accordingly, these pivots remain constantly in horizontal alignment and thereby constrain the iron carrier itself, and all parts carried by it, to move parallel to itself at all times. At its forward end the carrier 37 forks upwardly and downwardly to provide the spaced bearing portions 65 and 66 for the iron pivot 40. The iron 41 has journals which extend upwardly and downwardly into the bearings 65 and 66 and is thus permitted to pivot around this vertical axis, but not otherwise. The upper journal is provided with a rearwardly extending arm 67 at the end of which a suitable clamp 68 engages and retains the end of the cable 53.

The rear portion of the carrier 37 extends upwardly and terminates in a handle 69. In the rear portion of the carrier we also mount a guide pulley 70 around which the cable 53 passes; and immediately in front of the pulley 70 are two loosely mounted vertical rollers 71 between which the cable 53 is caused to pass to prevent it from slipping off the pulley 70.

The main portion of the carrier 37 is hollow or bored and permits the rearward passage therethrough of the wires or cable 42 serving to heat the iron.

Before describing the operation of our device we will point out that the weight 54 exerts a constant tension upon the cable 53 and urges the entire carrier 37 and the iron 41 toward the axis of the spindle 43, hence toward the hat mounted upon the chuck. To prevent damage to the iron or chuck in case the iron is forcibly advanced while no hat is interposed in its path, a pair of bumpers 72 are mounted upon lugs 73 integrally formed upon a midportion of the arm 36. The bumpers 72 are encountered by the links 39, as shown most clearly in Figure 2.

To hold the iron carrier in retracted position we provide a spring-pressed detent element 74 upon the lower portion of one of the links 38, the inner end of this detent riding smoothly over the outer face of one of the walls 55 and being adapted to snap into engagement with a bore or opening 75 provided in the latter. In other words, if the handle 59 is grasped and pulled backwardly to retract the iron carrier against the action of the weight 57, the detent will automatically engage with the opening 75 and hold the iron carrier in the retracted position shown by dot-and-dash lines 76 in Figure 3. When it is desired to advance the iron against a hat mounted upon a block 77, for example, the handle 69 is grasped with one hand and the detent 74 is withdrawn from the opening 75 with the other hand, the weight 54 then urging the carrier forwardly until the iron 41 rests yieldably against the hat. During this advance of the iron, and during all movements of the iron, the latter moves parallel to itself, and this is most clearly illustrated in Figure 3 by comparing the full-line showing of the iron with the dot-and-dash showing 78.

The operation of our device will be clear from the description hereinabove given of the several portions. The hat which is ready for ironing is placed upon a suitable hat block and the operator depresses the treadle 26, applies the block to the chuck 25, and then releases the treadle. With the motor 12 operating, the hat chuck and the hat will be rotated, the rotation being at the rate of approximately forty (40) revolutions per minute. With the wheel 17 out of engagement with the worm 13, and with the iron carrier in full retracted position, the arm 36 is swung by hand into a starting position adjacent to the brim of the hat. The knob 18 is then manipulated to place the wheel 17 into engagement with the worm 13, thus initiating a slow reciprocal movement of the rack 21 and a slow oscillation of the spindle 43, and hence of the iron. The detent 74 is then released, and the iron gently allowed to advance under the action of the weight 54 against the hat crown. No further attention is then required since the iron will oscillate slowly around the entire hat crown and perform its contemplated function. When the operation is completed, the handle 69 is simply withdrawn rearwardly until the iron carrier automatically locks in retracted position. The handle 18 is then caused to release the wheel 17, whereby the iron and the iron carrier may be swung into any desired out-of-the-way position. The foot treadle is then depressed and the hat and hat block withdrawn from the chuck, after which another hat block may be immediately applied, or the machine may be caused to cease

functioning by turning off the motor 12 and the heating connection for the iron.

It will be understood that during the ironing procedure the elliptical and irregular cross-section of the hat will cause the iron to move yieldably back and forth in a radial direction with respect to the spindle 43; and the iron will also be caused to pivot by a slight degree around the pivot axis 40. By virtue of our present construction, these two movements are not only extremely slight, but are practically devoid of all chatter and strain. The manner of mounting the iron is such that under no circumstances will the iron pivot about the axis 40 through more than five or ten degrees and, as a result, neither the cable 42 nor the cable 53 are ever subjected to excessive distortions or twists.

So far as the cable 53 is concerned, it is to be noted that our construction positions this cable in a single vertical plane, and for this reason, kinks are totally avoided and the wear and tear, if any, is reduced to an absolute minimum.

The movement of the iron parallel to itself at all times assures proper ironing of all areas of the hat crown and also causes the wear upon the iron surface to be distributed over a relatively wide horizontal band, as distinguished from a single focal point. This advantage is due not only to the parallel movement of the iron but also to the fact that the iron pivots only about a single axis and is not mounted for universal movement.

The absence of any universal movement for the iron is of further advantage in dispensing with pivots, journals, and bearings, and the constant wear and tear and chatter of necessity incident thereto.

It is to be particularly noted that the iron carrier and the iron, both of considerable weight, are mounted so as to overlie the arm 36 at all times. This makes the structure exceptionally staunch and subjects the spindle to a minimum strain. By our construction, the arm 36 is under no circumstances ever subjected to lateral strains which would tend to subject the several bearings to irregular wear and, in a very short while, produce looseness, chatter, and necessity for early replacement.

In general, our construction is firm and compact, highly efficient and reliable, capable of easy and simplified manipulation, capable of performing efficiently and with hardly any wear and tear for long periods of time, yet withal exceptionally simple from a manufacturing and assembling standpoint.

It will be obvious that changes in the details herein described and illustrated for the purpose of explaining the nature of our invention may be made by those skilled in the art without departing from the spirit and scope of the invention as expressed in the appended claims. It is therefore intended that these details be interpreted as illustrative, and not in a limiting sense.

Having thus described our invention and illustrated its use, what we claim as new and desire to secure by Letters Patent is—

1. In a hat ironing machine, the combination with a rotatable hat chuck, and an oscillating spindle perpendicular to the axis of said chuck, of an iron-carrier mounted on said spindle for oscillation therewith, and means for moving said carrier relative to the spindle and only in a plane passing through the spindle axis; said means comprising a radial arm carried by said spindle, and parallel, upwardly extending links pivotally supporting said iron-carrier above and spaced from said arm for pivotal movement substantially parallel to the axis of said arm.

2. In a hat ironing machine, the combination with a rotatable hat chuck, and an oscillating spindle perpendicular to the axis of said chuck, of an iron-carrier mounted on said spindle for oscillation therewith and including an iron-supporting pivot parallel to the spindle axis, and means for moving said carrier relative to the spindle to shift said pivot parallel to itself and only in a plane passing through the spindle axis; said means comprising a radial arm carried by said spindle, and a set of parallel, upwardly extending links pivotally supporting said iron-carrier above and spaced from said arm.

3. In a hat ironing machine, the combination with a rotatable hat chuck, and an oscillating spindle perpendicular to the axis of said chuck, of an iron-carrier mounted on said spindle for oscillation therewith and including an iron-supporting pivot parallel to the spindle axis, and means for moving said carrier relative to the spindle to shift said pivot parallel to itself and only in a plane passing through the spindle axis; said means comprising a radial arm carried by said spindle, and a set of parallel, upwardly extending links pivoted at their lower ends to said arm upon axes perpendicular to said spindle axis and pivoted at their upper ends to said iron-carrier.

4. In a hat ironing machine, the combination with a rotatable horizontal hat chuck, and an oscillating, vertical, hollow spindle beneath said chuck, of an iron-carrier mounted on said spindle for oscillation therewith, means for moving said carrier relative to the spindle and only in a vertical plane passing through said spindle axis, said means comprising a radial arm carried by the spindle and a set of parallel links pivotally supporting said iron-carrier above and spaced from said arm, and yieldable means for constantly urging said carrier toward the spindle axis, said yieldable means comprising a weighted cable extending from said carrier toward said spindle and thence downwardly through said

spindle; whereby said cable lies in its entirety in a vertical plane.

5. In a hat ironing machine, the combination with a rotatable horizontal hat chuck, and an oscillating vertical spindle beneath said chuck, a radial arm carried by said spindle, an iron-carrier, and means for mounting said carrier above and spaced from said arm for movement relative to said spindle, said means comprising a set of parallel, upwardly extending links pivotally articulated at their opposite ends to said arm and carrier respectively.

6. In a hat ironing machine, the combination with a rotatable horizontal hat chuck, and an oscillating vertical spindle beneath said chuck, a radial arm carried by said spindle, an iron-carrier, and means for mounting said carrier above and spaced from said arm for movement relative to said spindle axis, said means comprising a set of parallel links pivotally articulated at their opposite ends to said arm and carrier respectively; said links being pivoted upon horizontal axes whereby said carrier is constrained to move in a vertical plane passing through said spindle axis.

7. In a hat ironing machine, the combination with a rotatable horizontal hat chuck, and an oscillating vertical spindle beneath said chuck, a radial arm carried by said spindle, an iron-carrier including a vertical iron-supporting pivot, and means for mounting said carrier above and spaced from said arm for movement of said iron-supporting pivot toward and away from said spindle axis, said means comprising a set of parallel links pivotally connected at their opposite ends to said arm and carrier respectively, said links being pivoted upon horizontal axes whereby said iron-supporting pivot is constrained to move parallel to itself in a vertical plane passing through said spindle axis.

8. In a hat ironing machine, a rotatable hat chuck, an oscillating spindle perpendicular to the axis of said chuck and beneath the latter, a radial arm carried by said spindle, a set of parallel links pivoted to said arm at their lower ends, an iron-carrier pivotally supported on the upper ends of said links and including an iron-supporting pivot parallel to the spindle axis, a weighted cable associated with said iron-carrier for constantly urging said pivot toward the spindle axis, a handle on said iron-carrier for retracting the latter from the spindle axis, the links constraining said pivot to move parallel to itself at all times, a latch cooperable with one of said links for automatically locking said carrier in a retracted position after a retraction beyond a predetermined amount, and buffers arranged to be encountered by at least one of said links to limit the movement of the carrier toward the spindle axis when said latch is released.

In witness whereof, we have signed this specification this 19th day of February, 1930.

LOUIS ANGELUS.
DANIEL L. BAYLIS.