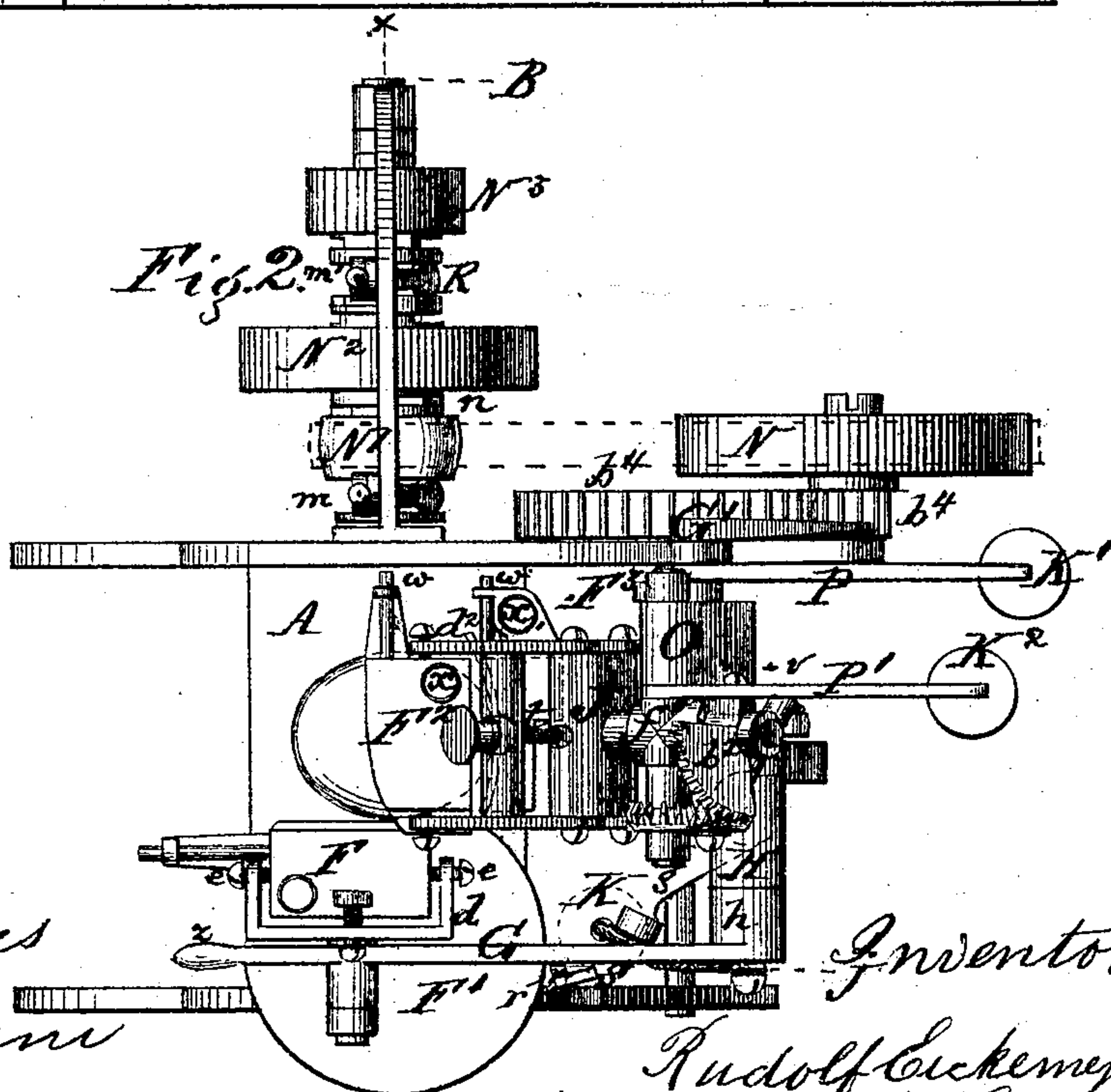
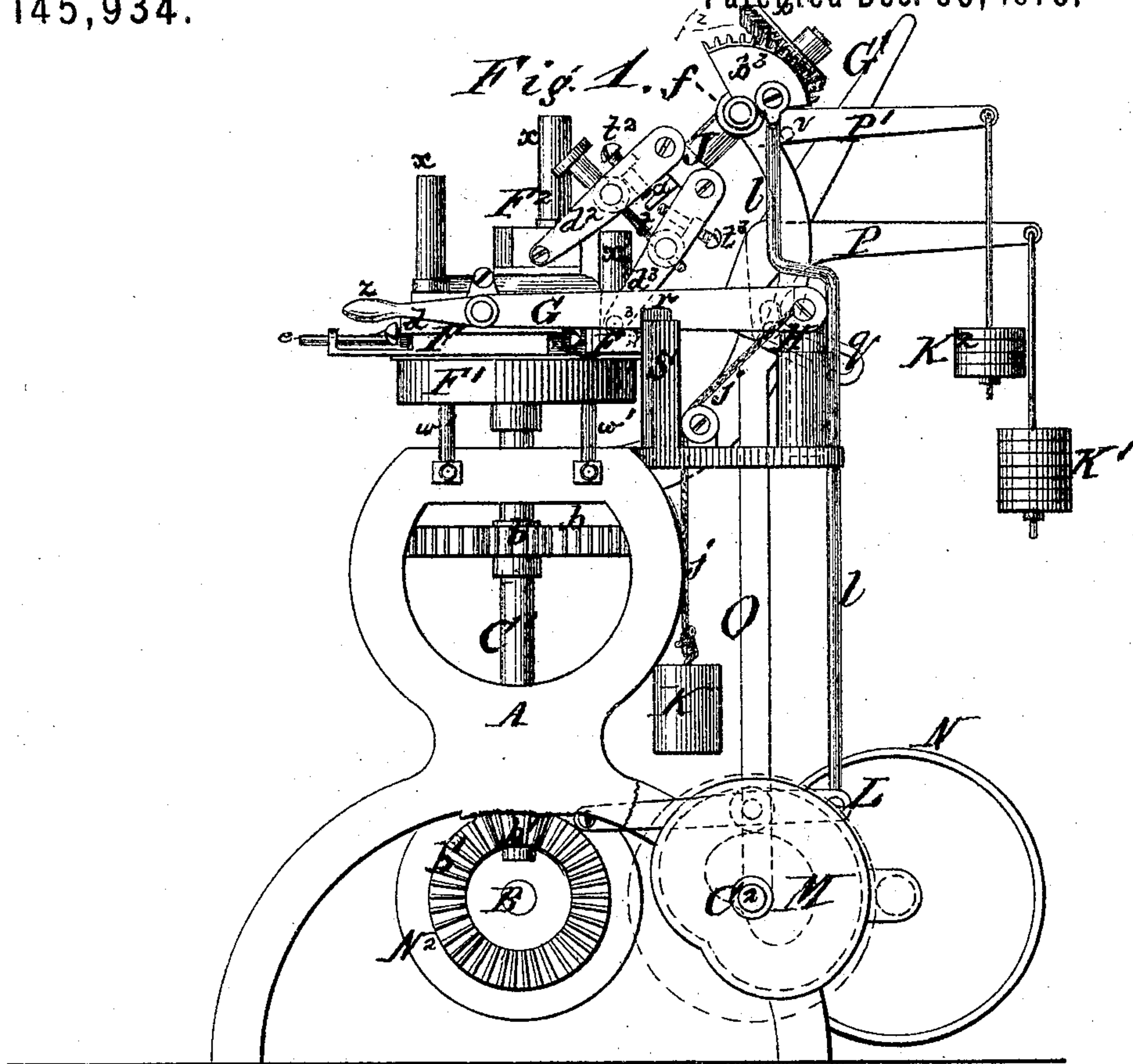


R. EICKEMEYER.
Machines for Ironing Hats.

No. 145,934.

Patented Dec. 30, 1873.



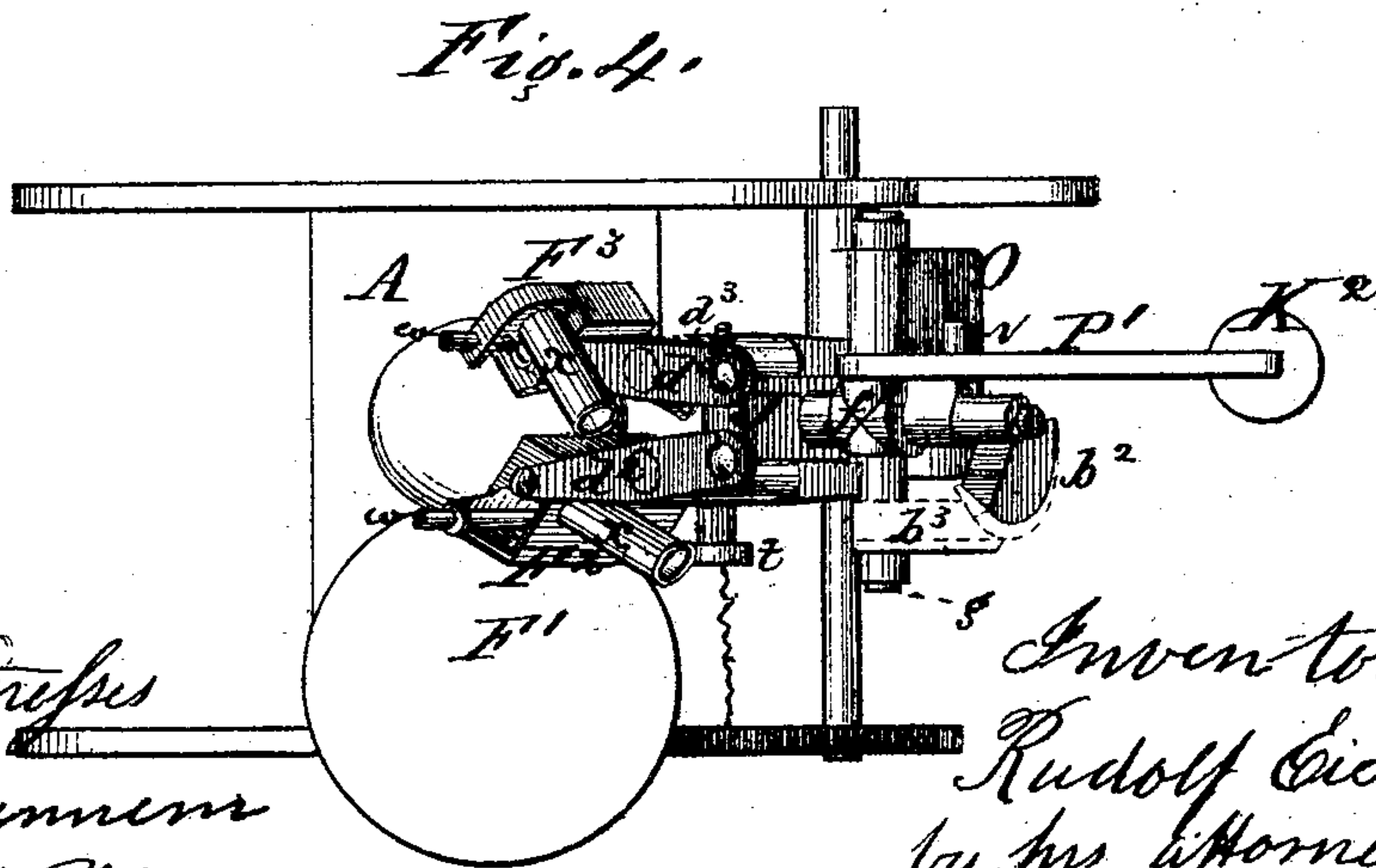
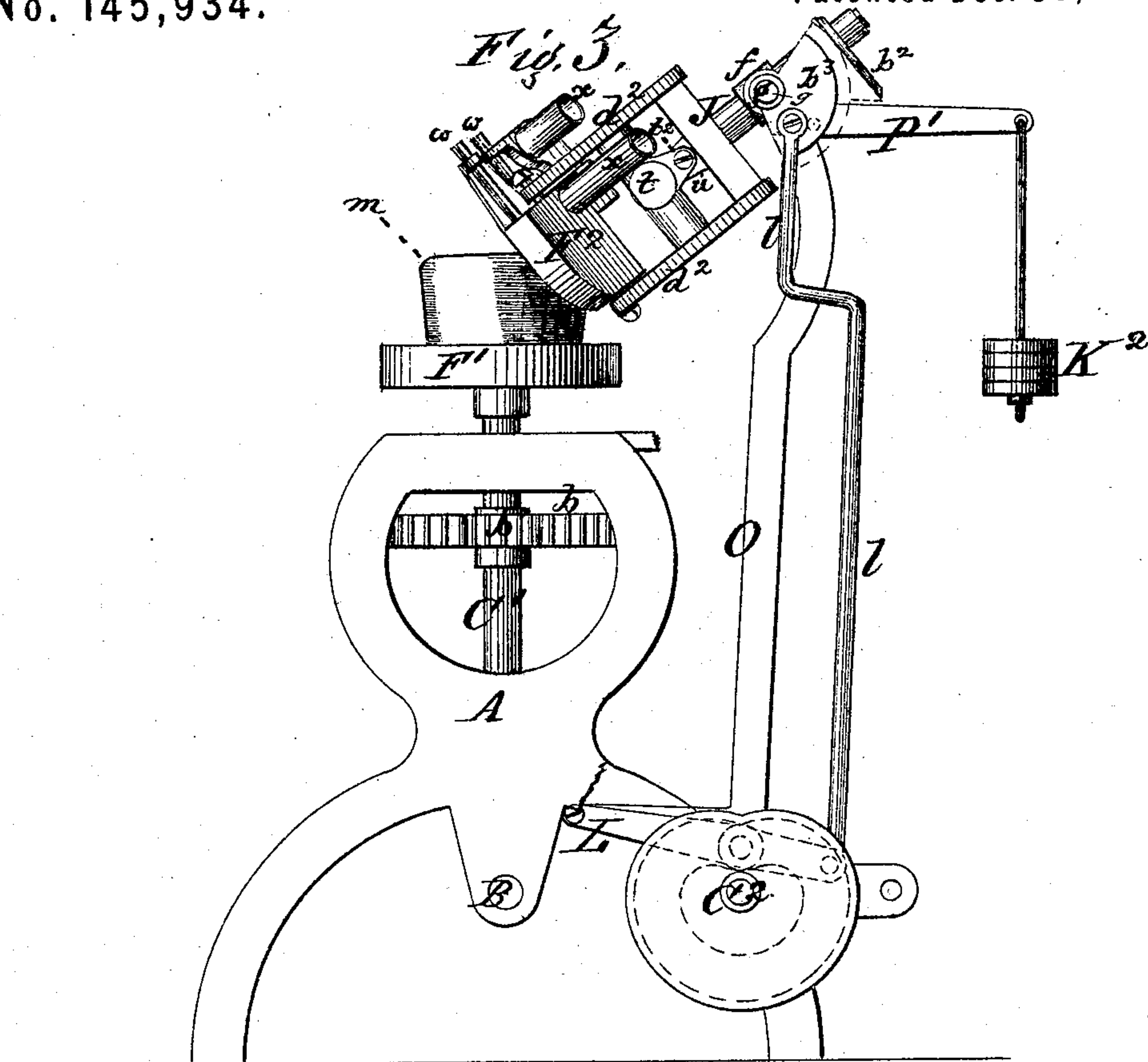
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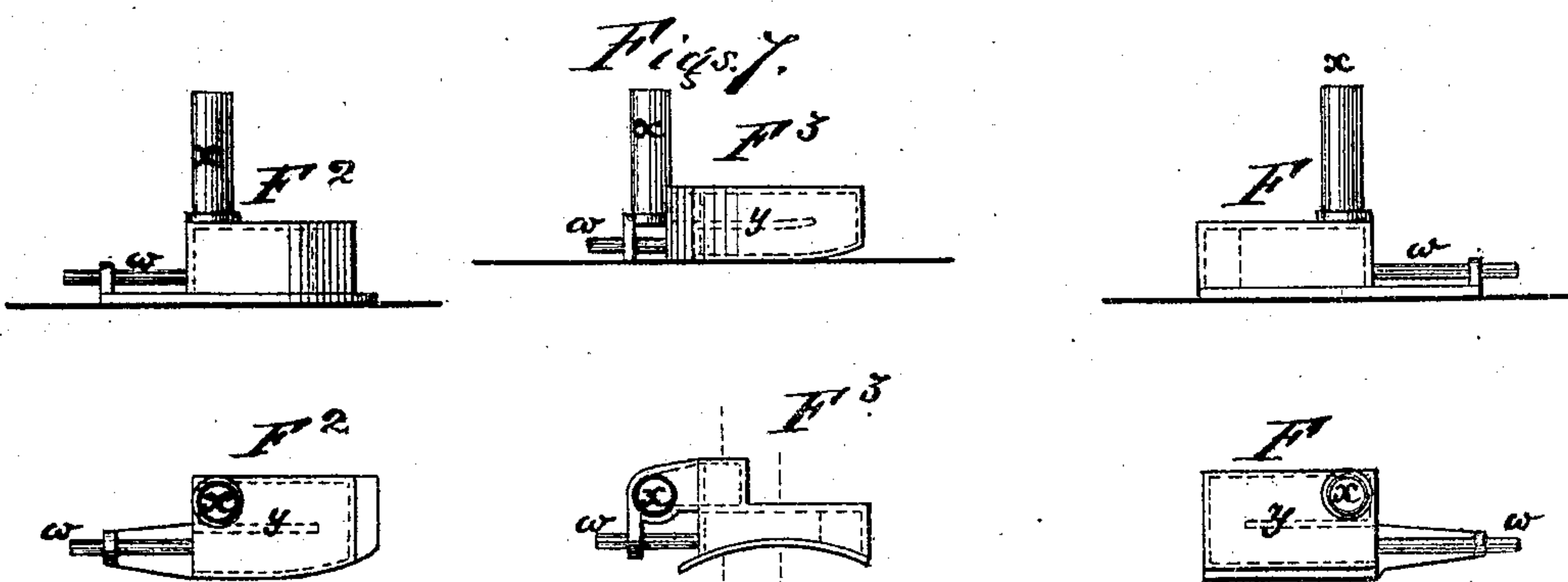
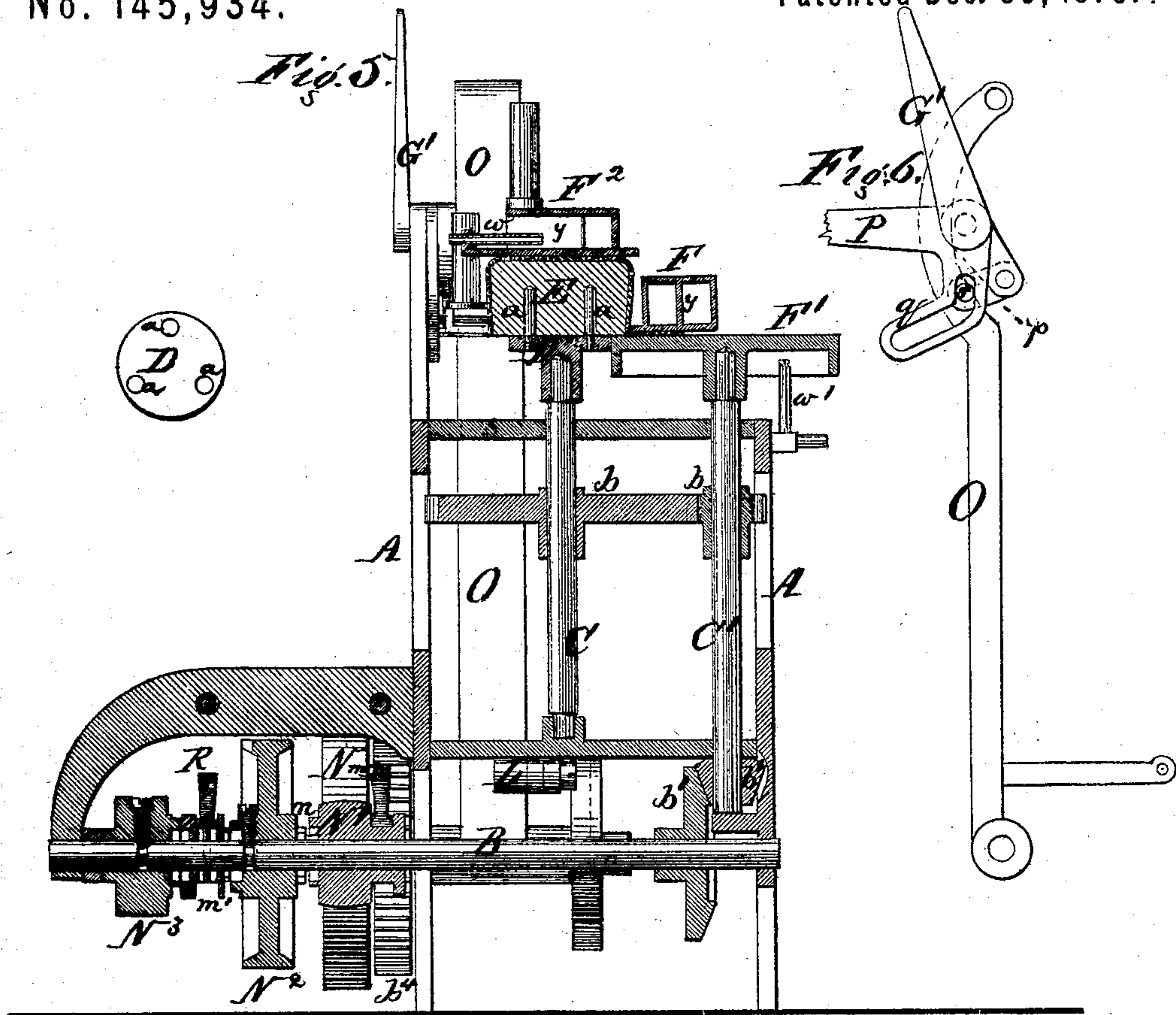
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Witnesses
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UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

IMPROVEMENT IN MACHINES FOR IRONING HATS.

Specification forming part of Letters Patent No. **145,934**, dated December 20, 1873; application filed April 4, 1873.

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have made an invention of certain new and useful Improvements in Machinery for Ironing Hats and for other purposes; and that the following is a full, clear, and exact description and specification of the same.

The object of this invention is to enable the whole of a hat to be ironed automatically without removing it from the machine, the tip and square being ironed, according to my invention, by means of one or more traversing irons, which change their positions so as to adapt their faces to the portions of the hat upon which they are to operate, and the brim being ironed upon both sides simultaneously without being wrinkled or strained.

The invention consists of certain mechanical constructions and combinations, which are specified in detail at the close of this schedule.

In order that the invention may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, an ironing-machine in which I have embodied them all.

In the said drawings, Figure 1 represents a side view of the machine. Fig. 2 represents a top view of the same. Fig. 3 represents a side view of certain portions of the machine with the traversing irons and their appurtenances operating upon the square of the crown. Fig. 4 represents a top view of said portions at that time. Fig. 5 represents a vertical section of the machine at the line *xx* of Fig. 2. Fig. 6 represents a view of certain parts of the machine detached from the residue. Figs. 7 represent various views of the irons which I have devised and which I prefer to use in the machine.

The same parts are denoted by the same letters throughout all the figures.

The machine represented in the said drawings has a strong frame, A, which supports the moving parts of the machine and sustains the driving-shaft B. At about the center of this frame there is an upright shaft, C, which is constructed to revolve in suitable bearings, and carries at its upper end the block-holder D, to which the hat-blocks are applied. These

hat-blocks are of the shape to which the crown of the hat is to be ironed, and may be made of wood, in the usual manner, the block E being in one piece when the crown is to be of such form that a solid block can be readily withdrawn from it, and the block being made in sections when the hat is bell-crowned. The block-holder D is provided with three upright pins, *a*, and the under sides of the hat-blocks are perforated with corresponding holes, so that the hat-block can be quickly applied to and removed from the machine, and when upon the machine is compelled to revolve with the upright shaft C and block-holder D. The said shaft C is connected with the driving-shaft B through the intervention of the cog-wheels *b b'* and the shaft C¹.

In order that the brim of the hat may be ironed simultaneously on both sides, two brim-irons, F F¹, are provided. One, F, of these irons is constructed to press upon the upper side of the brim, with the corner of the iron against the adjacent band of the hat. The other iron, F¹, is constructed to support the brim against the pressure of the upper brim-iron F, and also to iron the under side of the brim. The upper brim-iron F is connected by pivots *e e* with a yoke, *d*, so that this iron may rock upon its longitudinal axis, or thereabout, and the yoke *d* is pivoted to a movable arm, G, so that the brim-iron may rock upon its transverse axis, or thereabout, the practical effect of this double pivoting being that the upper iron can adapt itself to any peculiarity of the brim. The movable arm G is connected with the frame of the machine by a species of universal joint, which permits said arm and the brim-iron connected with it to be raised and moved laterally. The said joint is formed by the T-headed rest H, which is constructed to turn in a socket of the frame A, and by the pivot which connects the hub *h* of the arm G with said rest. As this pivot is at right angles to the stem of the rest, the movement of the arm and upper brim-iron in all directions is permitted. The weight of the upper brim-iron and its appurtenances is generally sufficient to furnish the requisite pressure for ironing; but additional weight may, if necessary, be applied to the arm G. The upper brim-iron is held toward the band by

means of a weight, K, which is connected with the hub of the arm by means of a cord, *j*.

As the hat is revolved in contact with the upper brim-iron, and there is more or less friction produced by this movement, there is a tendency to ruck up, strain, or wrinkle the brim. In previous hat-ironing machines this tendency has been counteracted more or less by supporting the brim upon a block which revolved with the hat-block; but the use of such a brim-block rendered the ironing of the under side of the brim simultaneously with the ironing of its upper side impracticable.

In the machine represented in the drawings, the tendency of the ironing to wrinkle, ruck up, or strain the brim is counteracted by constructing one of the brim-irons (in the present case the lower one, F^1) to revolve in the same direction as the hat-block, but at greater speed; and to this end the under brim-iron F^1 has the form of a disk, and is mounted upon the shaft C^1 , which is connected with the block-holder shaft C by means of the cog-wheel and pinion *b b*. From this combination of the two brim-irons, it follows that the tendency of the one brim-iron, F , to obstruct the forward movement of the hat-brim is counteracted, in whole or in part, by the tendency of the other brim-iron, F^1 , to move the brim forward at greater speed than it would be carried by the revolving hat-block on which the hat is mounted. The speed at which the revolving brim-iron is moved may be varied to suit circumstances; but it has been found by experiment that the best arrangement for the machine represented in the drawings is that the forward speed of the under brim-iron, at the middle of the brim, should be about twice as great as the speed of the brim at the same place. The surface of the revolving brim-iron F^1 is in the same plane, or thereabout, as the brim of the hat when in the machine; consequently the surface of the part of the iron in contact with the brim moves outward from the axis of the block-holder as that surface leaves the brim; and as the hat-brim is carried round by the revolution of the block-holder, the resultant action is to draw the nap of the brim radially outward from the band, and to assimilate the ironing to that done by hand. The under brim-iron might be arranged concentrically with the block-holder, and consequently with the hat thereon, and might be caused to revolve at a higher speed than the block-holder; but the arrangement of the revolving brim-iron laterally to the block-holder, as represented in the drawings, is preferred, because its tendency in this position is to cause the nap of the brim to lie approximately radially to the crown of the hat.

In order that the side crown, square, and tip of the hat may be ironed, two traversing irons, $F^2 F^3$, are provided. One of these irons, F^2 , is constructed to iron the tip of the hat-body, and the other iron to iron the side crown, while the two traverse or move over the square so as to iron it, the same iron in such traversing movement passing from the tip crosswise

over the square toward the side crown, or passing from the side crown crosswise over the square toward the tip, with its ironing-surface always bearing flatwise against the surface of the hat upon which it is acting. The tip-iron F^2 is pivoted to a yoke, d^2 , by which it is connected with a holder, J, which supports the iron through the intersection of its yoke, and the crown-iron F^3 is pivoted to a similar yoke, d^3 , by which it also is connected with the same iron-holder J. The iron-holder has the general form of a T, and its stem is constructed to turn in a hub, *f*, so that the iron-holder, and the irons connected with it, may be turned to cause the irons to traverse over the square *m* of the hat, and thereby iron it.

In order to turn the iron-holder and the traversing irons connected with it, the stem of the iron-holder is fitted with a cog-segment, b^2 , and a corresponding segment, b^3 , is arranged to turn upon an arm, *g*, projecting from the hub *f*, and to engage with the first cog-segment, b^2 . The second segment, b^3 , is connected by a rod, *l*, with a lever, L, which is moved by a cam, M, the lever being fitted with a friction-wheel, which runs in the groove of the cam. The cam is secured to a cam-shaft, C^2 , which is driven from the driving-shaft C through the intervention of the cog-wheels $b^4 b^4$, the belt-pulleys N N¹, and a belt whose position is indicated by the dotted lines in Fig. 2. The rotation of the cam M causes the iron-holder J, and the irons $F^2 F^3$ connected with it, to turn to and fro, so as to carry the faces of the irons across the square of the hat and back again. The time during which the irons are operating upon the square depends upon the form of the cam, the speed at which it is revolved, and the time during which it moves. These may all be varied, as required; and as it may be expedient to cause the hat to revolve at times without the irons $F^2 F^3$ being in operation upon it, the belt-pulley N¹ is arranged to run loose upon the driving-shaft, and a clutch-lever, *m*, and clutch *n* are provided to throw it either in or out of gear.

In order that the tip and crown irons $F^2 F^3$ may be readily removed from the hat and applied to it, the hub *f*, in which the iron-holder turns, is connected with a swinging bar, O, which is pivoted at its lower end upon the shaft C^2 , so that its upper end, with the traversing irons, may be moved from or toward the hat-block on the revolving block-holder. The movement is effected by means of a hand-lever, G' , which is pivoted to a standard of the main frame, and is connected with the swinging arm O by means of a link, *p*. In order that the traversing irons may press upon the hat with the requisite force, a weight, K^1 , is provided. This weight is suspended from the longer arm of an elbow-lever, P, whose shorter arm, *q*, is slotted to receive a stud, *s*, that is secured to the swinging arm O, so that the force of the weight K^1 forces the swinging arm toward the revolving block-holder and the hat-block, and causes the crown-iron to bear

against the hat thereon. As the yokes to which the irons F^2 F^3 are pivoted are inclined to the direction in which the swinging arm is forced by the weight, and as the square of the hat intervenes between the faces of the irons like a blunt wedge, the tendency of the weight is to cause those irons to separate when they bear upon the hat. This tendency is prevented by the screw t , which connects the yokes, so that the pressure of the swinging bar toward the hat-body not only causes the side crown-iron F^3 to bear laterally against the hat-body, but also causes the tip-iron to bear down upon the tip. The screw t thus acts as a link to connect the two irons, and it is made in the form of a screw, in order that the relative positions of the two irons may be adjusted to suit hats with crowns of different forms or sizes. The pivoting of the yokes d^2 d^3 to the iron-holder J permits them to move so as to adjust their faces to the square of the hat during the turning of the irons across it, and the extent of this self-adjustment is regulated by means of two adjusting-screws, t^2 t^3 , which screw through ears of the cross-bars of the yokes d^2 d^3 , and bear against a lug, u , projecting from the iron-holder J .

In order that the traversing irons may adjust themselves to the oval form of the hat-crown as its shorter and longer diameters are successively revolved past their faces, the hub f , that carries the iron-holder of the traversing irons, is pivoted to the swinging arm by being connected with it by a journal which turns in a bearing in that arm; and as the weight of the irons and yokes is all at one side of this journal, the irons tend to drop, the effect of which tendency, if not counteracted, would be to cause the tip-iron to press too strongly upon the tip, and the crown-iron to press too lightly against the side crown. The irons also would tend to drop when swung back from the hat, unless the tendency were counteracted. In order to counteract such tendency, a second weight, K^2 , is provided, and is arranged to operate upon the stock and irons through the intervention of the lever-arm P' , which is secured at its inner end to the hub f , which carries the iron-holder J , so that this weight tends to rock the hub f on its journal, and thus raise the head of the iron-holder J and the traversing irons connected therewith, thereby counterbalancing their weight, preventing excessive pressure upon the tip, and applying the requisite pressure to the side crown. This counter-weight K^2 is also so arranged as to modify the pressure of the traversing irons upon the hat while they are operating upon the square, at which time the pressure should be less, because of the less extent of surface upon which the irons operate at the time. To this end the lever-arm P' is fitted with a pin, v , which projects from it laterally behind the swinging arm O , and at a short distance therefrom, when the irons are operating upon the tip and side crown, so that during the ironing of these portions the counter-weight K^2 does not relieve the pressure of

the irons. When, however, the irons are turned crosswise upon the square, they and the swinging arm are pushed back by the square of the hat-block, which then bears simultaneously against the faces of the irons transversely to their length; and, as the square does not, in this position, tend to prevent the rise of the irons by the action of the counter-weight, this weight descends until the pin v of the lever-arm P' comes in contact with the back of the swinging bar O , and thus applies any excess of force in the weight K^2 to that arm, thereby facilitating its backward movement, counteracting partially the tendency of the weight K^1 to bear the irons against the hat, and reducing the pressure of the traversing irons. The weights K K^1 K^2 are, by preference, made up of disks suspended upon rods, and the disks are slotted at one side, that they may be readily applied to or removed from the suspending-rods, for the purpose of varying the force with which the irons are pressed against the hat, as required, in practice, for hats of different forms or different sizes or qualities. The pivoting of the tip and side-crown irons to their yokes, and the pivoting of the latter to the iron-holder J , permit the irons to sway for the purpose of adapting their faces to the varying positions of the surfaces of the hat upon which they act, such variation in the positions being due to the fact that hat-crowns are oval, and that the irons traverse across the square of the hat; and, in order that the connecting yoke-screw t may not prevent this swaying, it is connected with the cross-bar of one yoke, d^2 , by means of a bearing which turns in that cross-bar, and its nut is constructed to turn in the cross-bar of the other yoke d^3 .

The irons which I prefer to use are made hollow, and are heated by gas-jets. They are represented in detail at Fig. 7. Each iron is hollow, to permit of the introduction of the gas-pipe w , and each iron is constructed with a chimney, x , so as to create a current of air in a specific direction, and thus cause the hot products of combustion to traverse the cavity of the iron. The cavity in each iron is partially divided by a partition, as represented in dotted lines at y , so that the hot current of the products of combustion is caused to traverse the iron twice, the result of which is considerable economy in the consumption of gas required to heat the irons. The lower brim-iron, F^1 , also, is hollow below, and is heated by gas-jets supplied by the pipes w' w' . The driving-shaft B is fitted with two loose belt-pulleys, N^2 N^3 , either of which may be engaged with the driving-shaft by means of a double clutch, m' , which is operated by means of a clutch-lever, R . These pulleys are of different dimensions, and receive the driving-belt which transmits power from the line-shafting of the factory. The use of two belt-pulleys enables the driving-shaft to be driven at either of two different speeds, the smaller pulley N^3 being caused to revolve with the greater speed.

When the machine is not in operation, the

upper brim-iron F is removed from the vicinity of the rotating block-holder E by lifting this brim-iron by means of the handle *z*, formed upon the arm G, and by moving it outward and resting the arm upon a rest, S, whence the arm is prevented from moving by a stud, *r*, projecting from said rest. The tip and side-crown irons F² F³, also, are thrown back from the vicinity of the revolving block-holder by the movement of the swinging arm O and its appurtenances, by means of the hand-lever G'. A hat-block, with the hat fitted upon it, is then applied to the pins *e e*, and, if the hat is to be pounced or sponged preliminary to ironing it, the clutch-lever R is moved so as to throw the driving-shaft in gear with the faster-moving belt-pulley N³, so that the hat is caused to revolve rapidly. When ironing is to be performed, the clutch-lever is shifted so as to throw the driving-shaft in gear with the slower-moving driving-pulley N². Then the upper brim-iron F is brought into action by means of the lever G, and, as the brim is then pressed between the opposing faces of the two brim-irons, it is ironed on both sides simultaneously. The tip and side-crown irons F² F³ are brought into action by means of the lever G', and are caused to traverse over the square and back again by throwing the belt-pulley N into gear with the pulley N² by means of the clutch-lever *m*. The employment of a clutch and clutch-lever permits the operator to keep the tip and side-crown irons bearing upon the hat without traversing over the square as long as he deems expedient. When the hat is sufficiently ironed, the levers G and G' are moved so as to remove the irons, the hat, with the hat-block, is lifted from the pins *e* of the revolving block-holder, and a new hat, previously fitted to a hat-block, is put in its place, the machine being stopped or not during the shifting of the hat-blocks, as found expedient.

In the machine thus described, the revolving block-holder is the instrumentality by means of which the hat-block and the hat thereon are supported, and by means of which the hat is turned so as to present every part of it in succession to the irons. This revolving hat-block is combined with the several irons and their appurtenances by means of the frame of the machine, the gearing, and the appurtenances of the irons, all of which may be greatly varied without materially changing the combinations. Thus, for example, the swinging arm O may be replaced by a sliding instrumentality, by which the traversing iron or irons may be moved, or permitted to move, from or toward the revolving block-holder. So, also, a single iron may be arranged to traverse the square of the hat, and the work of ironing the tip and side crown may be mainly done by means of irons which do not traverse across the square. These and other modifications may be adopted to suit the views of different constructors.

I claim as my invention—

1. The combination, substantially as before set forth, of the revolving block-holder with

a revolving brim-iron having its ironing-surface arranged to revolve in the plane of the hat-brim when supported by the block-holder.

2. The combination of the revolving block-holder, the revolving disk-formed brim-iron, and the stationary brim-iron, the said two irons being arranged to operate simultaneously upon the opposite sides of the brim of the hat carried by the revolving block-holder, substantially as before set forth.

3. The combination of the stationary brim-iron and the revolving brim-iron, having their faces arranged opposite to each other, substantially as before set forth.

4. The combination, substantially as before set forth, of the revolving block-holder with a traversing iron, by mechanism, in such manner that the said iron is caused to move cross-wise over the square of the hat, when the said hat is caused to revolve with the block-holder.

5. The combination of the traversing iron, the turning iron-holder, the rocking hub of said holder, and the swinging arm, substantially as before set forth.

6. The combination of the traversing iron, the turning iron-holder, the rocking hub, and the counter-weight, substantially as before set forth.

7. The combination of the traversing iron, the turning iron-holder, the swinging arm, the pressure-weight, and the counter-weight, substantially as before set forth.

8. The combination of the two traversing irons, the yokes for said irons, and the screw by means of which the said yokes are connected, substantially as before set forth.

9. The combination of the two traversing irons, the pivoted yokes thereof, the iron-holder, and the adjusting-screws which control the sway of said yokes and irons, substantially as before set forth.

10. The combination of the revolving block-holder with two traversing irons, arranged so as to operate upon the tip and side crown, and to traverse the square of the hat, substantially as before set forth.

11. The combination of the revolving block-holder with a traversing iron, the turning iron-holder, and the swinging bar, by means of which the said traversing iron can be moved from or toward the block-holder, substantially as before set forth.

12. The combination of the revolving block-holder, the traversing iron, the pivoted yoke of said iron, and the turning iron-holder, substantially as before set forth.

13. The combination of the revolving block-holder, the traversing iron, the turning iron-holder, the swinging bar, and the weight by means of which the traversing iron is pressed toward the block-holder, substantially as before set forth.

14. The combination of the revolving block-holder with the traversing iron and the turning iron-holder through the intervention of a clutch, which permits the traversing iron to

be operated simultaneously with the block-holder, or not, as required, substantially as before set forth.

15. The combination of the revolving block-holder with two driving-pulleys and the clutch, so that the block-holder may be made to revolve at either of two different speeds, substantially as before set forth.

Witness my hand this 19th day of March,
A. D. 1873.

RUDOLF EICKEMEYER.

Witnesses:

JAS. G. WOODWORTH,
EDWARD W. KUSTER.