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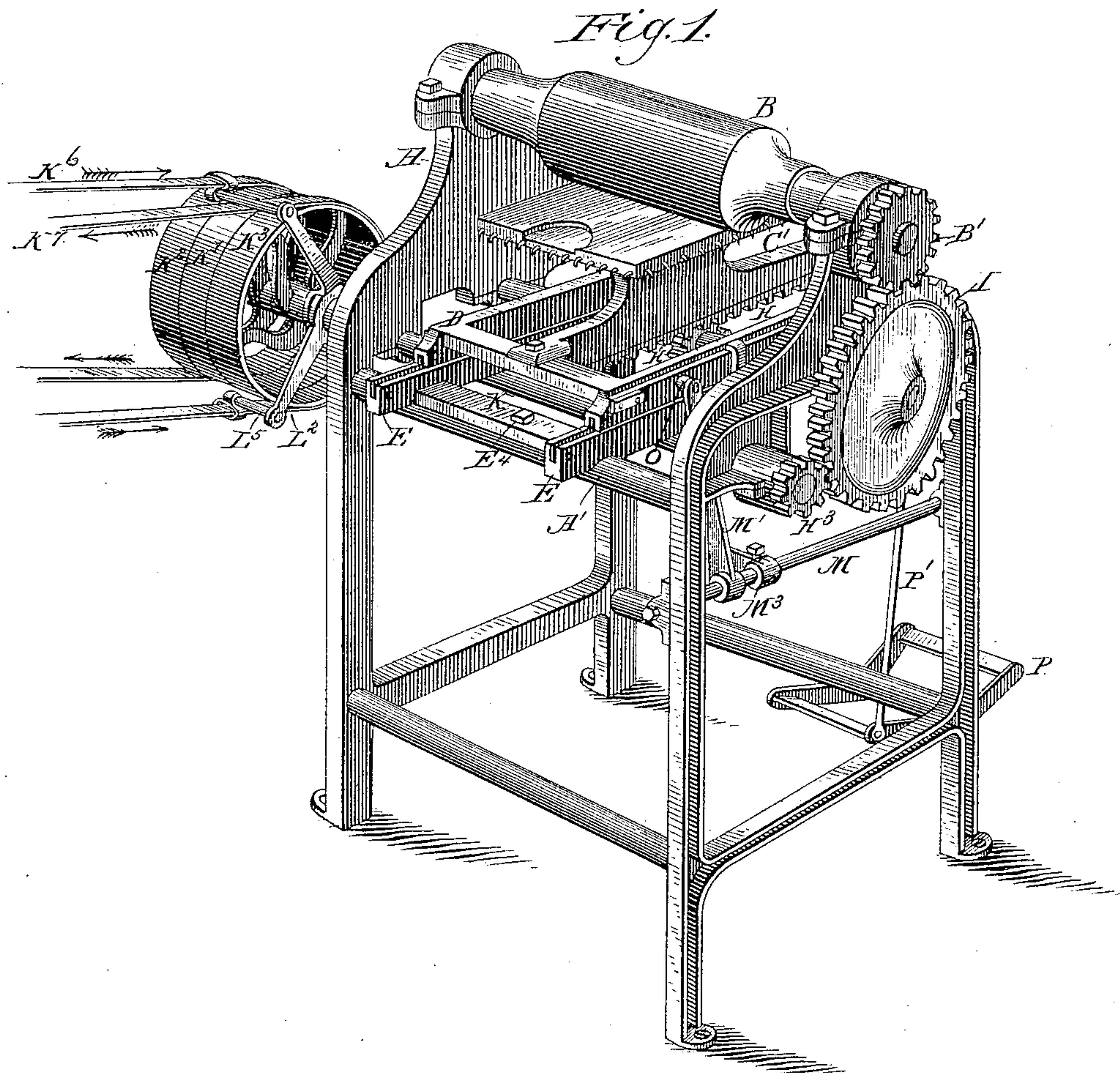
3 Sheets—Sheet 1.

L. H. WATSON.

IRONING MACHINE.

No. 353,769.

Patented Dec. 7, 1886.



Witnesses.

Will R. Quohndro.  
D. B. Keeler

Inventor.

Lewis H. Watson  
By, Geo G. Elliott

Atty.

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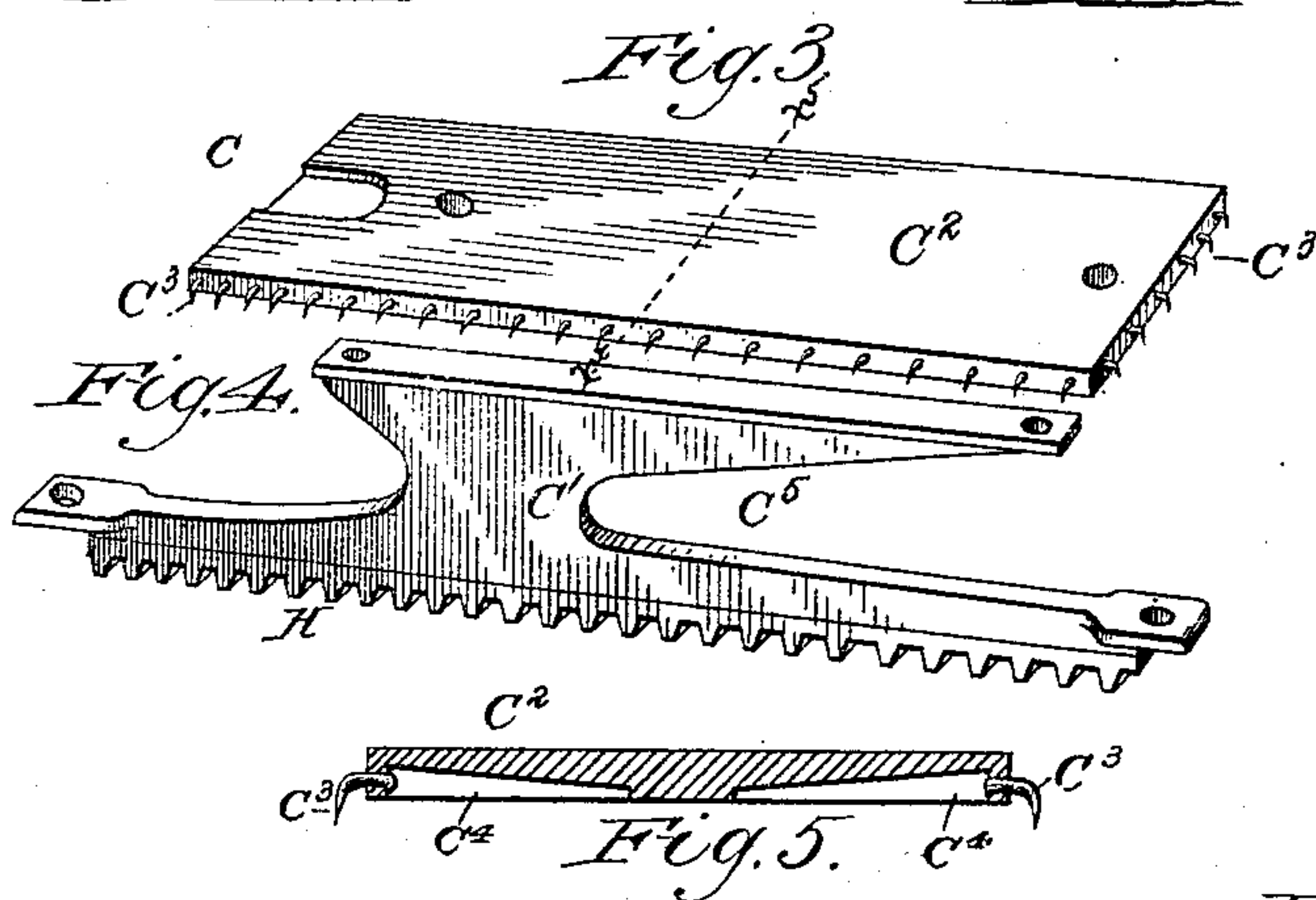
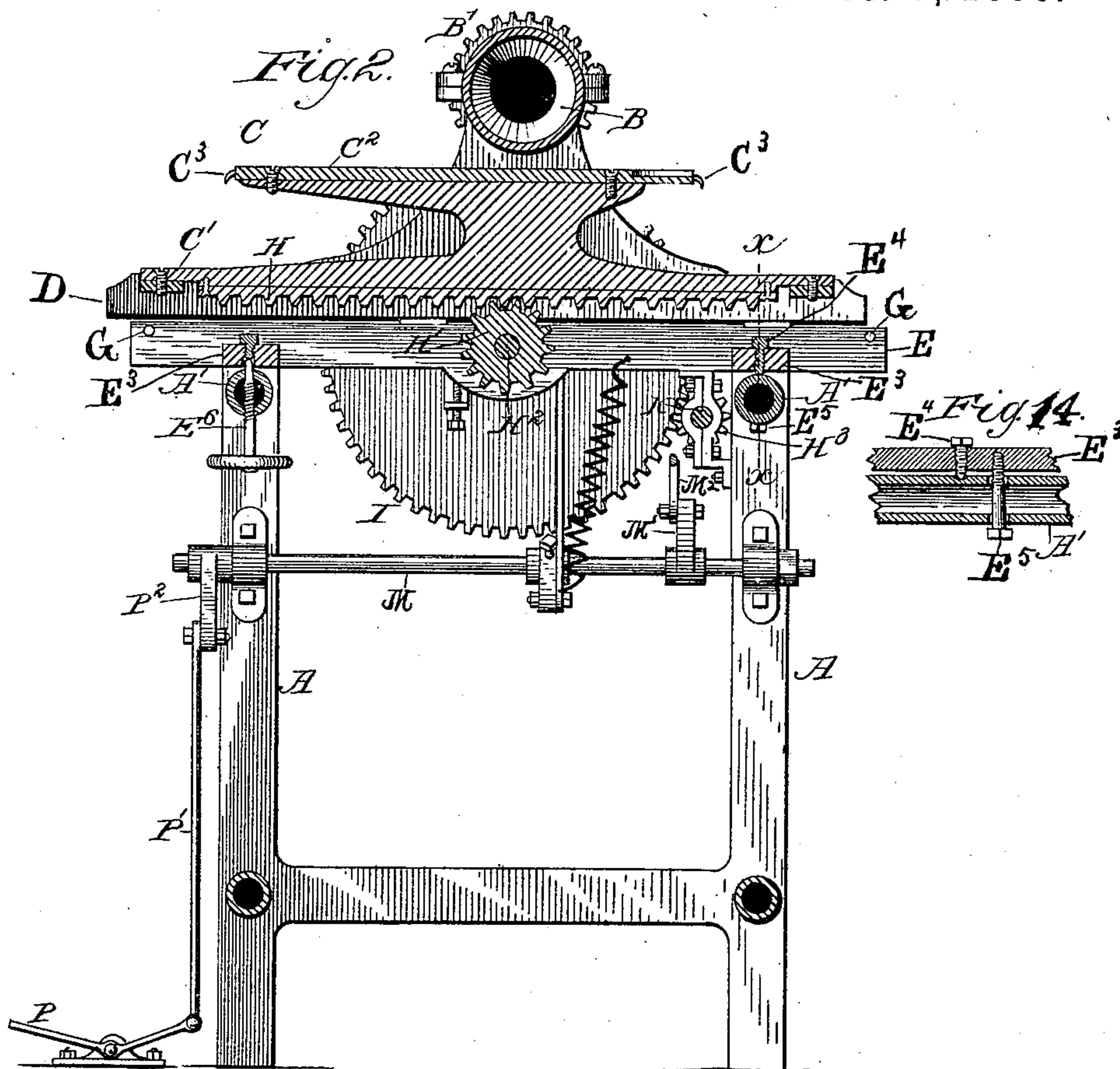
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L. H. WATSON.

IRONING MACHINE.

No. 353,769.

Patented Dec. 7, 1886.



Witnesses.

Will R. Crockett

David B Keeler

*Inventor*

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(No Model.)

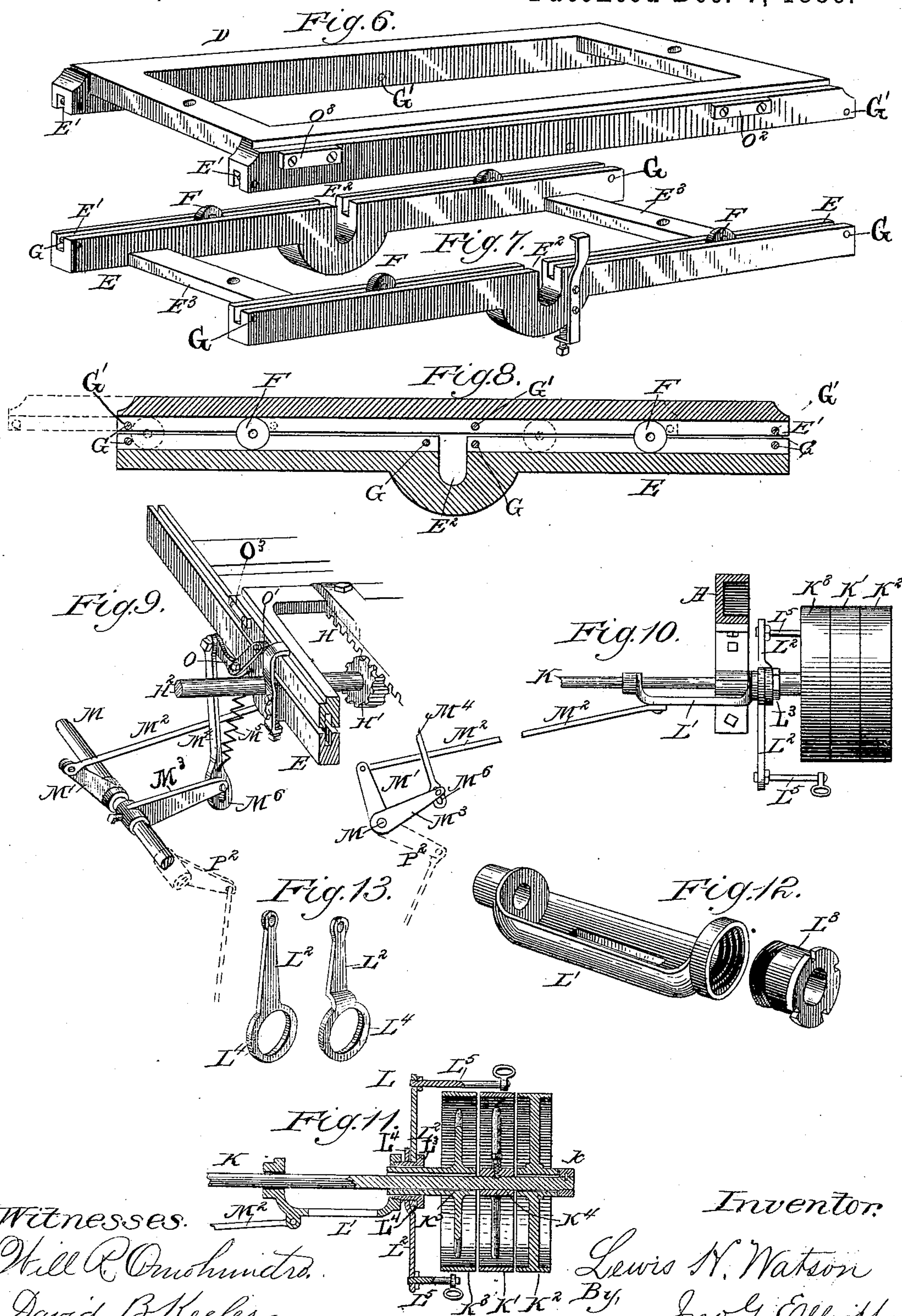
3 Sheets—Sheet 3.

L. H. WATSON.

IRONING MACHINE.

No. 353,769.

Patented Dec. 7, 1886.



Witnesses.

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David B. Keeler

Inventor.

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# UNITED STATES PATENT OFFICE.

LEWIS H. WATSON, OF CHICAGO, ILLINOIS.

## IRONING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,769, dated December 7, 1886.

Application filed May 31, 1883. Serial No. 96,597. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS H. WATSON, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Ironing and Polishing Machines, of which the following is a specification.

This invention relates to a machine for ironing and polishing shirts, cuffs, collars, and other articles.

The objects are to automatically stop both the iron and table when the table has completed its backward stroke; to provide for successful support of the table by a novel construction and arrangement of anti-friction devices and support for the same, which devices shall be self-adjusting in relation to the table whatever its position may be; also, to provide certain improved details of construction, hereinafter described and claimed, and illustrated in the annexed drawings, in which—

Figure 1 is a perspective view of my improved machine. Fig. 2 is a longitudinal section taken through the center of the machine. Fig. 3 is a perspective view of the top of the ironing-table. Fig. 4 is a perspective view of the middle portion of the ironing table for supporting the top. Fig. 5 is a transverse section through the table-top, taken on the line  $x^5$ . Fig. 6 is a perspective view of the base-frame of the ironing-table. Fig. 7 is a like view of the track-frame upon which the said base-frame is supported. Fig. 8 is a longitudinal section taken through the table-base at one side and through one of the tracks. Fig. 9 is a detail perspective view showing the device for effecting the reverse movements of the machine. Fig. 10 is a detail view showing the belt-shifter and the fast and loose pulleys. Fig. 11 is a longitudinal vertical section through the belt-shifter and the fast and loose pulleys. Fig. 12 is an enlarged perspective view of a portion of the belt-shifter, said view comprising a sleeve with a cap detached therefrom. Fig. 13 shows two arms belonging to the belt-shifter. Fig. 14 is a vertical section taken on the line  $x x$ , and showing means for supporting one end of the track-frame so as to allow it to rock.

This machine is constructed with a light and strong frame, A, adapted for supporting the

operative parts of the mechanism, and of a suitable height for bringing the ironing-table within convenient reach of the operator, said frame consisting substantially of vertical sides rigidly connected together by tie-rods, and provided with legs having feet that are adapted to admit of the frame being bolted or otherwise detachably secured upon the floor. The intermittingly and reversibly rotating ironing and polishing roller B is journaled at the upper portion of the frame, and is made hollow, so that it can be heated in some suitable way for ironing and polishing purposes—as, for example, it can be heated by means of the flame from a gas-burner, introduced through one of the hollow journals of the roller, or by means of hot slugs, that can be inserted in the roller as occasion may require. The reciprocating ironing-table C is arranged below the ironing and polishing roller, and is supported in proper juxtaposition to the same.

The ironing-table herein shown is constructed of three main parts—namely, a top, C<sup>2</sup>, a support, C', for said top, and a base-frame, D. The top plate, C<sup>2</sup>, is secured upon said support by means of bolts or screws or other convenient devices, and a sheet of rubber will usually be laid upon the table top and a cloth stretched over the same, so as to form a suitable surface for the articles to be ironed and polished. In order to secure the cloth in a stretched condition upon said table, I provide the latter, around its top edges, with a line of downwardly-bent hooks, C<sup>3</sup>, upon which the edges of the cloth can be caught and held. These hooks are conveniently secured to the table by forming the latter with recesses C<sup>4</sup> in the under side of its top and perforating the outer walls of said recesses, whereby short pieces of wire can be readily driven through the perforated edges and then bent down to form the hooks.

The middle portion or support, C', for the top of the table consists of a long narrow metal plate having its top edge somewhat widened, so as to form a seat for the top, and having one of its ends recessed or made substantially V-shaped, as at C<sup>5</sup>, so that space shall be left under the top for one side of a shirt after the latter has been slipped over the top of the table from one end thereof.



The base or carriage portion D, upon which the remaining portions of the table are supported, consists of a rectangular frame supported over horizontal tracks E by means of independent anti-friction wheels or rollers F, arranged to travel in grooves E', that are formed longitudinally in the top sides of the tracks and in the under sides of the side bars of the said base portion of the table, (best shown in Fig. 8,) in which said figure it will be seen that the base of the table rests upon the rollers, and is supported by the same, while the rollers which run upon the tracks are guided in their travel in the grooved ways. As the table thus supported is caused to move back and forth, so as to pass under the ironing and polishing roller, the anti-friction rollers are caused to travel along the grooved tracks with the table, but at a less rate of speed than the latter, so that after the table has traversed a sufficient distance to carry it to the full required extent and has arrived at the limit of its throw or travel in one direction it will project at one end of the machine beyond the track and still be supported by the rollers, which will have stopped at points along the tracks, as shown in dotted lines, Fig. 8, in which the table is illustrated as projecting beyond the track and the anti-friction rollers, substantially in the relative positions in which they will rest at such juncture.

To guard against the anti-friction rollers running accidentally off either end of the tracks, or running over or into a slot, E<sup>2</sup>, formed at or about the middle of each track to provide a passageway for a driving-shaft, hereinafter referred to, I provide suitable stops, G, at or near such points, said stops preferably consisting of short bolts or pins arranged across the grooves in the table-base and tracks and secured in the side of the same. It will be found that no matter at what points the rollers may be placed in the grooved way they will, after a reciprocating movement of the carriage, adjust themselves to their proper position. Similar stops, pins, or bolts, G', are also arranged in the grooved base of the table, which, in connection with the stops in the groove of the track, operate to maintain the rollers in such a position between the track and table as to prevent their dragging, and hence reduce friction after the table is once reciprocated. This will be understood by supposing the rollers to be first placed in the guideway in such a position that when the table is pushed forward the rollers will have traversed only a portion of the distance between the stops in the track, or that the same result has been caused by the rollers sticking. In either case the stop-pins on the table will engage such roller before the table has reached the end of its stroke, whereby the stop-pin will force the roller forward with the table to such a position that when the table makes its return-strokes the roller will be in position to traverse freely the full length or so much of the track as is assigned to it. By

this arrangement of stops in the track and stop-pins in the table the rollers, notwithstanding any slipping or tendency to wedge they may have, are forced at every stroke of the table to the limits prescribed by the track-stops, and hence are maintained in a position to most successfully support the table.

In order to maintain the top surface of the ironing-table in a plane coincident with the face of the ironing and polishing roller, and to maintain an equal pressure at each end of said roller, I support the track-frame in such a manner that it shall be capable of a slight side rocking movement. This is readily attained by resting one end of a bolt, E<sup>4</sup>, Fig. 14, at one end of the track-frame upon one of the tie-rods A' of the main frame and passing a bolt, E<sup>5</sup>, through a hole in said end portion of the main frame A of the machine and securing it to the track-frame, whereby the track-frame shall be capable of a side rocking movement, the bolt E<sup>5</sup> simply serving to hold the track-frame to the main frame. The other end of the track-frame is supported by a screw, E<sup>6</sup>, passing through the rods A' at the other end of the main frame, said screw being provided with a hand-wheel or analogous handle, whereby the screw can be turned so as to raise and lower the track-frame, and thereby correspondingly raise and lower the ironing-table so as to adjust it with relation to the ironing and polishing roller, and thereby vary the pressure upon the articles that are being ironed or polished, and also allow for different thicknesses of goods.

The ironing-table is provided at its base with a rack, H, that is engaged by a pinion, H', having an intermittent rotation in reverse directions, so as to reciprocate the ironing-table.

The ironing and polishing roller is intermittently rotated in reverse directions by a gear, I, engaging a pinion, B', upon one of the journals of the roller. The gear I is mounted on shaft H<sup>2</sup>, carrying the pinion engaging the rack-bar on the ironing-table, and is driven by a pinion, H<sup>3</sup>, on the driving shaft K, carrying fast and loose belt-wheels. The mechanism for intermittently rotating said shaft in reverse directions, so as to revolve the ironing and polishing roller and reciprocate the ironing-table at the proper moments, and to stop the machine at each return movement of the ironing-table, so as to allow the operator time for putting on, replacing, or adjusting articles to be ironed and polished, is as follows: The main driving-shaft K is supported in suitable bearings on the main frame of the machine, and carries a fast band-wheel, K', fixed upon the shaft between a pair of loose belt-wheels, K<sup>2</sup> K<sup>3</sup>. The fast and loose belt-wheels are respectively secured and arranged to run loose upon the driving-shaft in any well-known way—as, for example, the sleeve or hub provided with radial arms, engaging the interior of the fast pulley, is secured upon the shaft,



while a like hub,  $K^5$ , for either loose wheels, will run loose upon the said shaft. In the present illustration the outer loose wheel has, however, a hub running loose upon the shaft, and held thereon by a nut or collar fitted on the end of the shaft. The reverse movements of the shaft and its fixed belt-wheel are attained by means of the open and supposed-to-be crossed belts  $K^6$   $K^7$ , that are automatically shifted at the proper moments, so as to successively bring said belts upon the fixed wheel, in order to cause a reciprocatory movement of the ironing-table and corresponding revolutions of the ironing-roller, and also to throw the belts upon the loose wheels at the proper moments, so as to bring the machine to a standstill.

The belt-shifter  $L$  is actuated at the proper moments from a rock-shaft,  $M$ , arranged at one side of the machine, and carrying an arm,  $M'$ , fixed upon the rock shaft, and connected with the belt-shifter by means of a connecting-rod,  $M^2$ . (See especially Figs. 9 and 10.)

The belt-shifter comprises a half-cylindrical shell or sleeve,  $L'$ , which is arranged to slide upon the driving shaft, and to which the rod  $M^2$  is connected. This shell or sleeve is formed with proper hubs or caps at its ends, and serves as a vehicle for carrying a pair of arms,  $L^2$ , to which the fingers for moving the belts are secured. A cap,  $L^3$ , flanged at one end and screw-threaded at the remaining end, is screwed into one end of the shell or sleeve, and provides a bearing for the rings  $L^4$ , that are formed upon the inner ends of the arms  $L^2$  and tightly fitted upon such cap, from which they are prevented from slipping off by reason of the flanged end of the latter. These arms may be adjusted axially in relation to the driving-shaft, so as to engage belts running from any direction, and are held in the position desired by clamping the rings  $L^4$  between the end of the sleeve and the cap. The fingers  $L^5$  are made of unequal lengths, and secured to said arms in position to extend over the pulleys, and each finger is provided at its outer end with a suitable eye or loop, through which one of the belts passes, so that by sliding the sleeve along the shaft the belts will be simultaneously shifted. The relative lengths of the fingers of the belt-shifter will be such that in one position the belts will be upon the loose wheels, while by shifting the sleeves in reverse directions the belts can be successively shifted upon and off from the fast wheel.

The hub  $K^5$  of the loose wheel  $K^3$  is somewhat extended at one side, so as to form a sleeve, which extends into and turns within the cap  $L^3$ , that is secured to sleeve  $L'$ , so as to provide an enlarged bearing for cap  $L^3$ . The rock-shaft  $M$  carries an arm,  $M^3$ , that is connected by a connecting-rod,  $M^4$ , with a bell-crank,  $O$ , pivoted upon one of the sides  $E$  of the track-frame. These two arms  $M'$   $M^3$  upon the rock-shaft are each provided with a hub or sleeve adjustably secured upon the rock-

shaft by a set-screw, whereby in setting up the machine they can be accurately adjusted and secured in position. The upper arm of the bell-crank  $O$  carries a stud or roller,  $O'$ , which is normally maintained by a spring,  $M^5$ , in the path of a pair of dogs,  $O^2$  and  $O^3$ , respectively, secured upon and near the ends of one side of the base of the table, so that during the reciprocation of the carriage said roller shall be successively acted upon by these dogs or projections in order to vibrate the bell-crank and thereby actuate the rock-shaft  $M$ . As shown, spring  $N^5$  connects with the rod  $M^4$  and the track-frame  $E$ , although it can be otherwise arranged. The arm  $M^3$  on the rock-shaft has a slotted connection with the connecting-rod  $M^4$ , which is attained by providing said arm with a pin that is received in a slot,  $M^6$ , in the lower end of the rod, whereby either the bell-crank or a treadle,  $P$ , can successively act to operate the rock-shaft, as will be more particularly described farther on.

The treadle  $P$ , which is arranged at the front of the machine in convenient position to be acted upon by the operator, is connected by a rod,  $P'$ , with a crank-arm,  $P^2$ , fixed upon one end of the rock-shaft, (see Fig. 2,) whereby the rock-shaft can be actuated from said treadle, which, as will be hereinafter seen, is employed for the purpose of starting the machine, while the bell-crank  $O$  and the two dogs upon the carriage constitute the initial means for actuating the belt-shifter so as to start the carriage back after the completion of its forward movement, and also for stopping the carriage after it has returned to its first position.

The gear  $I$ , for driving the ironing and polishing roller, meshes with a pinion,  $H^3$ , rigid upon one end of the main driving-shaft  $K$ , so that a rotation of said shaft in either direction will cause a like revolution of the roller.

The operation is as follows: The belts being on the loose wheels and the ironing-table being at the front end of the machine in convenient position for the operator to place the shirts, cuffs, collars, or other articles upon the ironing-table, the machine is started by pressing upon the treadle so as to operate the rock-shaft  $M$ , and thereby actuate the belt-shifter, through the medium of arm  $M'$  on the rock-shaft and rod  $M^2$ , connecting said arm with the belt-shifter. This action will shift one of the belts on the fast wheel—as, for example, the open belt  $K^6$ , traveling in the direction of the arrow shown in Fig. 1—whereby the main driving-shaft will be rotated and the carriage caused to move forward simultaneously with a rotary movement on the part of the ironing and polishing roller through the medium of the gears hereinbefore described. When the carriage arrives at the end of its forward movement, the dog  $O^2$  on one end of the carriage strikes and actuates the bell-crank  $O$ , which in turn gives a downthrow to the slotted rod  $M^4$ , and this in turn actuates the rock-shaft



through the medium of an arm,  $M^3$ , carried by the rock-shaft, it being observed that at this junction the pin on the end of the said arm is at the top end of the slot in the rod, whereby the movement is positive and no lost motion occurs. This action on the part of the said mechanism turns the rock-shaft in a direction that will cause the belt-shifter to shift the open belt off and the crossed belt  $K^7$  on the fast wheel, whereby said crossed belt, traveling in the direction indicated by an arrow, will reverse the main driving-shaft, and hence cause a return of the carriage and a reverse rotation on the part of the ironing and polishing roller. As soon as dog  $O^2$  has released the bell-crank  $O$  the spring  $M^5$  will lift rod  $M^4$  and turn the bell-crank, so as to restore it to its normal position, thereby bringing its stud in position to be acted upon by the second dog,  $O^3$ . The pin on the end of the arm  $M^3$  will then be at the lower end of the slot  $M^6$  in the rod, whereby when the rod  $M^4$  is next lifted it will raise arm  $M^3$ , for the purpose of stopping the machine, and when the rock-shaft is next turned by the treadle, so as to start the machine, there will be a lost motion on the part of arm  $M^3$  by reason of its pin having a free play upwardly from end to end of the slot.

When the carriage arrives at the end of its return movement, the second dog,  $O^3$ , on the carriage will strike said stud and depress the same, thereby actuating the bell-crank and causing it to lift rod  $M^4$ , which will in turn cause arm  $M^3$  on the rock-shaft to rise, and thus give to the rock-shaft a movement reverse to the one that it has previously made. This movement of the rock-shaft actuates the belt-shifter so as to shift the belts, and thereby throw the crossed belt from the fast to a loose pulley, so that the machine will be stopped. It can be again set in motion by operating the treadle as before, so as to again start the carriage forward.

It will be seen that after each return movement and consequent stop of the machine the pin on arm  $M^3$  will be at the lower end of the slot in rod  $M^4$ , so that when the treadle is depressed and the rock-shaft turned, so as to actuate the belt-shifter in order to start the machine, arm  $M^3$  will in rising have a lost motion, for the purpose of moving the belt-shifter to start the machine.

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

1. The combination, with the ironing-table, the ironing-roller, and means for respectively reciprocating the table and rotating said roller, of mechanism forming a connection between said table and roller, whereby the movement of the table and roller are automatically stopped at the completion of each return movement of the table, substantially as and for the purposes described.

2. The combination, in an ironing-machine, of the ironing-roller, the table, the shaft, and mechanism connecting said shaft with the ironing-table, the fixed and loose pulleys, and a belt-shifter, being provided with arms mounted on said shaft, said shifter having an adjustment concentric with the shaft, substantially as described.

3. The ironing-table and mechanism for reciprocating the same, in combination with a grooved track, and loose anti-friction rollers guided in said track, which support the table and form a shifting bearing therefor; stops on said table for engaging the rollers, and stops on said track to limit the movement of the rollers, substantially as shown.

4. In an ironing-table, the rock-shaft  $M$ , arm  $M'$ , rod  $M^2$ , arm  $M^3$ , rod  $M^4$ , provided with a slot,  $M^6$ , which engages a pin on the end of the arm  $M^3$ , bell-crank  $O$ , having one of its arms pivotally connected to rod  $M^4$ , and the spring  $M^5$ , in combination with the reciprocating table provided with dogs which alternately engage the other end of said bell-crank, substantially as shown, whereby the belt-shifter is actuated by the movement of the reciprocating table.

5. In an ironing-machine, the combination of an ironing-table and mechanism for reciprocating the same, a bell-crank lever, a belt-shifter, and mechanism actuating said lever and shifter, a pair of dogs, and a spring for normally holding said lever in the path of the dogs, substantially as and for the purposes described.

6. An ironing-table, mechanism for reciprocating said table, an ironing-roller, and means for actuating the same in opposite directions, in combination with the sleeve  $L'$ , the arms  $L^2$ , the fingers  $L^5$ , and the fast and loose pulleys, all combined and operating substantially as and for the purposes described.

LEWIS H. WATSON.

Witnesses:

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JNO. G. ELLIOTT.