Jan. 2, 1923.

W. H. SUMBLING.

IRONING MACHINE.

FILED OCT. 18, 1920.

1,440,704.

4 SHEETS—SHEET 1.

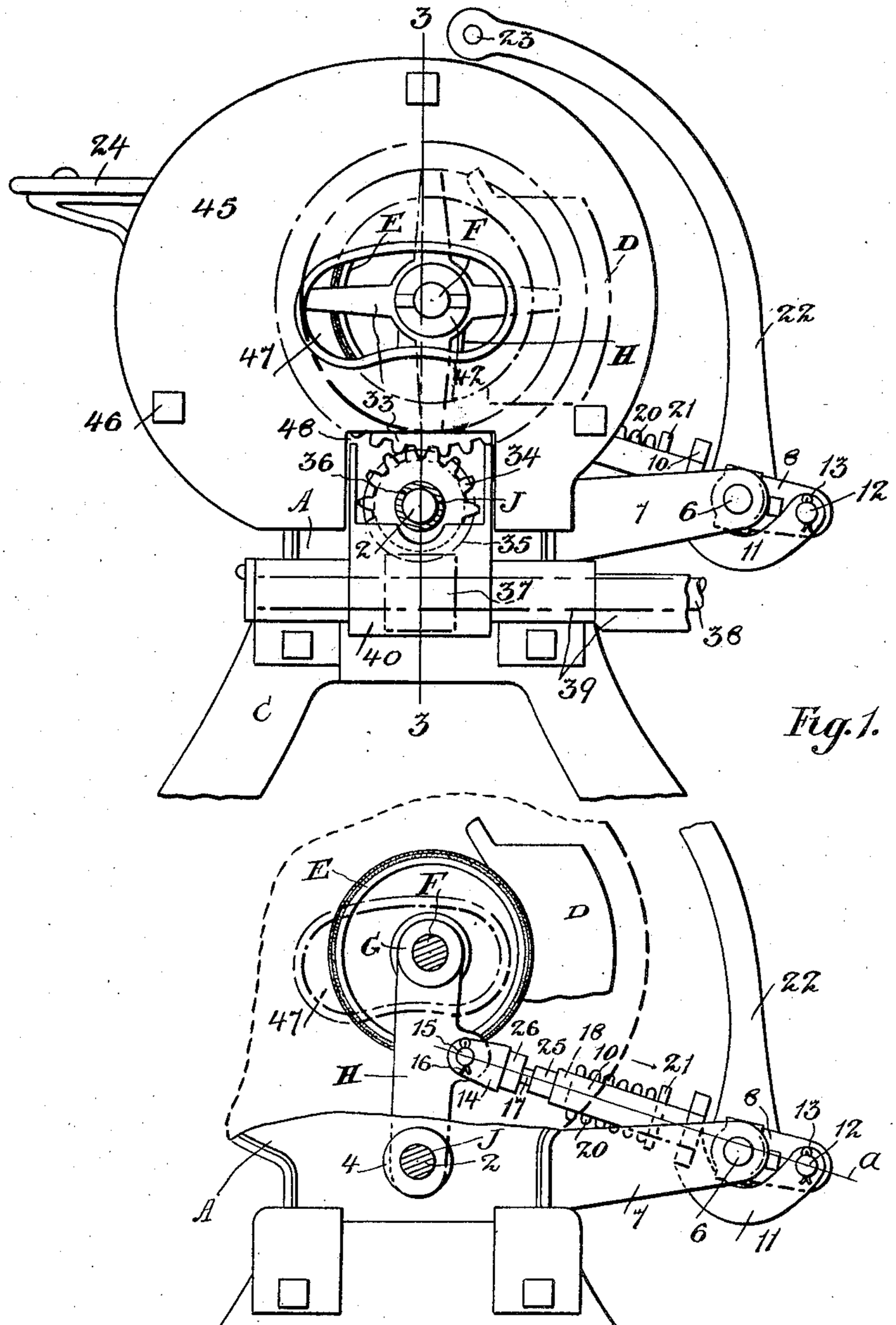

Fig. 1.

Fig. 2.

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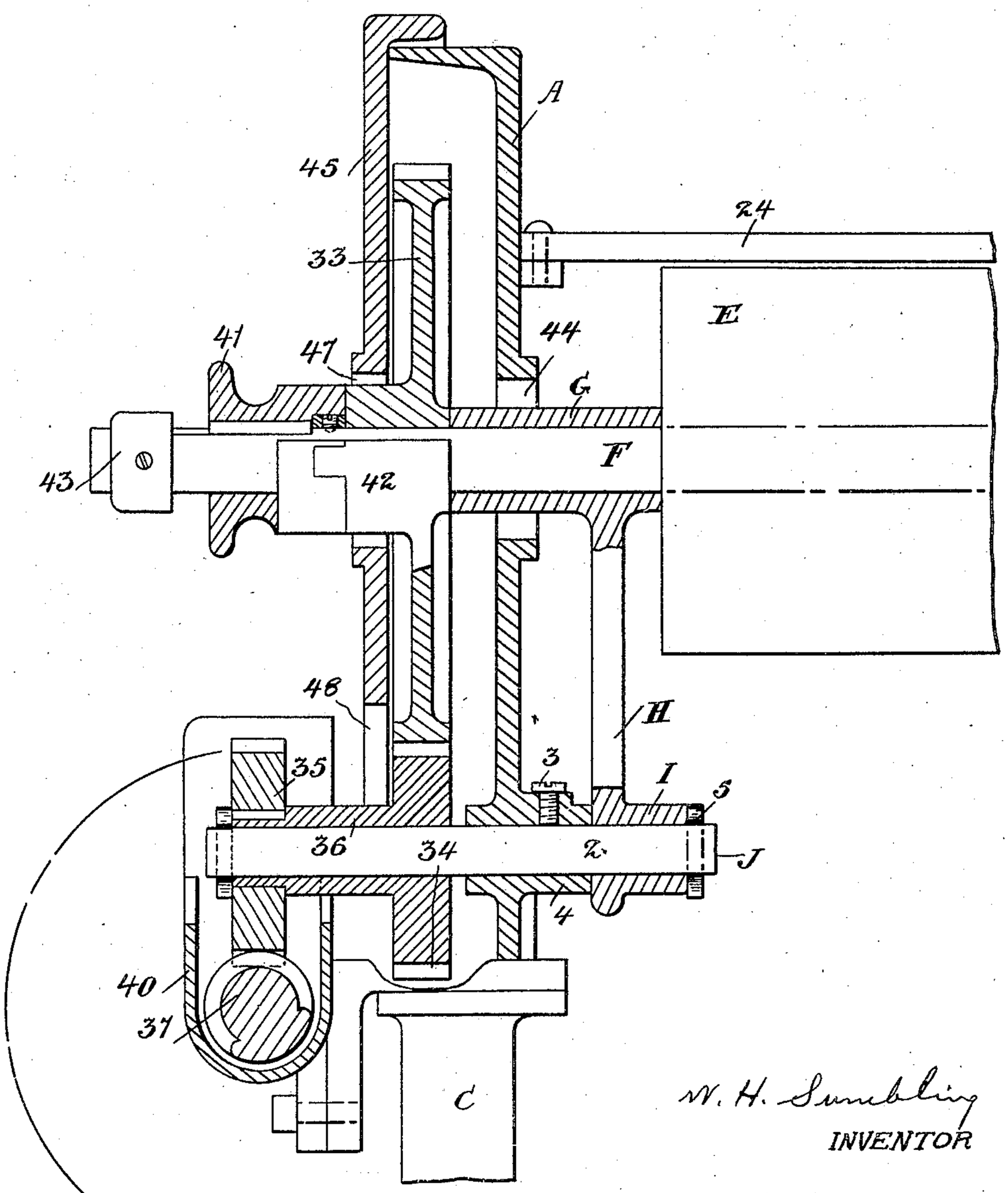

Fig. 3.

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4 SHEETS—SHEET 3.

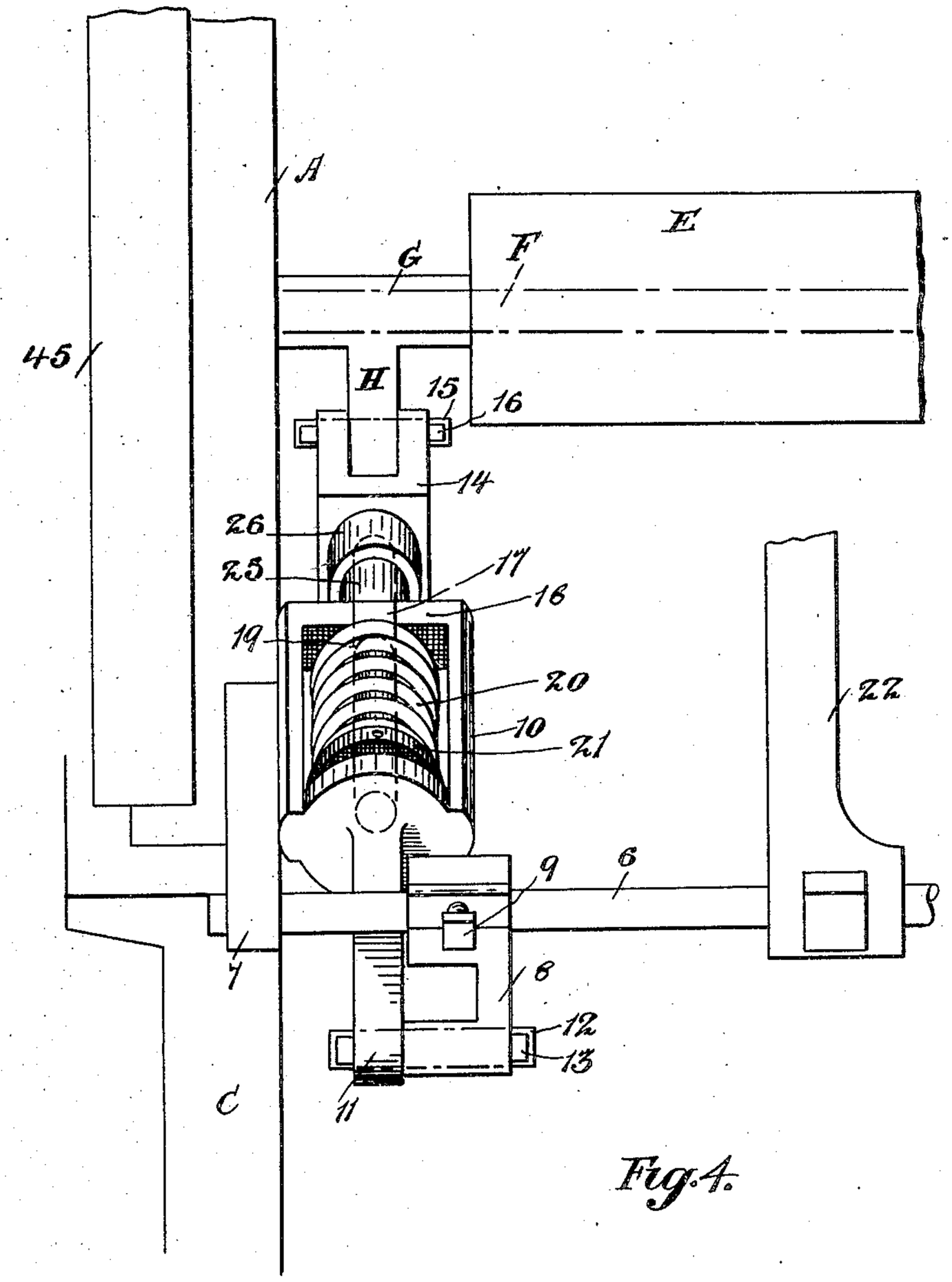

Fig. 4.

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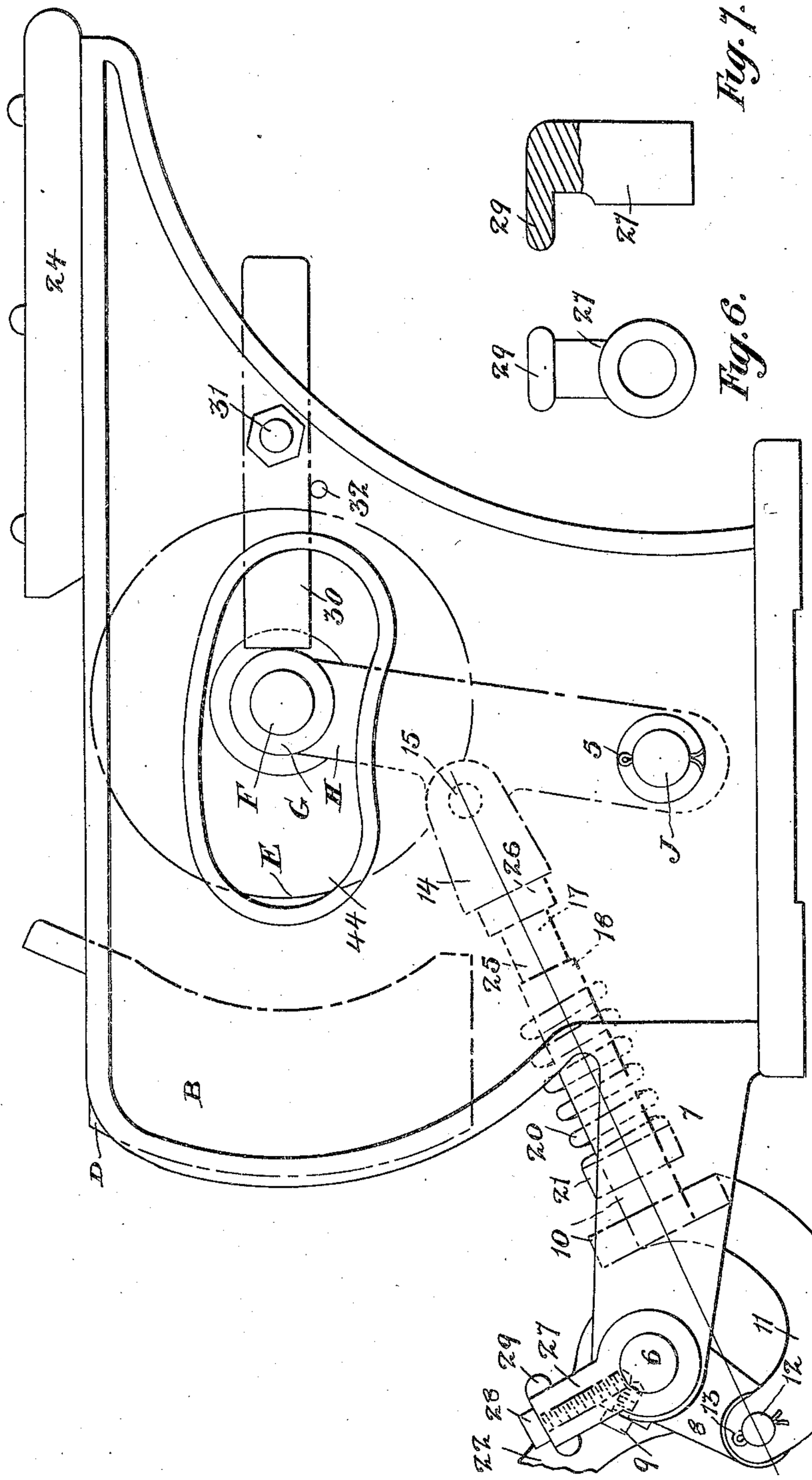

Fig. 1.

Fig. 6.

Fig. 5.

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Patented Jan. 2, 1923. 1,440,704

UNITED STATES PATENT OFFICE.

WILLIAM HENRY SUMBLING, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO SUMBLING MACHINERY COMPANY, LIMITED, OF TORONTO, ONTARIO, CANADA.

IRONING MACHINE.

Application filed October 18, 1920. Serial No. 417,742.

To all whom it may concern:

Be it known that I, WILLIAM HENRY SUMBLING, of the city of Toronto, county of York, Province of Ontario, Canada, a subject of the King of Great Britain, have invented certain new and useful Improvements in Ironing Machines, of which the following is a specification.

My invention relates to improvements in ironing machines, and relates more particularly to that class of machine in which a rotating roll co-acts with a heated shoe, and one of the objects of the invention is to so poise the roll that the same may be readily moved against or away from the shoe with the minimum of effort on the part of the operator and thus avoid the necessity of the operator having to exert physical power to actually lift the roll or the shoe. The elimination of the necessity of having to physically lift an element of considerable weight enables me to provide a machine which can be operated with the minimum expenditure of energy on the part of the operator, and particularly in adapting my machine for domestic use I find that a machine is greatly in demand which will not be as tiresome to operate as those wherein the roll or shoe is actually lifted. Another object of the invention is to so support the roll at each end that by reason of the comparatively short movement to be given the same by the operator when moving it against or away from the shoe, that there will be very slight wear on the supporting means for the roll, and as this wear will be the same at each end of the machine, there will be no possibility of the roll getting out of alignment with the shoe. The result is that goods can be more satisfactorily ironed, and by reason of the uniform friction of the roll against the shoe the cover therefor will be uniformly worn, and will consequently last longer than where more friction on one part will wear the cover out more readily in that particular location. A still further object of the invention is to provide a system of leverages so that the roll will be quickly positioned against the shoe, and an increased leverage in effect obtained, with the expenditure of the minimum of energy on the part of the operator, at the moment the roll is exerting the greatest pressure against the shoe. A still further object of my invention is to provide a system of resilient levers co-acting with the roll for the purpose set forth, so that the roll will be held against the shoe in such manner as to provide for the necessary yielding thereof according to the variation in thickness of the garment being ironed, and at the same time prevent any undesired movement of said levers as to release the pressure of the roll against the shoe. A still further object of my invention is to produce a machine of the class set forth which will contain the minimum number of parts consistent with efficiency, and to so design the various parts that they may be assembled and adjusted by semi-skilled labour, and in the following specification I shall set forth the preferred construction, and what I claim as new will be set forth in the claims forming part of this specification.

Figure 1 is an elevation of the right-hand end of my machine, showing the roll held against the shoe, and the train of gearing employed to rotate the roll. Figure 2 is a view similar to Figure 1 except that the outer casing and train of gearing have been removed to show clearly the lever mechanism controlling the movement of the roll to and away from the shoe. Figure 3 is a vertical longitudinal section on the line 3—3 Figure 1. Figure 4 is a perspective view of the operating lever mechanism for the roll at the right-hand end of the machine. Figure 5 is an elevation of the left-hand end of the machine showing the position of the lever mechanism when the roll is moved away from the shoe, and Figures 6 and 7 are respectively end and side elevations of the preferred form of stop used to limit the movement of the lever mechanism, the latter view being shown partly in section.

In the drawings like characters of reference refer to the same parts.

Sufficient has been set forth to show that my machine is of that type wherein the shoe is fixed, and the roll is brought into and out of engagement therewith. Of course the shoe may be heated in any desired manner.

A and B are respectively the right-hand and left-hand heads of the machine, and the same are carried after any suitable manner

by the standards C. D is the shoe which may be of any conventional type, and the same is permanently carried by the heads A and B in any suitable manner. E is the roll, and the same is suitably coupled to the shaft F so as to rotate therewith. The shaft F is mounted at each end in the hub G of the bearing-links H. These bearing-links are preferably each provided with a hub I whereby they are pivoted to their respective stub-shafts J. These stub-shafts project through their associated heads A and B, and as shown in Figure 3 the stub-shaft 2 is held in place by any suitable means such as a set screw 3 held in a boss 4 through which the stub-shaft 2 passes. The stub-shaft J shown in Figure 5 may be similarly mounted. It will be observed upon referring to Figure 3 that the hub I of each bearing link H rests in contact with its associated boss 4. 5 are split pins, or equivalent means carried by the stub-shaft J, and whereby in co-action with the boss 4 each bearing-link is held in place.

Upon referring particularly to Figures 2 and 5 it will be seen that the roll E is supported at each end through the medium of its shaft F by the bearing-links H, and that the operator will not be under the necessity of having to exert undue energy in shifting the position of the roll, as the same is "poised" above the pivotal points of the bearing-links H, and is moved through a relatively short arc. Since the weight of the roll E and its shaft F (and certain other parts hereinafter particularly referred to) is supported always by the bearing links H, it is obvious that the operator does not have to exert energy to lift the roll into and out of contact with the shoe D.

6 is a rock-shaft mounted in brackets 7 carried by the heads A and B. 8 are arms or levers adjustably mounted on the rock-shaft 6 and held in position thereon by any suitable means such as set screws 9. 10 are cages or holders each provided with a coupling member 11 preferably curved as shown particularly in Figures 1 and 2 so as to have movement underneath the rock-shaft 6 without contact therewith. The outer end of each coupling-member 11 is pivoted to each arm 8 by means of a pin 12 passed therethrough and held in place by any suitable means such as the split pins 13. 14 are eye-links each pivoted by means of a pin 15 to its associated bearing link H, and 16 are split pins or equivalent means held in the pins 15 to retain the same in place. 17 is a rod carried by each eye link 14, and these rods pass through the end plate 18 of each cage 10, and have clearance with the opening 19 formed in each plate 18 and shown partly by dotted lines in Figure 4. These rods extend through the longitudinal centre of each cage 10, and mounted on each rod is a coiled spring 20. 21 is a circular nut threaded on each rod 17 and adapted to regulate the tension of the spring, and to co-act with each end plate 18 in retaining the springs in place. Adjustably coupled to the rock-shaft 6 are a pair of operating levers 22 coupled together at their upper ends by a hand-bar 23, which is in convenient position to the guide-board 24 before which the operator stands so that this hand-bar may be readily manipulated to shift the position of the said operating levers.

25 is a washer loosely mounted on each rod 17 and located between the end plate 18 of each cage 10 and the boss 26 of each eye-link 14. When the operating levers 22 are moved into the position illustrated in Figures 1 and 2, the co-action between the arms 8 and their associated coupling-members 11 result in the movement of the cages 10 in the direction indicated by arrow in Figure 2, and the result is that the springs 20 are put under increased compression. Since each cage 10 is coupled through the medium of the eye-links 14 to the bearing-links H, it follows that when the said operating levers 22 are moved into the position before referred to, the roll E is brought into contact with the shoe D.

The relative position of the axis of each pin 15 in respect of its associated pin 12 is constant so that a line drawn through the axes of the said pairs of pins will always pass through the longitudinal centre of the cage 10. For instance, in Figure 2 the line a is shown as passing through the axes of the pins 15 and 12, and it will be observed that this line is positioned above the axis of the rock-shaft 6; therefore when once the operating levers 22 occupy the identified position, by reason of the direction of the force exerted by the spring 20 in each cage 10, pressure will be constantly exerted against the roll E and without any danger of the position of this roll being accidentally shifted.

Since the rods 17 have sliding movement within the end plates 18, it will be self evident that the roll E may automatically yield according to the variation in thickness of the garment or piece being ironed, and therefore the length or thickness of the washers 25 will be such as to prevent contact therewith simultaneously of the eye-links 14 and the end plates 18 when the parts are in the position illustrated in Figure 2.

To disengage the roll E from the shoe D, the operating levers 22 are thrown to the right in Figures 1 and 2, thus moving the arms 8 down into the position illustrated in Figures 4 and 5 so that the axis of each pin 12 will be below the axis of the rock-shaft 6. During this movement the forward movement of each cage 10 will decrease the compression of the springs 20, and the washers 25 will be brought into contact with the

bosses 26 of the eye links 14 and apply pressure against the bearing links H to move the roll E away from the shoe D.

Means of course must be provided to limit the forward movement of the operating levers 22. A convenient means for this purpose comprises a stop 27 held by any suitable means such as a set-screw 28 on the left-hand end of the rock-shaft 6. This stop is provided with a flange 29, and this flange is designed to contact with the bracket 7 carried by the head B (see Fig. 5) when the parts are in the position illustrated in Figures 1 and 2.

The stop 27 is of course adjustable and is fixed on its rock-shaft when the machine is assembled so that the lever mechanism before set forth will properly function.

To limit the range of movement of the roll E away from the shoe D, any suitable stop may be employed; for instance I show a plate 30 pivoted at 31 to the head B, and the heavier end of this plate when in the position shown in Figure 5 will be in the path of movement of the shaft F or the hub G of one of the bearing-links H. 32 is a stop carried by the head B which holds the plate 30 in place when in the position shown in Figure 5.

The fact that a suitable stop is used to limit the range of movement of the roll E from the shoe D insures that the roll will be "poised" at all times.

Any suitable driving means may be employed to rotate the roll E. My preferred form of driving means comprises a gear-wheel 33 loosely mounted on the shaft F. This gear-wheel is constantly in mesh with a pinion 34 loosely mounted on the stub-shaft 2. 35 is a worm-wheel keyed to the hub 36 of the pinion 34, and this worm-wheel is constantly in mesh with the worm 37 secured to or formed a part of the drive-shaft 38 (see Figure 1) mounted in the bearing 39 of the box 40, which houses the worm gears 35 and 37.

41 is a clutch splined on the shaft F, and this clutch is of a well-known type which co-acts with the hub 42 of the wheel 33 to control the movement of the shaft F and the roll E. Of course the clutch 41 is limited in its outward movement by any suitable means such as a stop 43 carried by the shaft F.

The heads A and B have apertures 44 formed therein to permit the shaft F to extend therethrough and receive the necessary movement through the medium of the bearing links H.

To enclose the gearing 33 and 34, I provide the head A with a cover 45 suitably held in place as by means of threaded bolts 46 tapped into the head A. This cover is apertured as shown at 47 to permit the hub 42 of the wheel 33 to extend therethrough as well as the shaft F for the purpose before set forth.

The cover 45 is also apertured as shown at 48 to permit the stub-shaft 2 and the hub 36 of the wheel 34 to project therethrough.

It will be clear that by reason of the relatively limited movement of the bearing links H on their respective stub-shafts, there will be very little wear therebetween, and consequently the roll E will be constantly in alignment with the shoe D.

Upon inspecting Figure 5 particularly it will be observed that when the operating levers 22 first start to move, by means of the lever mechanism before described connected to the bearing links H, the roll E will be initially advanced quickly towards the shoe D, and that the full application of the pressure of the roll E against the shoe D will be relatively slower and substantially without any impairment in the leverage. The system of levers co-acting as set forth in combination with the manner in which the roll is "poised" enables me to secure the advantages before set forth.

While I have described what I consider to be the best embodiment of my invention I desire it to be understood that the principle may be embodied in various other forms without going outside the scope of my claims, and I desire not to be limited to the construction shown except in so far as that may be necessary by reason of the prior art and the terms of my claims.

What I claim as my invention is:—

1. In an ironing machine, in combination a suitable frame embracing an end member at each end thereof one of which is slotted; a shoe carried by said end members; a shaft extending through said slotted end member; a roll mounted on and coupled to said shaft and located between said end members; a lever located at each end of said roll and adapted to form bearings for said shaft, the hub of one of said levers projecting through said slotted end member; stub-shafts mounted one in each of said end members with which the lower ends of said levers have pivotal engagement respectively, one of said stub-shafts projecting through one of said end members; a hub-provided pinion loosely mounted on the longer of said stub-shafts; means for rotating said pinion; a gear-wheel loosely mounted on said shaft and constantly in mesh with said pinion; clutch mechanism splined on said shaft and co-acting with the hub of said gear-wheel to couple the latter to said shaft when desired, and energy-storing lever-mechanism under the control of the operator for the purpose of actuating said levers to move said roll against and away from said shoe and adapted to permit said roll to yield to accommodate itself to the thickness of the garment or piece being ironed.

2. In an ironing machine, in combination a suitable frame embracing an end member at each end thereof; a shoe carried by said end members; a shaft; a roll on said shaft which rotates therewith; a lever located at each end of said roll and adapted to form bearings for said shaft and having pivotal association each with its associated end member; a rock shaft mounted in said frame; an arm carried by said rock-shaft at each end thereof; a link-member pivoted to each of the said arms, and each partly in the form of an open frame having an opening through the inner end thereof; a rod operating through the opening in the inner end of each of the said frames and each located with its longitudinal axis in alignment with the longitudinal axis of its associated frame-portion of said link members; means whereby the inner end of each of said rods has pivotal connection each with its associated lever at a point above the longitudinal axis of said rock-shaft; a washer loosely mounted on each of the said rods and intermediate the inner end of each of the said link-members and the means whereby each of the said rods has pivotal connection with its associated lever; a coiled spring mounted on each of the said rods and within the frame-portion of each link-member; a nut threaded on the free end of each of the said rods and adapted to hold said spring in coaction with the inner end of each of the said frame-portions of said link members to permit the same to function, and lever means mounted on said rock-shaft to operate the same for the purpose set forth.

WILLIAM HENRY SUMBLING.