

May 3, 1938.

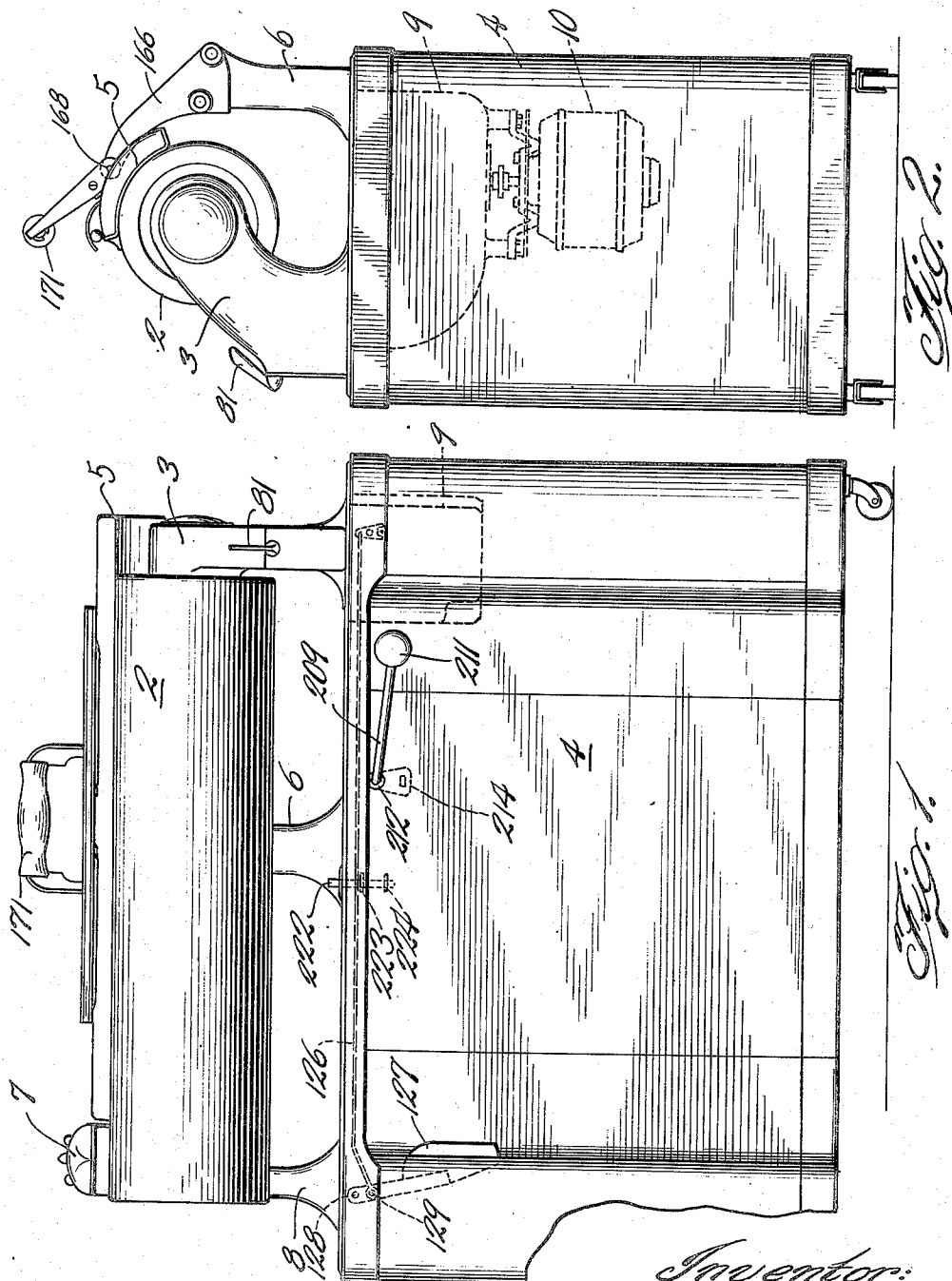
J. A. CASTRICONE

2,115,941

IRONING MACHINE

Filed March 19, 1937

12 Sheets-Sheet 1



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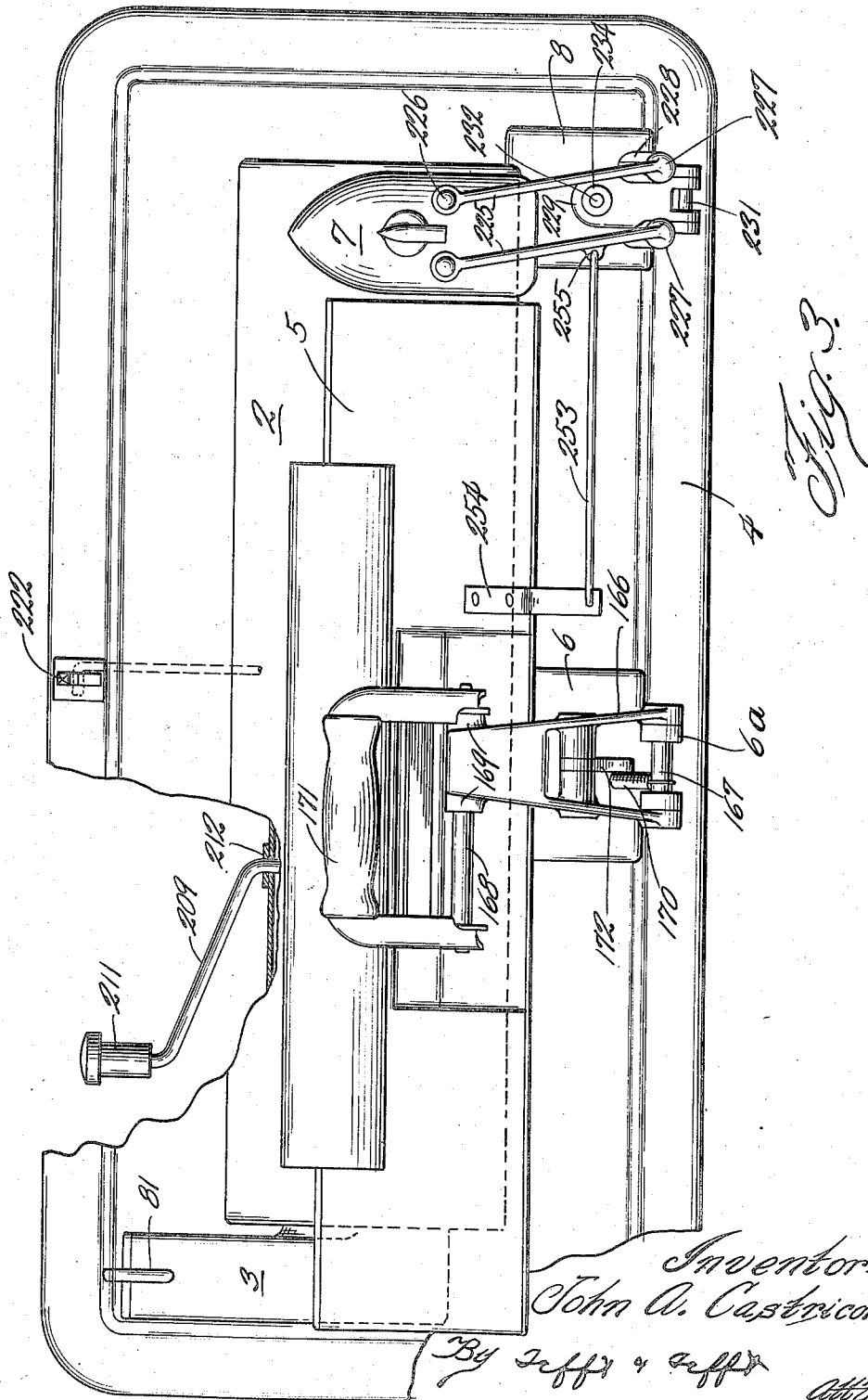
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IRONING MACHINE

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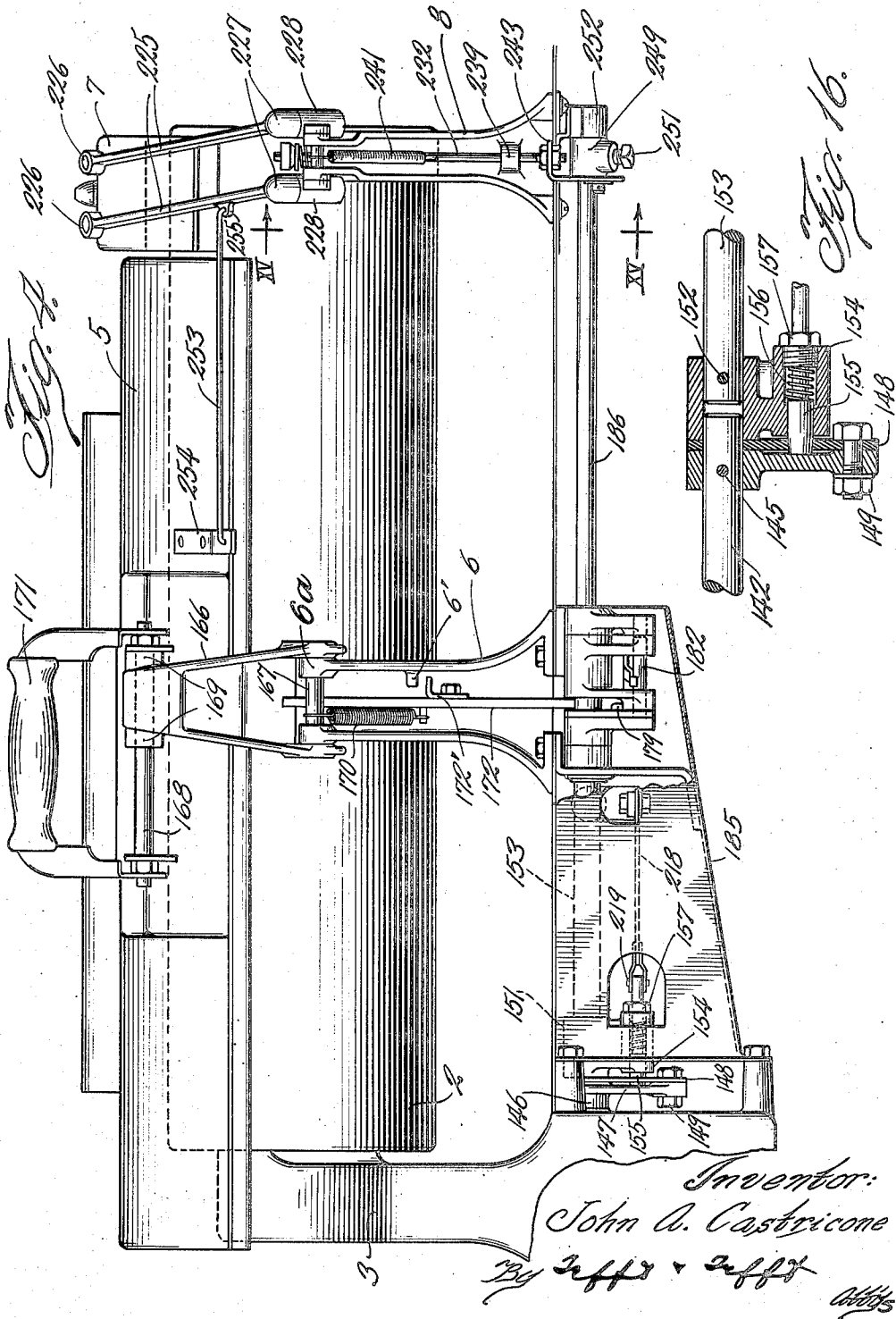
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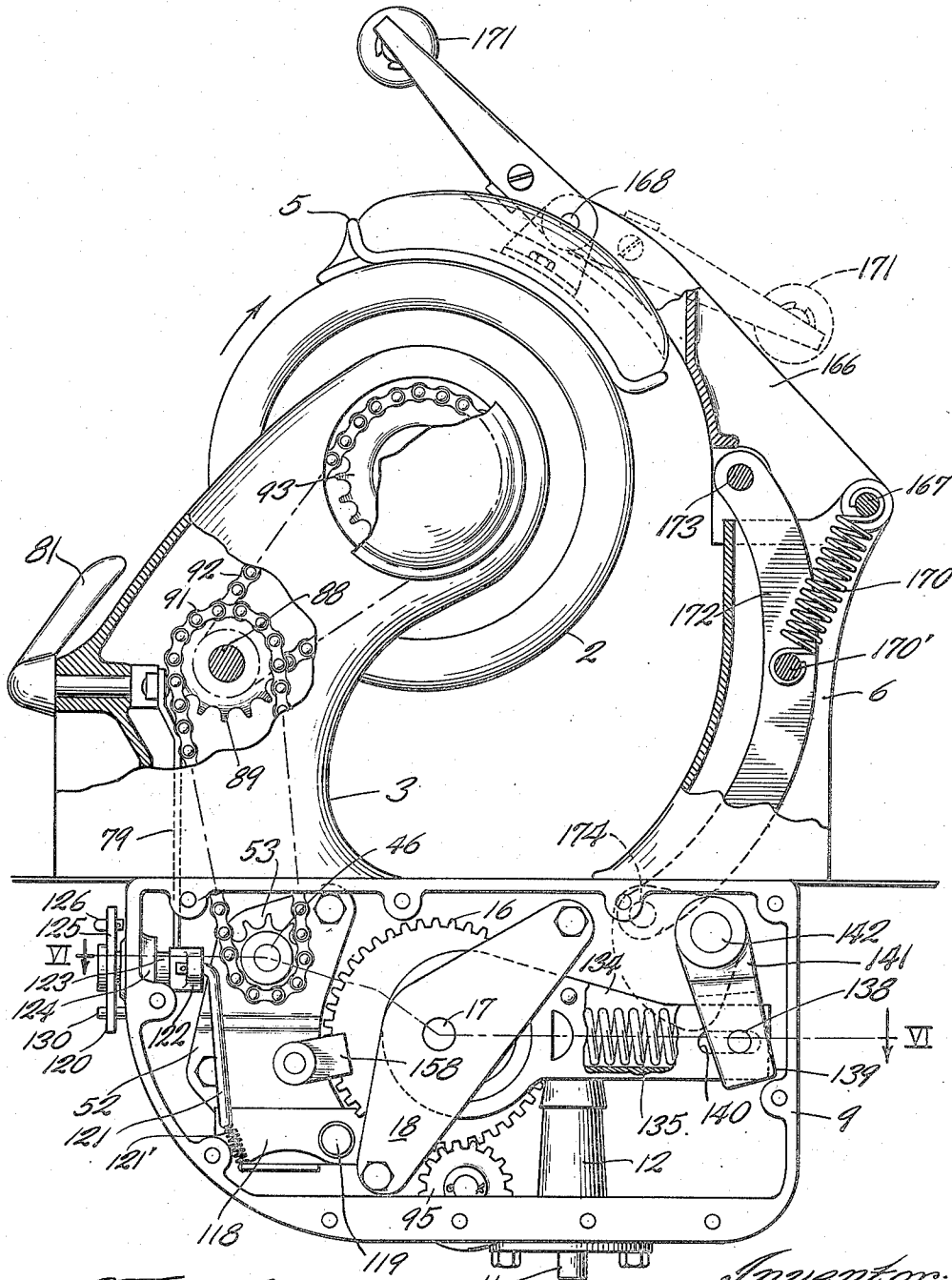


Fig. 5.

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May 3, 1938.

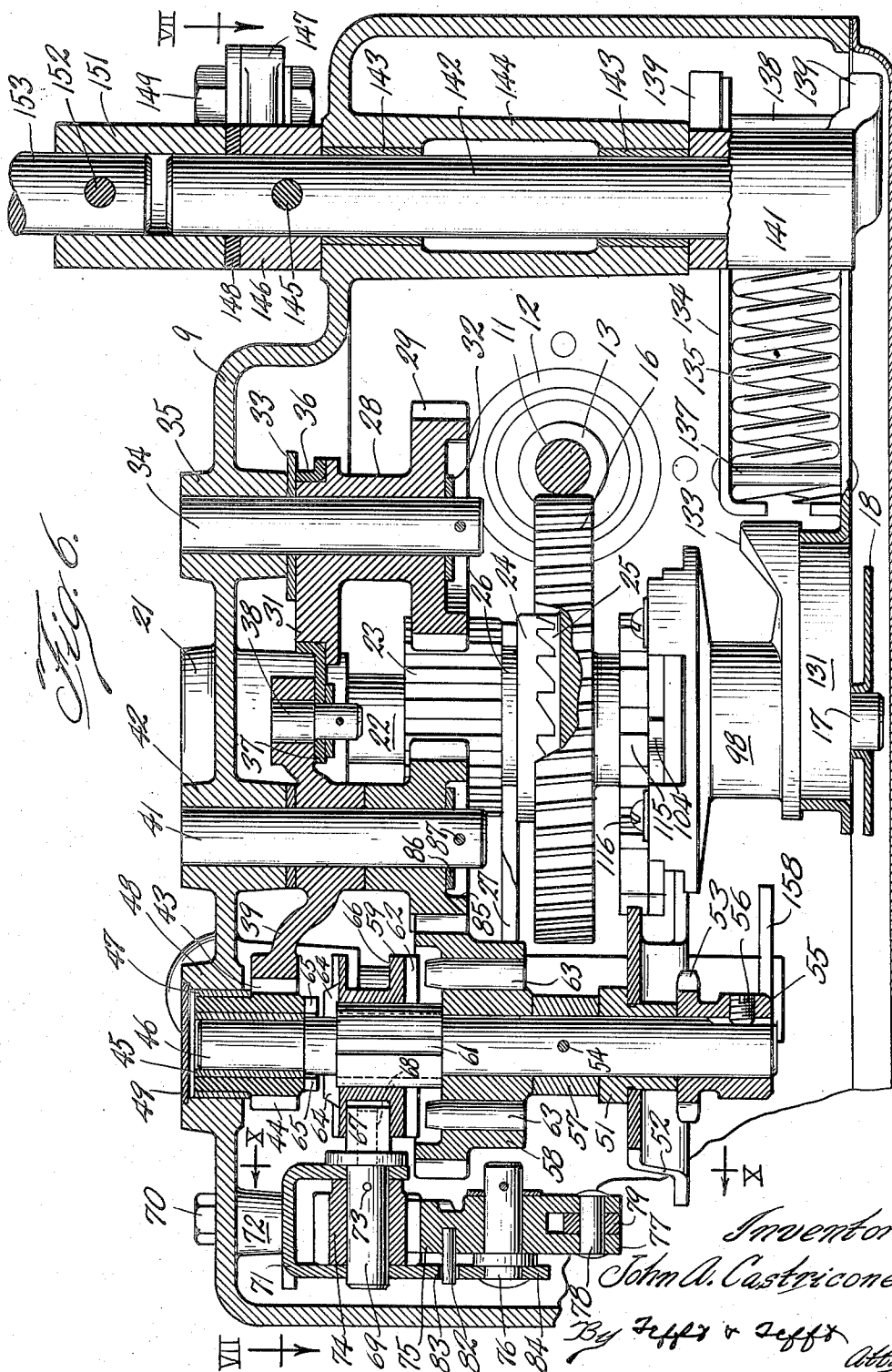
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IRONING MACHINE

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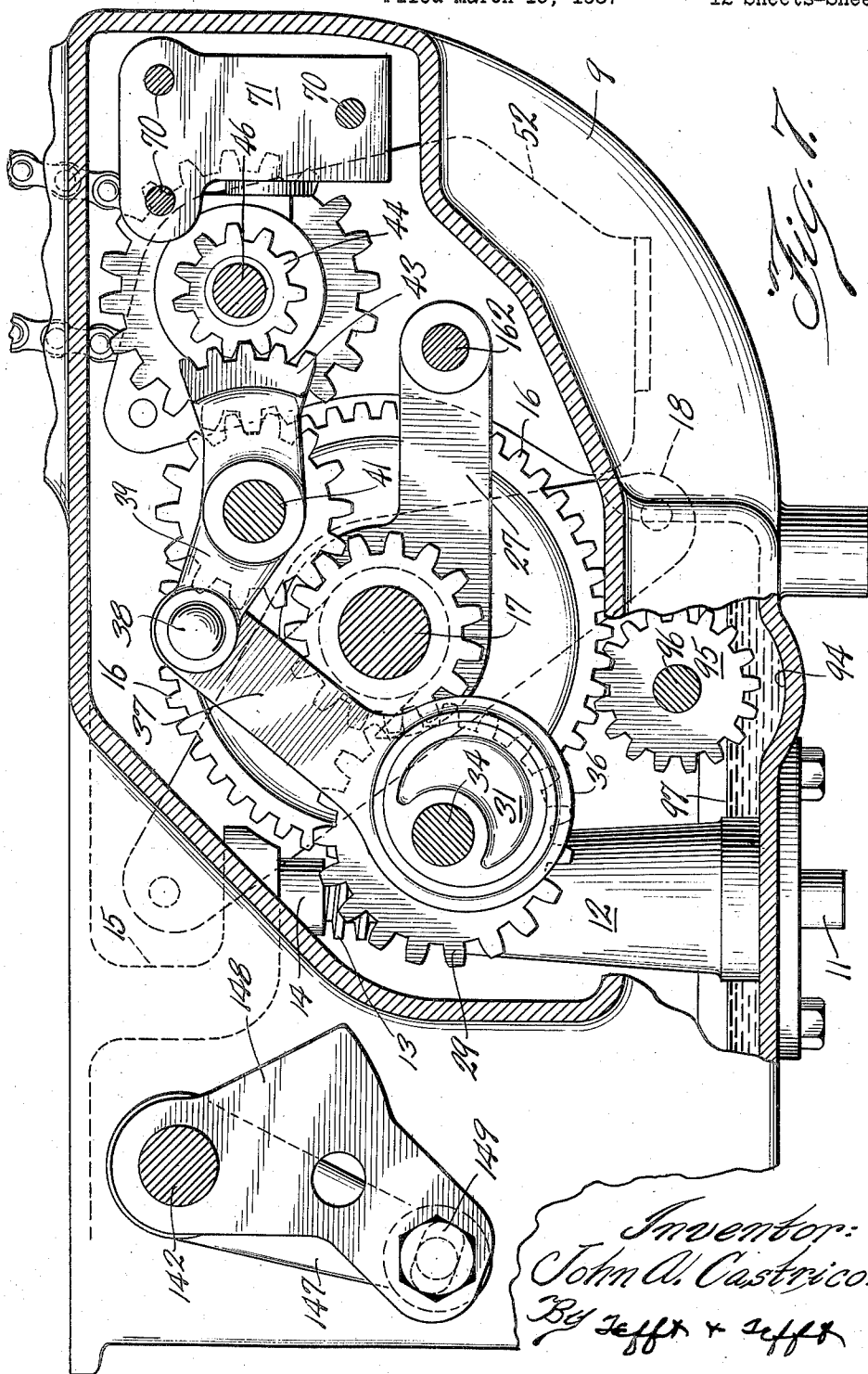
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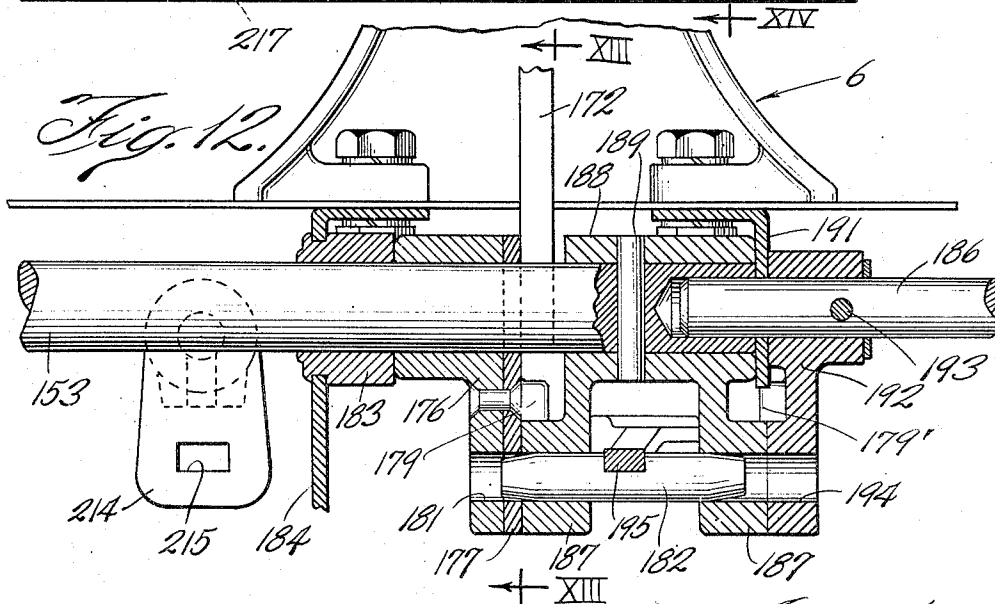
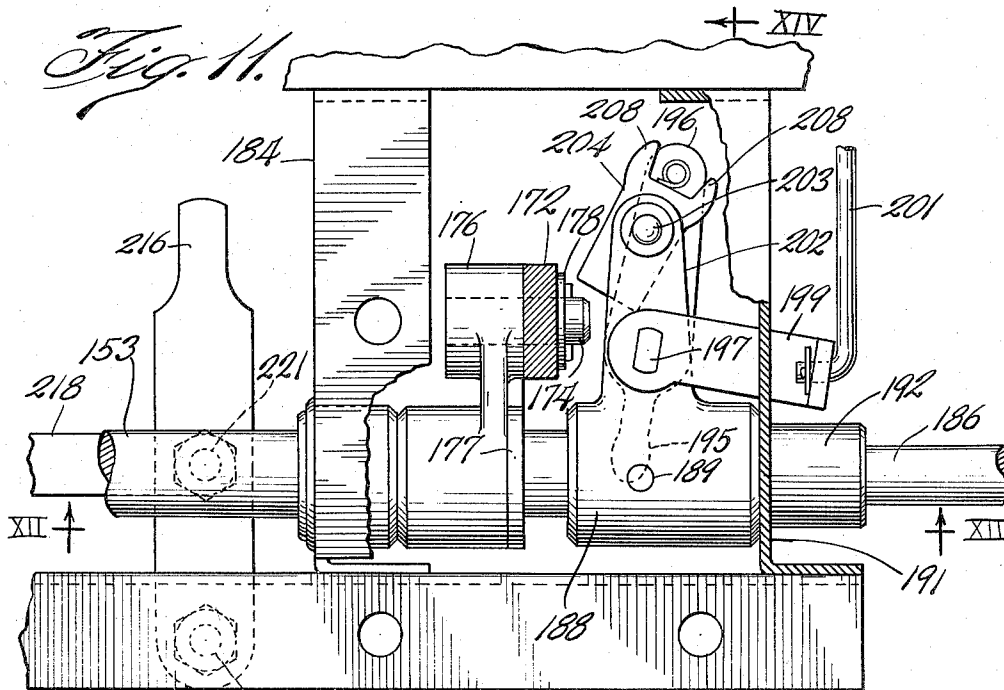
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12 Sheets-Sheet 8



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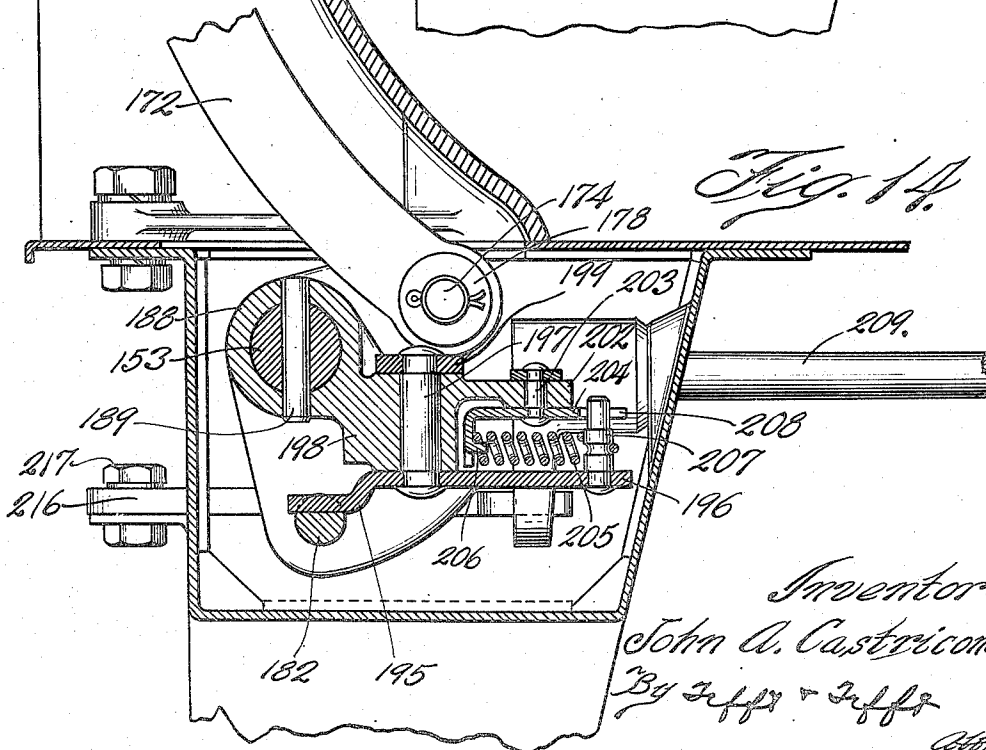
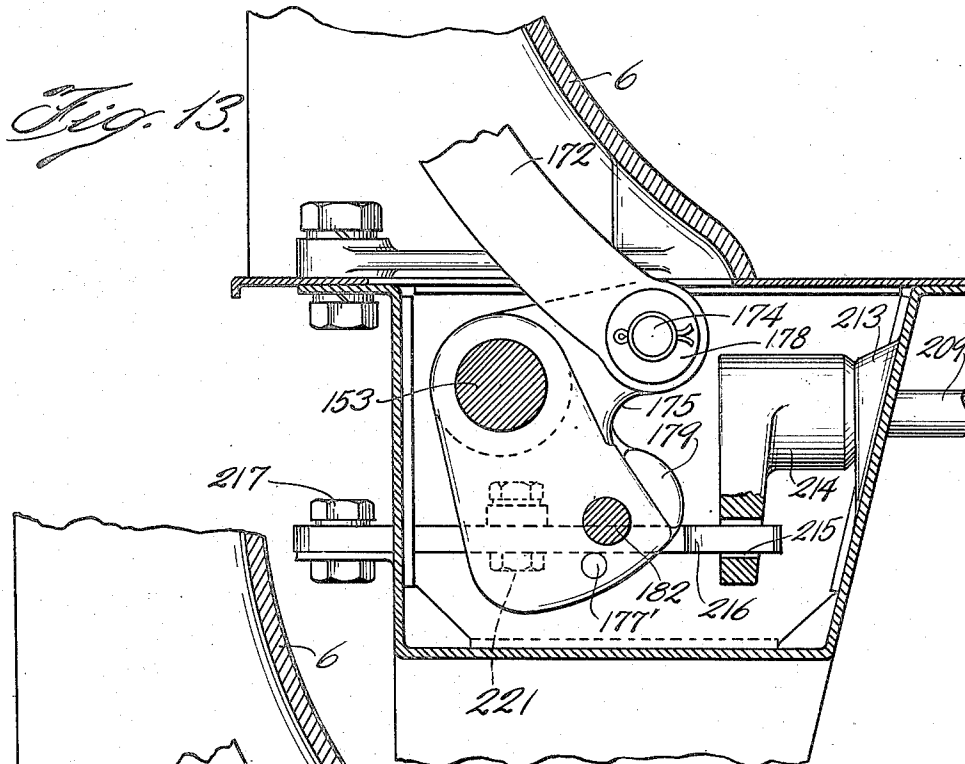
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Fig. 13.



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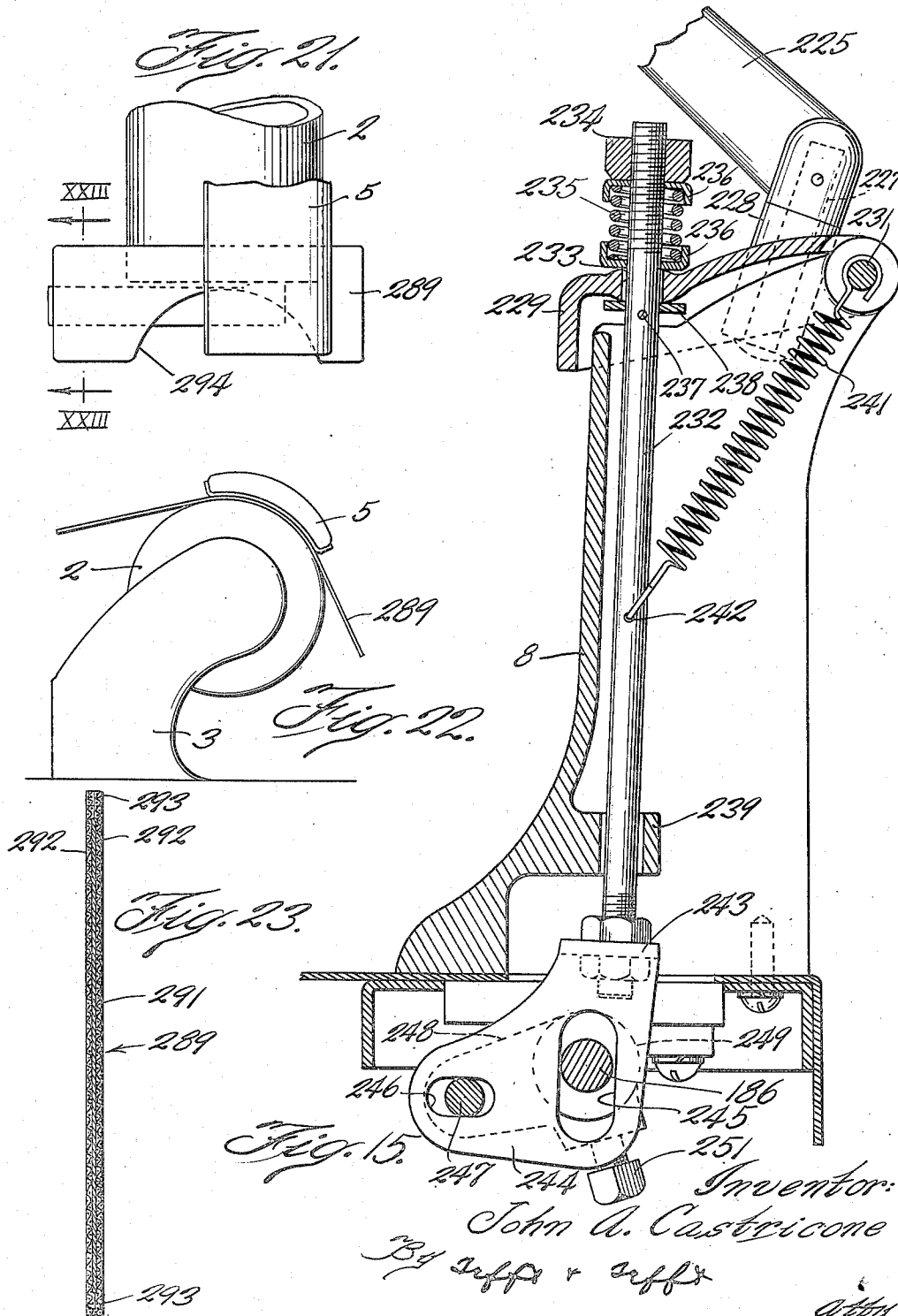
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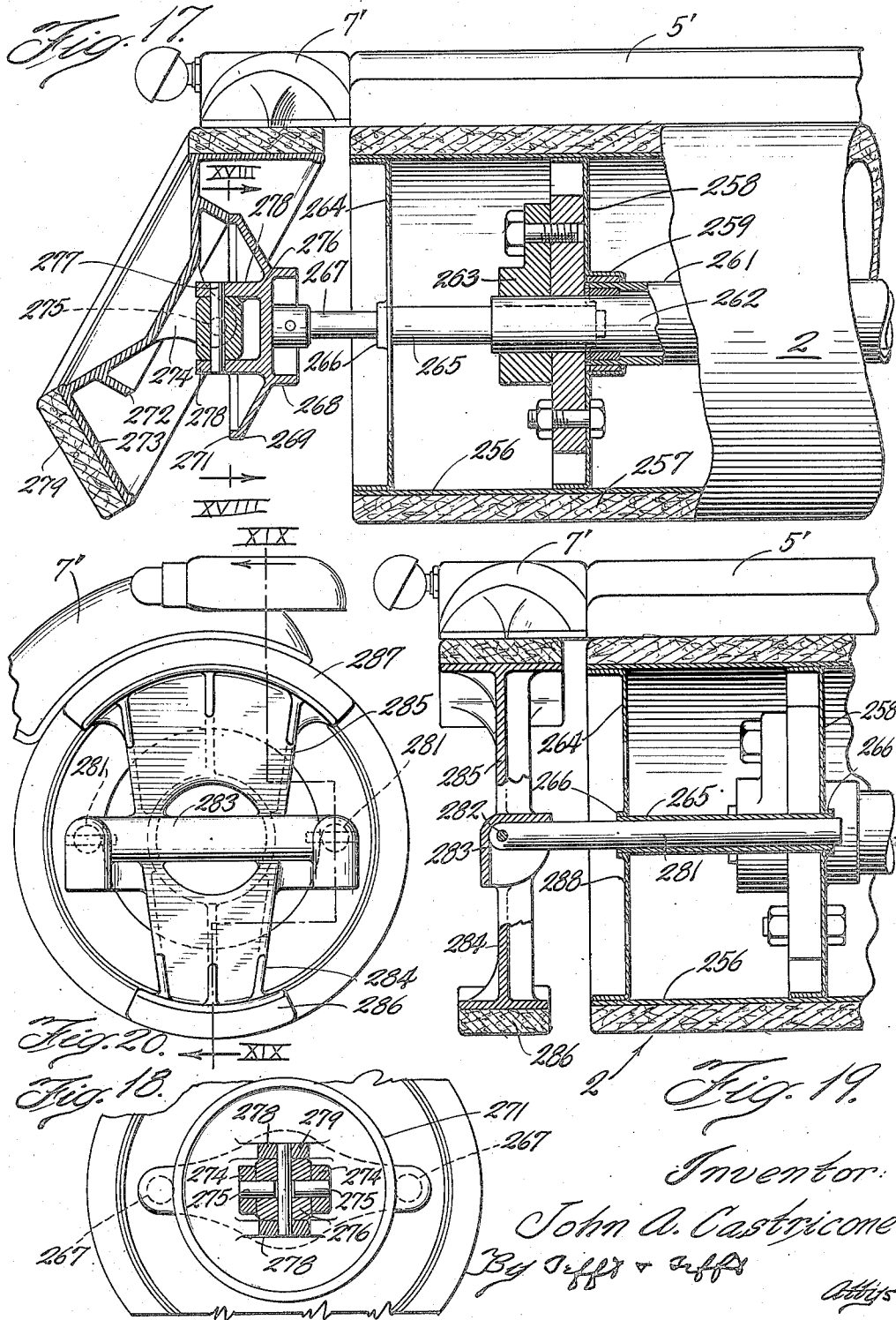
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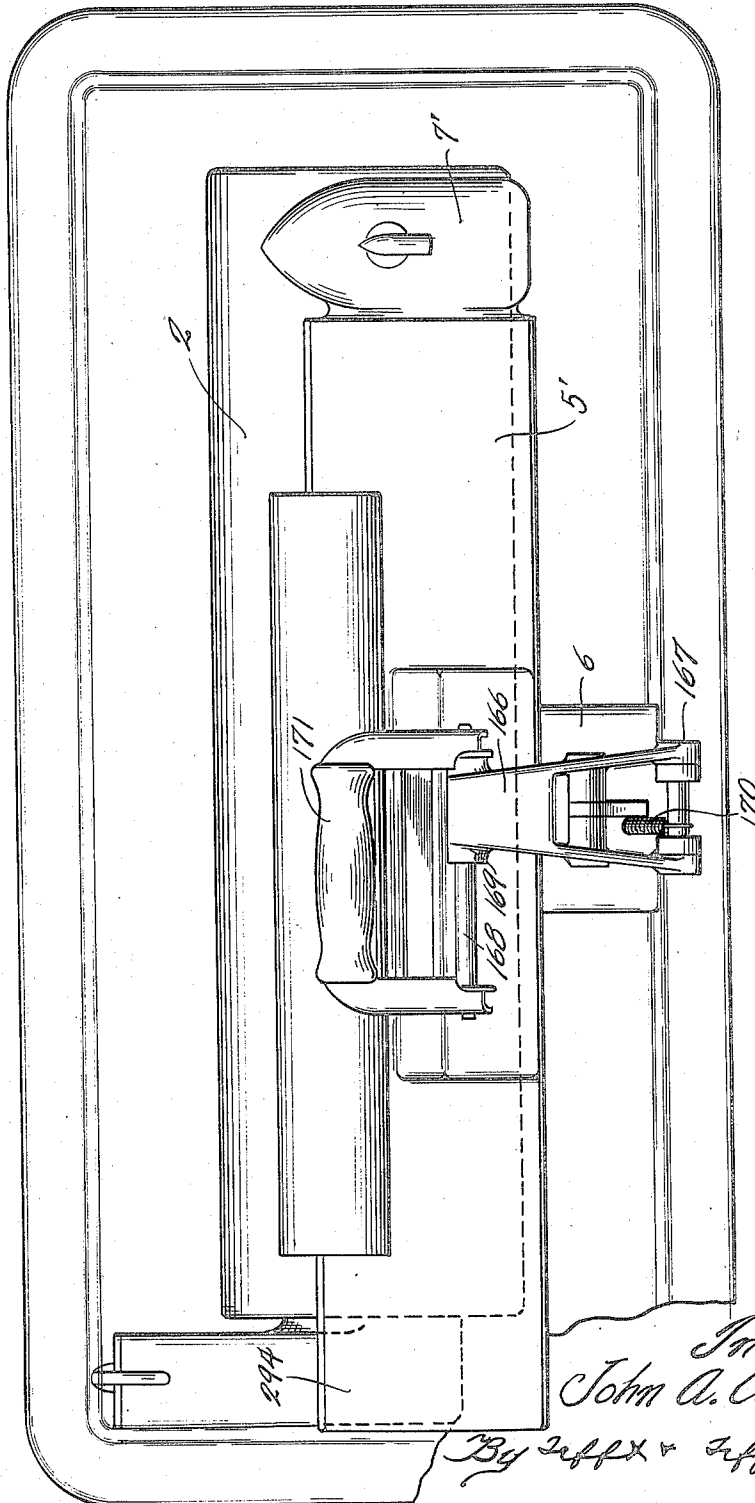


Fig. 24

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UNITED STATES PATENT OFFICE

2,115,941

IRONING MACHINE

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Application March 19, 1937, Serial No. 131,940

16 Claims. (Cl. 38—46)

This invention pertains to ironing machines for both domestic and commercial uses. The invention is illustrated as applied to an ironing machine of the roll bed type but as will become apparent hereinafter, certain features of the invention may be utilized in ironing machines of other types.

One of the primary objects of the invention is to provide an ironing machine in which one of the ironing members may be given a rocking or back-and-forth ironing movement of a character very similar to the movement utilized by a person in operating a flat or sad iron, whereby, for instance, a piece of cloth or other material may be thoroughly pressed without passing it through the ironer or between the ironing members several times. In the embodiment illustrated, the ironing roll or bed of cylindrical form is arranged to be rocked back and forth on its horizontal axis to effect the motions specified and for the purposes mentioned.

Another object is to provide an ironing machine mechanism whereby the ironing roll or bed and the ironing shoe may be moved longitudinally relative to one another for various purposes including the positioning of a portion of the roll or bed for cooperative relationship with an auxiliary ironing shoe and for the further purpose of permitting the use of cooperative ironing or pressing attachments or accessories to the machine. If desired, and as will be appreciated as the description unfolds, the longitudinal movements of either the main or auxiliary ironing shoe may be combined with the rocking movements of the roll.

Another object is to provide an auxiliary ironing shoe adapted to cooperate with the ironing roll or cylindrical bed or to cooperate with an auxiliary ironing roll or bed or with what may be termed ironing butts or pads for special ironing purposes, and to provide auxiliary ironing rolls, beds, butts or pads in the form of attachments, if desired, for cooperation with an ironing shoe.

A further object is to provide a novel arrangement for releasing the ironing shoe or shoes from its or their operative positions in order to permit the shoe or shoes to be moved to inoperative positions in case of failure of power or in any other emergency.

A still further object of the invention is to provide an ironing machine construction wherein two or more ironing shoes may be pressed against the work through the same mechanical power connections yet independently of one another.

Many other objects, the advantages and uses

of the invention will be or should become readily apparent after reading the following description and the claims and after viewing the accompanying drawings, in which

Fig. 1 is a front elevational view of an ironing machine incorporating a preferred embodiment of the invention;

Fig. 2 is an end elevational view of the right hand end of the ironing machine shown in Fig. 1;

Fig. 3 is a top plan view of the machine showing a combination shoe and flat iron;

Fig. 4 is a rear elevational view of the top portion of the machine on a scale slightly greater than the scale of Figs. 1 to 3, inclusive.

Fig. 5 is an end elevational view of the right hand end of the machine shown in Fig. 1 on an enlarged scale but with certain parts omitted showing a general arrangement of the roll driving and ironing shoe operating mechanisms.

Fig. 6 is an enlarged plan view of the roll and shoe operating mechanism taken substantially along the line VI—VI of Fig. 5;

Fig. 7 is a section taken substantially along the line VII—VII of Fig. 6 looking in the direction of the arrows;

Fig. 8 is a detail plan view of a part of the mechanism for controlling the operation of the ironing shoe and the ironing roll;

Fig. 9 is a detail view taken substantially along the line IX—IX of Fig. 8 looking in the direction of the arrows;

Fig. 10 is a fragmentary view taken substantially along the line X—X of Fig. 6;

Fig. 11 is a fragmentary plan of a part of the mechanism utilized in controlling the operation of the ironing shoes;

Fig. 12 is a fragmentary elevation view, partly in section, along the line XII—XII of Fig. 11;

Fig. 13 is a transverse vertical section taken along the line XIII—XIII of Fig. 12;

Fig. 14 is a transverse vertical section taken substantially along the line XIV—XIV of Fig. 11;

Fig. 15 is a fragmentary elevational view showing parts in section and taken along the line XV—XV of Fig. 4;

Fig. 16 is an enlarged detail view of a portion of the emergency iron release mechanism illustrated in the left hand corner of the face of Fig. 4;

Fig. 17 is a view of the left hand end (as respects the front of the machine) of the ironing roll with parts broken away to illustrate the support for the roll, the view also illustrating a conical roll attachment and a modified form of iron-

ing shoe wherein primary and secondary shoes are integral or structurally secured together.

Fig. 18 is a fragmentary end elevation taken along the line XVIII—XVIII of Fig. 17;

Fig. 19 is a view of the left hand end of the ironing roll and ironing shoe illustrated in Fig. 17 with a different ironing bed or butt attachment, taken along the line XIX—XIX of Fig. 20;

Fig. 20 is an end elevational view of the mechanism illustrated in Fig. 19;

Fig. 21 is a more or less diagrammatic view of an end of an ironing roll and overhanging end portion of an ironing shoe with a special flexible ironing attachment, bed or butt between the shoe and roll;

Fig. 22 is also a diagrammatic view of the mechanism illustrated in Fig. 21 and Fig. 23 is an enlarged section taken along the line XXIII—XXIII of Fig. 21 illustrating the construction of the flexible ironing bed or butt, and

Fig. 24 is a top plan view of an ironing machine with the modified form of ironing shoe illustrated in Figs. 17 to 20 inclusive, in operative association therewith;

The machine in general

The ironing machine illustrated in all views except Figs. 17 to 20, inclusive, comprises in general, an ironing roll 2 supported at one end by a standard or frame 3 upon a cabinet 4, a primary ironing shoe 5 supported upon a standard 6, a secondary or auxiliary iron 7 supported upon a standard 8, driving or operating mechanism carried within a housing 9 in turn enclosed by the cabinet 4, and a motor 10 to supply the power necessary to operate the various mechanisms. Whereas controls for controlling the operation of the machine are illustrated and will be described in conjunction with the parts controlled, the control switches for the motor itself and for the heating elements have not been illustrated, but may be assumed to be the ordinary devices usually employed for such purposes.

The drive mechanism

The shaft of the motor 10 may be coupled through any suitable coupling mechanism with a vertically mounted shaft 11 which finds bearing in a bearing member 12 carried on the housing 9. The upper end of the shaft 11 carries a worm 13 which at its upper end is journaled in a bearing 14 carried in a boss or projection 15 formed integral with or otherwise secured to the housing 9. The worm 13 engages and drives a worm gear 16 which is rotatably mounted upon a shaft 17 which at one end is carried in a bracket 18 secured to the housing member 9 and which at its other end is secured by a reduced portion 19 within a boss 21 on the housing 9. The shaft 17 is provided with an enlarged portion 22 which provides sufficient strength for it to act as a journal for a pinion 23 which is rotatably mounted thereon. The end of the pinion adjacent to the worm gear 16 is provided with a clutch member 24 adapted to be engaged with and to be disengaged from a clutch member 25 formed integral with or otherwise secured to the worm gear 16. A clutch operating member receiving groove 26 is provided between the teeth of the pinion 23 and the clutch member 24 for engagement of a forked clutch control member or arm 27 which, as will be described hereinafter, serves to shift the pinion longitudinally of the shaft portion 22 to engage or disengage the clutch parts 24 and 25.

A member 28 formed with gear teeth 29 meshed with the teeth of pinion 23 at one end and having an eccentric or cam 31 at its other end, is rotatably mounted between hardened plates 32 and 33 on a stub shaft 34 secured in a boss 35 on the housing 9. An eccentric strap 36 surrounds the eccentric or cam 31 and forms part of a crank arm 37 which is pivoted at its opposite end by a pivot pin 38 to a rocker arm 39 pivotally mounted upon a stub shaft 41 secured in a boss 42 formed on the housing 9. The opposite end of the rocker arm 39 has a sector gear 43 formed integral therewith and adapted to mesh with a pinion 44.

The pinion 44 carries a bushing 45 rotatably upon a reduced end of a shaft 46 and is also rotatably mounted in a bushing 47 carried by a boss 48 on the housing 9. A cap 49 may be used to close the end of the bearings to form a seal for the bearing. The opposite end of the shaft 46 is rotatably supported in a bushing 51 secured to a bracket 52. This end of the shaft also carries a sprocket 53 which is secured thereto as by set screw 56. Spaced from the bushing 51 by a thrust collar 57 which is pinned on the shaft by means of pin 54, is a pinion 58 which is freely rotatable on the shaft 46. Between the pinions 44 and 58 is a clutch collar 59 which is splined to the shaft 46 by a plurality of splines 61 and which at one end is slotted as at 62 for clutching engagement with pins 63 rigidly secured in pinion 58. The opposite end of the clutch collar 59 is provided with a number of slots 64 adapted to engage in corresponding teeth 65 formed in the inner end of pinion 44. The splined portion of the shaft 46 is enlarged to provide a shoulder to position the pinion 58.

The clutch collar 59 has an annular groove 66 within which a clutch shifter block 67 is disposed, the shifter block being pivotally mounted upon a pin 68 eccentrically secured to a flanged stub shaft 69 rotatably supported in a forked carrying member 71 in turn supported by three cap screws 70 secured in bosses 72 (only one shown) formed on the housing. Mounted on the stub shaft 69 between the forked arms of member 71 and secured to the shaft by a shear pin 73 is a pinion 74 which meshes with a sector gear 75 rockably mounted upon a pivot 76 fixedly secured to a part of member 71. The sector gear 75 forms one arm of a lever the other arm 77 of which is pivotally connected as at 78 to a rod 79 which is connected through a lever—and suitable connections with a control handle 81. Movement of the control handle 81 in one direction will operate the sector gear 75 to cause rotation of the pinion 74 which in turn will shift the clutch collar 59 longitudinally of the shaft 46 to engage pinion 44 or pinion 58 depending upon which connection is desired and the direction in which the control handle 81 is moved. The extent of movement of the sector gear 75 is determined by the abutment of a stop pin 82 fixedly secured to the sector gear 75 and rocking in a closed slot 83 formed in an extension 84 of one arm of the forked supporting member 71.

Between the rocker arm 39 and the internal end of the stub shaft 41 is a pinion 85 which is rotatably mounted on this shaft and held in place thereon by a thrust washer 86 in turn held in place by a cotter or shear pin 87. The pinion gear 85 is arranged at all times to mesh with pinions 23 and 58 and the gear 29 likewise at all times is in mesh with pinion 23 regardless of whether the clutch members 24 and 25 are en-

gaged or not. When the motor is in operation driving the worm gear 16 and the clutch members 24 and 25 are engaged, the gears 23, 29, 43, 44, 58 and 85 will be in motion although the shaft 46 may be still if the clutch collar 59 should be in a neutral position. If the clutch collar 59 be shifted to connect the shaft 46 with pinion 44, the shaft 46 will be rocked back and forth whereas if the collar 59 be shifted to connect the shaft with pinion 58, the shaft 46 will be rotated.

The roll support 3 is hollow and of a cantilever form as more clearly illustrated in Fig. 5. Intermediate of its length is a shaft 88 which carries a large sprocket 89 and a smaller sprocket (not shown). A chain 91 is trained over sprockets 53 and 89 and a chain 92 is trained over the other sprocket on the shaft 88 and over sprocket 93 which in turn is connected with the roll 2 for driving the same. The arrangement is such that the roll 2 may be rotated in the direction of the arrow shown in Fig. 5 or may be oscillated.

The bottom of the housing 9 is so formed as to provide an oil sump within the low part 94 of which a small idler gear 95 is mounted for rotation upon a shaft 96 secured in the housing. This idler gear is arranged to dip into a body of oil 97 carried in the sump and to carry the same to the worm gear 16 and to other moving parts but as this mechanism and the bearing boss 12 (the bearing boss 12, incidentally, is removable from the housing) form no part of the present invention and are described and claimed in my co-pending application, Serial No. 69,007, filed March 16, 1936, they will not be further described herein.

Power applying mechanism for roll and ironing shoe rock shaft

Rotatably mounted on the shaft 17 is an element 98 which is arranged to be rotated between the position in which it is illustrated in Figs. 6 and 8 and a position of 180° removed therefrom. The inner end of element 98 is provided with two transverse slots 99 and 101 which are substantially at right angles to one another. Within the slot 99 and pivotally mounted upon a reduced portion 110 of the member 98 is a member 102 having oppositely directed fingers 103 and carrying a pin 104 and normally urged in a counter-clockwise direction about the portion 104 (viewing Fig. 9) by a tension spring 105 fixed between a post 106 and one of the fingers 103 and a post 107 carried by the element 98. Within the slot 101 and slidable therein is a plate 108 which is slotted as at 109 to receive the pin 104, which has an elliptical slot 111 through which the shaft 17 and the portion 110 pass freely, and which is provided with a plate 112 at one end, the plate 112 being rigidly secured thereto in any suitable manner. The plate 112 has a tooth 113 adapted to be received in any one of a series of conforming depressions or notches 114 formed in a disc 115 secured to the worm gear 16 for rotation therewith. The plate 108 retains the member 102 in its position in its slot while the plate 108 in turn is retained in its position by cap screws or the like 116.

Normally in the position shown in Fig. 9 where it serves to engage one of the fingers 103, is a dog 117 formed on one end of a lever 118 pivoted upon a pivot pin 119. This dog 117 may be released from a finger 103 when the lever 118 is moved about its pivot in the direction of the arrow shown thereon in Fig. 9, whereupon the spring 105 will swing the member 102 about its pivot to the op-

posite side of slot 99 from the position in which it is shown in Fig. 9, thereby causing the pin 104 to move the slide plate 108 to the left, thereby engaging the tooth 113 with one of the recesses 114 in the disc 115, and element 98 will proceed to rotate with gear 16 if this gear is being rotated.

The lever 118 is arranged to be operated through certain connections, including a pull rod 121, a crank arm 122 secured on one end of a pivot pin 123 rotatably mounted in a boss 124 on the housing 9, a crank arm 125 secured on the opposite end of pivot pin 123, a pull rod 126 and a lever 127 pivoted within the cabinet at 128 and pivotally connected to the pull rod 126 as at 129. In order to limit the movement of cranks 122 and 125 and thus the extent of movement of lever 118, the crank 125 is continued beyond the pivot 123 where it is forked to provide projections 120 both of which are arranged to engage a pin 130 secured to the frame of the machine. The lever 127 is arranged to be operated by the knee of the machine operator. It is intended that the lever 127 shall be pushed by the operator only momentarily and only long enough to release the dog 117 from behind the tooth 103 whereupon the control will be immediately released so that the dog 117 is free to engage behind a succeeding finger 103 to which position it is returned immediately by the action of a tension spring 121' which may be secured between the pull rod 121 and a portion of the bracket 52. Thus when the element 98 has rotated 180°, the succeeding finger 103 will engage the dog, and through the medium of the pin 104, engaged with the walls of the slot 109, will move the tooth 113 out of engagement with the disc 115 and the element 98 will come to rest.

The outer end of element 98 is formed with an eccentric 131 about which an eccentric strap 132 is secured. At the high point of the eccentric and inwardly therefrom, a cam surface 133 is formed, the purpose of which will shortly appear. The eccentric strap 132 may be formed integrally with a housing 134 for a spring 135 one end of which spring is arranged to abut against tongues 136 struck from the housing 134. A rivet 137 may serve to hold the housing sides in position as well as to retain the end of the spring 135 in position. The opposite end of spring 135 bears against a pin 138 rigidly secured through and to the arms 139 of a forked crank member 141 fixedly secured to a rock shaft 142 rotatably mounted in bearings 143 carried by a boss 144 on the housing 9. The rock shaft 142 projects outwardly of the housing 9 where it is pinned by a pin 145 in sleeve boss 146 formed in a casting 147. A hardened plate 148 also surrounds this end of the rock shaft 142 and is secured to the casting 147 by a bolt 149. The rock shaft 142 is extended even beyond the plate 148 where it enters a guide bushing member 151 securely pinned by a pin 152 to a shaft 153. The guide bushing member 151 is provided with an integral projecting portion 154 within which a plunger 155 is reciprocally mounted and normally urged toward the left (viewing Figs. 4 and 16) by a spring 156 which abuts at one end against a shoulder formed on the plunger 155 and a shoulder formed on a gland nut 157 which may be screwed into the member 154 but through which the plunger 155 is adapted to be slid.

The hardened plate 148 is provided with an aperture adapted snugly but slidably to receive the end of plunger 155 and when the plunger 155

is entered into this aperture the shaft 153 is rigidly connected with the rock shaft 142 to be rocked thereby.

It will be apparent that when the operator releases the dog 117 from one of the fingers 103 and the element has rotated through 180° the element will, in one position, come to rest as shown in Fig. 6 where the spring 135 will have been compressed and will have urged the pin 138 toward the extreme right. The forked crank member 141 and the rock shaft 142 will have been rocked to the position shown in Figs. 5 and 6, but, depending upon the extent to which the rock shaft 142 may be moved (this movement is determined by several factors although chiefly by the contact of an iron with a roll or bed member as will later appear) the pin 138 may ride back in the slots 140, while the spring 135 compresses. Upon the operator's next release of the dog 117 the element 98 will again rotate 180° at which time the tension upon the spring 135 will be released and the forked crank member 141 and the rock shaft 142 will be urged in a clockwise direction (viewing Fig. 5) and at this time the cam surface 133 will have engaged a projecting arm 158 secured between a flange 159 and a sleeve 161 carried by a plunger 162 slidably held in a boss 163 on housing 9 and urged outwardly of the boss by a spring 164. Held between the nut 165 and the sleeve 161 is the forked clutch control member 27. When the cam surface 133 strikes the arm 158 it forces the plunger 162 into the recess of the boss 163, compressing spring 164, and simultaneously, through the forked clutch control member 27 disengages the clutch elements 24 and 25.

The main ironing shoe and its operating mechanism

The standard 6 pivotally supports an ironing shoe carried by a support member 166 on a pivot 167 passing through ears 6^a on the standard 6. The ironing shoe 5 is mounted upon the supporting member 166 on a pivot pin 168 which is arranged to slide back and forth in a bearing boss 169 formed on the member 166, the pin 168 being securely fastened to a plate carried by the ironing shoe. A handle 171 is pivotally carried on the pin 168 and may be swung from the full line to the dotted line position of Fig. 5. The ironing shoe support 166 is arranged to be rocked about the pivot 167 to carry the iron toward or away from the ironing roll 2 by a curved operating rod 172 which at its upper end is pivotally secured as at 173 to the support 166 and at its lower end is pivotally connected as at 174 to one arm of a two part bell crank lever generally designated 175. A tension spring 170 connected between the pivot 167 and a post 170' secured to the operating rod 172 normally tends to pull the rod 172 upwardly and to swing the iron support 166 and the iron away from the ironing roll.

The two parts of the bell crank lever 175 may be in the nature of a casting 176 and a hardened steel anti-wear plate 177 abutting thereagainst and secured thereto by a rivet 177', the said casting and plate being rotatably carried on the rock shaft 153. The pivot pin 174 upon which the operating rod 172 is carried is firmly secured in the member 176 and rod 172 is held in place by a washer and pin together designated 178. The member 176 may be provided with a projection or boss 179 to serve as a stop for purposes to be described and the two bell crank members 176 and 177 are provided with register-

ing apertures generally designated 181, for the reception of a connecting bolt or pin 182. The shaft 153 finds support in a bearing member 183 secured in a frame member 184 fixed between the cabinet top and a housing member 185 which is arranged to house the emergency release mechanism, the rock shaft and mechanism for operating the primary ironing shoe 5. The rock shaft 153 projects onward beyond the bell crank lever 175 and is bored concentrically to receive and provide a bearing support for one end of an auxiliary rock shaft 186 which is connected with the auxiliary iron 7.

The connecting bolt or pin 182 is utilized to connect either the auxiliary iron 7 or the primary iron 5 with rock shaft 153 so that whichever iron is desired for use may be operated leaving the other iron idle and out of operating position. This pin 182 is slidably carried in arms 187 of a member 188 which is fixedly secured to the shaft 153 for rotation therewith by a pin 189. A thrust plate 191 forming an additional support for the shaft 186 is secured to the ironing machine frame. The auxiliary iron rock shaft 186 carries a crank arm 192 pinned thereto as by pin 193, the crank arm 192 having an aperture 194 therein for reception of the connecting bolt 182. It will be noted that if the connecting bolt 182 is moved sufficiently to the left (viewing Fig. 12) its left hand end will pass through the registering apertures in the two parts of bell crank lever 175 and will connect the operating rod 172 with the rock shaft 153. The auxiliary rock shaft 186 will be disconnected from the rock shaft 153 at this time. If on the other hand the connecting bolt 182 is shot to the right (viewing Fig. 12) its right hand end will enter the aperture 194 in the crank arm 192 and connect the auxiliary rock shaft 186 with the rock shaft 153, at the same time disconnecting the primary iron from the rock shaft 153.

In view of the possibility that the primary iron when disconnected from the rock shaft, might be swung by the spring 170 to a position where it might be difficult again to insert the bolt 182 in the hole or aperture 181 in the bell-crank 175, stop members may be provided to insure registration of the pin or bolt 182 with the aperture. To this end a stop lug 6' on the standard 6 is arranged to be engaged by a stop member 172' adjustably mounted upon the operating rod 172. The stop member 172' is adjustably positioned to engage the stop lug 6' to limit further movement of the primary iron when the main rock shaft is in its released position (i. e. when both the primary and the auxiliary ironing shoes are in released positions) and at which time the bolt 182 is in register with the aperture 181. It will also be noted that the ends of bolt 182 are slightly tapered or bevelled to aid in entering the bolt in the apertures 181 and 194.

The mechanism for shifting the bolt 182 comprises a shift lever 195, one end of which is engaged in a slot formed in the top of the bolt 182 and the other end 196 of which is connected with a spring overthrow mechanism which will be described. The center portion of the lever 195 is secured against rotation relative to, but for rotation with, a pivot pin 197 which is rotatably mounted in an arm 198 carried by the member 188 while the upper end of the pin 197 is secured for rotation with but against rotation with respect to an operating arm 199 which in turn is connected with a pull and push rod 201 leading to a hand control lever to be described.

A branch arm 202 of the arm 198 carries a pivot pin 203 which rotatably supports a cage 204 within which a tension spring 205 is carried. The spring is centered and secured at one of its ends by a projection or lug 206 struck from the cage 204 and at its other end is secured about a pin 207 riveted to the arm 196 of the lever 195 and projecting between spaced arms 208 formed on the upper portion of the cage 204. This over-throw mechanism operates, when the pull or push rod 201 is pulled or pushed, to snap the lever 195 and the bolt 182 from one extreme position to the other so that the bolt may connect either the primary iron or the auxiliary iron with the rock shaft 153.

Before proceeding to describe the auxiliary iron and its immediately associated operating mechanism it may be desirable to digress momentarily to describe the connections by which the machine operator may control the emergency release and the mechanism for connecting and disconnecting the primary and auxiliary irons with the rock shaft. At the front of the cabinet for quick action by the operator is a lever 209 which at one end carries a knob 211. The other end of the crank lever 209 passes through a pivot bearing 212 at the front of the cabinet and projects rearwardly of the cabinet through a boss 213 in a frame element to a connection with a crank 214 which is slotted as at 215 to receive one end of a shift lever 216, the other end of which is pivotally mounted upon the machine frame as at 217. The emergency release plunger 155 is connected with a pull rod 218 by a pivot pin 219 and the rod 218 is pivotally connected to the shift lever 216 by a pivot 221. In case the motor should fail while either iron is being pressed against its ironing bed, the operator may disconnect the rock shaft 153 from the rock shaft operating mechanism merely by swinging the lever 209 and its knob in a clockwise direction and the irons may then be thrown to their inoperative positions.

Also at the front of the cabinet and within the convenient reach of the operator is a lever control member 222 pivotally supported in the cabinet frame on a pivot 223 and pivotally connected as at 224 with the push-pull rod 201. By pushing or pulling on the upper end of lever 222, the operator may shift connecting bolt 182 to connect whichever iron is desired for use.

The auxiliary iron and its immediate operating mechanism

The auxiliary iron 7 is carried by a pair of parallel arms 225 which are pivotally secured to the iron upon pivots 226 at one end and which at their other ends are pivotally secured as at 227 upon brackets 228 carried by a cap 229 pivotally carried by a pivot 231 at the upper rear portion of the standard 8.

The auxiliary iron 7 is moved against its cooperating ironing bed and away therefrom by a rod 232 which passes through an aperture 233 formed in a boss in the cap member 229. Adjustment nut 234 threaded on the upper end of the rod 232 serves to confine and compress a spring 235 between cup washers 236 one of which abuts the nut and the other of which abuts the upper rounded end of the boss through which the rod 232 passes. A pin 237 and a washer 238 serve to limit the extent to which the rod 232 may pass upwardly through the aperture 233 and the bottom portion of the boss is rounded as is the top part to permit certain slight rocking or adjustment motion between the rod and cap member

229. It will also be noted that the aperture 233 is made considerably larger in diameter than the diameter of the rod 232 to permit of relative adjustment between the cap member 229 and the rod 232; likewise a lug 239 formed on the standard 8 at its lower end has an aperture through which the rod 232 passes and this aperture is large enough to give a substantial amount of clearance around the rod. A tension spring 241 engaged at one end with the pivot 231 and at its other end secured to the rod 232 as at 242 normally tends to raise the rod 232 and the cap member 229 which in turn tends to lift the auxiliary iron from its bed. The tension of this spring 241 is overcome and the iron is moved against its bed by certain connections between the rod 232 and the rock shaft 186 now to be described.

The lower end of the rod is firmly secured to one leg of an L-shaped plate 243, the other leg 244 of which has an elongated aperture 245 through which the auxiliary rock shaft 186 passes and a second elongated aperture 246, the major axis of which is substantially at right angles to the major axis of the aperture 245 through which a crank pin 247 is carried by a crank arm 248 cast integral with a crank member 249 which may be adjustably secured to the auxiliary rock shaft 186 by a set screw 251. As in connection with the primary iron, it is desirable to insure registration of the bolt 182 with the aperture 194. This is very easily accomplished by loosening the set screw 251, adjusting crank member 249 about shaft 186 to the proper position to secure the result desired and again tightening the set screw. It will be appreciated that the position of the axis of slot 245 with respect to a point on shaft 186 not only determines the length of travel of operating rod 232 but also will determine the position of the arc of movement of shaft 186 and crank arm 192 thereby fixing the position of crank arm 192 for register of aperture 194 with bolt 182.

A bearing member 252 suitably supported from the frame of the machine rotatably carries the outer end of the auxiliary rock shaft 186. A rod or link 253 engaged at one end in a strap 254 secured to the primary iron 5 and at its other end secured in a lug 255, carried by one of the parallel arms 225 may be employed to connect the auxiliary and primary irons for simultaneous shifting movements longitudinal of the ironing bed or roll 2 but as will be understood this link may be disconnected and either iron used independently of the other if such use be desired. The auxiliary shoe 7 may be shifted so as to operate on the end of the roll or on any of the attachments hereinafter described.

Certain ironing attachments

Referring more particularly to Figs. 17 to 23, inclusive, and for the present, to Figs. 17 and 18, it will be noted that the ironing roll or pad 2 is composed of a sheet metal cylinder 256 about which suitable padding and the like 257 is secured in any manner well known in the art. A dished plate 258 is welded or otherwise secured to the cylinder 256 at a place a fair distance inside of the outboard end of the cylinder and has a cylindrical flange 259 adapted to surround and rotate about a stationary hollow shaft 261 which at its end shown in Fig. 17 is free and unsupported although at its opposite end it is rigidly secured in any suitable manner to the standard 3. A round shaft 262 secured at its outboard end to a spider 263 which in turn is firmly secured to the dished plate 258, has its opposite end mounted in

a suitable bearing and firmly secured to the sprocket 93 for rotation therewith. The end of the cylinder 256 is partially closed by a dished plate 264 which is welded or otherwise firmly secured to the cylinder 256.

At places 180° displaced from one another on a diameter passing through the axis of the cylinder 256 and centered equal distances from said axis are two sleeves 265. These sleeves may be firmly secured to circular upstanding flanges 266 formed in the dished plates 258 and 264. The sleeves 265 are arranged slidably to receive a pair of rods 267 which are firmly secured to what may be termed a hub member 268 which has an outwardly flared circular portion 269 the outer edge surface 271 of which is finished to provide a guiding surface adapted to cooperate with a beveled guide surface 272 formed on a circular flange integral with a conical roll member 273. The roll 273 has a pair of spaced arms 274 which are pivoted upon pivot pins 275 carried by a block 276 which in turn is pivoted at right angles to the pins 275 upon a pivot pin 277 carried by arms 278 formed on the hub member 268. Suitable padding 279 on the surface of the conical roll 273 surfaces the roll for ironing purposes.

In Fig. 17 modified forms of ironing shoes are shown, the primary shoe 5' being shown as integral with or otherwise firmly secured to the auxiliary shoe 7'. However, the auxiliary ironing roll 273 will cooperate with either the auxiliary iron 7 or the auxiliary iron 7' and it is immaterial that the roll 273 happens to be shown in connection with the ironing shoe 7'. In either case when the roll 273 is in use the pressure of the auxiliary ironing shoe upon the top of the roll will maintain the roll in position illustrated in Fig. 17 with the guide surface 272 rolling upon the guide surface 271 as the primary roll rotates. It is a simple matter to attach or detach the conical roll 273 to and from the primary roll and some ironing operations which could not be performed between the primary roll and the primary shoe may be performed by the use of the auxiliary roll 273 and the auxiliary ironing shoe.

In Figs. 19 and 20 a segmental ironing pad attachment has been illustrated. Here as in the case of the previous attachment a pair of rods 281 are insertable into the sleeves 265 but are pivotally connected upon pivot 282 upon an elongated hub member 283. A pair of arms 284 and 285, one carrying an ironing bed 286 of small arc and the other carrying an ironing bed 287 of larger arc, are cast integral with or otherwise secured to the hub 283.

Inasmuch as there may be occasions when it is desirable to retain this segmental ironing bed connected with the main ironing roll but free from cooperative relationship with an auxiliary ironing shoe, the operator may pull the segmental bed endwise until the segmental bed portions may be swung about the pivot 282 to dispose the smaller segmental bed 286 in line with an aperture 288 formed in the dished member 264 whereupon the operator may push the segmental bed 286 through the aperture. Similarly if it be desired to move the conical ironing bed or roll 273 out of cooperative position with an auxiliary ironing shoe, it is merely necessary to raise the ironing shoe from the conical bed and permit the roll to swing about one of its universal joint pivots so that the low point of the guide surface 272 is continuously engaging the low point of the guide surface 271.

In Figs. 21 to 23, of which Figs. 21 and 22 are more or less diagrammatic, what may be termed

a flexible ironing board or ironing bed has been illustrated. This flexible bed, generally designated 289, may be composed of a sheet of spring steel 291, although it may be composed of other suitable material, covered by felt or other suitable fabric covering 292 on both sides. The fabric covering preferably extends beyond the marginal edges of the steel core and is sewn together around the margin as by sewing 293. The particular flexible board illustrated is designed for pressing or ironing portions of articles such as a shirt about the collar thereof for which purpose an arcuate notch 294 is provided in one of the longitudinal edges of the board. The flexibility of the board permits it to be passed through the ironing machine between the ironing shoe and the primary or an auxiliary roll, the board flexing to conform to the ironing surfaces as it passes through and thereafter to restore itself to its original flat position. It will also be noted, as illustrated in Fig. 21, that when the primary ironing shoe has been shifted where its end 294 overhangs one end of the ironing roll (in embodiments illustrated at the end of the roll adjacent to the standard 3) the machine is ideally arranged for use of the flexible pad 289.

Operation of the machine

Assuming that the motor switch (not shown) has been thrown to start the motor 6, the worm 13 will drive the worm gear 16 continuously. As soon as the operator nudges the control lever 127 with her knee, the dog 117 will be released from behind the finger 103, shown at the top of Fig. 9, but which at this time will have been situated at the bottom. As soon as the dog 117 releases this finger 103, the tooth 113, engaging in a notch 114, will rotate the member 98 through 180° at which time the lever 127, having been released, the dog 117 will engage the succeeding finger 103 putting the parts in the position where they are illustrated in Fig. 9. At this time the eccentric 131 will have compressed the spring 135 and will have rocked the rock shafts 142 and 153 in a clockwise direction (viewing Figs. 13 and 14).

The 180° rotation of the member 98 will have carried the cam 133 away from the projecting arm 158 and the spring 164 will have moved the sleeve 161 to carry the clutch control member 27 and the gear 23 longitudinally of the shaft 22 to engage the clutch members 24 and 25. As soon as the clutch members 24 and 25 are engaged, the gear 23 will drive the gear 29 and the gears 85 and 58 and the gear 29, through the connections previously described, will rock the sector gear 43 which in turn will rock the gear 44. Depending upon whether the operator desires to have the ironing bed or roll 2 rotated or rocked, she will move the control handle 81 to the right or to the left, thereby engaging either clutch elements 62 and 63 or clutch elements 64 and 65, respectively.

If the primary and not the auxiliary iron is to be used, the operator will shift the lever 222 in such direction as to shift the connecting bolt or pin 182 between the member 188 and the bell crank lever 175 whereupon, when the rock shaft 153 is rocked, as previously described, the primary iron will be brought down upon the ironing roll. If on the other hand, the operator desires to utilize the auxiliary iron, the lever 222 will be moved in the opposite direction to that previously mentioned, to shift the connecting bolt or pin 182 between the members 187 and 194, at the same time releasing the primary ironing shoe.

The stop 179 is provided to prevent the bolt

182 from over-riding the plate 177 and engaging behind the inner edge thereof with possible serious damage resulting therefrom, as might occur were someone to press the primary ironing shoe against the roll and then attempt to shift the bolt to connect this shoe to the rock-shaft. Were the primary shoe to be pressed against the roll under such circumstances, the bolt cannot slip past the edge of plate 177 because the boss 187 will engage the stop 179 and tend to throw the primary iron back to its inoperative position and, in any event, will prevent the bolt from riding beyond the edge of plate 177. Similarly, a stop 179' serves to prevent the opposite end of the bolt from catching behind an edge of crank 192.

The ironing machine illustrated and any other machine which may be utilized with ironing shoes and shoe control and operating mechanisms of a character such as described, when assembled with primary and secondary irons integrally or otherwise rigidly connected together as depicted in Figs. 17 to 20, inclusive, and Fig. 24 will not utilize a separate mount for the auxiliary ironing shoe nor the mechanism for connecting and disconnecting the auxiliary shoe with the shoe rock shaft. This, of course, is more or less obvious. However, the remainder of the operating mechanism may be the same as or closely similar to that described, supra.

The primary shoe 5' and the auxiliary shoe 7' because they are integrally or otherwise secured together as a unit, will be shiftable together longitudinally of the ironing roll or bed 2 by means of handle 171 either to cause the end of the primary shoe 5' to overhang the supported end of bed 2 or, when shifted in the opposite direction, to cause the auxiliary or secondary shoe 7' to overhang or project beyond the opposite end of the bed 2. The flexible bed 289 may be used with the overhanging end of the primary or main shoe 5' or it may be used with the secondary or auxiliary shoe 7' in a similar manner. Then, too, the auxiliary shoe 7' may be used with the various other auxiliary rolls or attachments as will be appreciated. The auxiliary shoe 7' may be pointed at its forward end after the manner of an ordinary hand iron for the purpose of that arrangement.

While I have illustrated and described a preferred form of the invention and preferred types of attachments and have indicated certain modifications of features thereof, many other variations and arrangements may be devised within the purview of my contribution. Consequently I do not desire to be limited except by the spirit of the invention and the scope of the appended claims.

I claim:

1. In a clothes ironing machine, the combination with a feeding and presser roll and cooperatively mounted ironing shoe, of mechanism for rotating the roll either continuously in one direction or in to-and-fro partial rotations, and setting means for said mechanism whereby it will rotate the roll in said continuous direction or automatically repeat to-and-fro partial rotations thereof.

2. In a clothes ironing machine, the combination with a feeding and presser roll and a cooperatively mounted ironing shoe, of mechanism for operating the roll including a motor and instrumentalities interposed between said motor and said roll, comprising means to rotate the roll continuously in one direction and means for

effecting automatic oscillations of the roll between fixed limits, and controlling means to effect either of said actuations.

3. In a clothes ironing machine, the combination with a feeding and presser roll and cooperatively mounted ironing shoe, of mechanism to impart to said roll successive oscillations between two fixed limits about its axis while it is maintained in a fixed position, and control means to start up said successive oscillations and for stopping the same at will.

4. In a clothes ironing machine, the combination with a feeding and presser roll and cooperatively mounted ironing shoe, of a motor, and mechanical instrumentalities between the motor and the roll to effect rotation of the latter, said mechanism including instrumentalities whereby the roll will have rotation continuously in one direction and other instrumentalities whereby said roll will have successive to-and-fro partial rotations, and control means for selectively effecting the operation of either of said instrumentalities.

5. In a clothes ironing machine, the combination with a feeding and presser roll, of an ironing shoe, means for effecting engagement of the articles to be ironed between the roll and shoe, and mechanism for imparting continuous oscillations of the roll between two fixed limits, whereby a particular area of the said article will be subjected to correspondingly repeated pressing actions of mechanically predetermined extent.

6. In a clothes ironing machine, the combination with a feeding and presser roll, of an ironing shoe, means for effecting engagement of the article to be ironed between the roll and shoe, and mechanism for imparting an automatic succession of to-and-fro partial rotations of the roll whereby a particular area of the said article will be subjected to correspondingly repeated pressing actions of mechanically predetermined extent, said mechanism including means to effect continuous rotation of the roll to an unlimited extent in one direction, and means for selectively effecting either said to-and-fro partial rotations or said continuous rotation.

7. In an ironing machine, an ironing roll, an ironing shoe cooperatively associated with said roll, and operating mechanism including means for rotating said roll continuously in a given direction and means for imparting a continuous oscillatory movement to said roll while the roll is maintained in a given position with respect to the shoe, in combination with means for selectively effecting the operation of either said continuously rotating or said oscillating means.

8. In an ironing machine, an ironing roll, an ironing shoe cooperatively associated with said roll, and operating mechanism for rotating said roll continuously in one direction or for effecting continuous oscillatory movements of the roll and shoe between two fixed limits while the roll and shoe are maintained in a given position with respect to each other, in combination with a selective control for effecting either said continuous rotation or said oscillatory movements.

9. In a clothes ironing machine, the combination with cooperative members comprising a feeding and presser roll and ironing shoe mounted for relative movement towards and from each other, of operating mechanism including means for continuously rotating the roll in a given direction or for imparting to-and-fro movement between the feeding and presser roll and ironing shoe within fixed limits when in ironing engage-

ment while maintaining one of said members stationary and the roll in a given position with reference to the shoe, and a control for mechanically effecting the character of operation of the operating mechanism to accomplish ironing in a continuous direction or spot ironing in to-and-fro directions.

10. In a clothes ironing machine, the combination with a feeding and presser roll, a primary ironing shoe normally coextensive with the roll, and an auxiliary ironing shoe, of means for mounting the primary ironing shoe whereby the same may be moved into a different position longitudinally of the roll to uncover an end portion of the roll, and means for independently mounting the auxiliary ironing shoe whereby the same may be engaged with a portion of the roll which has been uncovered.

11. In a clothes ironing machine, the combination with a primary feeding and presser roll, an auxiliary presser member, and a movably mounted ironing shoe adapted to be bodily shifted into ironing relationship with either the primary presser roll or the auxiliary presser member.

12. In a clothes ironing machine, the combination with an ironing roll, and an ironing shoe having a curved under face complementary to the surface curvature of the ironing roll, of means for mounting said ironing shoe normally beyond the end of the ironing roll, said mounting for the ironing shoe being formed and arranged to permit the shoe to be moved substantially longitudinally of the roll into ironing relationship with the latter.

13. In a clothes ironing machine, the combination with a feeding and presser roll, a primary ironing shoe normally coextensive with the roll, and an auxiliary ironing shoe, of means for mounting the primary ironing shoe whereby the same may be moved into a different position longitudinally of the roll to uncover an end portion

of the roll, and means for independently mounting the auxiliary ironing shoe whereby the same may be engaged with a portion of the roll which has been uncovered, including connections between the primary and auxiliary shoes whereby the displacement of the former will cause the latter to assume its ironing position with reference to the roll.

14. In a clothes ironing machine, the combination with a feeding and presser roll, a primary ironing shoe normally coextensive with the roll and an auxiliary ironing shoe, of means for mounting said roll and shoes for relative longitudinal movement with respect to the roll whereby to effect pressing positioning of the roll and the primary ironing shoe or pressing positioning of the said roll and the auxiliary ironing shoe.

15. In a clothes ironing machine, the combination with a feeding and presser roll, of a cooperating ironing shoe substantially coextensive therewith, and means for supporting said shoe to enable swinging movement of the shoe toward and from the roll on an axis parallel to the axis of the roll, said supporting means including parts permitting adjustment of the shoe to various stations therealong and lengthwise of the roll.

16. In a clothes ironing machine, the combination with a feeding and presser roll and cooperating ironing shoe, of supporting means whereby the shoe may be swung towards and from the roll on an axis parallel to the axis of the roll and adjusted to different stations along said supporting means and lengthwise of the roll, and means enabling manual positioning of the shoe to successive stations along said supporting means to suit the article being ironed, so that said article may be supported on an exposed portion of the roll beyond the shoe and the shoe moved up at will to pressing relationship with said article to correspondingly iron succeeding portions thereof.

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