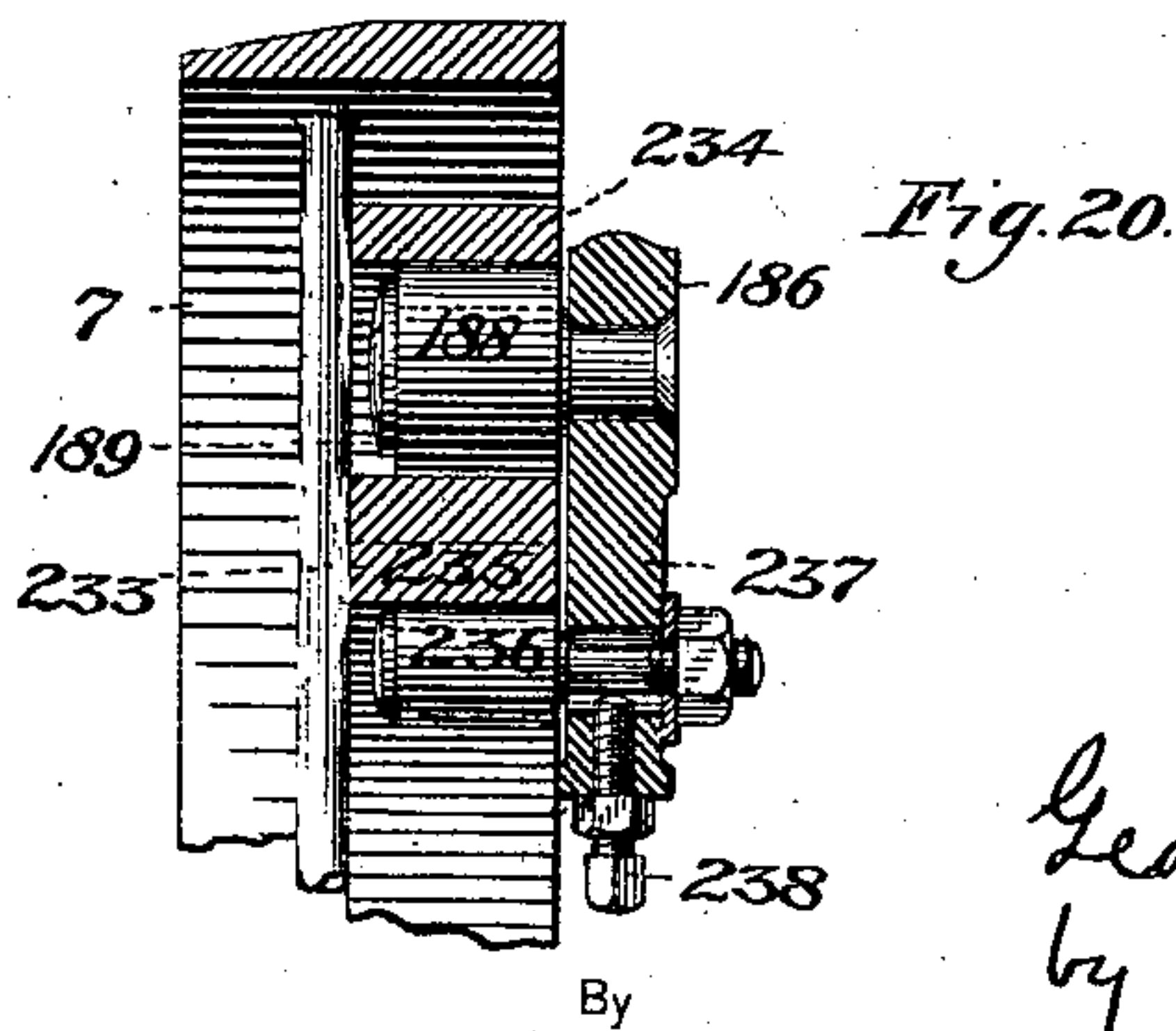
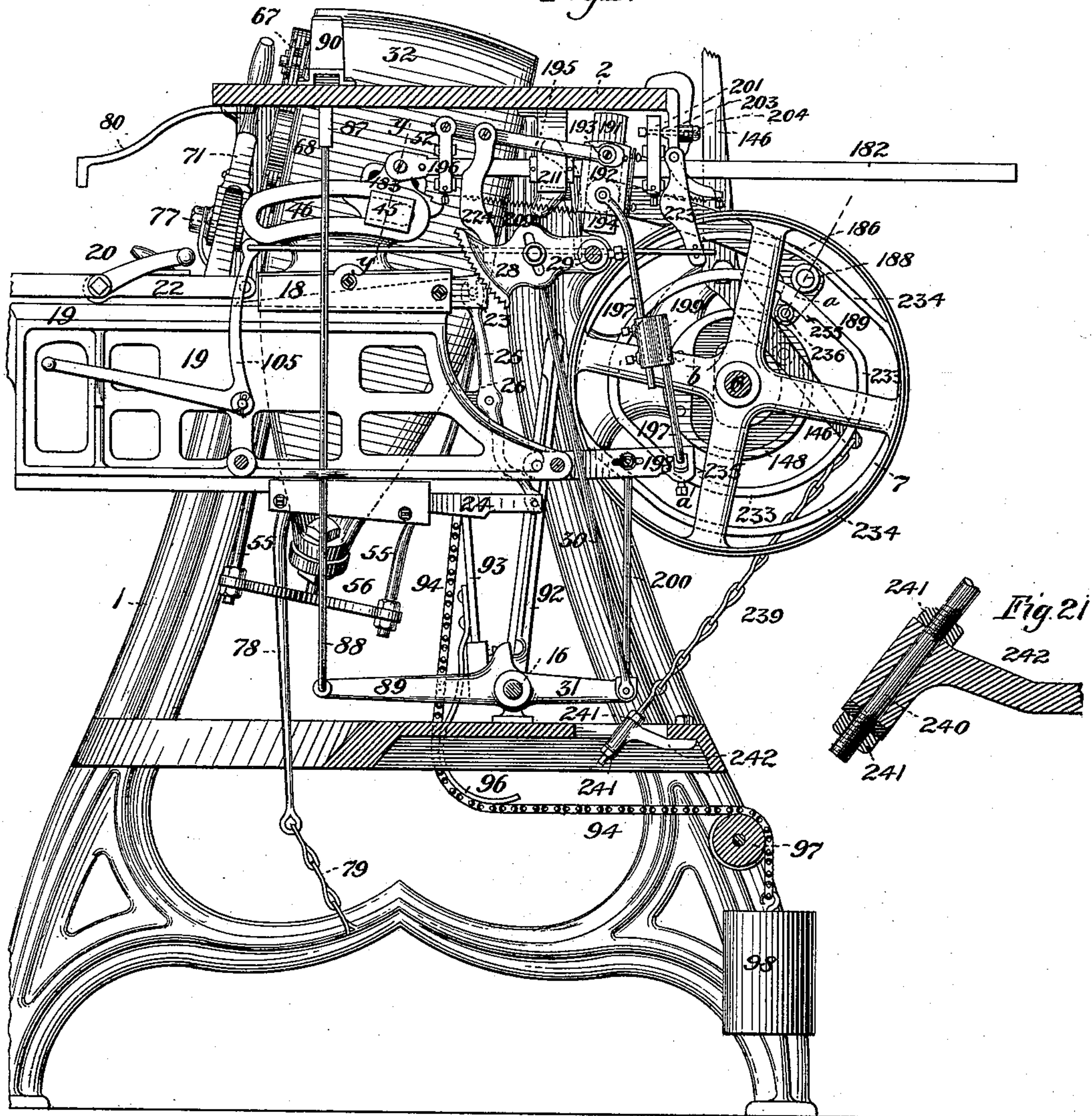


4 Sheets—Sheet 1.

No. 407,741.

Patented July 23, 1889.

Fig. 1.



WITNESSES

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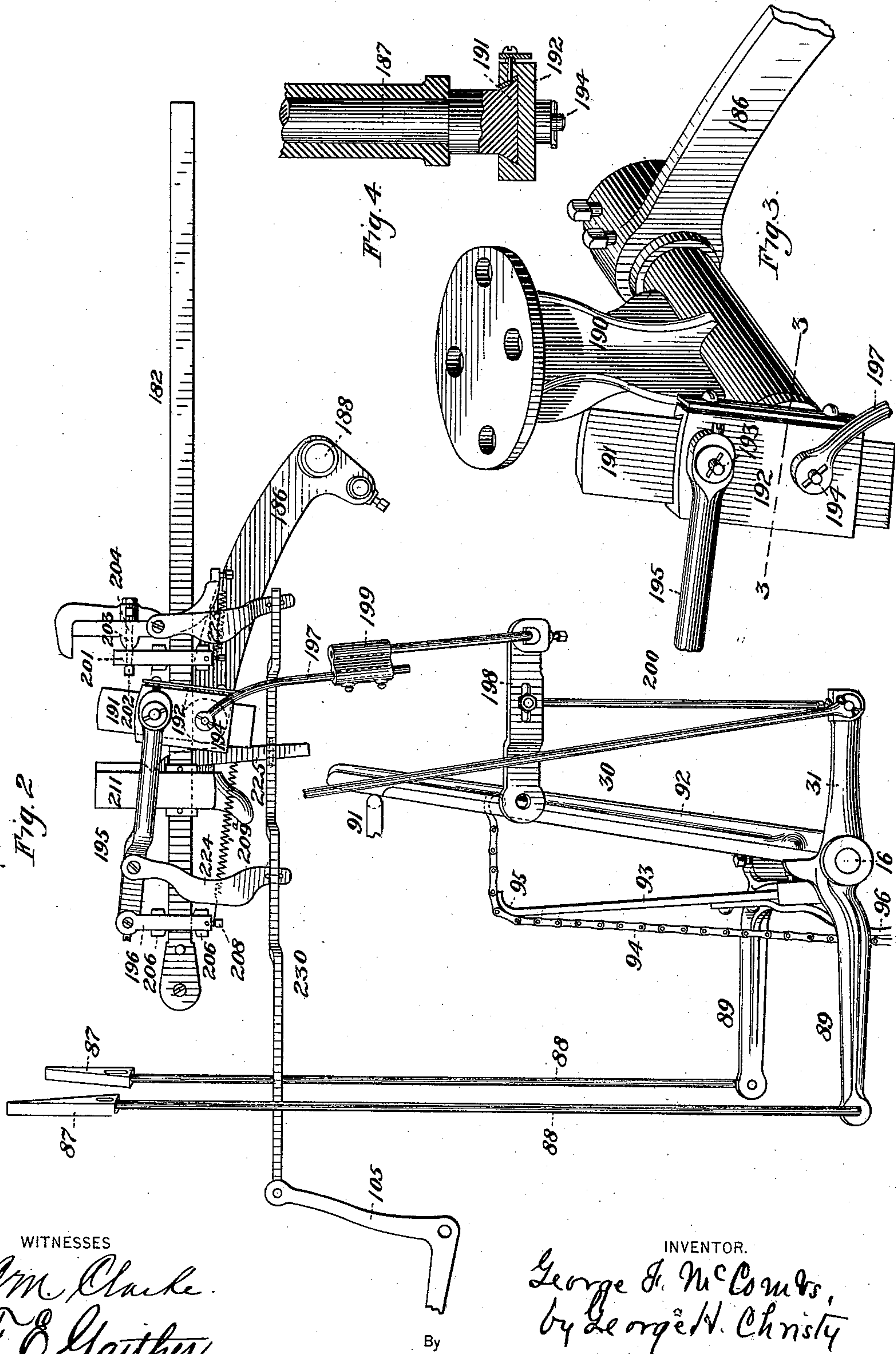
(No Model.)

4 Sheets—Sheet 2.

G. F. McCOMBS.
BROOM SEWING MACHINE.

No. 407,741.

Patented July 23, 1889.



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(No Model.)

4 Sheets—Sheet 3.

G. F. McCOMBS.
BROOM SEWING MACHINE.

No. 407,741.

Patented July 23, 1889.

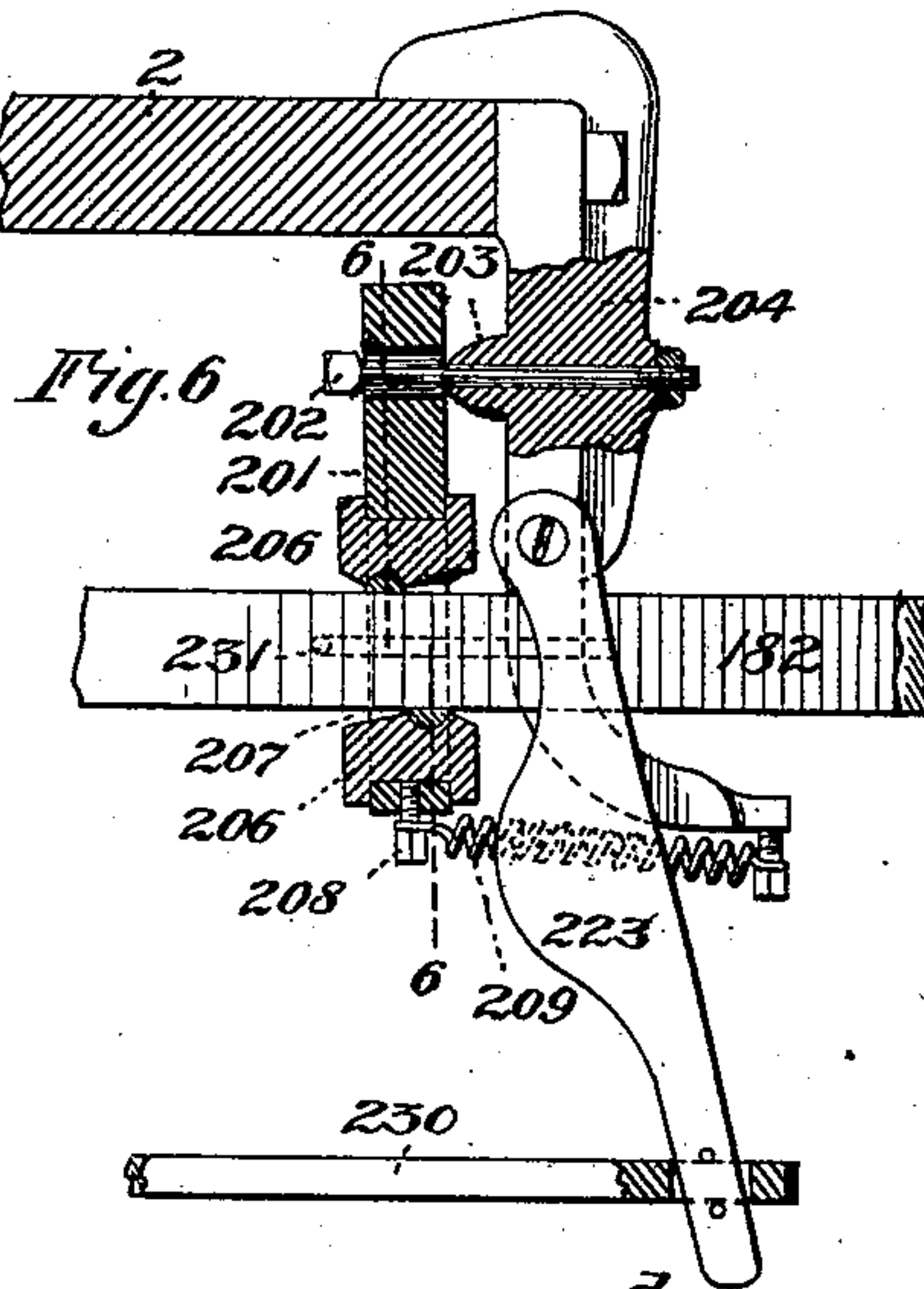
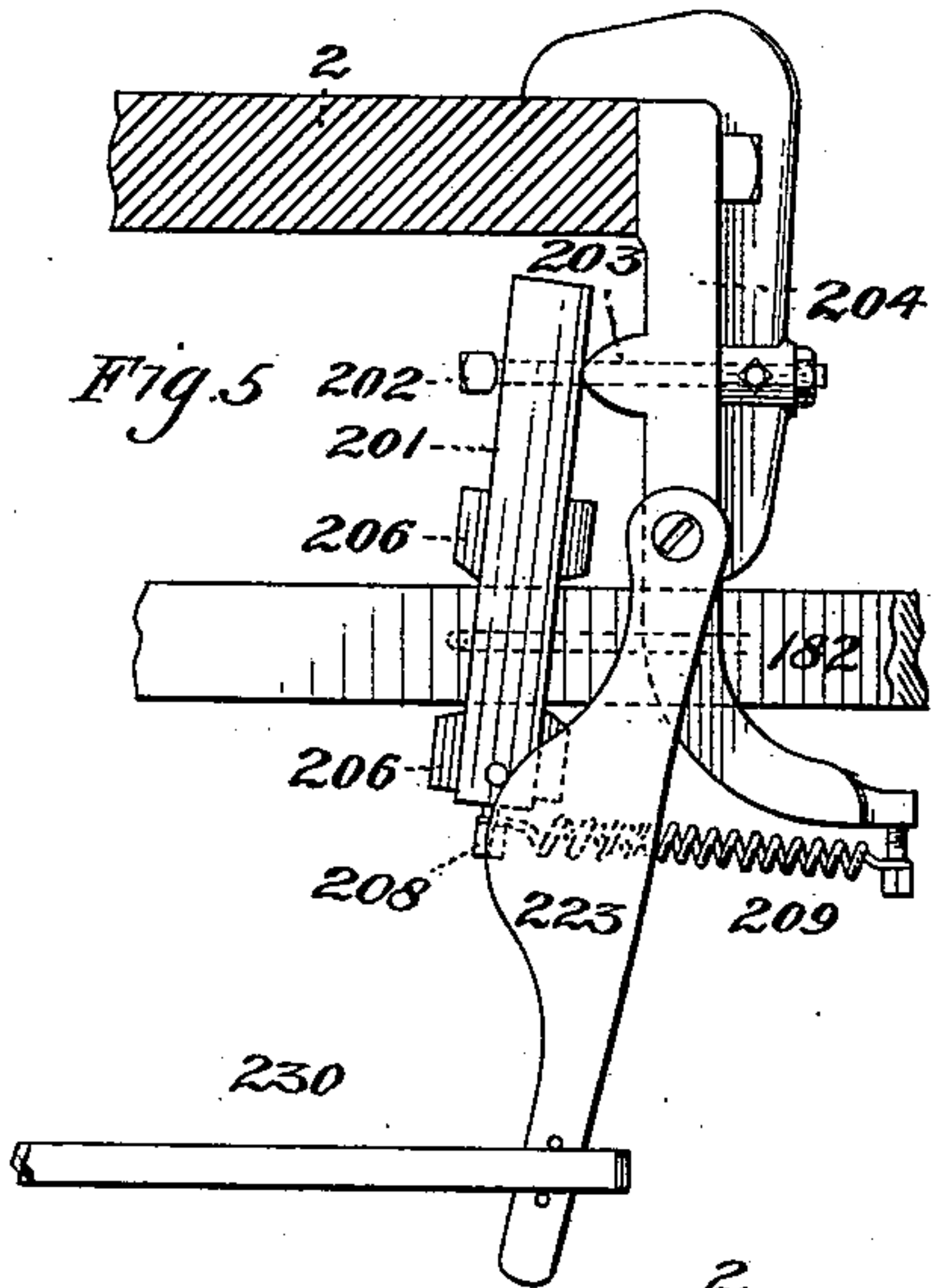
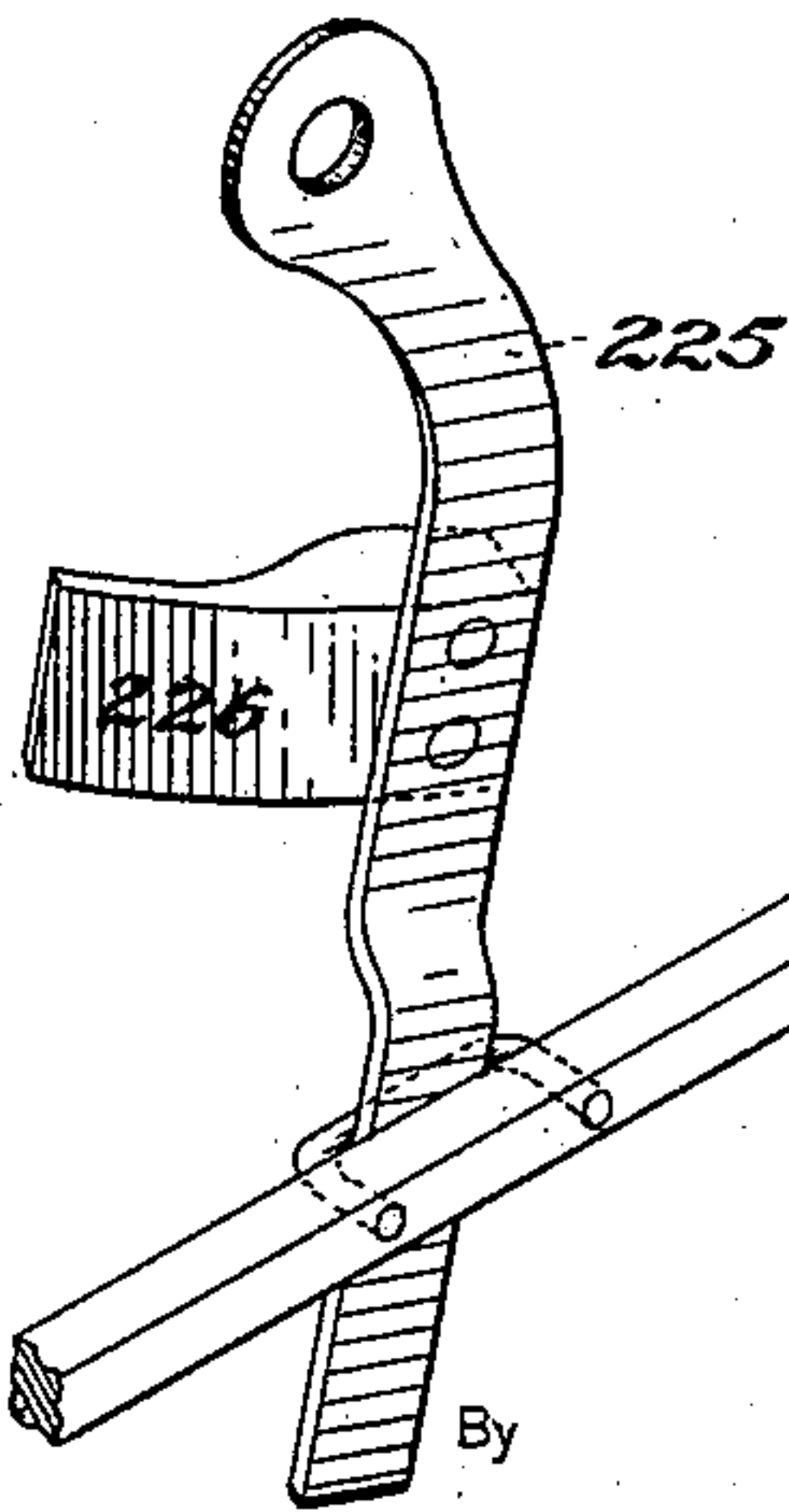
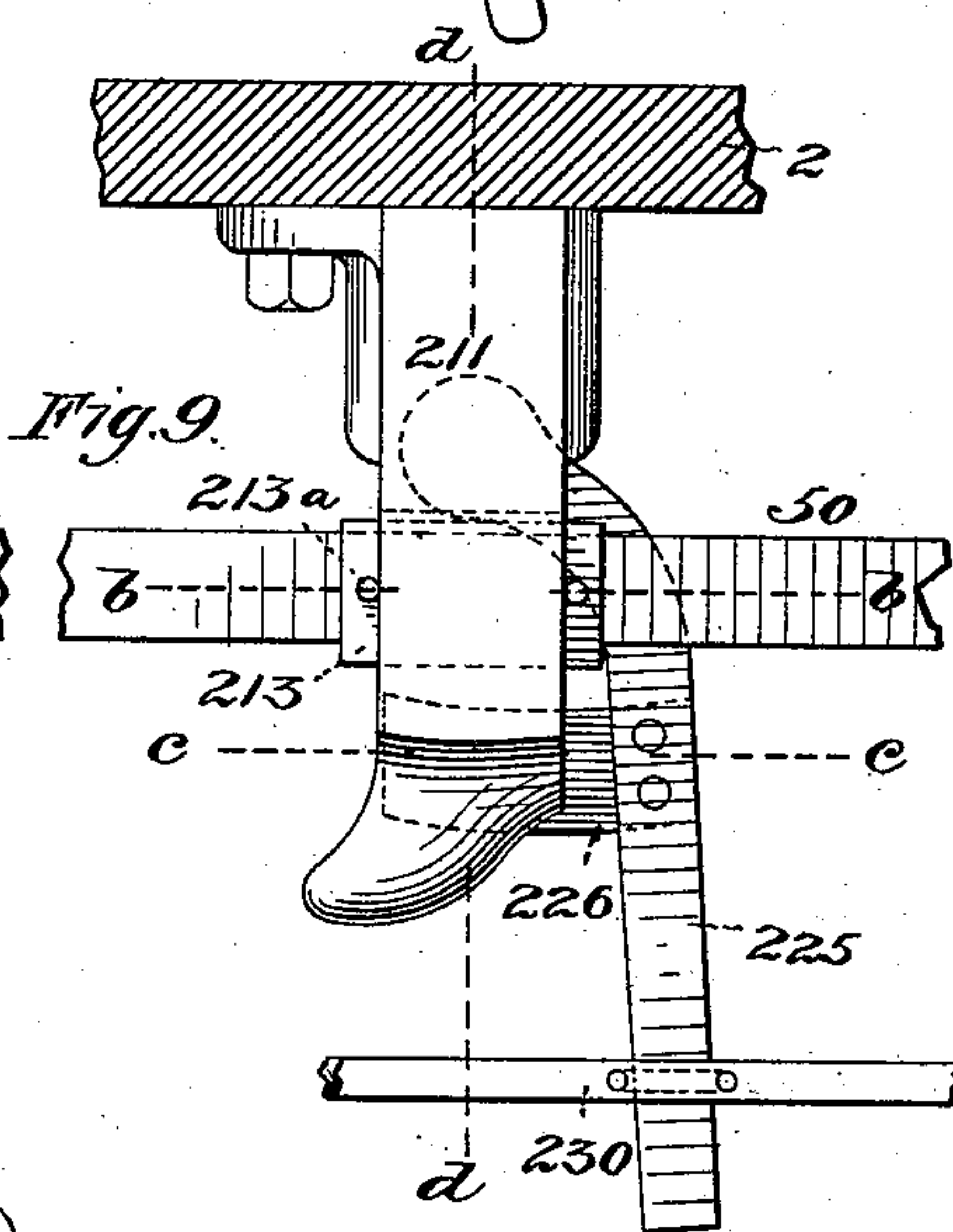
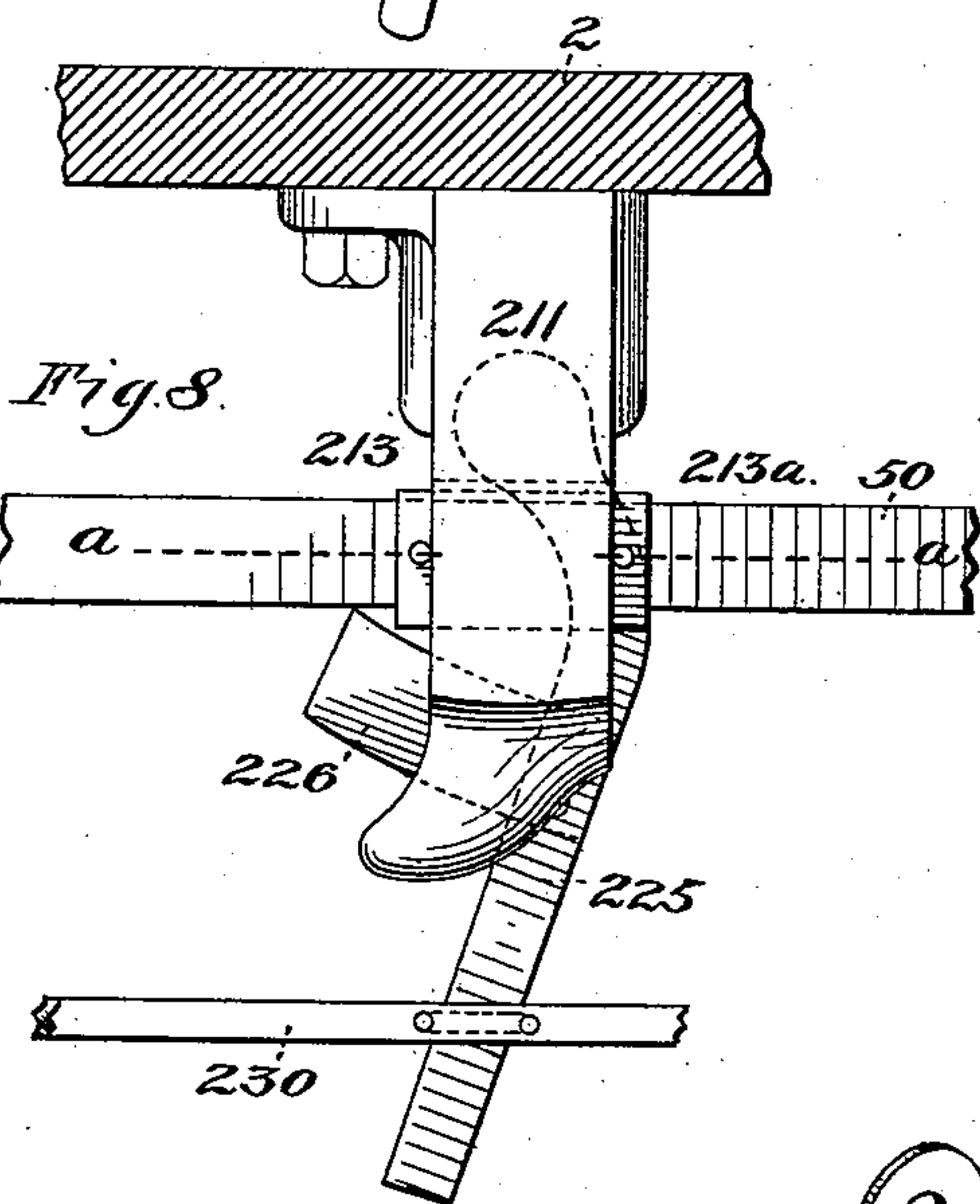
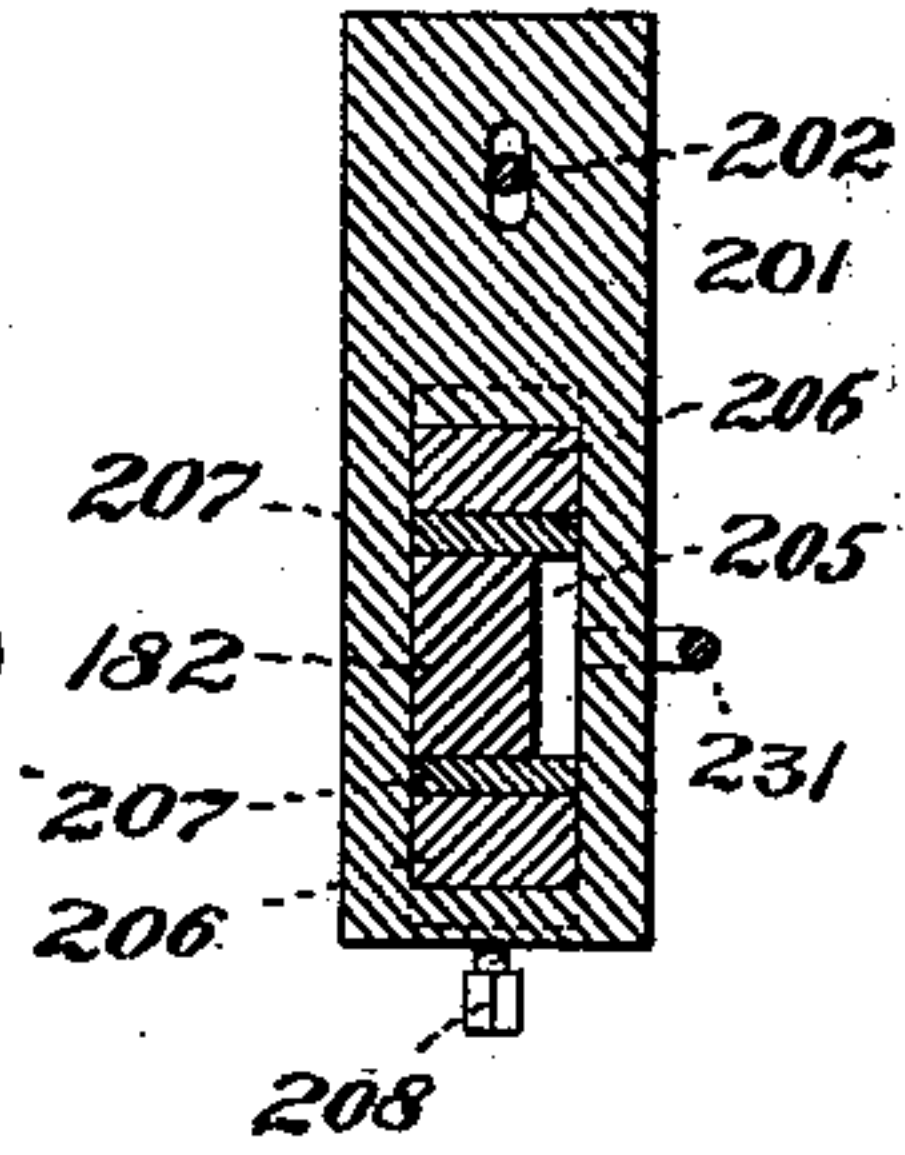


Fig. 7.



WITNESSES

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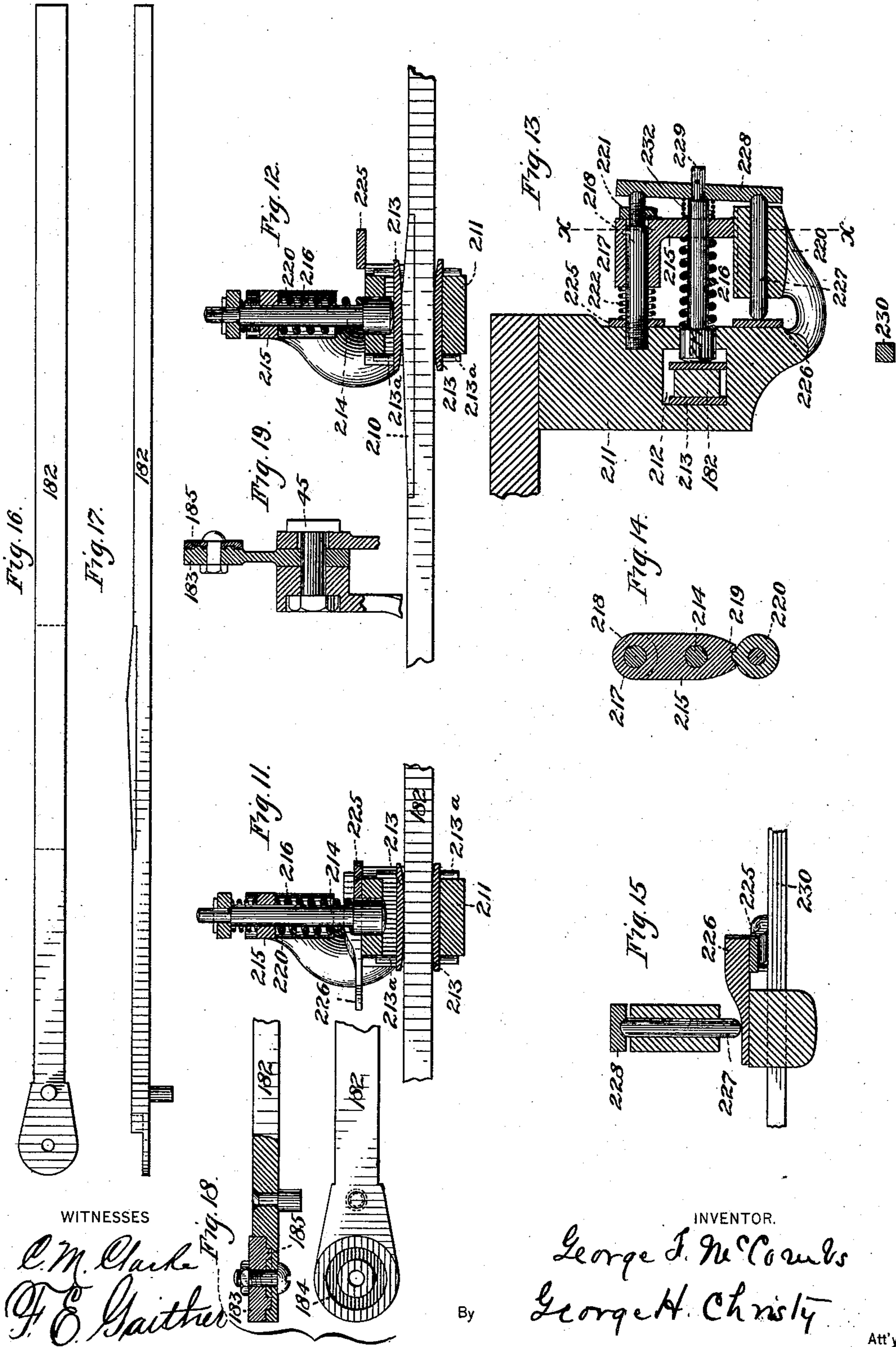
(No Model.)

4 Sheets—Sheet 4.

G. F. McCOMBS.
BROOM SEWING MACHINE.

No. 407,741.

Patented July 23, 1889.



WITNESSES

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UNITED STATES PATENT OFFICE.

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BROOM-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 407,741, dated July 23, 1889.

Application filed April 20, 1889. Serial No. 307,969. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. McCOMBS, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Broom-Sewing Machines, of which improvements the following is a specification.

In Letters Patent No. 208,407, granted to me September 24, 1878; No. 238,140, granted to myself and Charles Rogers February 22, 1881, and No. 338,999, granted to me March 30, 1886, are described and claimed machines for sewing brooms; and the invention described herein relates to certain improvements in the machines set forth in said Letters Patent, and has for its object certain improvements in the construction and operation of the mechanism for feeding the broom along during the sewing operation, whereby the amount of such feed may be adjusted with a greater degree of accuracy by and in accordance with the thickness of the part of the broom operated on, such adjustment of the feed being regulated automatically by the clamps or vise-jaws in grasping the broom.

In general terms the invention consists in the construction and combination of mechanical devices or elements, all as more fully hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view in side elevation of a broom-sewing machine constructed in its general features in accordance with the Letters Patent hereinbefore referred to and embodying my improved feed mechanism. Fig. 2 is a side elevation of the feed mechanism detached from the machine. Fig. 3 is a perspective view of the rock-shaft and its connections for operating the feed mechanism. Fig. 4 is a sectional view on the line 3 3, Fig. 3. Fig. 5 is a view in elevation of the detent mechanism, showing the releasing device in operative position. Fig. 6 is a sectional view of the same, showing the detent and releasing device in normal position. Fig. 7 is a sectional view on the lines 6 6, Fig. 6. Figs. 8 and 9 are views in elevation of the holdback or brake mechanism with its releasing connection, the latter being shown in operative position in Fig. 8. Fig. 10 is a

detail view of the releasing connection or device for the holdback or brake. Figs. 11 and 12 are sectional views taken on the line *b b*, Fig. 9, showing the brake mechanism in operation on different parts of the feed-bar. Fig. 13 is a sectional view on the line *d d*, Fig. 9. Fig. 14 is a sectional detail of the brake or holdback mechanism taken on the line *x x*, Fig. 13. Fig. 15 is a similar view taken on the line *c c*, Fig. 9. Figs. 16 and 17 are side and edge views, respectively, of the feed-bar. Fig. 18 shows the end of the feed-bar in section and side elevation. Fig. 19 is a sectional view on the line *y y*, Fig. 1, showing the manner of connecting the feed-bar to the clamp or vise. Fig. 20 is a sectional detail view of the operating-cam, showing the manner of connecting the rocker-arm thereto; and Fig. 21 is a sectional detail view of the take-up for the mechanism operating the threading-rods.

The machine to which my improvement is applied is constructed in all essential particulars, except the mechanism for feeding the broom-clamp, similarly to that described and shown in Letters Patent No. 338,999, hereinbefore referred to; and hence no specific description of said machine will be necessary herein, except in so far as may be required for a clear understanding of the present improvements. The broom being secured between the jaws of the clamp, (only the jaw 32 being shown,) said clamp is shifted into operative position by the lever 20, connected to the carriage carrying the clamp by the link 22, as described in said Letters Patent, said carriage sliding along the horizontal ways 19. In its inward movement a striker-arm 91 engages a lever 92, loosely pivoted on a rock-shaft 16, and forces said lever to the right in Fig. 1. During the first portion of the movement of the lever a post 93, secured at its lower end to the rock-shaft 16, is also shifted to the right, said post being connected to the lever by a chain passing around frictional surfaces 95 and 96 on the post 93, and around a pulley 97, journaled on the frame, to a weight 98, which is suspended from its lower end. The frictional contact of the chain 94 with the post 93 causes the lever 92 to carry with it the post 93, and thereby effect a cor-

responding partial rotation of the shaft 16, which through the arms 89 and rods 88 effects an elevation of the wedges 87, thereby centering the clamp or vise in the manner fully shown and described in Letters Patent No. 338,999.

In order to effect the necessary intermittent feed movement of the device on its pivot upon the carriage, a feed-bar 182 is connected, as hereinafter described, to a plate 183, which in turn is connected to the socket of the funnel-piece of the vise. The feed-bar is reciprocated in a rectilinear direction, as will hereinafter appear, and the movement of the vise is curvilinear; hence the bar and vise should be so connected together as to permit of these different movements of these parts without interference with each other. To this end a circular groove 184 is formed in one end of the feed-bar 182 for the reception of a circular rim 185, formed on one side of the plate 183, as shown in Figs. 16 to 19, thus forming a strong hinge-connection between the plate and the feed-bar. The feed-bar 182, which is made parallel on the upper and lower edges, as shown, is operated with a step-by-step movement by a lever 186 through mechanism to be hereinafter described, said lever being secured at one end to a rock-shaft 187, and provided at its opposite end with a friction-roller 188, engaging a cam-groove 189 in the pulley 7, as shown in Fig. 1. This cam-groove 189 is provided with two acting portions substantially parallel with a diameter of the pulley 7, and with two inactive portions concentric with the shaft 6; hence the lever 186, and with it the feed-bar 182 and the vise or clamp, will be operated twice during each revolution of the pulley—once for one of the needles and once for the other needle—such movement of the vise or clamp being the same as in Letters Patent No. 338,999.

On the outer end of the rock-shaft 187, which is mounted in a suitable bearing at the lower end of a hanger 190, (see Fig. 3,) secured to the under side of table 2, is formed a block or guide-plate 191, having beveled edges, as shown in Figs. 3 and 4, forming guides for the sliding head 192, provided with a groove having undercut side walls, as shown in Fig. 4. This sliding head is provided with pivot-pins 193 and 194 near its ends, and to the pivot-pin 193 is connected one end of a rod 195, the opposite end of said rod carrying the grip mechanism 196, constructed, as hereinafter described, to engage and shift the feed-rod 182 during its forward movement and to slide over the rod during its rearward movement. The lower pivot-pin 194 is connected to one end of a rod 197, the opposite end of said rod being connected to the end of a lever 198, the other end of the lever being pivotally connected to the inner end of the guides or ways 19, as shown in Fig. 1. As shown in Figs. 1 and 2, the rod 197 is formed in two sections, one section having a coupling 199 secured thereto and the other

section of the rod being adjustable in said coupling, thereby permitting of the lengthening or shortening of the rod 197, and effecting a corresponding variation in the intermittent movement of the feed-rod and vise, as will be hereinafter stated. The lever 198 is connected at a point approximately midway of its length to a rod 200, and the opposite end of said rod is connected to the arm 31, secured to the rock-shaft 16, or formed integral with one of the arms 89 and extending beyond the rock-shaft 16, as shown in Figs. 1 and 2. As hereinbefore stated, the rock-shaft 16 and the arms 89 are shifted by the carriage 18 in its inward movement, for the purpose of centering the clamp or vise, through the medium of the wedges 87, the amount of such movement of the rock-shaft 16, arms 89, and wedges 87 being dependent upon the thickness of the broom secured in the vise, as fully described in Letters Patent No. 338,999. The arm 31 being connected or moving with the arms 89, said arm will be shifted a corresponding amount thereby, through the medium of the rods 200 and 197 and levers 198, shifting the sliding head 192 on its block 191, thus moving the pivot-pin 193 toward or away from the axis of the rock-shaft 187. This adjustment of the pivot-pin 193 produces a like change in the length of movement imparted to the feed-bar 182, and also in the step-by-step movement of the vise or clamp, thus automatically adjusting the length of stitch by and in accordance with the thickness of the broom or part thereof to be operated on. It will be observed that the lever 198 is slotted at the point of connection of the rod 200 therewith, so as to permit of an adjustment of the point of connection and a consequent change of the length of movement of the lever 198.

In order to prevent any rearward movement of the feed-bar 182 during the return-stroke of the grip 196, a detent 201 is employed, said detent being held by a bolt 202, passing through the block forming the body of the detent, against a fulcrum 203, formed on the hanger 204, secured to the table 2, as shown in Figs. 1, 2, 5, and 6, the hole through the block being made larger than the bolt, and the portion of the head of the bolt adjacent to the block being rounded, so as to permit of a slight swinging movement of the detent, as hereinafter described. The grip 196 and the detent 201 are similar in construction and operation; hence only the detent will be particularly described again. The detent consists of a metal block having a rectangular recess 205 formed therethrough, as shown in Figs. 6 and 7, for the passage of the feed-bar 182.

Within the recess 205 are fitted the jaws 206, provided in their inner or adjacent faces with semicircular grooves for the reception of the correspondingly-shaped shoes 207. The jaws and shoes are so proportioned relative to the length of the recess in the block

and the width of the feed-bar that the distance between the operative faces of said shoes is equal to the width of the feed-bar, and in order to compensate for wear the lower jaw is made adjustable by means of set-screws 208, passing through the lower end of the block, as shown in Figs. 6 and 7. As will be seen by reference to Fig. 6, the shoes 207 are arranged in different vertical planes, the upper shoes being a little ahead of the lower shoes in the direction of movement of the feed-bar, so that a slight rearward movement of the lower or free end of the block 201 will cause the shoes to bind upon the edges of the feed-bar, while a contrary movement, as imparted by the forward feed of the rod 182, will permit said rod to slide freely. In order to permit of the inclinations of the detent referred to, the faces of the jaws 206 are beveled or inclined from opposite sides of the shoes, as shown in Fig. 6, thus preventing any liability of the jaws coming in contact with the edges of the rod 182. The shoes 207 will readily accommodate themselves to any inclination of the detent, and thus keep the flat surfaces in contact with the edges of the rod. A spring 209, attached at one end to the free end of the detent and at its opposite end to the tail of the hanger 204, is employed to give a slight rear pull to the lower end of the detent, thereby holding the shoes 207 against the edges of the rod, in readiness to grip and hold the rod at the first rearward movement of said rod 182, or any tendency thereto. The clutch or grip 196 is constructed, as hereinbefore stated, similar to the detent 201, and is pivotally connected to the front end of the arm 195, as shown in Figs. 1 and 2. The spring 209^a of the grip is connected at its rear end to a pin on the under side of the rock-shaft 187, so that when said shaft is rotated to impart a forward movement to the grip 196 the spring will be subjected to a pull forward by the grip and backward by the pin on the rock-shaft, thus increasing the tension of said spring.

As the arm 186 is raised by the operation of the pulley 7, as hereinbefore stated, the rock-shaft 187 is partially rotated, and the arm 195 and grip 196 are moved forward to the left, as shown in Figs. 1 and 2, the shoes of the grip being held in operative engagement with the edges of the feed-rod 182 by its spring 209, the feed-rod will respond to the first movement of the arm 195 and grip 196 and move forward therewith, being dragged through the detent 201. As the arm and grip are moved back, the rod is held from movement by said detent, the grip being dragged back along the rod.

As shown in Fig. 1, the vise or clamp has at the beginning of the sewing operation an inclination to the right, and as the sewing proceeds it moves to a vertical position, and is then inclined to the left. The weight of the clamp or vise is such that after it passes its vertical position it will tend to move too

rapidly to the left, pulling the feed-bar through the grip and detent. In order to prevent such movement of the vise or clamp, the feed-rod is provided with a wedge-like portion 210, said portion being either formed on the side of the bar, or preferably by forming a recess in the side of the feed-bar and inserting a suitably-shaped block therein, as shown in Figs. 16 and 17. This wedge portion 210 is so located on the feed-bar that its front end will engage a holdback or brake mechanism, hereinafter described, a little before the vise or clamp reaches a vertical position and begins to incline to the left, as hereinbefore stated, and of sufficient length to continue such engagement during the entire movement of the vise or clamp from a vertical position to the extreme of its inclination to the left. The holdback or brake mechanism consists of a block 211, secured to the under side of the table, as shown in Figs. 1, 8, and 9, and having an opening 212 therethrough for the passage of the feed-bar 182, and on opposite sides of the feed-bar are placed the friction plates or shoes 213, having their inner or adjacent faces curved, as shown in Figs. 11 and 12, said shoes being held from movement with the feed-bar by pins 213^a engaging the sides of the block 211. One of the friction plates or shoes 213 rests against the wall of the opening in the block, and the other is held against the feed-bar by a spring-actuated plunger 214, as shown in Figs. 11, 12, and 13, the inner end of said plunger passing through the block 211 into the opening 212, and is supported and guided at its outer portion by a tension-plate 215, through which the stem of the plunger passes, the actuating-spring 216 surrounding the stem and bearing at one end against the head of the plunger and at its opposite end against the tension-plate. This tension-plate 215 is provided at one end with a socket 217, fitting over a stud 218, screwing into the block 211, and at its opposite end with a notch or groove engaging a bead or spline 219, formed on the side of a horn 220, projecting laterally from the lower end of the block 211. The outer end of the stud 218 is threaded for the reception of the nut 221, by the adjustment of which up and down the stud a corresponding adjustment of the plate 215 and spring 216 is effected.

In order to insure a free movement of the tension-plate, an equalizing-spring 222 is interposed between the lower end of the socket 217 and the block 211, said spring serving to counterbalance any tipping action of the spring 216 upon the tension-plate. By a proper adjustment of the tension of the spring 216 the shoes will not be pressed sufficiently hard against the sides of the feed-bar during the passage of the parallel portions thereof between said plates, but said shoes will begin to operate as soon as the foot of the wedge-portion 210 enters between them, and by reason of the constantly-increasing thickness of the feed-rod the tension of the spring in-

creases as the vise or clamp is inclined from its vertical position, thereby increasing the forward pull on the feed-rod.

In order to release the feed-rod 182 from engagement with the grip 196 and detent 201, when it is desired to shift the carriage 18 and vise or clamp into and out of operative position, tripping-arms 223 and 224 are pivotally suspended, one from the connecting-rod 195 and the other from the hanger 204, in such relation to the grip and detent that a forward movement of the tripping-arms will slightly shift the lower ends of the grip and detent forward or to the left in Figs. 1, 2, 5, and 6, against the tension of the springs 209 and 209^a, and thereby free the edges of the feed-rod from engagement with the shoes 207 and permit a free movement of the feed-rod, the vise or clamp, and carriage. In order to free the feed-rod from the holdback or brake, a tripping-arm 225 is journaled at its upper end on the stud 218, and to said arm is secured a wedge-block 226, having its thin end normally under a pin 227, passing through the horn 220, the opposite end of said pin bearing against one end of a lever 228, fulcrumed at its opposite end on the stud 218, as shown in Fig. 13. The outer end of the plunger 214 passes through the lever 228, and is so held in engagement therewith by the key 229 that when the pin 227 and one end of the lever 228 are raised or moved outwardly by the wedge 226 the plunger is pulled out sufficiently to release the feed-rod from the pressure of the shoes 213. In order to steady the lever 228 and prevent any rattling in the working of the machine, a light spring 232 is interposed between said lever and the adjusting-plate 215. The tripping-levers 223, 224, and 225 are connected to a rod 230, which is attached to a bell-crank lever 105, pivoted to the ways or guides 19, in convenient proximity to the lever 20, employed for shifting the carriage 18. In order to prevent so great a movement of the grip and detent by the tripping-levers as will cause them to again engage the feed-bar, a stop 231 (represented in dotted lines in Figs. 5 and 6) is secured to the tail-piece of the hanger 204 in such relation to the detent as to properly limit the releasing movements and that of the grip.

If desired, the wedge 226 may be so arranged as to engage a collar on the lower end of the plunger 214, so as to raise the same when desired, thereby avoiding the use of the pin 227 and lever 228; or any other suitable mechanical device may be employed for relieving the feed-rod from the pressure of the shoes 213.

The cam-groove 189 is formed by the cam-ring 233, which properly controls the movement of the roller 188, and is the essential part, and by the housing-ring 234, whose function is to hold said roller in proper relation to the cam-ring. It is not practicably possible, however, to so construct these cam-rings and the roller that the latter will at all times

fit snugly in the cam-groove, as the roller must fit sufficiently loose in the groove to permit of its rotation; hence the roller 188 is not at all times in proper position to be shifted by active portions of the cam-groove when such portions come into line with the roller in the rotation of the pulley 7.

In order to prevent the loss of motion in the feed mechanism, the cam-ring 233 is provided on its inner side with shoulders 235, located in line with or slightly in advance of the front ends *a* of the active portions of such ring, said shoulders being adapted to engage a roller 236, mounted on a tail 237, formed on the end of the lever 186. The stem of the roller 236 passes through a slot in the tail 237, and is supported in position therein by a screw-bolt 238, so that it may be adjusted into proper relation with the roller 188, as shown in Fig. 20, so that by the engagement of the roller 236 with the shoulders 235 the roller 188 will always be drawn into position to engage the ends *a* of the active portions of the cam-ring.

In order to hold the roller on the levers 146, employed for operating the threading-rods, as described and shown in Letters Patent No. 338,999, in proper position to be operated on by the point *b* on the inner disk portion of the cam 148, as shown in Fig. 1, a chain 239, or other suitable flexible connection, is attached at one end to the end of the lever 146 and at the other end to a threaded bolt or rod 240, passing through a bracket 242, secured to the frame of the machine, said bolt or rod being provided with nuts 241, whereby the bolt and chain may be drawn down so as to bring the roller on the lever 146 into proper operative position.

By increasing or decreasing the length of the connection 197 between the sliding head 192 and lever 198, as hereinbefore described, the amount of each step-by-step movement of the broom vise or clamp may be increased or diminished, thus providing for an adjustment of what might be termed the "normal" length of stitch, unaffected by the automatic adjustment of the stitch as controlled by the broom vise or clamp.

I claim herein as my invention—

1. In a broom-sewing machine, the combination of a carriage fitted to slide upon ways or guides, a broom vise or clamp pivoted to said carriage, a rock-shaft 16, operated by the carriage in its inward traverse, mechanism, substantially as described, for centering and clamping the broom-vise in operative position, a rock-shaft 187, a sliding head fitted to have a traverse on the rock-shaft at right angles to the axis thereof and operated by the vise centering and clamping mechanism, and a feed-rod connected to the broom vise or clamp and operated by the sliding head, substantially as set forth.

2. In a broom-sewing machine, the combination of a pivotally-mounted broom vise or clamp, mechanism for centering and clamp-

ing the broom-vise in operative position, a rock-shaft 16, operating such centering and clamping mechanism and controlled thereby, a rock-shaft 187, a sliding head fitted to have
 5 a traverse on said rock-shaft at right angles to the axis thereof, an adjustable connection between the sliding head and an arm on rock-shaft 16, and a feed-rod connected to the broom vise or clamp and operated by the
 10 sliding head, substantially as set forth.

3. In a broom-sewing machine, the combination of a pivotally-mounted broom vise or clamp, a plate 183, connected to said vise or clamp and having a circular rim formed there-
 15 on, a feed-bar having a groove formed therein for the reception of the circular rim, thereby forming a hinge-joint between the plate and feed-bar, and mechanism, substantially as described, for moving the feed-bar, substantially
 20 as set forth.

4. In a broom-sewing machine, the combination of a pivotally-mounted broom vise or clamp, a feed-bar connected to the vise or clamp, a reciprocating automatically-oper-
 25 ating grip, and an automatically-operating detent, said grip and detent engaging the feed-bar, substantially as set forth.

5. In a broom-sewing machine, the combination of a pivotally-mounted broom vise or clamp, a movable feed-bar connected thereto,
 30 and a brake or holdback engaging the feed-bar and controlling the movements of the vise, substantially as set forth.

6. In a broom-sewing machine, the combination of a pivotally-mounted broom vise or clamp, a feed-bar connected thereto, a recip-
 35 rocating automatically-operating grip, an automatically-operating detent, and a brake or holdback for controlling the movements of the vise or clamp, said grip, detent, and hold-
 40 back engaging the feed-bar, substantially as set forth.

7. In a broom-sewing machine, the combination of a swinging block having an opening
 45 therethrough, jaws arranged in said opening, automatically-adjustable shoes mounted in the adjacent faces of said jaws, and a feed-bar having parallel edges passing between
 said shoes, substantially as set forth.

8. In a broom-sewing machine, the combination of a swinging block having an opening
 50 therethrough, jaws arranged in said opening, one of said jaws being adjustable, automatically-adjustable shoes mounted in the adja-
 55 cent faces of said jaws, and a feed-bar having parallel edges passing between said shoes, substantially as set forth.

9. In a broom-sewing machine, the combination of a swinging block having an opening
 60 therethrough, jaws arranged in said opening, automatically-adjustable shoes mounted in the adjacent faces of said jaws, said shoes lying in different vertical planes, and a feed-
 bar having parallel edges passing between
 65 said shoes, substantially as set forth.

10. In a broom-sewing machine, the combi-

nation of a block having an opening there-
 through, a feed-bar having a wedge-like por-
 tion on one side thereof and passing through
 said opening, and a stationary and a movable
 shoe arranged on opposite sides of the feed-
 bar, the movable shoe having a yielding
 pressure upon the feed-bar, substantially as
 set forth. 70

11. In a broom-sewing machine, the combi- 75
 nation of a block having an opening there-
 through, a feed-bar having a wedge-like por-
 tion on one side thereof and passing through
 said opening, a stationary and a movable
 shoe arranged on opposite sides of the feed- 80
 bar, and a spring-actuated plunger for fore-
 ing the movable shoes against the feed-bar,
 substantially as set forth.

12. In a broom-sewing machine, the combi- 85
 nation of a block having an opening there-
 through, a feed-bar having a wedge-like por-
 tion on one side thereof and passing through
 said opening, a stationary and a movable shoe
 arranged on opposite sides of said feed-bar, a
 plunger bearing at one end against the mov- 90
 able shoe, a tension-plate adjustably mount-
 ed on a stud on said block, and a spring sur-
 rounding the plunger and interposed between
 said plate and a shoulder on the plunger, sub-
 stantially as set forth. 95

13. In a broom-sewing machine, the combi-
 nation of a block having an opening there-
 through, a feed-bar having a wedge-like por-
 tion on one side thereof and passing through
 said opening, a stationary and a movable 100
 shoe arranged on opposite sides of said bar, a
 spring-actuated plunger operative on the
 movable shoe, lever connected to the plunger,
 a pin bearing against the free end of said le-
 ver, and a movable wedge for moving the 105
 pin, substantially as set forth.

14. In a broom-sewing machine, the combi-
 nation of a block having an opening there-
 through, a feed-bar having a wedge-like por-
 tion and passing through said opening, a 110
 spring-actuated plunger for controlling the
 movements of the feed-bar, and a wedge for
 forcing the plunger away from the feed-bar,
 substantially as set forth.

15. In a broom-sewing machine, the combi- 115
 nation of a carriage fitted to slide upon ways
 or guides, a broom vise or clamp pivoted to
 said carriage, a feed-bar connected to the vise
 or clamp, a reciprocating automatically-oper-
 ating grip and an automatically-operating 120
 detent, the grip and detent engaging the
 feed-bar, and tripping-arms for releasing the
 feed-bar from engagement with the grip and
 detent, substantially as set forth.

16. In a broom-sewing machine, the combi- 125
 nation of a carriage fitted to slide upon ways
 or guides, a broom vise or clamp pivoted to
 said carriage, a feed-bar connected to the vise
 or clamp, a reciprocating automatically-oper-
 ating grip, an automatically-operating detent, 130
 a brake or holdback, the grip, detent, and
 brake, and simultaneously-operating trip-

ping-levers for releasing the feed-bar from engagement with the grip, detent, and brake or holdback, substantially as set forth.

17. In a broom-sewing machine, the combination of a pivotally-mounted broom vise or clamp, a feed-bar connected thereto, a grip engaging the feed-bar, a rock-shaft connected to said grip, an arm secured to the rock-shaft and provided with rollers, one of which is adjustable, and a wheel having a cam-ring 233,

said ring being provided with shoulders 235 on its inner face in line, or approximately so, with the front ends of the active portions of the cam-ring, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEORGE F. McCOMBS.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.