

No. 711,723.

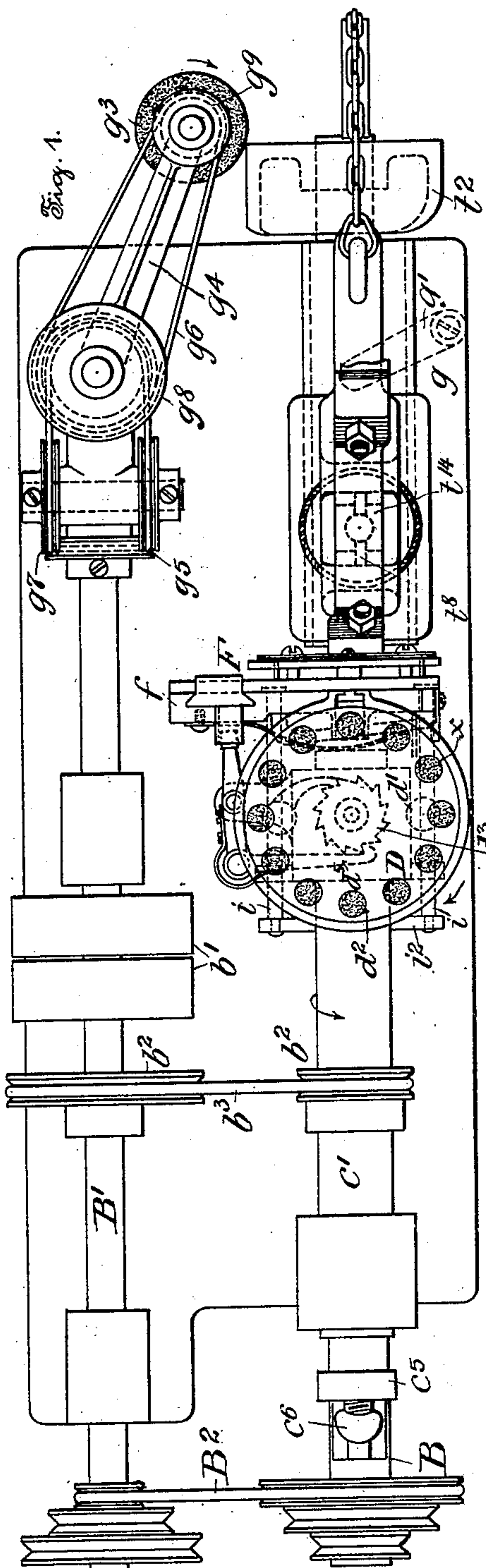
Patented Oct. 21, 1902.

J. HENRICH.
BUTTON TURNING MACHINE.

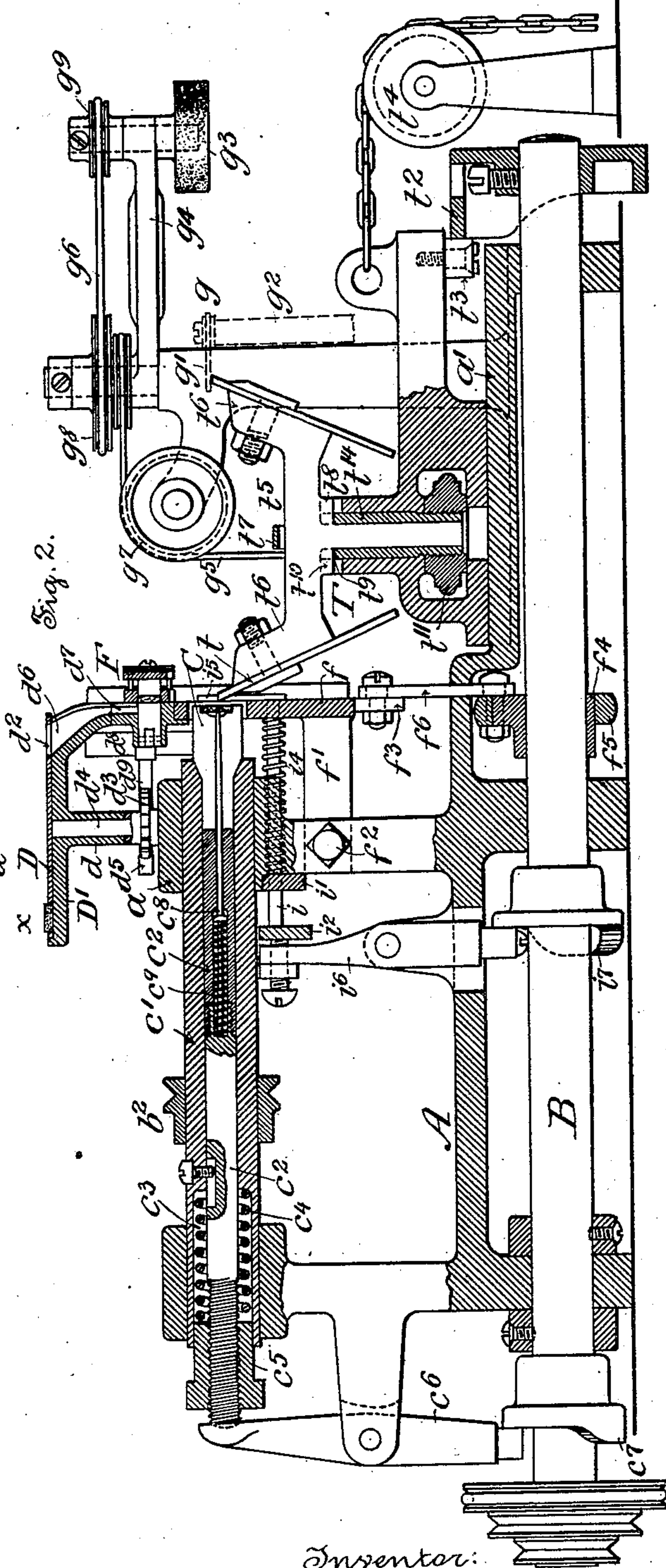
(Application filed Mar. 1, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
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M. Bormann.



Inventor:
Julius Henrich
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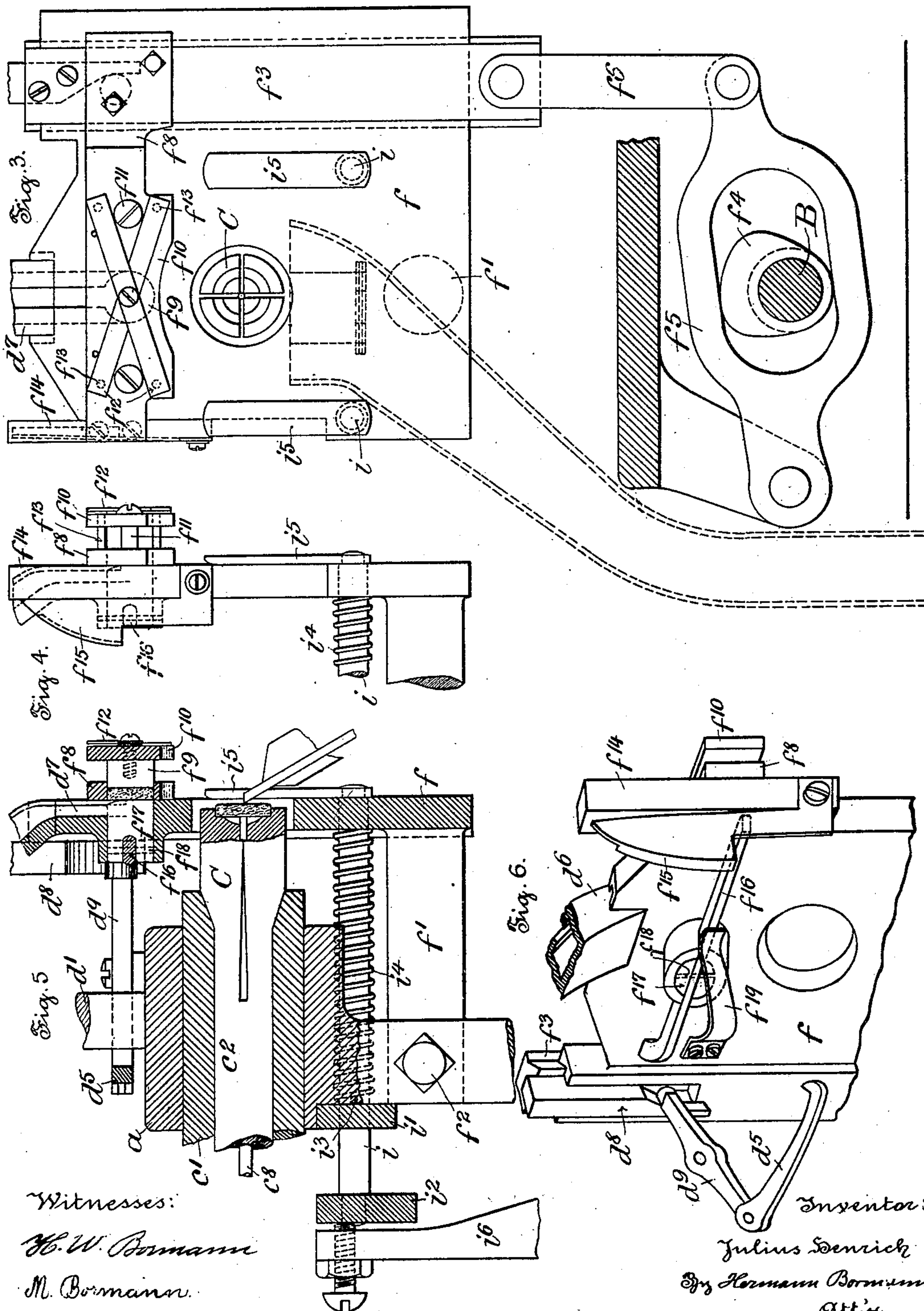
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4 Sheets—Sheet 2.

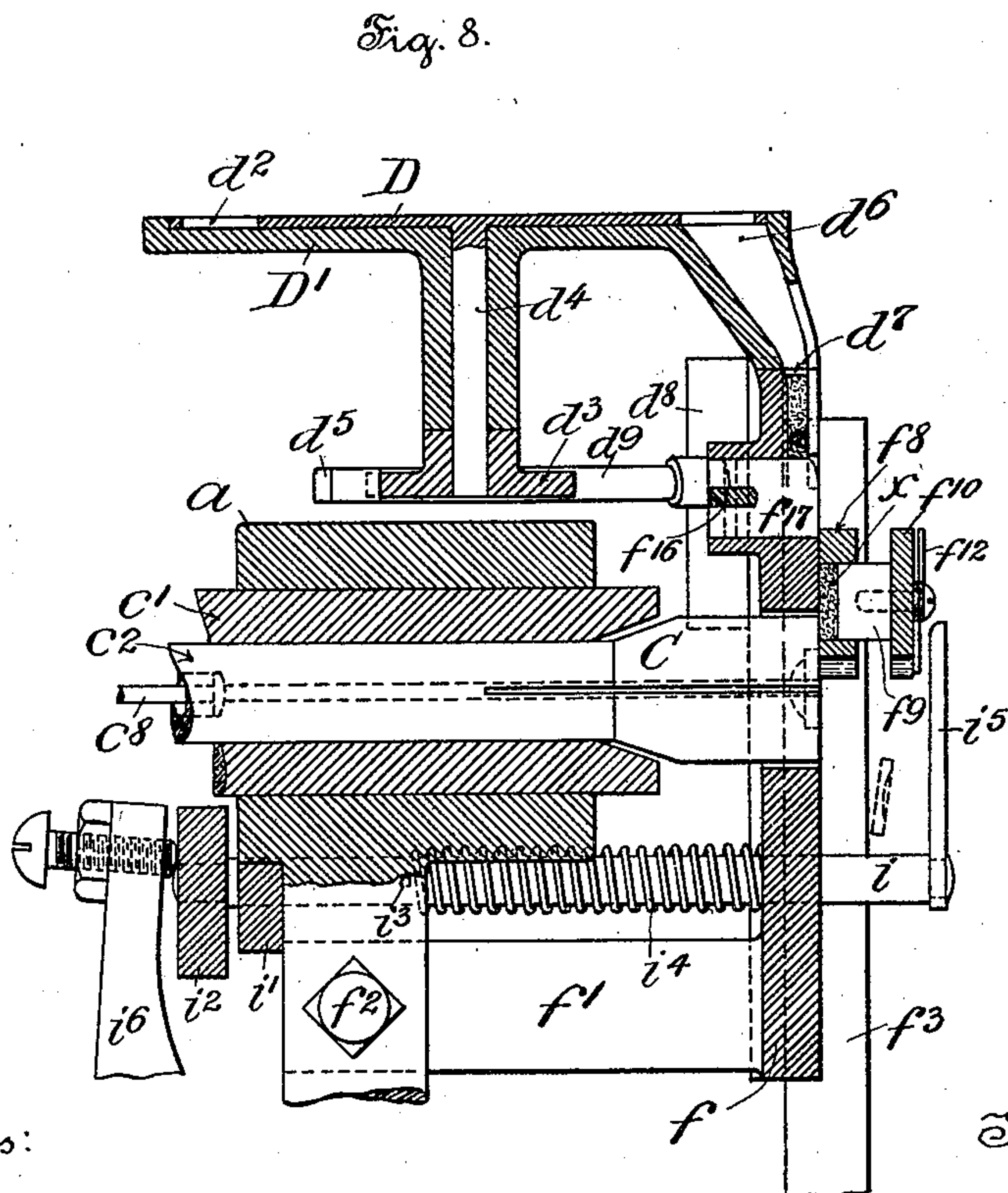
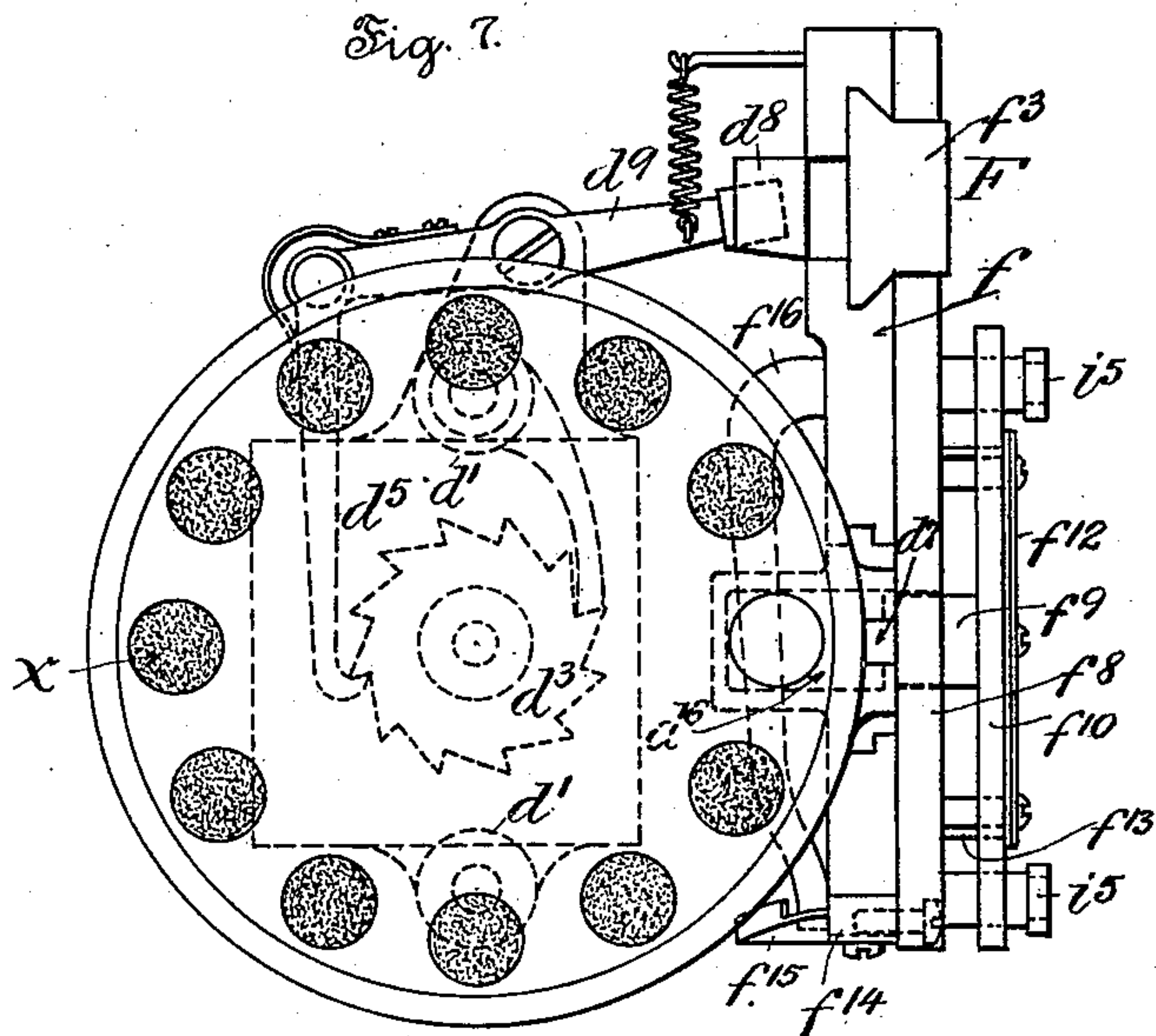


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(No Model.)

4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

Fig. 9.

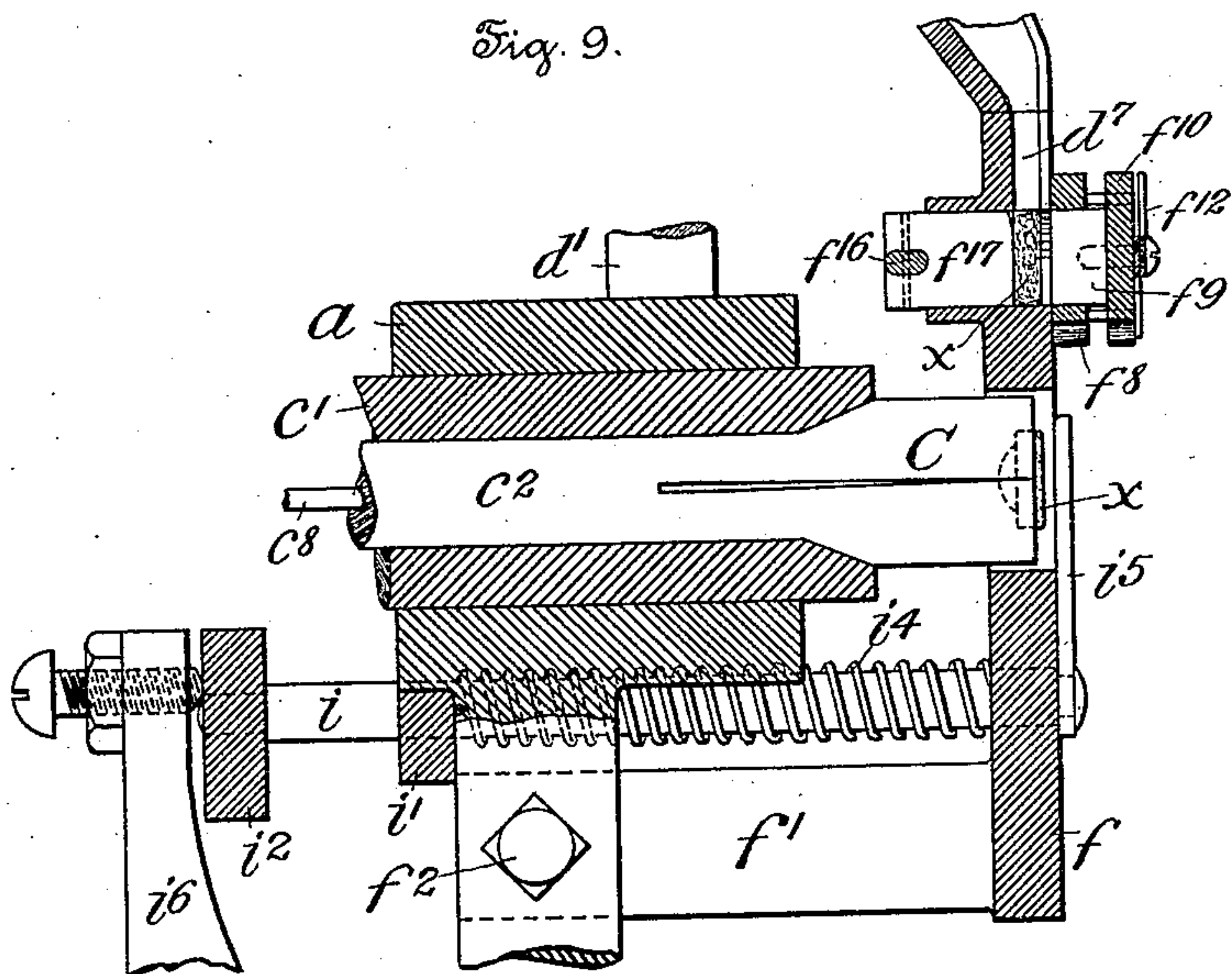
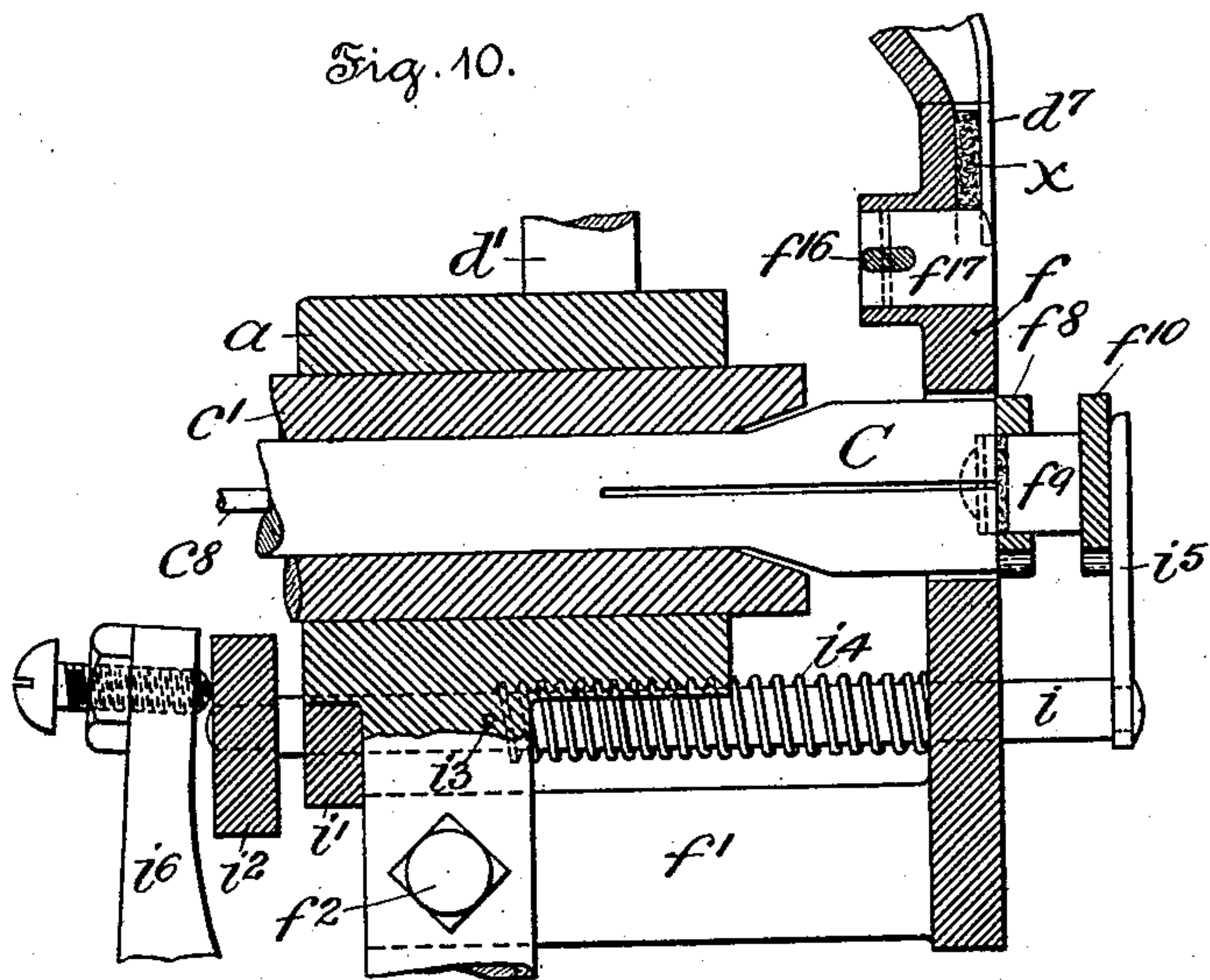


Fig. 10.



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UNITED STATES PATENT OFFICE.

JULIUS HENRICH, OF PHILADELPHIA, PENNSYLVANIA.

BUTTON-TURNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,723, dated October 21, 1902.

Application filed March 1, 1901. Serial No. 49,477. (No model.)

To all whom it may concern:

Be it known that I, JULIUS HENRICH, a subject of the Emperor of Germany, (but having declared my intention of becoming a citizen of the United States of America,) residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented new and useful Improvements in Button-Turning Machines, of which the following is a specification.

My invention relates to machinery for making pearl or other buttons, and more particularly to such as is used for facing the same; and the object thereof is to provide a machine by which button-blanks are automatically fed from a feeding disk or band to the clutch mechanism in order to increase the capacity of the turning-machine and to reduce the cost of labor, as one attendant may easily operate two or even three such machines.

My invention consists of a button-turning machine having a rotatable clutch and an automatically-sliding tool-rest, a feed table or band, and means for automatically transferring the button-blanks from the feed-table to and into the chuck; and my invention further consists of the improvements hereinafter more fully described, and pointed out in the claims.

My invention will be more fully understood taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a plan of a lathe or button-turning machine embodying my improvements. Fig. 2 is a longitudinal section of the said machine, showing the chuck, the automatic feeder, the tool, and means for sharpening the same. Fig. 3 is a transverse section of the machine just in front of the feeder, showing the latter and its operating mechanism in elevation. Fig. 4 is a side view of a part of the feeder. Fig. 5 is a central longitudinal section of the spindle with chuck having a button-blank clamped therein and also showing the feeder in section and at its highest position. Fig. 6 is a perspective rear view of the feeder, showing also the means for operating the feeding-table. Fig. 7 is a top view of the feeding-table for the button-blanks and its operating mechanism, together with the button-blank, transferring device.

Fig. 8 is a central longitudinal section of the spindle with chuck, showing the ejection of a finished button therefrom and the transferring device almost in position to insert a new button-blank into the chuck. Figs. 9 and 10 are views similar to Fig. 8, showing the different positions of the transferring device.

Referring now to the drawings for a further description, A is the base of the machine, in which the main shaft B is journaled. This main shaft B is driven from a countershaft B' by means of the belt b^3 to operate the chuck C, feeder F, and tail-stock or tool-rest T by means of cams which will be hereinafter more fully described. From the shaft B' the sleeve c' and chuck-spindle c^2 are driven by the pulleys b^2 and belts b^3 , and the countershaft B' is driven from any suitable power by means of the fast and loose pulleys b' .

The chuck C for holding the button-blank is made in any desired manner, but preference is given to the construction as shown in Fig. 1, in which the chuck-head is split and provided with a conical shoulder normally seated in the enlarged opening of the sleeve c' . The chuck C is provided with a spindle c^2 , which is keyed or otherwise held to the sleeve c' , so that the spindle c^2 may be moved longitudinally to cause the opening and closing of the jaws of the chuck. In the sleeve c' is formed an enlarged opening c^3 , in which a spring c^4 for normally closing the chuck is seated with one end, the other end bearing against a nut c^5 on the spindle c^2 . To open the chuck C either when being rotated or at a standstill, the spindle c^2 is pushed against the action of the spring c^4 by the lever c^6 , which is pivoted to the base of the machine and operated from the main shaft B by the cam c^7 .

In order to eject the finished button from the chuck when the latter is opened, or, in other words, to insure such ejection a shouldered rod c^8 is inserted in one-half of the chuck-spindle c^2 and normally projects through the front end of the chuck by the action of a spiral spring c^9 , pressing with one end against the shoulder of the rod c^8 , which, however, is limited in its outward movement by the offsetted aperture in the spindle c^2 .

The tool t is carried on a sliding tail-stock T, mounted on a slide a' of the base A and

moved longitudinally on the slide α' by means of the cam t^2 , bearing on a roller t^3 of the tail-stock T. A counterweight (not shown) suspended over a pulley t by a chain insures contact of the roller t^3 with the cam t^2 , so that the movements of the tail-stock are regulated entirely by the cam t^2 . This cam t^2 and the cam c^7 for actuating the chuck C operate in such a way that when a button-blank is being inserted into the rotating chuck C the tool is farthest away from the same, and as soon as the chuck closes the tool t moves quickly against the rotating button-blank to face or turn the same. The tool-holder or tail-stock may be of any desired construction; but preference is given to that shown in Figs. 1 and 2, in which a vertical adjustable sleeve t^{14} carries the Y-shaped tool-holder t^5 , on each of the two arms t^6 of which a tool is clamped, so that while one tool t is in operation the other may be sharpened or replaced without stopping the machine. The tool-holder t^5 is held in the sleeve t^{14} by means of a suitable spring t^7 and is prevented from turning by the lugs t^8 engaging slots t^9 in the sleeve t^{14} and projection t^{10} of the tail-stock T. In order to reverse the tools, it is necessary to only throw the spring or spring-catch t^7 back and lift the tool-holder t^5 sufficiently to disengage the lugs t^8 from the slots t^9 and turn the said tool-holder t^5 one-hundred and eighty degrees. The raising and lowering of the tool-holder t^5 , which is necessary to set the tool into proper relation with the chuck C, is effected by the nut t^{11} , inserted between cheeks of the tail-stock T and meshing with the threads of the sleeve t^{14} , so that by turning the nut t^{11} in one direction the sleeve t^{14} and tool-holder t^5 will be moved downward and when turned in the opposite direction the sleeve t^{14} and tool-holder t^5 will be moved upward. To properly set the tool t not in use, a gage g is provided, consisting of an arm g' , pivotally mounted on a post g^2 of the machine-bed A, and to sharpen the tool not in use a grindstone or emery-wheel g^3 is journaled on a swinging arm g^4 and driven from the counter-shaft B' by means of belts g^5 g^6 and pulleys g^7 , g^8 , and g^9 , as may be readily seen from Figs. 1 and 2.

In order to feed the button-blanks automatically into the chuck C, a rotary disk D is arranged above the chuck C, and a device or feeder F is provided in front of the chuck to transfer the button-blank x from the disk D to the chuck C, and this is accomplished in the following manner: Above the journal α for the chuck-spindle sleeve c' is provided a circular table D', supported by the posts d' and having a central sleeve or bearing d formed thereon. The disk D is provided with apertures d^2 the size of the button-blanks x and is rotated by means of a ratchet-wheel d^3 , secured to a stem d^4 of the disk D. This ratchet-wheel d^3 has as many teeth as there are apertures d^2 , so that when the wheel is moved the space of one tooth by means of a pawl d^5 an aperture d^2 registers with an open-

ing d^6 of the table D' and permits a button-blank x to fall into the chute d^7 , from which it is transferred to the chuck C. It is important to present the best or solid side of a button-blank to the tool, and by arranging the devices as just described this result will be secured, as the attendant in charge will place the side of the blank to be faced uppermost, so that when the latter enters the chute the face of the button-blank is outwardly.

At the front of the chuck C and surrounding the same is a face-plate f , secured to the machine-base A by means of a stud f' and set-screw f^2 in such a manner that the chuck C when open is flush with the face of the said plate f . At a distance from the center of the face-plate f , Fig. 3, is provided a vertical sliding bar f^3 , receiving reciprocating motion from the main shaft B of the machine by means of an eccentric f^4 , eccentric-strap f^5 , and link f^6 , and this eccentric is so set in relation to the cams c^7 and t^2 that when the tool t travels away from the chuck C and the latter opens the sliding bar f^3 is lowered, and when the chuck closes and the tool advances toward the chuck the bar f^3 is raised.

Rigidly attached to the bar f^3 is a cross-bar f^8 , provided with an aperture in which a plug f^9 , secured to an auxiliary bar f^{10} , is attached. This auxiliary bar f^{10} is held slidingly to the cross-bar f^8 by means of the studscrews f^{11} and is held outwardly through the flat springs f^{12} , bearing with their respective ends against the four pins f^{13} , secured in the cross-bar f^8 .

To the free end of the cross-bar f^8 is secured a guide f^{14} , carrying a flexible cam f^{15} to operate a lever f^{16} and plug f^{17} . The latter is arranged in the plate f just below the chute d^7 to, first, prevent a button-blank in the same from falling through the opening when the cross-bar f^8 is in its lower position, and, secondly, to force a button-blank against the action of the flat springs f^{12} into the opening of the cross-bar f^8 , as shown in Fig. 5. The lever f^{16} is pinned to the plug f^{17} at f^{18} , and a spring f^{19} normally presses against the lever f^{16} , so that the outer end of of the plug f^{17} is flush with the face of the plate f .

In order to rotate the disk D by means of the ratchet-wheel d^3 , a cam d^8 is fastened to the rear of the sliding bar f^3 , which slides up and down therewith and oscillates a lever d^9 , to which the pawl d^5 is hinged, Figs. 1, 6, to 8. When the cross-bar f^8 is opposite the chuck C, Fig. 10, it is necessary to force the button-blank out of the cross-bar and into the chuck C and against the action of the spring c^9 of the rod c^8 in the chuck C, and this is accomplished by the rods i , mounted in a cross-bar i' and the face-plate f , and are connected by a bar i^2 . In each of the two rods i is mounted a pin i^3 , and between this and the face-plate f is inserted a spring i^4 , so that the rectangular projections i^5 , one at each rod i , are normally pressed against the face of the plate f . Both of these rectangular pro-

jections i^5 are moved away from the face of the plate f in order to let the auxiliary bar f^{10} pass between by the lever i^6 , pivoted to the base A of the machine and bearing with its upper end against the bar i^2 and with its lower end against a cam i^7 on the shaft B of the machine. This cam i^7 is of such a shape and set in relative position with the cams c^7 , i^2 , and eccentric f^4 as that the projections i^5 are moved outwardly before the auxiliary bar f^{10} reaches its lowest position, when they will be relieved of the action of the cam i^7 and be forced by the springs i^4 to press the auxiliary bar f^{10} , with plug f^9 , toward the open chuck C, forcing the button-blank x into the same and following the chuck C until it is closed, after which the cross-bar f^8 moves upward and the projections i^5 under the influence of the springs i^4 return to their normal position against the face-plate f .

The actions of the feeding devices just described are as follows: The chuck C is constantly rotating at a speed of, say, seven hundred revolutions per minute, and the speed of the main shaft B is about eighteen revolutions per minute, so that about eighteen buttons may be faced in one minute on one machine, each facing requiring about forty revolutions of the blank. The button-blanks x are placed by hand, with their face sides up, in the apertures of the disk D, which, as before stated, delivers one blank to the chute d^7 whenever one button-blank is faced and released from the chuck C. When the tool t is in position, as shown in Fig. 2, one button-blank is in the chuck C, Fig. 5, being faced and one is in the aperture of the cross-bar f^8 ready to be brought into the chuck C. The button in the chuck being finished, the tool t recedes, and the chuck C through the instrumentality of the cam c^7 and lever c^6 opens and the button is forced out of the chuck by means of the rod c^8 , Fig. 8. In the meanwhile the cross-bar f^8 , with the auxiliary bar f^{10} and holding the button-blank, is lowered by the cam f^4 , cam-lever f^5 , link f^6 , and sliding bar f^3 until the center of the button-blank is in line with the center of the chuck C, which latter when open, Fig. 10, is flush with the face of the plate f . The rectangular projections, Fig. 8, having before been moved from the face of the plate f by the cam i^7 and lever i^6 , the latter now gliding off the high section of the cam i^7 permits the springs i^4 to force the projections i^5 , Fig. 10, against the ends of the auxiliary bar f^{10} and press the button-blank into the chuck C against the pressure of the spring c^9 of the rod c^8 . By the downward movement of the sliding bar f^3 the disk D is turned so as to feed another button-blank into the chute d^7 , Fig. 10, and this is held by the plug f^{17} . In the upward movement of the sliding bar f^3 with cross-bar f^8 and spring-cam f^{15} the latter engages the end of the lever f^{16} and forces the same backward against the action of the spring f^{19} to withdraw the plug f^{17} , Fig. 9, and allow the button-blank

to drop, so that it is between the two plugs f^{17} and f^9 , Fig. 9. The spring f^{19} being stronger than the springs f^{12} on the auxiliary bar f^{10} , the plug f^{17} presses the button-blank into the opening of the cross-bar f^8 , Fig. 5, so that by its next downward movement another blank is presented to and pressed into the chuck C. In the downward movement of the sliding bar f^3 , cross-bar f^8 , and the spring-cam f^{15} the latter passes the end of the lever f^{16} without actuating the same, as may be seen from Figs. 6 and 7, while when the spring-cam f^{15} moves upward the point of the cam engages the lever f^{16} and forces the free end outward to actuate the plug f^{17} , as described.

It will be understood by those skilled in the art to which this invention pertains that modifications may be made in the construction and arrangements of the devices for transferring button-blanks from a feeder to a constantly-revolving chuck, and I especially call attention to the fact that modifications may be made without departing from the spirit of the invention as herein described.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a button-facing machine the combination with a revolving chuck, of an automatic feeding device comprising a stationary table, a rotatable disk mounted thereon, apertures in said disk, a chute attached to said table, a transferring device comprising a stationary adjustable plate supporting said chute, a movable plug in said plate and below said chute, a cross-bar slidably arranged in front of the said plate, an opening in said bar, registering with the plug in said plate and with the chuck according to the position of said cross-bar, an auxiliary bar slidably mounted on said cross-bar, a plug attached to said auxiliary bar and fitting said opening in the cross-bar, and means for forcing the plug of the auxiliary bar toward the chuck when opposite the same, substantially as and for the purposes set forth.

2. In a button-facing machine the combination with a revolving chuck, of an automatic feeding device comprising a stationary plate surrounding said chuck, a chute in said plate, a sliding button-blank carrier registering with the chute-opening and the chuck when in respective positions, means attached to said plate to force a button-blank into the button-blank carrier, when opposite the chute-opening, and means to force the said button-blank from the said carrier into the chuck when the carrier is opposite the said chuck, substantially as and for the purposes set forth.

3. In a button-facing machine the combination with a revolving chuck, of an automatic feeding device, comprising a stationary chute, a plug slidably mounted below said chute, a button-blank carrier, means for shifting said carrier from in line with the plug of the chute to the center of the chuck,

a spring-operated plug in said carrier, means for admitting a blank in front of the chute-plug and forcing the same into the said carrier, and means for forcing the said blank into the chuck, substantially as and for the purposes set forth.

4. In a button-facing machine the combination with a revolving chuck, of an automatic feeding device, comprising a stationary chute, a plug slidingly mounted below said chute, a lever and spring operating said plug, a button-blank carrier, means for shifting the same to register with the said plug of the chute and the chuck, a spring-operated plug in said carrier and spring-operated projections to force a blank from the said carrier into the chuck, substantially as and for the purposes set forth.

5. In a button-facing machine the combination with a revolving chuck, of an automatic feeding device comprising a chute, a plug slidingly mounted below said chute, a lever and a spring to operate said plug, a button-blank carrier consisting of a cross-bar, a sliding bar and an auxiliary bar, an opening in said cross-bar, a spring-operated plug in said auxiliary bar, said plug sliding in said opening of the cross-bar, a spring-cam adapted to actuate the lever of the said chute-plug, and means to force the said auxiliary bar toward the chuck when in line therewith, substantially as and for the purposes set forth.

6. In a button-facing machine the combination with a revolving chuck, of an automatic feeding device comprising a stationary table, a chute therein, a disk mounted in said table, apertures in said disk, a ratchet-wheel on said disk, a plug below said chute, a lever and spring to operate said plug, a button-blank carrier consisting of a cross-bar, a sliding bar and an auxiliary bar, an opening in said cross-bar, a spring-operated plug in said auxiliary bar, said plug sliding in said opening of the cross-bar, a spring-cam adapted to actuate the lever of the said chute-plug, a

cam on said sliding bar to operate the ratchet-wheel of the said disk and means for forcing the said auxiliary bar toward the chuck when in line therewith, substantially as and for the purposes set forth.

7. In a button-facing machine having a main shaft, a tail-stock, a cam on said shaft for actuating the said tail-stock, the combination with a revolving chuck, of an automatic feeding device comprising a stationary table, a chute thereon, a disk mounted in said table, apertures in said disk, a ratchet-wheel on said disk, a plug below the said chute, a lever and spring to operate said plug, a button-carrier consisting of a cross-bar, a sliding bar and an auxiliary bar, a cam on said main shaft for operating said sliding bar, an opening in said cross-bar, a spring-operated plug in said auxiliary bar, said plug sliding in said opening of the cross-bar, a spring-cam connected with the sliding bar to actuate the lever of the said chute-plug, a cam on said sliding bar to operate the ratchet-wheel of the said disk, two spring-operated rods with rectangular projections, a cross-bar connecting the said rods, a lever hinged to the machine-bed and a cam on the main shaft to push the said projections outwardly, to let the auxiliary bar pass downward, substantially as and for the purposes set forth.

8. In a button-facing machine the combination with a revolving chuck comprising a sleeve, a chuck-spindle slidingly mounted in said sleeve, a shouldered rod and spring within said chuck-spindle, of a tail-stock with an adjustable Y-shaped tool-holder in said tail-stock, and means for sharpening one tool, while the other is operating, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JULIUS HENRICH.

Witnesses:

OLIVER S. KEELY,
HERMANN BORMANN.