

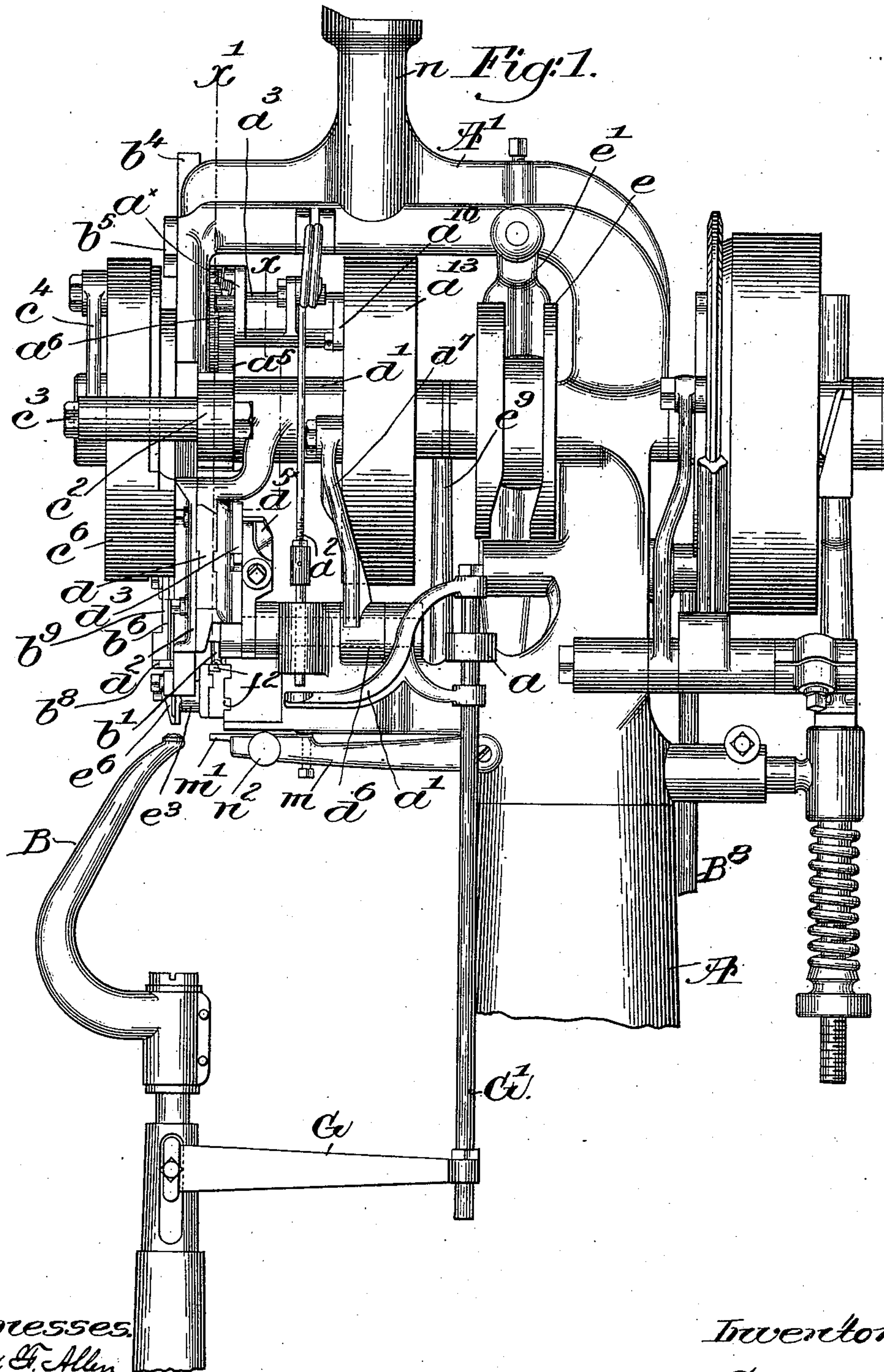
(No Model.)

5 Sheets—Sheet 1.

L. GODDU.
NAILING MACHINE.

No. 563,478.

Patented July 7, 1896.



Witnesses.
Edward G. Allen.

Fred S. Grunbaf.

Inventor:

Louis Goddu
by Crosby & Gregory
Attys.

(No Model.)

5 Sheets—Sheet 2.

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Fig. 2.

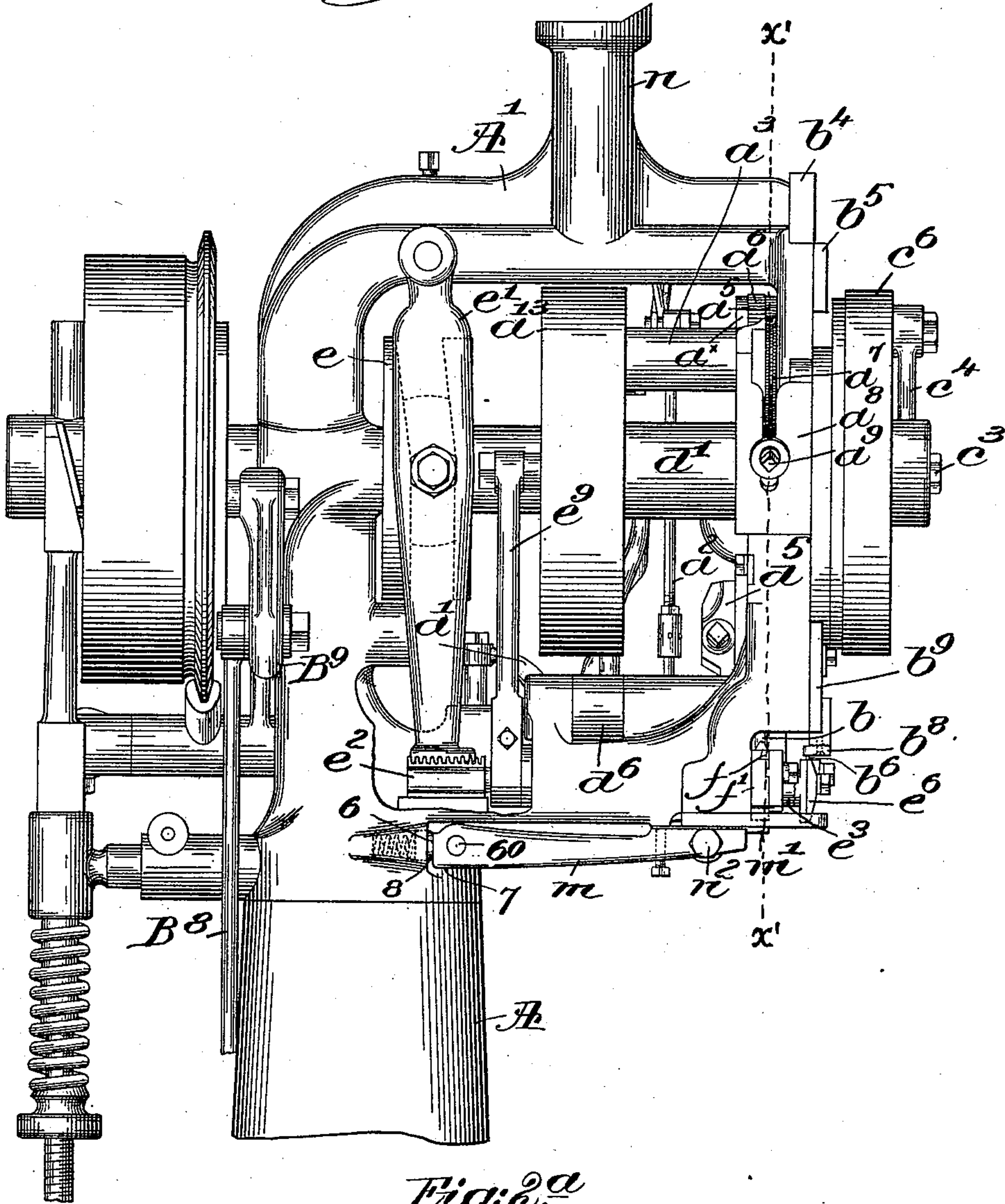
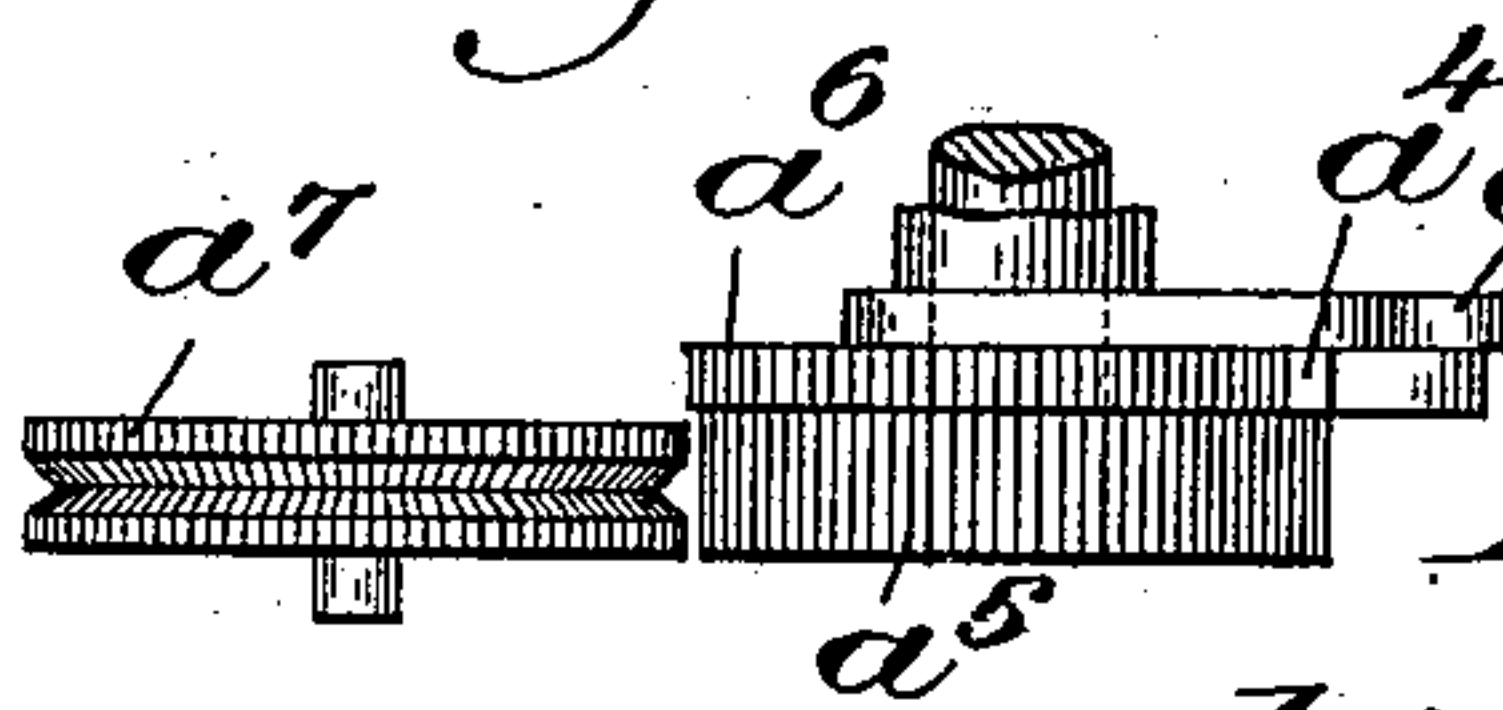


Fig. 2a



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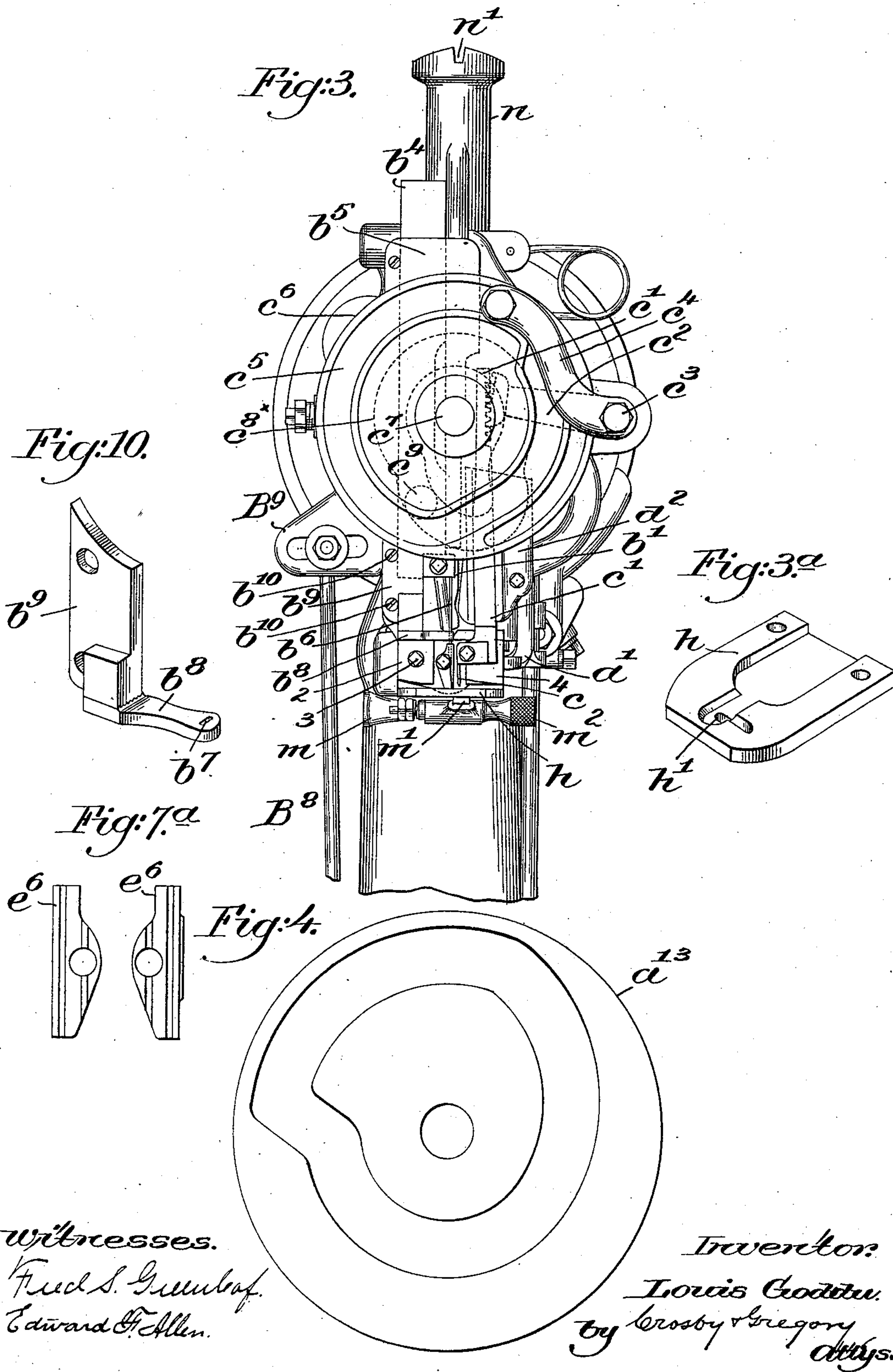
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Fig. 6.

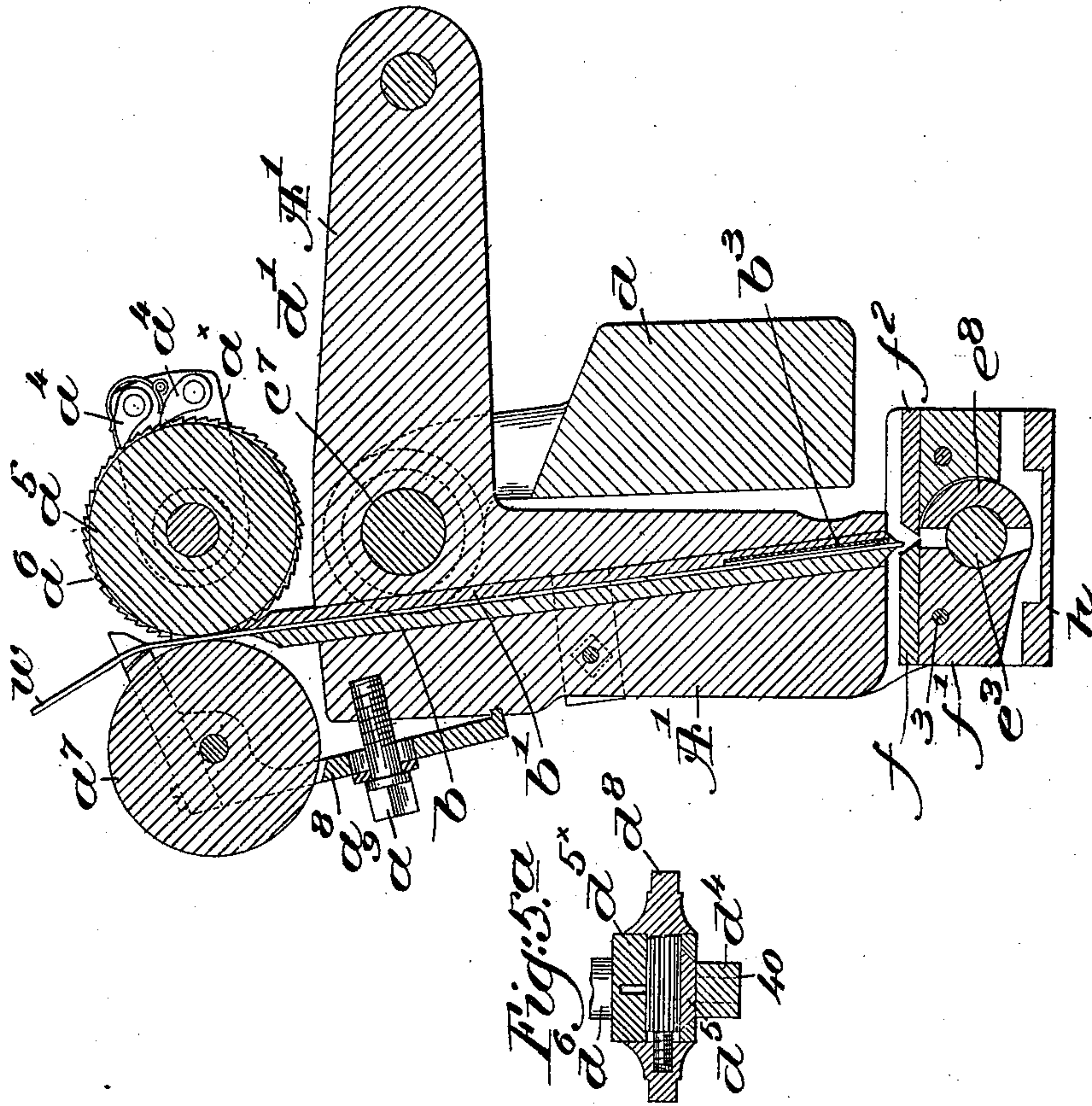


Fig. 5.

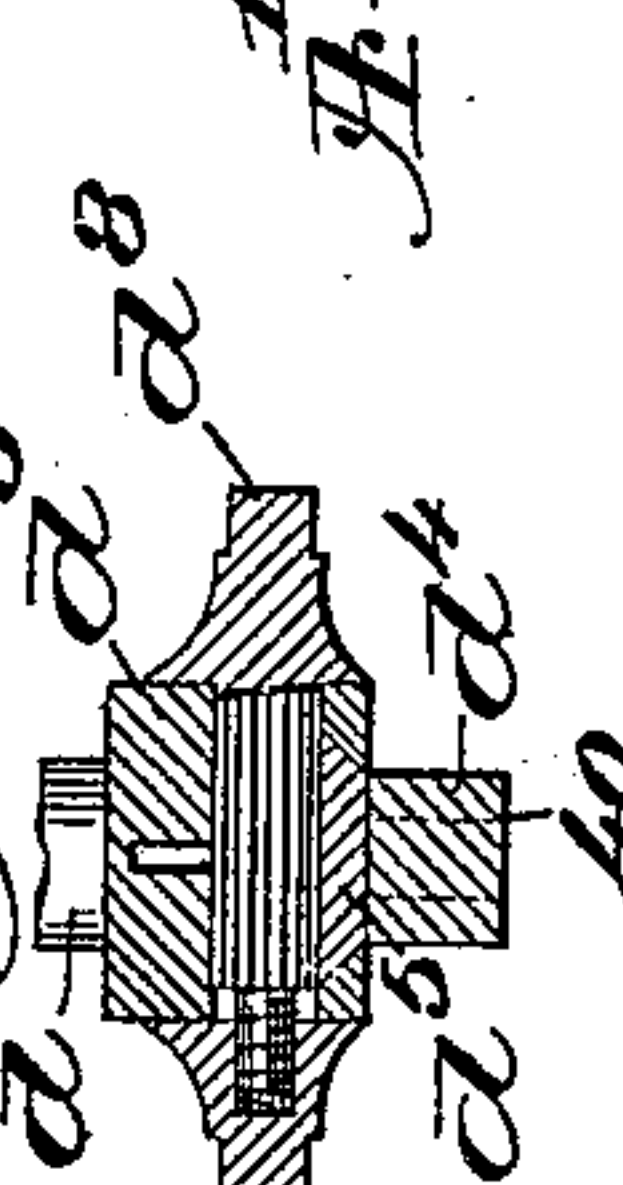
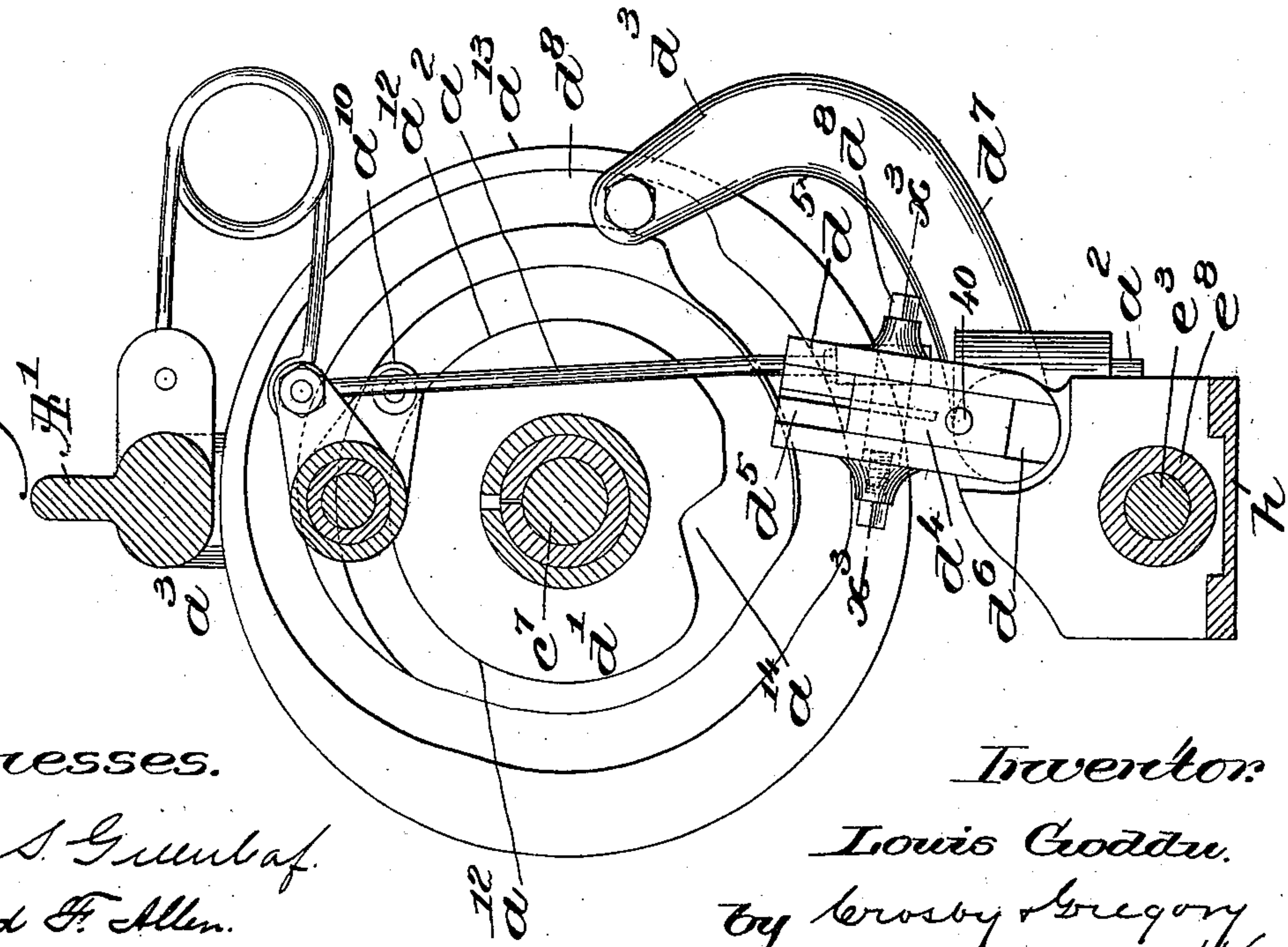


Fig. 5.



Witnesses.
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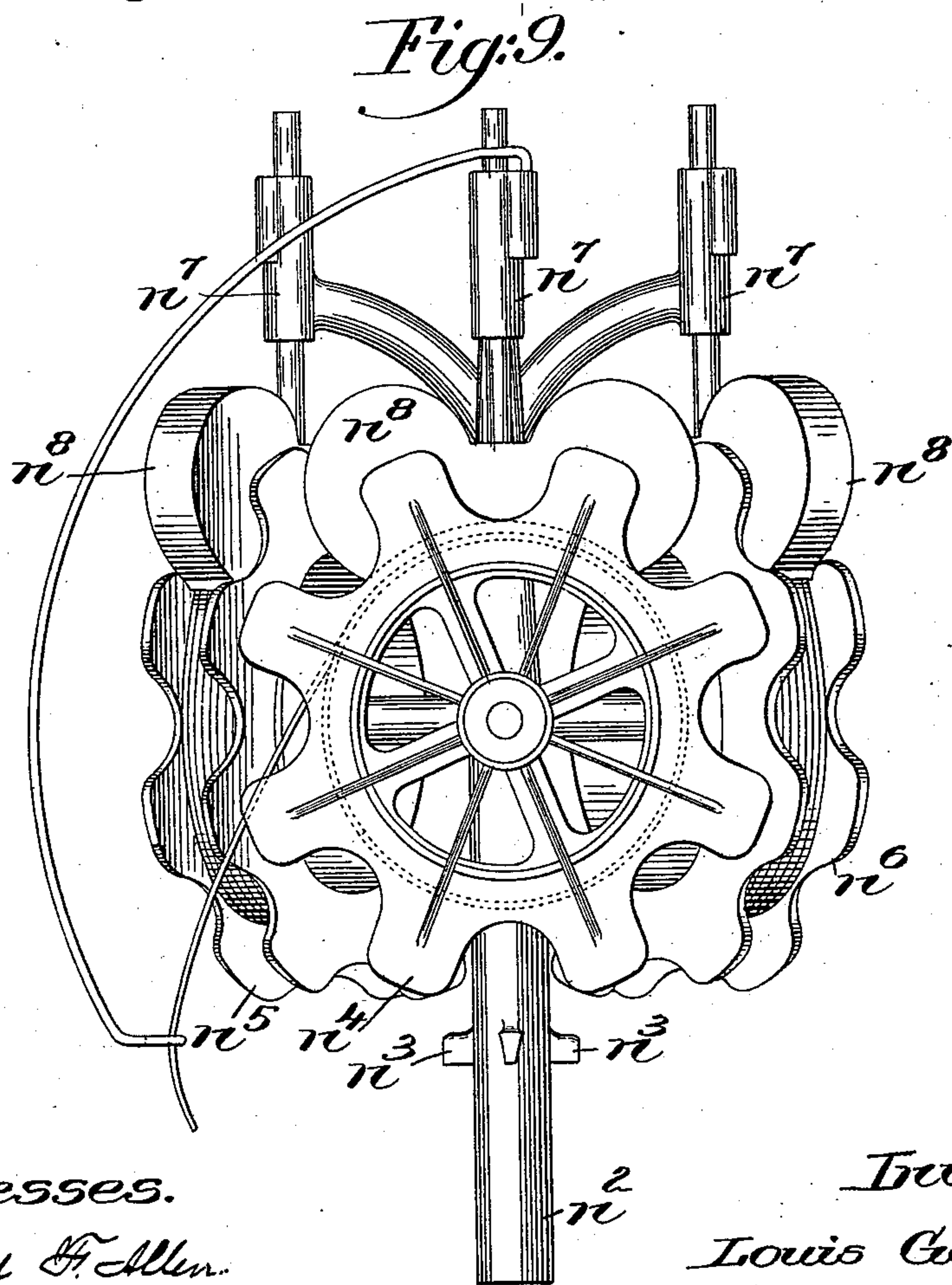
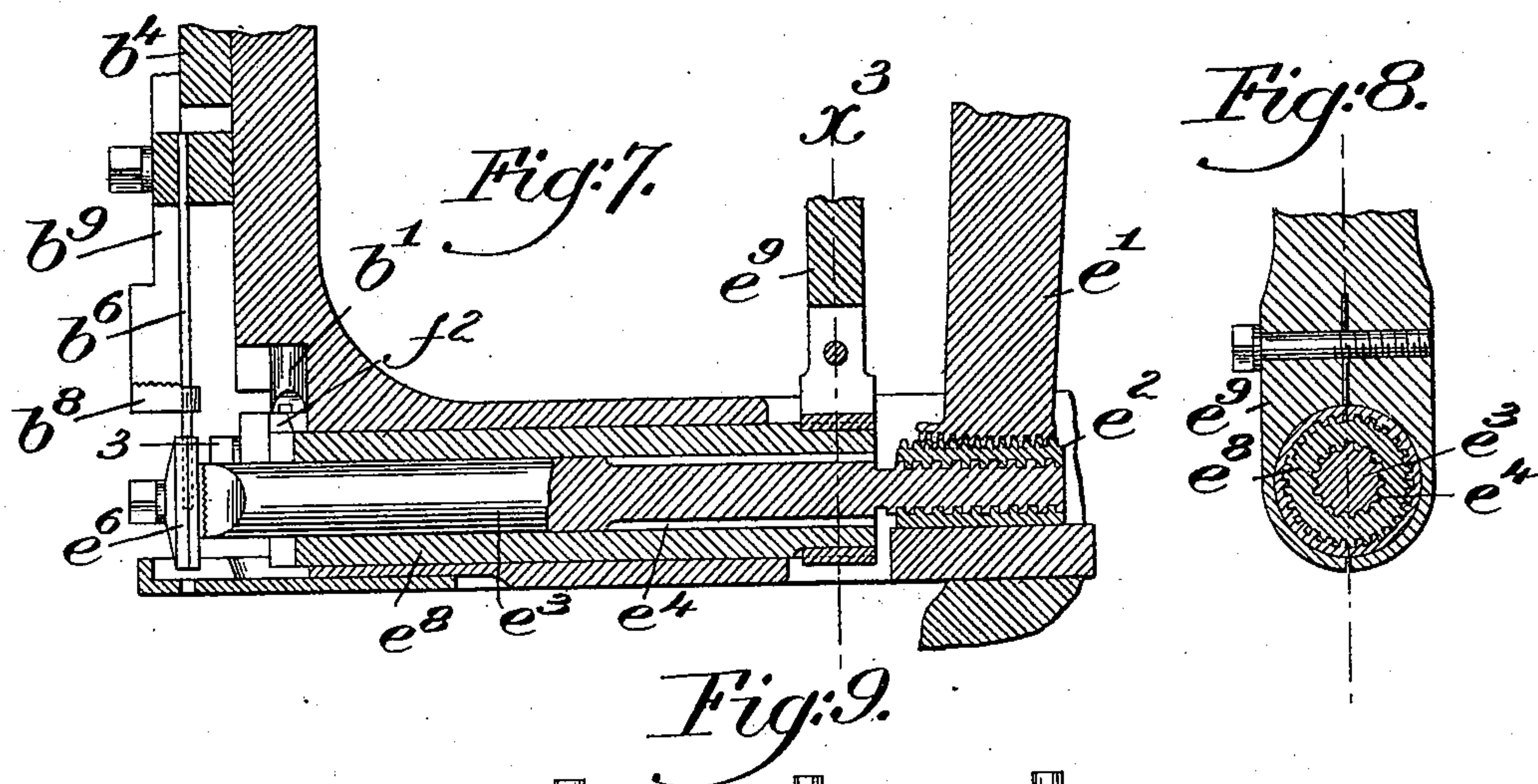
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Witnesses.

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UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE.

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 563,478, dated July 7, 1896.

Application filed June 25, 1894. Serial No. 515,680. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GODDU, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Nailing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In the manufacture of boots and shoes, round, threaded, corrugated, and other wires are cut off to form nails or fastenings to be driven by a machine into the outer sole to confine it to the upper and inner sole, and the length of the fastening-wire is automatically varied according to the thickness of the material into which it is to be driven, but the heels are commonly attached to the sole by another machine using a different fastening, and a tread-lift is added to the heel by "spanking" the same, as it is called, onto the ends of the partially-driven nails or fastenings used to confine the heel to the sole.

Some buyers of shoes demand that the tread-lifts and sometimes the heels be united to the sole of the shoe by slugs made from a ribbon of wire quadrangular in cross-section, and to do this latter work special machines have been devised.

I have provided a machine which with but slight changes in some of its parts may be readily adapted for driving a wire of any desired shape in cross-section, thus adapting one and the same machine to a greater variety of work.

The machine herein to be described when used for uniting an outer sole to an inner sole of a lasted shoe has means for automatically adapting the fastening to the thickness of the stock, but when used for slugging a heel or quilting a sole where the length of fastening is uniform the devices for varying the feed of the wire may be rendered inoperative and the feeding of the wire be made uniform. To provide for the automatically-variable feed or the uniform feed of the wire, the wire-feeding mechanism has been provided with what I denominate as a "measuring-gate," it being adapted to be turned aside when the feeding of the wire is to be uniform. The awl and driver used are shown as actuated positively in both directions by cams, rather

than by a cam in one direction and a spring in the other direction, as most commonly practiced. I have simplified and improved the cutting mechanism for the wire, and also the means for moving the nose from cutting position into position to let the nail be acted on by the driver.

Figure 1 is a right-hand side elevation of the upper part of a nailing-machine embodying my invention, the column having the base to rest on the floor having been omitted, as well as the usual treadles connected therewith. Fig. 2 is a left-hand side elevation of the upper part of the machine, the horn shown in Fig. 1 having been omitted. Fig. 2^a is a top or plan view of the wire-feeding devices to be referred to. Fig. 3 is a front elevation of the upper part of the machine shown in Fig. 2; Fig. 3^a, a view of the foot *h*, enlarged. Fig. 4 shows the cam in detail. Fig. 5 is a section in about the dotted line *x*, Figs. 1 and 2, looking toward the rear; Fig. 5^a, a sectional detail in the line *x*³, Fig. 5, showing the block *d*⁴ and the gear for adjusting it. Fig. 6 is an enlarged sectional detail in about the line *x*¹, Fig. 2. Fig. 7 is an enlarged longitudinal sectional detail chiefly to show the nose or nail-carrier and its operative parts. Fig. 7^a shows the throat *e*⁶ in detail. Fig. 8 is a section in the line *x*³, Fig. 7. Fig. 9 is a detail showing the multispool-holder for the different kinds of wire; Fig. 10, an enlarged detail view of the guide *b*⁸.

The framework consists, essentially, of a column A, having at its upper end a head A', shaped to constitute bearings or supports for the various working parts, the base of said column, which in practice rests on the floor, being omitted.

Before describing in detail my improved machine I will say that the horn B, the arm G, extended laterally from the horn-shaft, the stop-rod G', connected to said arm and rising and falling in unison with the horn, the lever B⁹, having connected to it the rod B⁸, are all the same as indicated by like letters in United States Patent No. 403,835, dated May 21, 1889, and in practice the rod B⁸ is connected to a lever attached to the horn-shaft, so that the horn is lowered after each fastening has been driven and while the awl to be described feeds

the work, said horn-shaft in practice being normally pressed upwardly by a spring during the driving operating, all as provided for in said patent, and said parts, being well known, do not require to be herein further described.

The stop-rod G' slides at its upper end in a guide a , and said rod has mounted loosely on it a measuring-gate a' , which when in its operative position, as shown by full lines, Fig. 1, (it being used only when the machine is being used for driving fastenings for uniting the sole to the shoe,) acts as a stop for the measuring-leg a^2 , also found in said patent, said leg being connected with an arm of a pawl-carrying sleeve a^3 , (see Figs. 1, 2, and 5,) said sleeve having another arm a^x , provided with spring-controlled pawls a^4 , (see Fig. 6,) which act on the toothed periphery of a ratchet-wheel a^5 , connected to or forming part of a wire-feeding wheel a^6 , suitably scored or serrated at its periphery to engage and feed the wire w , being used, said wire being pressed against said serrated surface by a pressure-wheel a^7 , mounted in a yoke or frame a^8 , adjustably attached to the framework by a screw a^9 , said pressure-wheel having an annular V-shaped groove, the periphery of said wheel at each side said groove being serrated to bear against one side of a flattened wire, the wall of the groove being also serrated to afford projections to engage either a quadrangular, square, round, or oval, or other shaped wire, a portion of which may enter said groove. The groove also acts to aline the wire with the wire-passages below.

The measuring-gate rises and falls with the stop-rod connected, as stated, to the horn, and consequently said gate when in working position, as in Figs. 1 and 3, acts to stop the descent of the leg a^2 sooner or later, and consequently shorten the back stroke of the pawls a^4 , to thus effect at their next forward stroke a greater or less movement of the feed-wheel, to thus feed a greater or less length of the wire into the nose or carrier e^6 , to be described, this operation being automatic, to thus provide for the length of fastening desired.

A roller or other stud a^{10} on a third arm of the pawl-carrying sleeve a^3 is acted upon by a cam-surface a^{12} (see Fig. 5) at one side of the cam a^{13} , said cam-surface having a depression or space a^{14} , into which the said roller or other stud a^{10} enters, as required, when the pawl-carrier is moving on its back stroke to assume a starting-point, the roll entering said space more or less, according to the thickness of the stock, to thus provide for the required length of feed stroke next to be made.

The wire-guide (shown best in Fig. 6 and located just below the feeding-wheel) is composed of two plates b b' , the plate b being provided next the plate b' with a guiding-groove for the wire to be driven, the said groove being shaped to correspond substantially with the cross-section of the wire, whether round, flat, or otherwise, and to read-

ily change from round to flat wire, or vice versa, the plate b may be readily removed from the machine, first by taking off, however, the frame a^8 , carrying the wheel a^7 . The lower end of the plate b' is provided with a steel wear-plate b^3 .

The driver-bar b^4 is mounted in suitable guideways behind the fixed face-plate b^5 of the head of the machine, said driver-bar having attached to it by a suitable screw a driver b^6 , which at its lower end enters a driver-passage b^7 (see Fig. 10) in a guide b^8 , connected to or forming part of a plate b^9 , attached to the head of the machine by screws b^{10} , the edge of the said plate constituting a side guide for one side of the said driver-bar.

The awl c is attached to the lower end of an awl-bar c' , provided at one side (see dotted lines, Fig. 3) with teeth, which are engaged by teeth of an arm c^2 , forming part of a two-armed lever mounted upon a stud-screw c^3 and having a second arm c^4 , which is provided with a roller or other stud, (see Fig. 3,) which enters a groove c^5 in the outer face of the cam-hub c^6 , fast upon the outer end of the main shaft c^7 .

The rear side of the cam-hub c^6 is provided (see dotted lines, Fig. 3) with a cam-groove c^{8x} , which receives a roller or other stud c^9 , (see dotted lines, Fig. 3,) extended from the front of the driver-bar, said cam reciprocating said driver-bar positively up and down.

The shank of the awl-bar is adapted to slide vertically in guideways in a rocking frame d , having a sleeve-like hub d' , which embraces a hub surrounding the main shaft in front of the cam-hub a^{13} . The rocking frame has attached to it at its front side by suitable screws the movable side guide d^2 for the awl-bar in its vertical movement, and at its rear side said rocking frame has attached to it a guideway having a movable side d^3 of a guideway, (see Fig. 1,) in which guideway is placed a swivel-block d^4 , (see Figs. 5 and 5^a,) which is entered by a pin 40, extended from a dovetailed slide d^5 , provided at one face with teeth, said slide being fitted into a dovetailed passage in a rocking arm d^{5x} , connected to a short rock-shaft d^6 , having an arm d^7 , provided with a roller-stud which enters a cam-groove d^8 (see Fig. 5) at the outer side of the cam-hub a^{13} , said rock-shaft, by engaging the sliding block, moving the rocking frame to effect the feeding of the material, while the awl is in it, over the horn.

The arm d^{5x} referred to carries a short stud-gear d^{80} , (see Fig. 5^a,) the teeth of which engage the teeth of slide d^5 and moves it with relation to the said arm and rocking frame to alter at will the length of the feed.

The main shaft has a cam e , provided at its periphery with a groove in which is entered a roller or other stud of a toothed lever e' , pivoted at its upper end on a stud on the framework, the lower end of said lever having, as shown in Fig. 2, rack-teeth to engage the teeth of a block e^2 , (see also Fig. 7,) hav-

ing within it a series of threads or annular rings and projections which fit a series of threads or annular rings and projections on a shaft e^3 , which for the greater part of its length is milled, as at e^4 , to constitute splines, said shaft at its forward end having attached to it a throat e^6 , composed of two parts. (Shown separated in Fig. 7^a.) The end of the wire is fed from the wire-guide into this throat, and when of the proper length is cut off, as will be described, and then the throat is moved with the fastening into the path of movement of the driver. The throat referred to has a longitudinal movement from the position under the guideway for the wire to the position occupied by the driver, such movement being effected by the lever e' , referred to. The throat receives the wire from an inclined wire-passage, and the driver works in a vertical line, so the throat has to be tipped slightly in passing from one into its other position, and to effect this tipping movement I have placed upon the milled body of the shaft e^3 a sleeve e^8 , fluted internally to fit the flutes or splines of said shaft, and also preferably for a short distance externally, (see right of Figs. 7 and 8,) and upon this sleeve I have mounted a lever e^9 , having a roller or other stud to enter a cam-groove at the rear side of the cam-hub a^{18} . It will be understood that the shaft e^3 may slide backward and forward to a limited extent within the said sleeve e^8 , and the block e^2 , by reason of its peculiar connection with said shaft by grooves and rings, permits the shaft to be rocked and reciprocated at the same time without either movement affecting the other.

The movable cutting-blade f (see Fig. 6) is held in adjusted position by means of a cap-plate 2 and a screw 3 upon an arm f' of the sleeve e^8 .

The stationary cutter f^2 is represented as held between the head of the machine and a detachable cap 4, held in place by a suitable set-screw.

When the wire has been fed into the movable throat for the proper distance, the sleeve referred to will be rocked to cause the movable blade or cutter to pass the lower end of the guideway for the wire and cut the wire off, and at the same time the throat will be tipped into its substantially vertical position, so that when it is moved forward, as described, the hole in the throat will come properly under the driver to enable the latter to strike the nail or fastening therein and drive it out from the throat. During the forward movement of the throat containing the loose fastening, the lower end of the fastening may ride on the top of a foot h until the throat has been moved far enough to come opposite the hole h' therein, the hole in which the awl works when feeding the material, and through which the fastening passes into the work.

When it is desired to change from nailing the sole to slugging the heel or quilting the sole, the operator will turn aside the measur-

ing-gate a' , and if a radically-different wire as to size and shape is to be used, the wire-guide b may be changed, the driver and throat e^6 to one having an opening of the desired shape in cross-section.

I have pivoted at 60 upon the head of the machine an arm m , provided with a gage m' , having at its under side suitable teeth to be engaged by the teeth of a hand-shaft m^2 , the gage being adjustable on the arm in order to place the fastenings at the proper distance from the edge of the sole, the entire apparatus being turned down out of the way when it is desired to slug a heel or quilt soles. The arm referred to has two flattened portions 6 7, against which acts a spring-pressed pin 8, it holding said arm either in its working or in its inoperative position, as desired.

The head of the machine has a socket n at its top provided with suitable notches n' , and into this socket is fitted a pin n^2 or post, having a series of projections n^3 , either of which may engage the said notch, and the said post has, as herein represented, three studs, on which are mounted three wire-carrying spools n^4 n^5 n^6 , containing different kinds of wire, either round, square, or flat, according to the work to be done. The rod n^2 may be rotated more or less, as desired, to bring one or the other of said projections into the notch, thus bringing one or the other of the said spools into working position, according to which wire it is desired to use. The upper end of the spool is represented as provided with guides n^7 for the shanks of brakes n^8 , which, acting by gravity, bear upon the surface of the wire on the spool and prevent it from overrunning.

The clutch-pulley mechanism for rotating the main shaft at desired times and the devices for controlling the same, as well as the brake, are and may be common to other nailing-machines.

The pressure-wheel a^7 (see Fig. 2^a) has an annular V-shaped groove in its periphery, and at each side of said groove the periphery of said wheel is serrated or scored, as are also the walls of said groove. This pressure-wheel acts upon the wire being used, of whatever cross-section, and presses the same against the scored periphery of the feeding-wheel a^5 .

Providing the pressure-wheel with a V-shaped groove enables it to receive a wire of most any cross-section, such, for instance, as square, round, oval, &c., and the V-shaped groove enables a portion of the wire to enter more or less and bind therein. The scored periphery of the pressure-wheel, on the contrary, may act on the flat side of a wire and press the opposite flat side against the feed-wheel a^5 .

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

1. In a nailing-machine, the horn, its spindle, its attached arm and rod free to rise and fall with the horn, the wire-feeding wheel,

its actuating-pawl, and measuring-leg, combined with the movable measuring-gate, to operate, substantially as described.

2. The hollow sleeve e^8 , the movable cutter member operatively connected therewith, a complemental cutter-blade, a wire-guide, wire-feeding mechanism, a driver-bar having a driver, and a shaft located within said sleeve and provided with a nail-receiving throat, combined with devices to rotate said sleeve and with it said shaft to not only actuate the cutter, but also to oscillate said throat, and devices to reciprocate said shaft in said sleeve to enable the throat attached thereto to be put into position with the fastening contained in it in the path of movement of said driver, substantially as described.

3. The movable frame, having guideways for the awl-bar, and a block-receiving guideway, and a rock-shaft having an arm provided with a guideway, combined with a slide-block and pinion intermediate said block-receiving guideway and said arm, whereby by adjustment of said slide-block by said pinion the length of feed effected by the awl carried by the awl-bar may be quickly regulated, substantially as described.

4. In a nailing-machine for forming nails from a continuous length of wire, the following instrumentalities, viz: a wire-guideway composed of two pieces b, b' , one of said pieces being grooved to receive the wire, the other piece presenting a plane or ungrooved face to the wire, feeding mechanism to feed the wire through said guideway, and cutting mechanism to sever the said wire into nail lengths, the provision of making the wire-receiving groove wholly in one-half the guideway enabling said half to be readily changed to adapt the machine to the use of wires of different cross-sections, substantially as described.

5. In a nailing-machine for forming nails from a continuous length of wire, the follow-

ing instrumentalities, viz: a wire-guideway composed of two pieces b, b' , one of said pieces being grooved to receive the wire, the other piece presenting a plane or ungrooved face to the wire, feeding mechanism to feed the wire through said guideway, and cutting mechanism to sever the said wire into nail lengths, a throat to receive said nail, and devices to rock said throat and to move it into position to place the nail carried by it under a driver, substantially as described.

6. In a nailing-machine, the following instrumentalities, viz; a throat pivotally supported midway between its ends, to receive a nail, a foot to rest upon the work and having a groove at its upper side to receive and guide the lower end of said throat, as it is rocked, and having also a nail-passage leading from the bottom of said groove, combined with means to rock said throat from the position where it receives a nail into position to have a nail driven therefrom, the foot supporting the nail while the throat is rocked, substantially as described.

7. In a nailing-machine, an awl-bar having an awl, a movable frame having a guideway for said awl-bar and a block-receiving guideway; and a rock-shaft having an arm provided with a guideway which is split for part of its length, combined with a toothed slide having a pivoted block to enter the guideway of said movable frame; and a stud-pinion adapted to engage the said toothed slide, and means cooperating with said pinion and guideway to lock the toothed slide in place after the same has been adjusted, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS GODDU.

Witnesses:

GEO. W. GREGORY,
EMMA J. BENNETT.