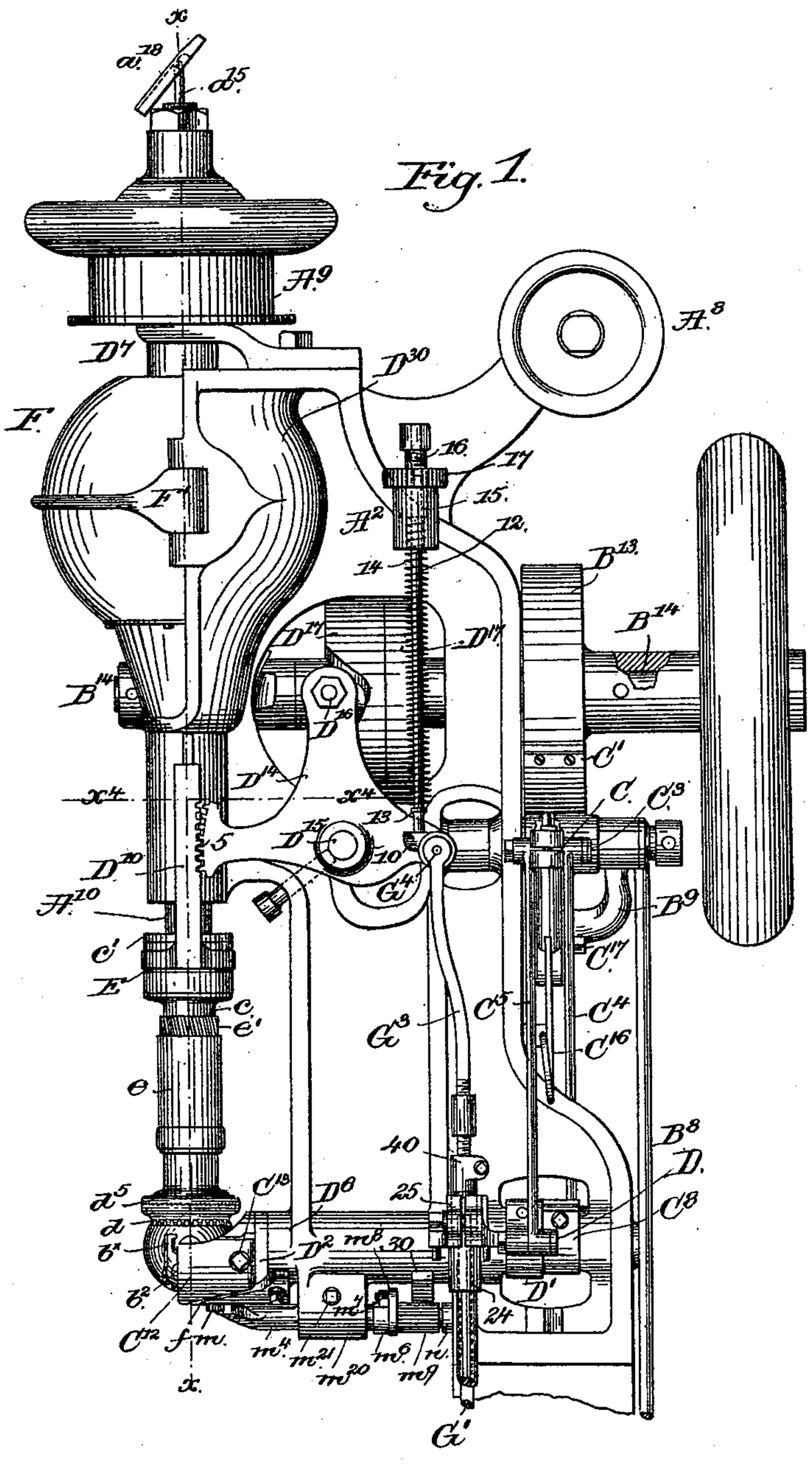
(No Model.) 5 Sheets—Sheet 1.

L. GODDU.

MACHINE FOR UNITING SOLES TO UPPERS.

No. 403,835. Patented May 21 1889.

Fig. 1.



Witnesses.
John F. C. Pennebaker.
Frederick L. Emery.

Inventor:
Louis Goddu.
By Lowrby & Gregory Attys.

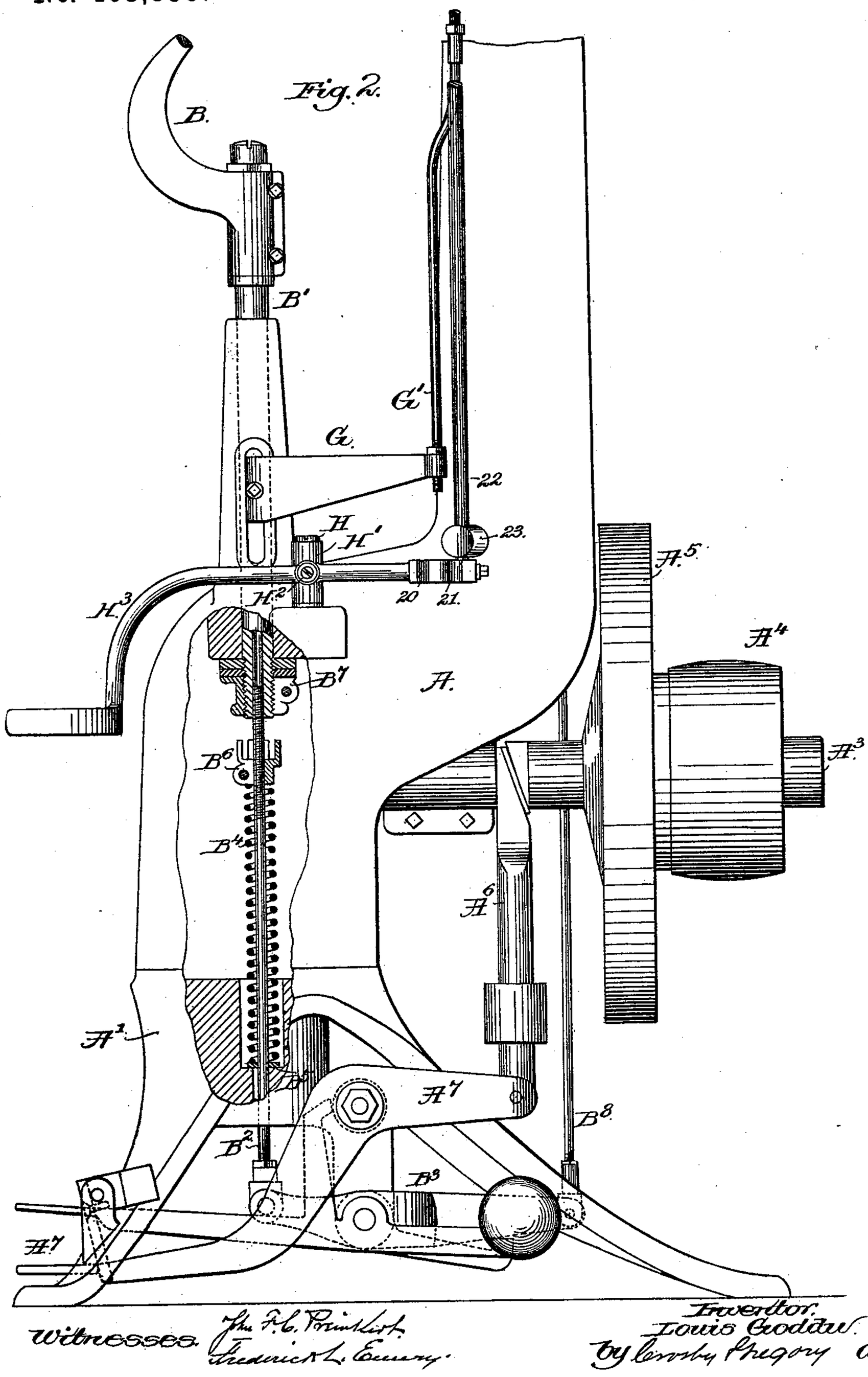
(No Model.) 5 Sheets—Sheet 2.

L. GODDU.

MACHINE FOR UNITING SOLES TO UPPERS.

No. 403,835. Patented May 21 1889.

Fig. 2.



Witnesses. John F. C. Printhorst. Frederick L. Emery.

Inventor. Louis Goddu. By Crosby Gregory Attys.

(No Model.) 5 Sheets—Sheet 3.

L. GODDU.

MACHINE FOR UNITING SOLES TO UPPERS.

No. 403,835. Patented May 21 1889.

Fig. 3.

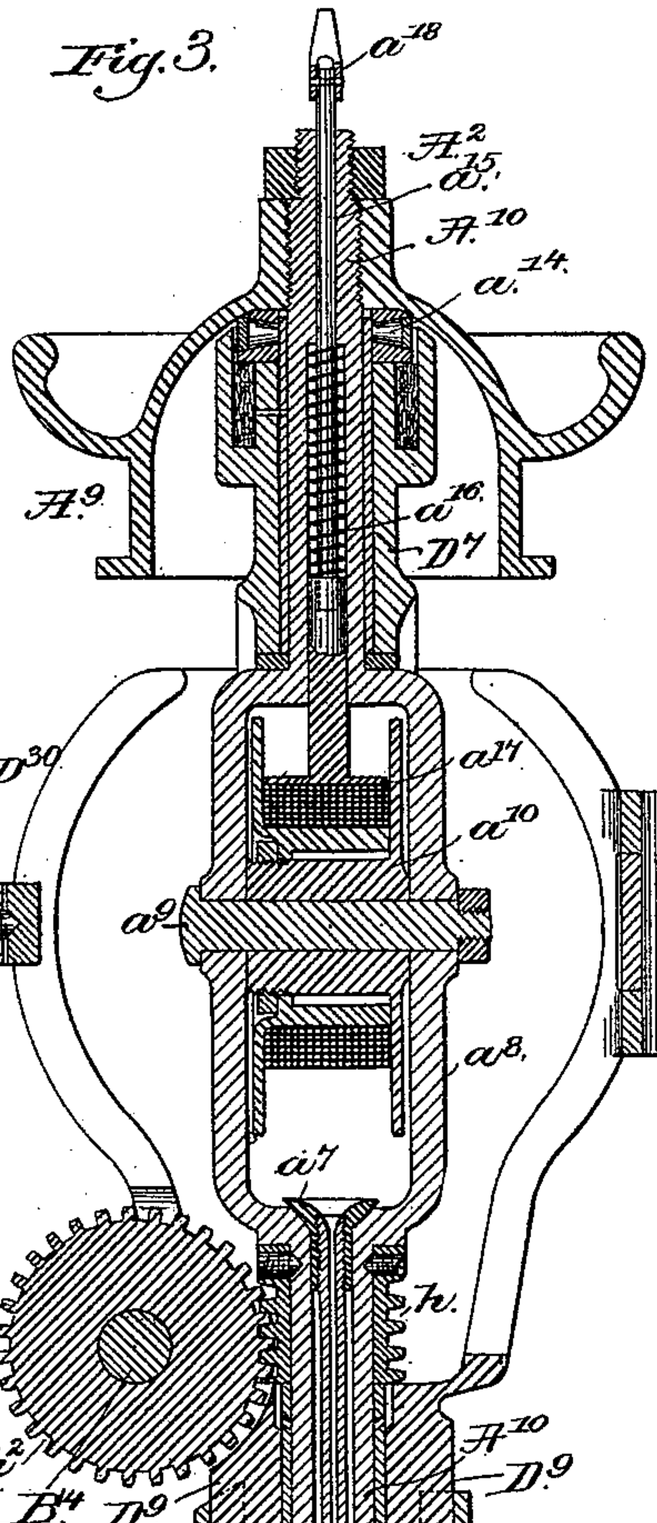


Fig. 5a

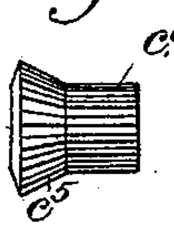


Fig. 4.

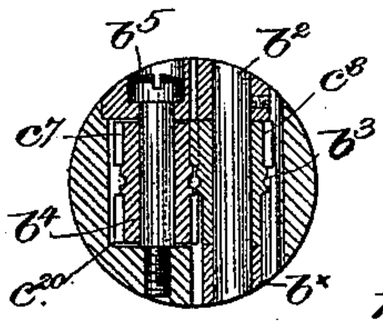


Fig. 5.

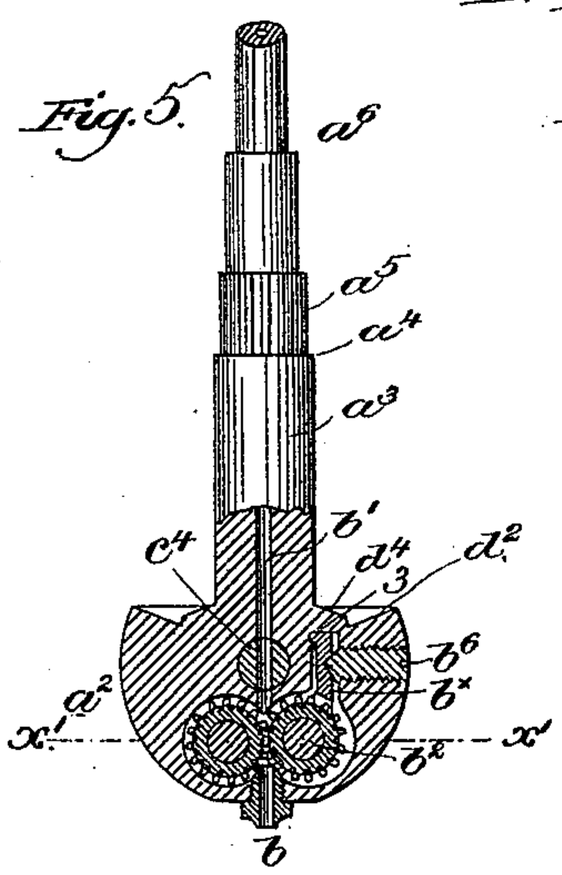


Fig. 6.

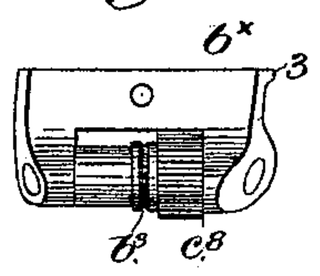


Fig. 7.

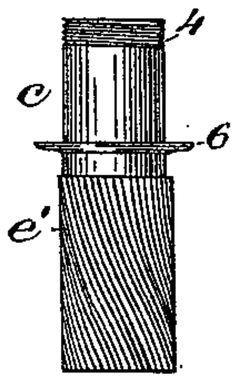


Fig. 8.

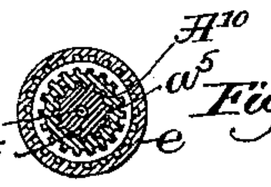


Fig. 9.

Fig. 10.

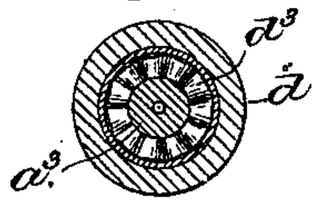
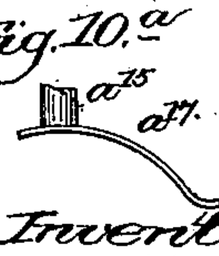


Fig. 10a.



Witnesses:
John F. C. Prentiss
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Inventor:
Louis Goddu.
by Lemby & Gregory Attys

(No Model.) 5 Sheets—Sheet 4.

L. GODDU.

MACHINE FOR UNITING SOLES TO UPPERS.

No. 403,835. Patented May 21 1889.

Fig 11.

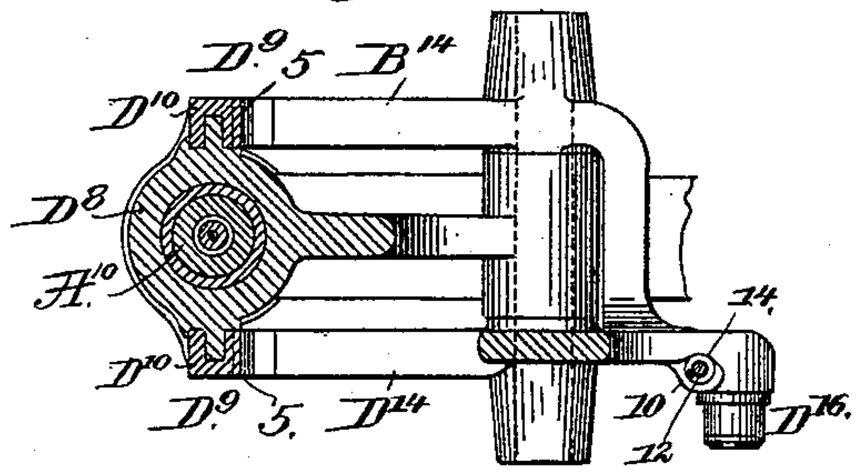


Fig. 12.

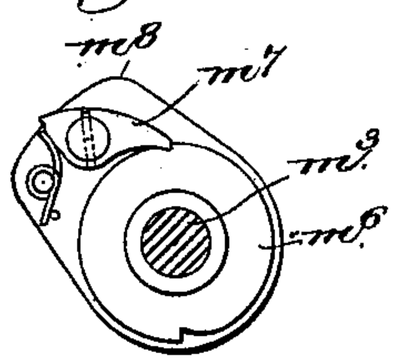


Fig. 13.

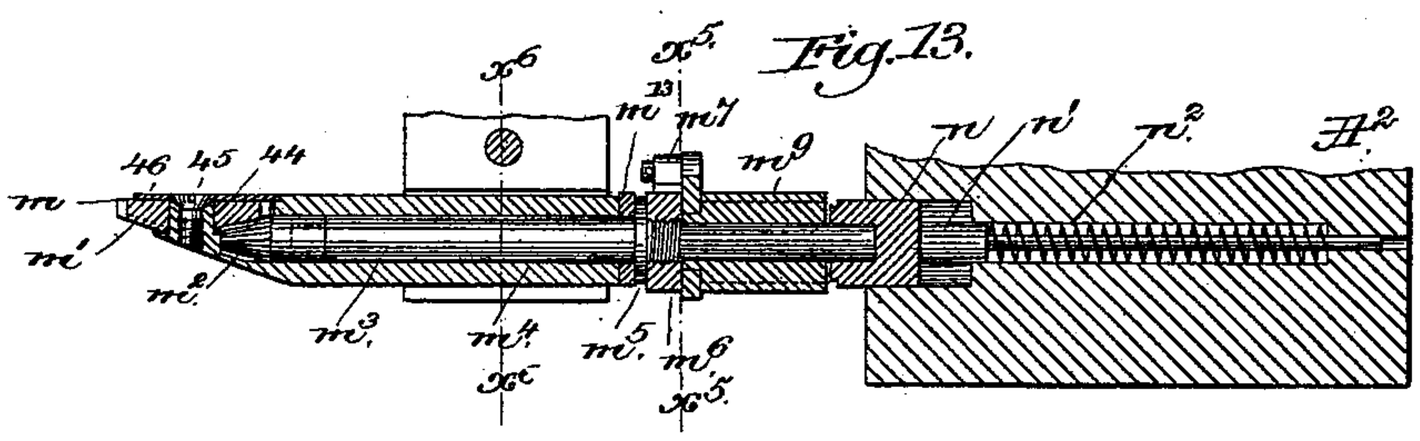


Fig. 14.

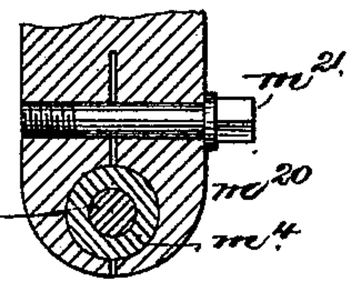


Fig. 25.

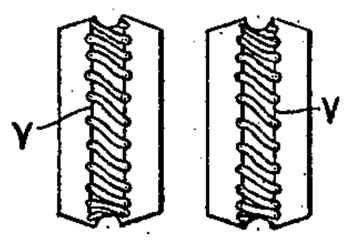


Fig. 15.

Fig. 26.

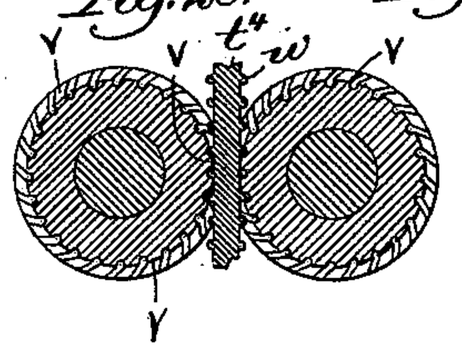
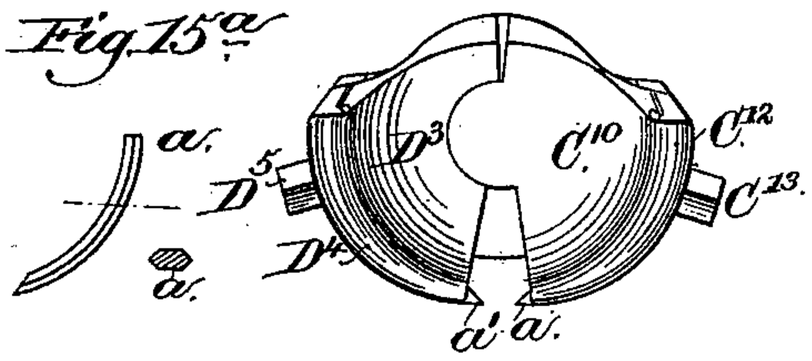


Fig. 27.

Fig. 16.

Fig. 15a.



Witnesses.
John F. L. Printhart
Frederick L. Emery

Inventor.
Louis Goddu.
By Serrell & Gregory Attys.

(No Model.) 5 Sheets—Sheet 5.

L. GODDU.

MACHINE FOR UNITING SOLES TO UPPERS.

No. 403,835. Patented May 21 1889.

Fig. 17.

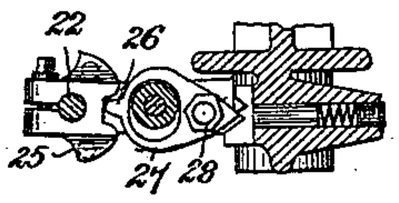


Fig. 18.

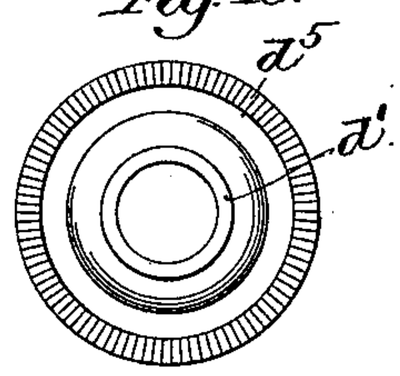
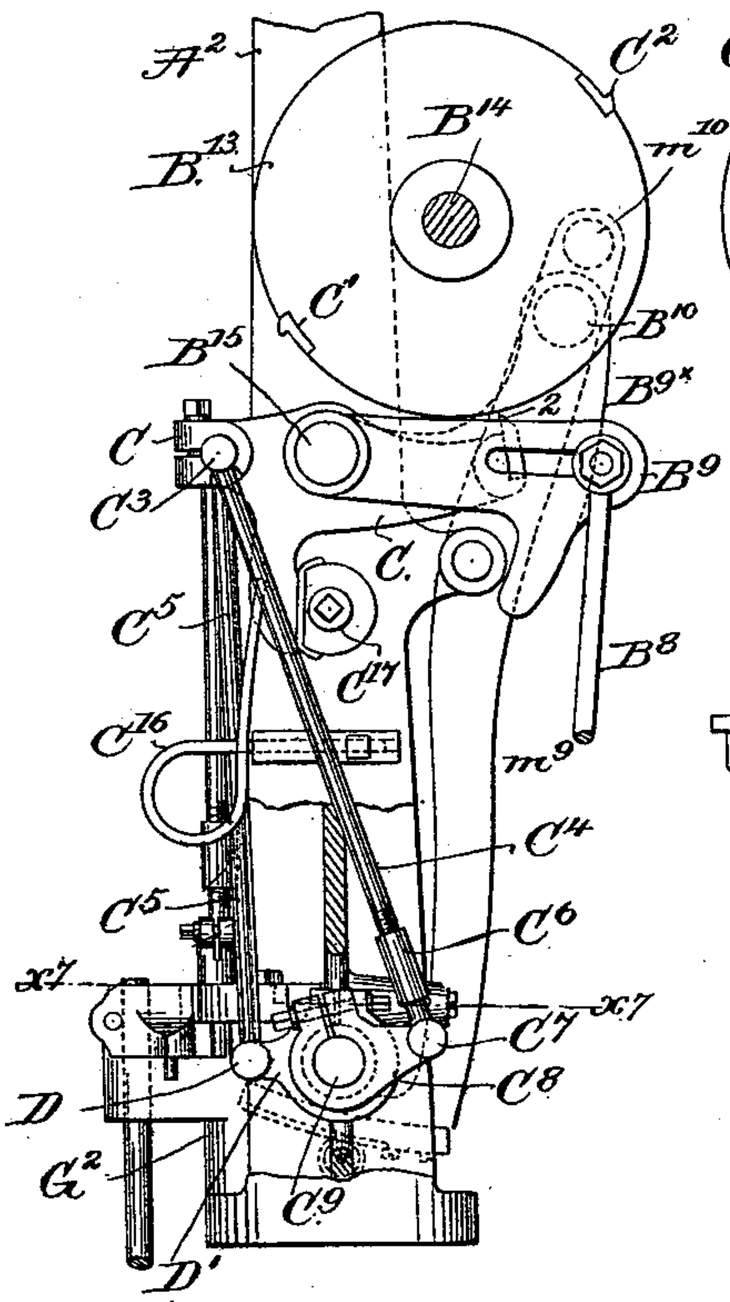


Fig. 19.



Witnesses.
John F. C. Printzlau
Frederick L. Emery

Fig. 20.

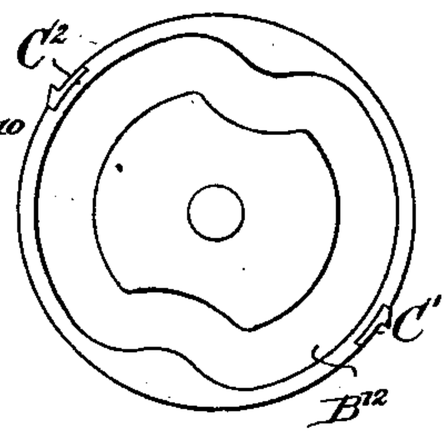


Fig. 21.

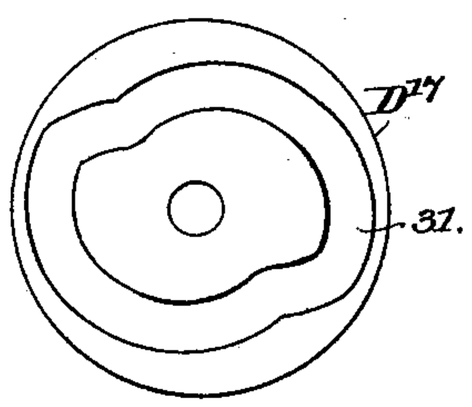


Fig. 22.

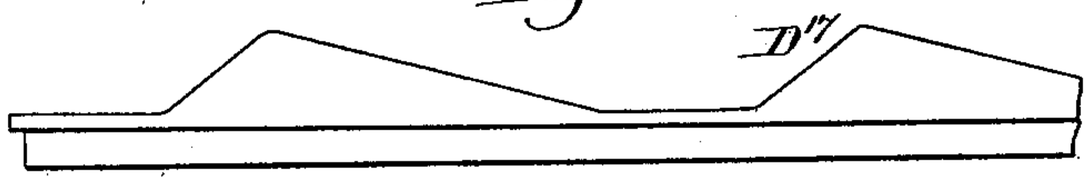


Fig. 23.

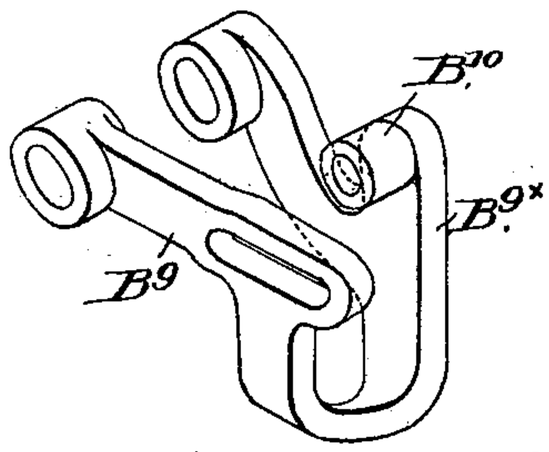
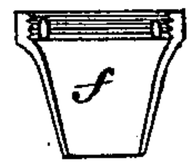


Fig. 24.



Inventor.
Louis Goddu
by Crosby Gregory. Attys.

UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, ASSIGNOR TO JAMES W. BROOKS, PRINCIPAL TRUSTEE, OF CAMBRIDGE, AND FRANK F. STANLEY, ASSOCIATE TRUSTEE, OF BOSTON, MASSACHUSETTS.

MACHINE FOR UNITING SOLES TO UPPERS.

SPECIFICATION forming part of Letters Patent No. 403,835, dated May 21, 1889.

Application filed July 30, 1888. Serial No. 281,387. (No model.)

To all whom it may concern:

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

This invention is an improvement upon that class of machines wherein a threaded wire is fed through the spindle into the stock supported upon a horn, the feed of the wire being variable to automatically adapt the machine to the thickness of the stock upon the horn, the end of the wire being screwed into the stock substantially to the horn and then cut off, leaving the fastener of a suitable length for the stock. The wire which I prefer to use has two threads, substantially as described in United States Patent No. 370,136, granted to me on the 20th day of September 1887, to which reference may be had, and it will be noticed that the threads of the wire at opposite sides are diametrically in line rather than a thread on one side opposite a space on the other, as is the case with a wire having a single thread.

The feed-rolls herein to be described are grooved to embrace the wire, and are also scored to embrace a thread of the wire and to enter the spaces between the threads, thereby enabling the said feed-rolls to positively grasp the wire, not only diametrically in the line of its threads, but also in the line of its spaces, or to close between the threads, thus effectually preventing any marring of the threads. The more firmly the wire is grasped the more reliable the feed.

In my improved machine the rotating wire-carrying spindle has combined with it feeding-rolls, which, besides rotating with the spindle, are rotated about their own axes intermittingly by a feeding-sleeve also rotating with the spindle, the said feeding-sleeve being provided with diagonal or spiral flutes which co-operate with diagonal or spiral flutes of a clutch-sleeve serving to move a gear which actuates the feed-rolls.

One feature of my present invention consists in the combination, with a wire-carrying spindle and feed-rolls therein and a reciprocating sleeve having spiral or diagonal flutes, of a spirally or diagonally fluted clutch-sleeve and means actuated thereby to move the said feed-rolls.

In machines heretofore known to me using a screw-threaded wire passing from a spool through a vertical spindle driven by a belt the entire bearing for the spindle has been located below the spool; but herein the wire-carrying spindle has bearings close to and both above and below the spool, the spindle so supported running very accurately and smoothly.

In the machine herein to be described the driving-pulley for the spindle is extended down around the upper bearing for the spindle, so that the strain of the driving-belt upon the pulley is borne by a portion of the spindle within a bearing, or, in other words, the spindle is supported in the line of the strain of the belt upon it. So also, the bearing end of the spindle is bored to receive the shank of a presser-plate, which produces friction upon it to prevent any excess of rotation of the spool, a spring co-operating with the said presser-plate causing the latter to act with greatest force upon the wire when the spool is full, at which the movement of the spool is apt to be in excess of that desired, by reason of momentum, the friction gradually growing less as the wire is unwound from the spool, the weight of the wire and spool then growing less and the momentum increasing. The presser-plate also acts to prevent the passage of the free end of the wire backward under it in case the wire is broken. The cutters and their actuating mechanism are of peculiar construction chiefly, to gain great strength and simplicity of parts.

I have combined with the cutter-carriers means whereby both cutter-carriers are operated simultaneously in opposite directions to insure the simultaneous action of the cutters from opposite sides of the wire into substantially the center of the wire, the said cutters being thereafter separated or both moved

away from the wire to leave space for the passage below them of the end of the wire, as it is to be again inserted into the stock. The operating-edges of the cutters herein shown are directly opposite each other, so as to cut through the wire described in a diametrically straight line, each cutter having a like bearing upon the wire at its opposite sides, thus preventing any tendency to bend or twist the wire out of shape. It is a great desideratum that the wire between the throat and the stock be straight and free from bends.

The machine herein to be described has also been provided with peculiar means under the control of a lever for suspending the feed of the wire. So, also, the machine contains a novel feed mechanism for feeding the stock over the horn.

Particular features of this invention will be hereinafter described, and specified in the claims at the end of the specification.

Figure 1 is a right-hand elevation of the upper part of a machine for uniting soles to uppers embodying this invention. Fig. 2 is a like view of the lower part of the machine represented in Fig. 1, the upper end of the horn being, however, broken off to save space on the drawings; Fig. 3, an enlarged vertical section taken through the machine in line *x*, Fig. 1, the wire between the spool and the throat being omitted to avoid confusion of the drawings. Fig. 4 is a section of Fig. 5 in the line *x'*. Fig. 5 is a broken detail of the lower end of the wire-carrying spindle; Fig. 5ª, a detail of the pinion c^5; Fig. 6, a detail showing one of the feed-rolls with the frame or plate constituting its bearings; Fig. 7, a detail showing the feeding-sleeve. Fig. 8 is a detail of the upper end of the clutching-sleeve broken out to show the spiral or diagonal flute within it. Fig. 9 is a section in the line x^2, Fig. 3; Fig. 10, a section in the line x^3. Fig. 10ª is a detail of the presser-plate which acts upon the wire. Fig. 11 is a partial section in the line x^4, Fig. 1. Fig. 12 is an enlarged sectional detail taken in the line x^5, Fig. 13; Fig. 13, a longitudinal section taken through the feed mechanism and parts to support it; Fig. 14, a section in the line x^6, Fig. 13; Fig. 15, a horizontally-longitudinal section of the cutter-carriers with their cutters. Fig. 15ª is an elevation and section of one of the cutters; Fig. 16, a front elevation of the cutter-carriers and cutters, the rest *f* being omitted; Fig. 17, a sectional detail in the line x^7, Fig. 19. Fig. 18 is a top or plan view of the clutch-sleeve *d'*; Fig. 19, a partial rear side elevation of the machine shown in Fig. 1, the balance-wheel being omitted; Fig. 20, a front side view of the cam B^{13}; Fig. 21, a rear side view of the cam D^{17}. Fig. 22 shows the feeding portion of the cam B^7 laid out as a plane surface. Fig. 23 is a detail of the arm or lever B^9; Fig. 24, a detail showing the rest *f* detached. Fig. 25 shows portions of the feed-rolls on an enlarged scale side by side to illustrate the positions of its projections and spaces. Fig. 26 is a section showing the wire between the feed-rolls, and Fig. 27 shows a piece of the double-threaded wire enlarged.

The frame-work, of suitable shape to support the various parts, is composed, essentially, of a column, A, base A', and head A^2. The column A supports a stud, A^3, on which is placed loosely a belt-pulley, A^4, driven from a suitable shaft, and also a belt-pulley, A^5, the contiguous faces of the said two pulleys being of cone or other usual shape to constitute friction-pulleys, the hub of the pulley A^5 being beveled to be acted upon by a beveled slide, A^6, to force the pulley A^5 against the constantly-moving pulley A^4 whenever it is desired to run the machine, the said slide being under the control of a treadle, A^7. The pulley A^5, in practice, is surrounded by a belt, (not shown,) which is extended over two like guide-pulleys, A^8, only one being shown, and then about the pulley A^9, fast to the wire-carrying spindle A^{10}, the connection being preferably by a right-hand screw-thread, the pulley being retained in place by a check-nut, A^{12}, united to the spindle by a left-hand screw-thread.

The horn B, of usual shape, is free to be rotated on the horn-shaft B', made vertically movable in suitable bearings in the column A, the horn-shaft being prolonged by a rod, B^2, screwed into its lower end and jointed to a treadle, B^3, the said rod being surrounded by a spiral spring, B^4, resting on a washer, B^5, supported by the column A, the upper end of the spring receiving against it an adjustable nut, B^6, screwed upon the rod B^2, the spring thus supporting the horn in a yielding manner, the upward movement of the horn being limited by a nut, B^7, screwed to the horn-shaft.

The treadle B^3, at its rear end, has jointed to it a rod, B^8, the upper end of which is in turn jointed (see Fig. 19) in an adjustable manner to an arm, B^9, of peculiar shape, and shown separately in Fig. 23, wherein it will be seen, as also in Fig. 19, that the said arm has a U-shaped projection, $B^{9\times}$, having a roller or other stud, B^{10}, which enters a cam-path, B^{12}, in a cam, B^{13}, fast on the cam-shaft B^{14}. The arm B^9 has its fulcrum on a stud, B^{15}, and the rotation of the cam B^{13} through the devices described raises and lowers the horn automatically twice during each rotation of the shaft, the horn being depressed just before the feed is to take place, two nails being inserted at each rotation of the cam-shaft. The stud B^{15} also serves as the fulcrum of a lever, C, (shown partially in dotted lines, Fig. 19,) having an adjustable toe, 2, which is acted upon by the lugs C' C^2, inserted in the periphery of the cam B^{13}. The lever C, at its outer end, (see Figs. 1 and 19,) is split to receive a pin or stud, C^3, on which are placed and retained loosely two connecting-rods, C^4 C^5, the one C^4 having, preferably, an adjustable section, C^6. The rod C^4 is jointed by bolt C^7 to a collar, C^8, clamped to the shank C^9 of the

cutter-carrier C^{10}, the said carrier having secured to it by a bolt, C^{13}, a clamp, C^{12}, one of the cutters, *a*, being firmly clamped between the said carrier and clamp. One of the cutters *a a'* is shown separately in Fig. 15^a. The said cutter is of arc shape, and may be readily adjusted in position between the carrier and clamp as worn away by grinding.

The rod C^5 is joined by bolt D to an arm, D', clamped to the sleeve-like shank D^2 of the cutter-carrier D^3, having co-operating with it a clamp, D^4, connected thereto by a screw, D^5, the cutter *a'* being clamped between the said carrier D^3 and clamp D^4. The sleeve-like shank D^2 serves as a bearing for the shank C^9, and in turn takes a bearing at D^6 in a rigid part of the frame-work.

The lever C has a depending arm, (see Fig. 19,) which is acted upon by a spring, C^{16}, which spring normally keeps the said depending arm against the stop C^{17}, in practice made adjustable on the head A^2, the cutters *a a'* being fully open for the passage of the wire when the said arm is against the said stop, adjustment of the stop providing for a greater or less separation of the cutters.

Each carrier is cup-shaped, and each is moved at the same time for like distances, but in opposite directions, so that the said cutters are made to approach and cut into the wire from opposite sides to its center and then to separate for the passage of the end of the wire beyond the cutters. The cup-shaped carriers receive within them and they oscillate about the spherical end a^2 of the wire-carrying spindle A^{10}, composed of several parts, the spherical head having an extension, a^3, provided with a shoulder at a^4, above which the extension is provided with a series of straight flutes, as at a^5, the upper end of the said extension receiving upon it (see Fig. 3) a nut, a^7, the latter connecting the extension a^3 with the main body of the spindle, the said main body having secured to or forming part of it the yoke a^8, carrying the stud a^9, on which is mounted and turns the spool a^{10}, which carries the wire. The upper end of the spindle A^{10} turns in a bearing, D^7, and between the said bearing and the hub of the pulley A^9 is interposed an anti-friction bearing, a^{14}, composed, essentially, of two plates and interposed conical rolls.

The spindle within the bearing D^7 is bored to receive a presser-rod, a^{15}, having a presser-plate, a^{17}, to bear on the wire on the spool by a force measured by a spring, a^{16}, surrounding the said rod, the latter at its upper end having a hand-lever, a^{18}, by which to lift and hold it when desired. The spherical end a^2 of the spindle carries a throat-piece, *b*, in line with the wire-passage *b'*, and it has (see Fig. 4) a pin, b^2, held in a spring-plate, $b^\times$, (shown detached in Fig. 6,) on which pin is mounted to turn one of the wire-feed rolls b^3, having a gear, c^8, at one end, which meshes with a like gear, c^7, on the feed-roller b^4, held in place by the stud-screw b^5, both the said feed-rolls having annular scored grooves to fit the threads of the wire, as will be hereinafter described. The spring-plate $b^\times$ has a lip, 3, which (see Fig. 5) enters a notch in the spindle, and is held in place by a set-screw, b^6, the latter also regulating the pressure of the rolls on the wire.

The spindle A^{10} takes a second bearing in a rigid part, D^8, of the frame-work, the said rigid part being provided (see Fig. 11) with guides D^9, which are embraced by ears of a U-shaped yoke, D^{10}, (see Figs. 3 and 11,) provided with an opening through which is extended loosely the feeding-sleeve *c*, (see Figs. 3 and 7,) the upper end of the said sleeve having screw-threads, as 4, which screw into a flanged nut, *c'*, having, as shown, a beveled under face which bears upon a series of conical anti-friction rollers, c^2, the said rollers resting upon a portion of the said yoke near the feeding-sleeve *c*. This yoke at its rear side is provided with rack-teeth, as best shown in Fig. 1, which teeth are engaged by sector-teeth, as 5, at the end of a double-armed lever, D^{14}, loosely mounted on a stud, D^{15}, the said lever having a roller or other stud, as D^{16}, which is acted upon twice during each rotation of the cam-shaft B^{14} by a cam, D^{17}, secured to the said shaft, the said cam through the said lever lifting the said yoke and with it the said sleeve.

To enable the extension a^3 to be more firmly secured to the spindle A^{10} than it could be by the nut a^7 alone, I have provided the said extension with the straight flutes a^5, (see Fig. 5,) thus forming a series of projections which enter grooves of corresponding shape cut in a chamber at the lower end of the wire-spindle A^{10}, the said projections and grooves being shown as engaged in Fig. 9, that figure being a section of Fig. 3 in the line x^2. A friction-washer, c^3, is interposed between the shoulder a^4 of the extension a^3 and the end of the spindle A^{10}. The spherical head a^2 receives in it a stud-screw, c^4, which serves to hold loosely a beveled pinion, c^5, having a sleeve-like shank, c^6, (shown separately in Fig. 5^a,) which is also toothed, the teeth of the sleeve portion c^6 (see Fig. 3) engaging the teeth c^{20} of the feed-roller b^4, before described. The stud-screw c^4 has a hole, *t*, (see Fig. 3,) in line with the wire-passage in the spindle, and the wire passes through the said hole *t* on its way to the feed-rolls.

To revolve the beveled pinion c^5, the machine has a crown-gear, *d*, (see Figs. 1 and 3,) forming part of a sleeve, *d'*, surrounding the extension a^3 loosely, the latter acting as a guide for the said crown-gear, the teeth of the crown-gear which are not in engagement with the said beveled pinion nearly touching the race d^2, (see Fig. 5,) the wear of the said teeth upon the said race being obviated by or through conical anti-friction rollers d^3, interposed between the beveled shoulders d^4 (see Fig. 5) and a reversely-beveled shoulder at the interior and at the lower end of the sleeve *d'*, as best shown in Fig. 3. Fig. 10 shows

one of these series of anti-friction rollers, the section of Fig. 10 being in the line x^3, Fig. 3, through the rollers referred to.

The upper portion of the crown-gear referred to has a series of ratchet-teeth, d^5, (see Figs. 1 and 18,) which are adapted to be engaged by a like series of ratchet-teeth at the flanged lower end of the sleeve *e*, the latter sleeve surrounding the tubular shank d' of the crown-gear.

The feeding-sleeve *c* referred to has a collar, 6, which bears against one washer or plate of an anti-friction box, E, containing a series of conical rollers and interposed between the said collar 6 and the lower end of the yoke D^{10}. Below the collar 6 the sleeve *c* is provided with a series of diagonal flutes, e', and internally the said sleeve *c* is grooved longitudinally to leave teeth and spaces to engage corresponding spaces and teeth cut longitudinally in the periphery of the spindle A^{10}, as shown by dotted lines in Fig. 3 and by full lines, Fig. 1, from the lower end of the bearing D^8 down to the lower end of the said spindle.

The upper end of the sleeve *e*, surrounding the lower end of the sleeve *c*, is fluted or grooved internally to correspond with the external flutes or grooves, e', of the sleeve *c*, so that the said flutes or grooves in engagement when a reciprocating movement is given to the sleeve *c* will oscillate the sleeve *e* more or less about the sleeve d' and extension a^3 and cause the flanged part of the said sleeve *e* to, by its ratchet-teeth, engage the ratchet-teeth of and move the crown-gear *d* a greater or less distance, that depending upon the length of the reciprocation of the sleeve *c*. In this way intermitting movement in one direction is given to the crown-gear *d* to enable it, through the gears c^5, to rotate the feed wheels or rollers b^3 b^4 to feed the wire and thrust it into the stock at the proper time for the proper distance. As the longitudinally-fluted external portion of the spindle A^{10} engages corresponding flutes at the interior of the feeding-sleeve *c*, it follows that the said sleeve *c* rotates in unison with the spindle A^{10}, driven by the belt on the pulley A^9, and the sleeve *e*, which forms a coacting part of the feed-sleeve *c*, also rotates in unison with the spindle A^{10}; but it will be noticed that the crown-gear *d* does not rotate independently of the said spindle and of the extension a^3 except as the sleeve *c* is raised and lowered within or with relation to the sleeve *e*, and consequently only when it is desired to rotate the feed-rolls about their supports b^4 b^5, the said rolls always, however, traveling with and at the same speed as the spindle A^{10}. When the sleeve *c* is lifted, it, through its diagonal flutes in engagement with the diagonal flutes of the sleeve *e*, would lift the latter right along with it; so the sleeve *e* has been provided internally with a small space about and with a shoulder just below the washer c^3, so that the latter, as soon as the sleeve *e* has been lifted sufficiently to disengage its ratchet-teeth from the ratchet-teeth of the crown-gear, is stopped by the washer, and thereafter the continued ascent of the sleeve *c* causes the sleeve *e* to be rotated backward prior to its ratchet-teeth reengaging the ratchet-teeth of the crown-gear to produce a new feed movement of the feed-rolls.

The diagonal or spiral flutes on the sleeve *c* are herein shown of a pitch about sixty degrees; but it is not desired to limit this invention to any particular pitch of the spiral or diagonal flutes, as that will depend upon the maximum length of the wire to be fed for a fastening and upon the extent of stroke it is convenient to give to the lever D^{14}.

The frame-work as herein shown is bulged or raised to form a chamber in which the yoke a^8 may revolve, the said chamber having a door, F, by which to cover its open face, the said door being hinged at F′ and having a suitable fastening at F^2.

To enable the wire employed (it being taken from the spool a^{10}) to be fed through the spindle for varying distances, according to the thickness of the stock or leather resting upon the top of the horn and between the horn and the usual rest or plate, *f*, which bears upon the upper side of the material, the extent of the movement of the feed-rolls about their axes must be automatically varied in accordance with the thickness of the stock. To do this the shank of the horn has fixed to it an arm or projection, G, to which is secured a rod, G′, the upper end of which enters a guide, G^2, the upper end of the said rod serving as a variable stop for the measuring-leg G^3, which is attached by a pin, G^4, (see Fig. 1,) to one end of the lever D^{14}. The lever D^{14} has (see Fig. 1) a lug, 10, upon which bears the lower end of a rod, 12, having a shoulder, 13, upon which rests a strong spiral spring, 14, the upper end of the said spring being shown as entering a hole in a chambered lug, 15, fastened to the head A^2, the said chambered lug receiving an adjusting-nut, 16, which may be turned on the rod 12 to bear with more or less force upon the upper end of the said spring, and thus exert more or less pressure upon the lug 10 and lever B^{14}. The nut 16 is held in adjustable position by a set-nut, 17. The strength of the spring 14 is sufficient to turn the lever D^{14} and lift the yoke D^{10} and feeding-sleeve *c*. If the spring 14 is permitted to turn the lever D^{14} far enough to permit the stud D^{16} carried by it to fully enter the cam portions of the cam D^{17}, then the said cam will produce the maximum stroke of the lever D^{14}, and the feed-rolls will feed the wire a distance equal to the longest fastening to be inserted; but when the material on the horn is less than the maximum thickness then the horn, elevated by the spring B^4, carries up with it the rod G′ and serves as a stop for the leg G^3, attached to the lever D^{14}, and as a result thereof the extent to which the lever D^{14} may turn under the action of the spring 14 is

shortened, so that the cam portion of the cam D^{17} is not permitted to act for its full throw upon the roll D^{16}.

The column A has erected upon it a stud-screw, H, upon which is placed a hub, H′, of a knee-lever, H^3, having at its inner end sector-teeth 20, which engage like sector-teeth upon a block, 21, secured to the lower end of a rock-shaft, 22, having bearings at 23 24. This rock-shaft has clamped to it a block, 25, notched at its inner end to leave lugs 26, which, as the rock-shaft 22 is turned by the knee-lever, may be made to act upon a toe, 26, (see Fig. 17,) of a stop, 27, pivoted at 28, and turn the said stop about the said pivot when it is desired to throw out of operation or to continue in operation the feed mechanism for the wire.

The measuring-rod G^3 has clamped upon it a foot, 40, shown as a block having a downward extension, which, when the stop 27 is in one position, is free to enter the large hole in the said stop; but when the said stop is turned to one side, as described, by the knee-lever the said extension meets the top of the stop, and so long as the said stop remains in such position the lever D^{14} will not be moved to feed the wire. The cam-shaft B^{14} derives its motion through a worm, *h*, upon the spindle A^{10}, the said worm engaging a worm-gear, h^2, fast on the said cam-shaft.

The feed of the shoe is effected by a toothed wheel, *m*, (see Fig. 13,) the edge of which works against the edge of the sole. This wheel has beveled teeth at its under side, as at *m*′, which are engaged by beveled teeth, as m^2, at the end of a shaft, m^3, extended through a loose box, m^4, the said shaft having a loose washer, as m^5, at the rear end of the said box, and having screw-threads, as shown at Fig. 13, upon which is screwed a ratchet-wheel, m^6, having two teeth, which are engaged one after the other by a pawl, m^7, of a pawl-carrier, m^8, secured to or forming part of a pinion, m^9, loose on the rear end of the said shaft m^3, and engaged by sector-teeth 30 (see Fig. 1) at the lower end of a lever, m^9, provided at its upper end with a roller or other stud, as m^{10}, (see dotted lines, Fig. 19,) which roller enters a cam-path, 31, at the rear side of the cam-hub D^{17}. A leather or other friction washer, as m^{13}, is interposed between the said washer m^5 (see Fig. 13) and the said box, the said leather washer acting by its friction, measured by the spring n^2, to prevent any accidental movement of the ratchet m^6, especially when the pawl is traveling through its backward movement. The box m^4 has a hollow hub, 44, on which the feed-wheel turns, the said hub being threaded to receive a screw, 45, extended through a cap-plate, 46. The box m^4 is held in a split bearing, m^{20}, held together by a clamp-screw, m^{21}, the said box being adjustable longitudinally, so as to place the wheel m^2 in proper relation to the top of the horn, according to the distance it is desired to insert the fastenings from the edge of the sole.

Owing to the flutes upon the lower end of the feeding-sleeve being in diagonal or spiral position, it results that the friction between the said feeding-sleeve and the sleeve *e*, as the said feeding-sleeve is pushed down, is sufficient to firmly place the teeth of the clutch-sleeve into contact with the teeth of the clutch-gear employed to impart motion to the feed-rolls, thus preventing any liability of the clutch-surfaces being disengaged except just as the clutch-sleeve is lifted, as before described.

In the invention herein described it will be noticed (see Figs. 25 and 26, where the feed-rolls are shown enlarged) that the projections *v*, which enter between the threads *w* of the wire t^4 to be inserted, a short piece of which is shown separately in Fig. 27, are exactly opposite each other, and that the spaces in the said feed-rolls between the said projections *v* are exactly in line, thus enabling the said spaces to receive the threads of the wire, which threads, as described in United States Patent No. 370,136, are directly or diametrically opposite each other at opposite sides of the wire. In this way the feed-rolls are permitted to have such a firm, secure, and close grip on the wire as to preclude the possibility of the wire slipping or of buckling or bending.

The two bearings D^7 D^8 for the wire-carrying spindle are connected by a cap-shaped or bonnet-like portion, D^{30}, and forming part of the rigid frame-work, to which is hinged at F′ the cover F, the bonnet and cover completely concealing the reel and spindle, thus preventing the creation of a current of air to annoy the operator when the spindle is run at speed; and, further, the motion of reel and spindle, being concealed, does not affect the eye of the operator.

I have herein shown and described certain parts as fluted diagonally and spirally; but I do not desire to limit my invention to any particular form of such flutes.

In the manufacture of the wire-carrying spindle herein described and the parts carried by it during its rotation care has been taken to so proportion the weight of the parts that the spindle is balanced as it is turned, and as a result thereof the spindle may be rotated at a faster speed with less jar than would be possible if the said spindle was not so balanced.

I claim—

1. In a machine for uniting soles and uppers, a wire-carrying spindle and feed-rolls having gears c^7 c^8 and a gear, c^{20}, combined with the beveled gear having a sleeve-like portion, c^6, and with a gear to engage and rotate the said beveled gear, substantially as described.

2. The wire-carrying spindle, its geared feed-rolls, and a gear, *d*, having a clutch, and gearing between the said gear and the feed-rolls, combined with a clutch-sleeve having spiral or diagonal flutes and with a reciprocating feeding-sleeve having spiral or diag-

onal flutes to actuate the said clutch-sleeve, substantially as described.

3. The wire-carrying spindle, its geared feed-rolls, and the screw-stud c^4, having an opening coinciding with the wire-passage, combined with the gear d and intermediate bevel-gear rotated thereby and in engagement with one of the feed-rolls, to operate substantially as described.

4. The wire-carrying spindle, geared feed-rolls, a gear, as d, having a clutch portion, and means intermediate the said gear and the feed-rolls, and a clutching-sleeve having spiral or diagonal flutes, and a feeding-sleeve having co-operating spiral or diagonal flutes, combined with a stop for the clutching-sleeve in its longitudinal movement, whereby the clutch-faces of the clutching-sleeve and the gear d may be separated and the clutching-sleeve be thereafter rotated for the proper distance, substantially as described.

5. In a machine for uniting soles and uppers, a horn or support for the work, a continuously-rotating fluted spindle provided with feed-rolls, and a reciprocating feeding-sleeve fluted to engage flutes of the spindle and to be rotated in unison therewith, the said feeding being further fluted spirally or diagonally, combined with a clutching-sleeve having spiral or diagonal flutes and rotating at the speed of the spindle in one direction, and with gearing intermediate the said clutching-sleeve and the feed-rolls, the reciprocations of the feeding-sleeve longitudinally during its rotation with the spindle causing the clutching-sleeve to vibrate or oscillate about the spindle as it travels with the latter to feed the wire intermittingly, substantially as set forth.

6. The rotating wire-carrying spindle and the wire-carrying spool located between its ends, combined with bearings for the said spindle both above and below the spool, and with feed-rolls having gears meshed one with the other, and with means carried by and rotating with the spindle to rotate the said feed-rolls intermittingly, substantially as described.

7. The wire-carrying spindle, the wire-carrying spool between its ends, and bearings for the spindle above and below the spool, combined with the chambered pulley A^9, embracing the upper bearing, substantially as described.

8. The wire-carrying spindle and the spool between the ends of the spindle, combined with a spring-actuated presser-plate to bear upon the wire, substantially as described.

9. The wire-carrying spindle and its spool and presser-plate having a shank, a^{15}, combined with means to retain the presser-plate lifted from the spool, substantially as described.

10. The wire-carrying spindle, the feeding-sleeve, and the yoke to support the said sleeve, combined with a lever reciprocating the said yoke and with a cam to actuate the said lever, substantially as described.

11. The wire-carrying spindle, the feeding-sleeve, and the yoke to support the said sleeve, combined with a lever reciprocating the said yoke, and with a cam to actuate the said lever, and with an upwardly-pressed horn, a measuring-leg connected with the said lever, and intermediate connections between the said leg and horn, substantially as described.

12. The wire-carrying spindle, the feeding-sleeve, and the yoke to support the said sleeve, combined with a lever reciprocating the said yoke, and with a cam to actuate the said lever, and with the rod 12, spring 14, and adjusting-nut 16, to operate substantially as described.

13. The wire-carrying spindle and a throat, b, combined with the cutter-carriers and the adjustable arc-shaped cutters having their cutting-edges in line with each other, to operate substantially as described.

14. The wire-carrying spindle having the spherical end a^2, feed-rolls therein, means to rotate the feed-rolls, and the throat b, combined with the cutter-carriers concaved at their upper sides to permit the rotation of the spherical head of the spindle and with the cutters and clamps to hold them, substantially as described.

15. The cutter-carrier D^3, having a tubular shank, and the cutter-carrier C^{10}, having its shank C^9 extended through the said tubular shank, combined with a lever, means to actuate it, and connecting mechanism between the said lever and the shanks of the said cutter-carriers to actuate them simultaneously in opposite directions, substantially as described.

16. The cutter-carrier D, having a tubular shank, and the cutter-carrier C^{10}, having its shank C^9 extended through the said tubular shank, combined with a lever, means to actuate it, and connecting mechanism between the said lever and the shanks of the said cutter-carriers to actuate them simultaneously in opposite directions, and with a stop and means to retain the said lever normally against the said stop, substantially as described.

17. The horn, the lever B^8, with which it is connected, and the rod B^8, combined with the two-armed lever B^9 $B^{9\times}$, having a roller or other stud, and with a cam, B^{13}, to automatically depress the horn at the proper time, substantially as described.

18. The lever D^{14}, its attached measuring-leg having a collar, 40, the oscillating rod 22, and the block 25, attached thereto, combined with a stop, substantially as described, actuated by the said block to prevent the descent of the said measuring-leg when it is desired to arrest the feed of the wire, substantially as described.

19. The feed-wheel having beveled teeth,

the box by which the wheel is supported, and the shaft m^3, having beveled teeth to engage the said wheel, combined with a ratchet-wheel and with a pawl and means to operate the pawl to rotate the shaft, substantially as described.

20. The feed-wheel having teeth at its periphery and teeth m' at its under side, a shaft, m^3, to actuate the said feed-wheel, the ratchet of the said shaft, and the pawl and pawl-carrier, the box m^4, and friction-washer m^{13}, interposed between the ratchet-wheel and box, combined with means to act upon the said shaft and press it into the said box, the friction-washer preventing any accidental slipping of the ratchet-wheel on the shaft, substantially as described.

21. The wire-carrying spindle having the spherical end a^2, feed-rolls carried by the said spindles to rotate the said feed-rolls, and a throat, b, combined with cutter-carriers concave at their upper sides to permit the rotation of the spherical end of the spindle and with means, substantially as described, to oscillate the said cutter-carriers.

22. The wire-carrying spindle, its feed-rolls, means to rotate them, and the throat b, combined with the cutter-carriers concave at their upper sides and convex at their lower sides, and with the rest f, concave at its upper side next the said cutter-carriers, substantially as described.

23. In a nailing-machine for uniting soles to uppers, a feed-wheel, the shaft m^3, to rotate the said feed-wheel, and the box or bearing m^4, in which the said shaft rotates, combined with a bearing in which the said box is made longitudinally adjustable, thereby enabling the feed-wheel to operate against the edge of the sole notwithstanding different distances at which the fastenings may be set back from the edge of the sole, substantially as described.

24. In a machine for uniting soles to uppers, a spindle to carry the wire, a spool-supporting yoke, and a spool having its center of rotation in line with the wire-passage through the said spindle, combined with the two bearings D^7 D^8, and the cup-like rigid portion D^{30}, connecting the said bearings, and the door E, to form a cover for the said cup D^{30}, substantially as described.

25. In a machine for uniting soles and uppers, a rotating wire-carrying spindle and a reel for the double-threaded wire rotating with the spindle, combined with feed-rolls for the wire and means to rotate them, the said feed-rolls having a series of projections, as v, which on the opposite feed-rolls are exactly in line, and with spaces also exactly in line, whereby the said projections and spaces are adapted to enter the exactly-opposite grooves and embrace the exactly-opposite threads w of the said double-threaded wire, substantially as described.

26. In a machine for uniting soles to uppers, the wire-carrying spindle having the enlarged lower end, combined with feed-rolls geared together and driven by a gear located wholly within the said enlarged lower end, substantially as described.

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

LOUIS GODDU.

Witnesses:
G. W. GREGORY,
B. DEWAR.