No. 755,755. PATENTED MAR. 29, 1904.

H. L. & W. EDGE.

STAPLE MAKING MACHINE.

APPLICATION FILED MAR. 27, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

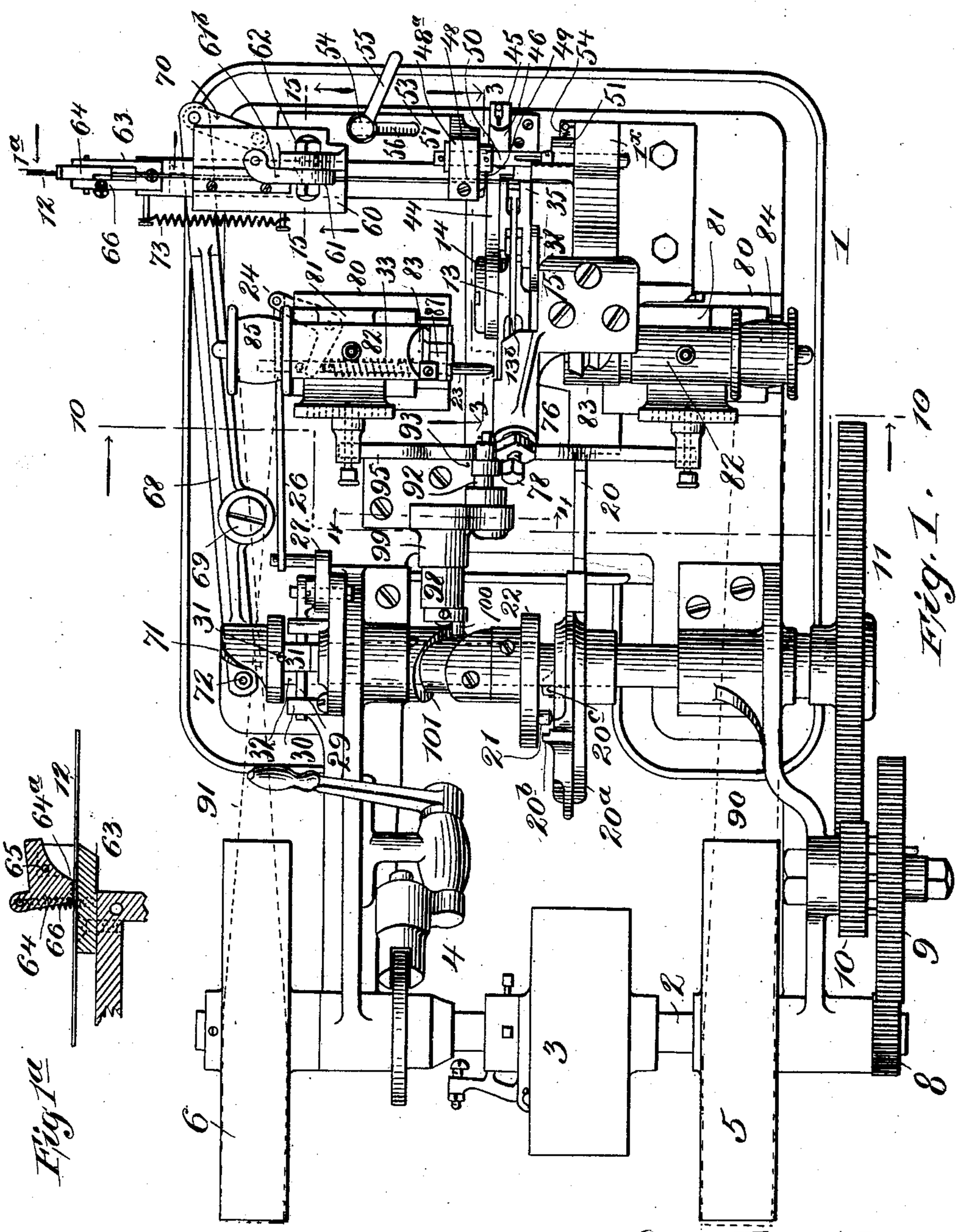

Fig. 1.

Fig. 1a.

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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 16.

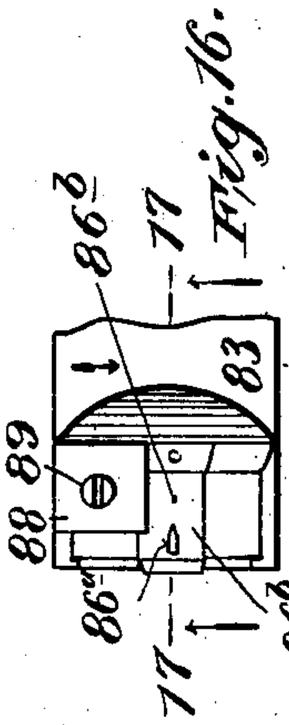

Fig. 17.

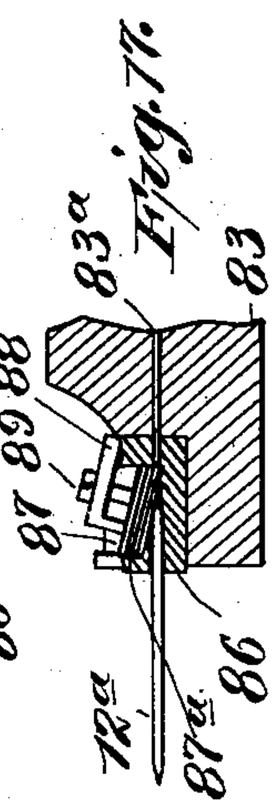

Fig. 2a.

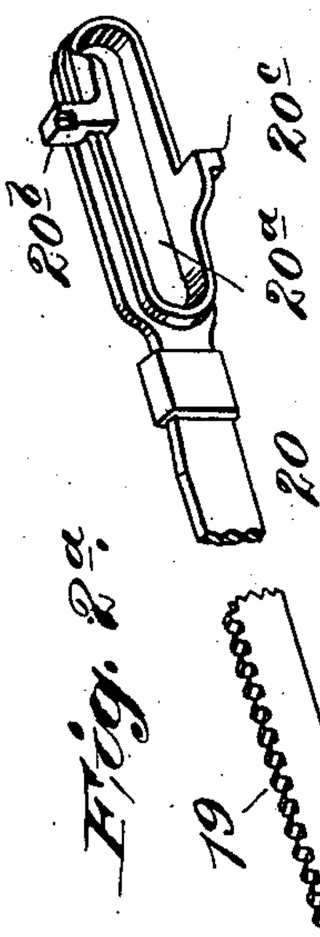

Fig. 2.

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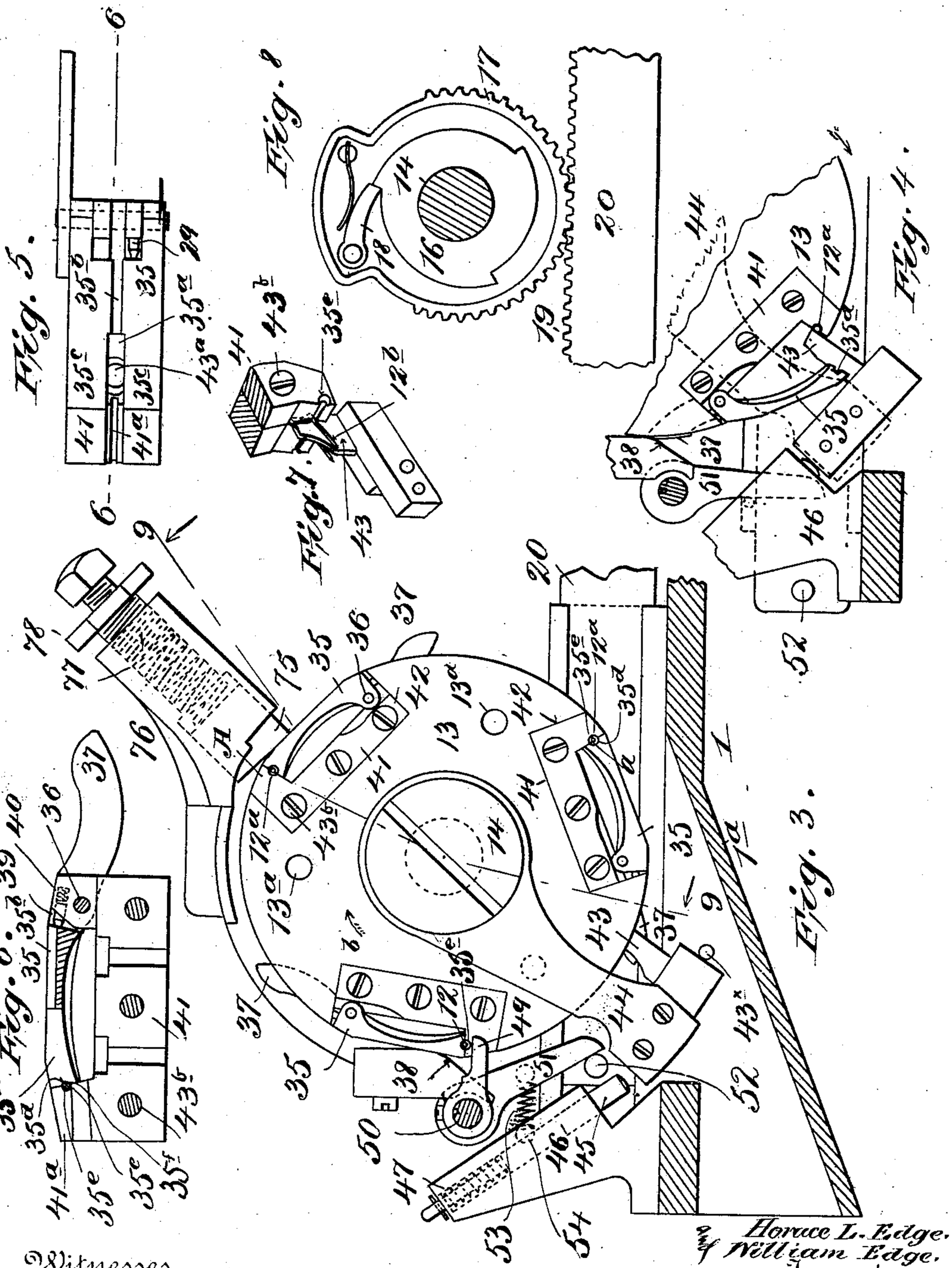
NO MODEL.

4 SHEETS—SHEET 3.



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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 10.

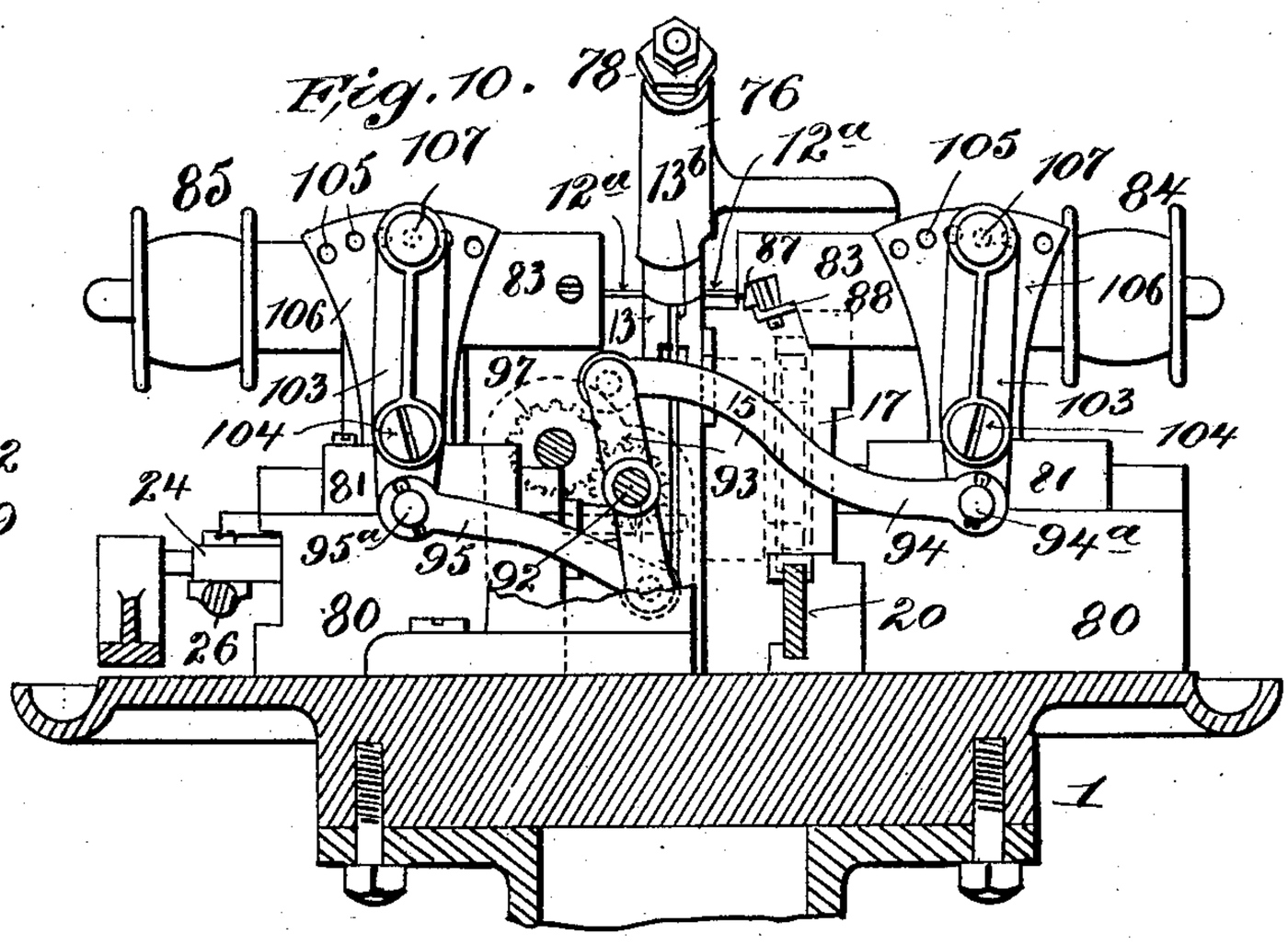


Fig. 11.

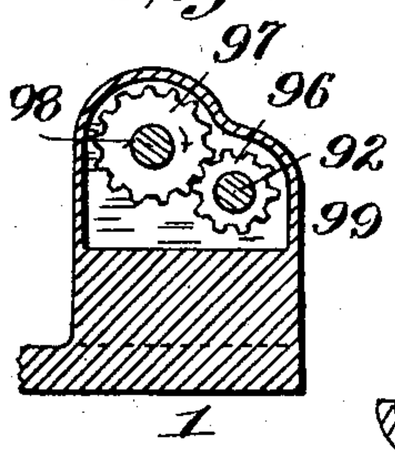


Fig. 9.

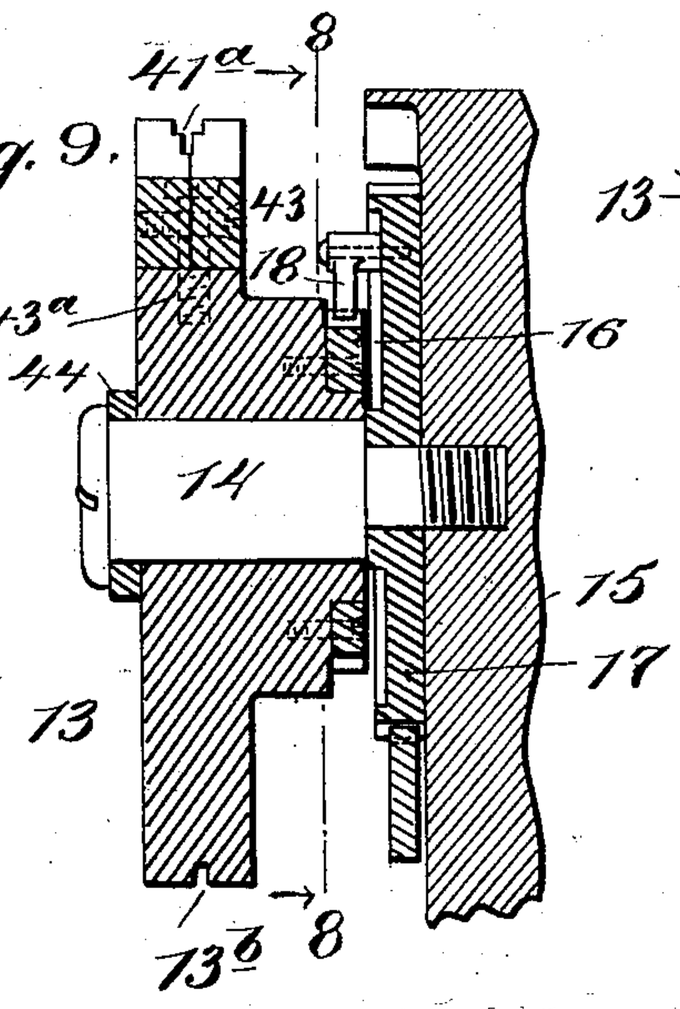


Fig. 12.

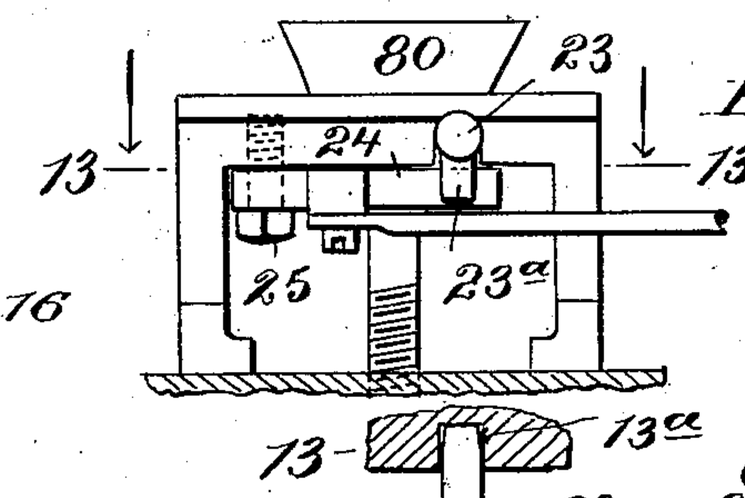


Fig. 15.

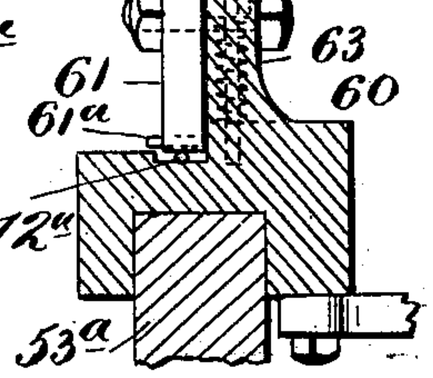


Fig. 13.

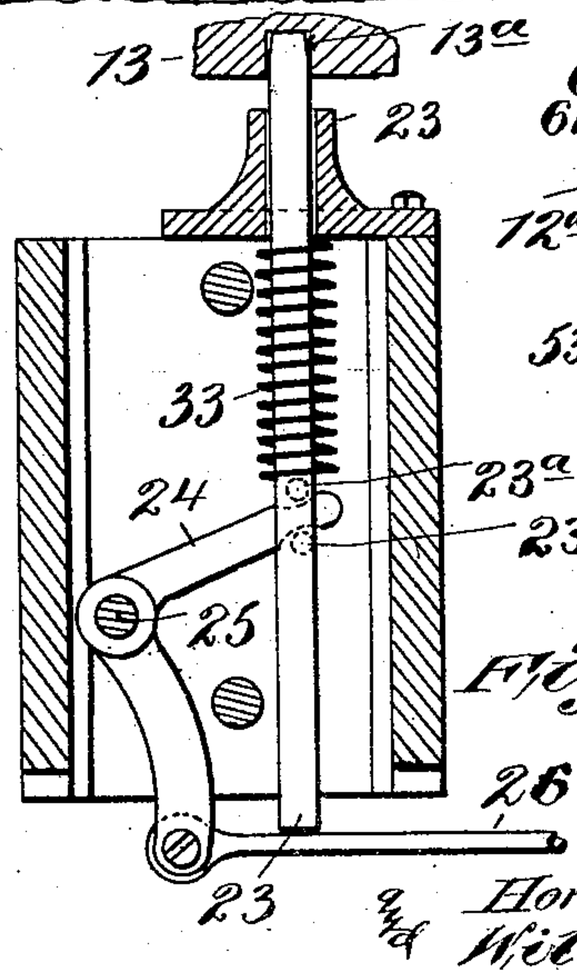
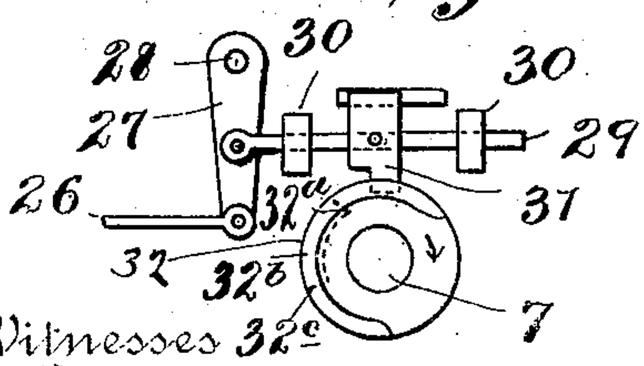


Fig. 14.



Witnesses
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No. 755,755. Patented March 29, 1904.

UNITED STATES PATENT OFFICE.

HORACE L. EDGE AND WILLIAM EDGE, OF NEW YORK, N. Y., ASSIGNORS TO WILLIAMS WIRE HINGING MACHINE COMPANY, A CORPORATION OF NEW YORK.

STAPLE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 755,755, dated March 29, 1904.

Application filed March 27, 1903. Serial No. 149,790. (No model.)

To all whom it may concern:

Be it known that we, HORACE L. EDGE and WILLIAM EDGE, residents of New York city, borough of Brooklyn, New York, have invented certain new and useful Improvements in Staple-Making Machines, of which the following is a specification.

The object of our invention is to provide a machine for making staples from continuous lengths of wire fed thereto, and particularly staples having conical or tapering points; and to these ends we provide means for feeding wire and cutting it into desired lengths, means for holding such lengths of wire while their ends are being pointed, and means for bending the pointed lengths of wire into staple form and discharging the staples from the formers.

The invention further contemplates the novel features of improvement hereinafter more fully set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a plan view of a machine embodying our invention. Fig. 1ª is a detail section on the line 1ª of Fig. 1. Fig. 2 is a side elevation of the machine, partly broken. Fig. 2ª is a detail perspective view of a reciprocative member of the machine. Fig. 3 is a vertical section substantially on the line 3 3 in Fig. 1 looking in the direction of the arrows. Fig. 4 is a detail view of parts shown in Fig. 3 in a different position. Fig. 5 is a face view of the grippers for holding the lengths of wire to be formed into staples. Fig. 6 is a side view thereof, partly in section, on the line 6 6 in Fig. 5. Fig. 7 is a detail perspective view of the staple-bending devices. Fig. 8 is a detail view, partly in section, on the line 8 8 in Fig. 9. Fig. 9 is a section substantially on the line 9 9 in Fig. 3 looking in the direction of the arrows. Fig. 10 is a cross-section on the line 10 10 in Fig. 1 looking in the direction of the arrows. Fig. 11 is a detail section on the line 11 11 in Fig. 1. Fig. 12 is a detail edge view showing means for holding the staple-wire-carrying disk in operative position. Fig. 13 is a section thereof on the line 13 13 in Fig. 12. Fig. 14 is a detail side view of means for operating the locking-pin shown in Fig. 13. Fig. 15 is a detail section on the line 15 15 in Fig. 1 looking in the direction of the arrows. Fig. 16 is an enlarged detail view of one of the staple-pointing cutter-heads, and Fig. 17 is a section thereof on the line 17 17 in Fig. 16.

Similar characters of reference indicate corresponding parts in the several views.

The numeral 1 in the drawings indicates a frame, which may be of suitable construction, and at 2 is indicated a shaft journaled in suitable bearings on said frame and shown provided with a driving-pulley 3, and in the arrangement shown pulley 3, while mounted freely upon shaft 2, is adapted to be clutched thereto by suitable clutching mechanism, (indicated generally at 4,) although a fast and loose pulley of usual form can be used for operating shaft 2. Shaft 2 is also provided with pulleys 5 6 for operating the staple-point cutters, as hereinafter set forth. At 7 is indicated a shaft carried in suitable bearings upon frame 1, and said shaft is illustrated as adapted to be operated from shaft 2 by interposed gearing, as 8 9 10 11, for giving shaft 7 the desired speed and direction of rotation.

The wire (indicated at 12) from which the staples are to be formed and which may be carried to the machine from a reel and passed through suitable or well-known wire-straighteners is presented to intermittently-rotative carrier or disk 13, that is provided with grippers to hold lengths of wire while the ends thereof are being pointed and the pointed lengths bent into staple form. The carrier 13 is mounted upon a stud 14, carried by a standard or the like 15, supported by frame 1, Fig. 9. The means shown for intermittently rotating carrier 13 comprise a ratchet-wheel 16, secured to said carrier, and an oscillatory gear 17, mounted to rotate upon stud 14 and carrying a pawl 18 to engage ratchet 16, the gear 17 meshing with a rack 19, carried by a reciprocating member or bar 20, suitably guided upon frame 1. (See Fig. 10.) To reciprocate the member 20, the same is shown

provided with a slotted head portion 20^a to receive and be guided by shaft 7, and said head is shown provided with lugs 20^b 20^c, adapted to be engaged by a pin 21, carried by shaft 7, as upon a flange or extension 22 secured thereto. Said pin and lugs reciprocate member 20 and allow a rest between each stroke. The means shown, however, for intermittently rotating carrier 13 may be varied from that set forth, if desired.

To lock carrier 13 in position to receive lengths of wire and while a length of wire is being pointed, we have shown a locking-pin 23, adapted to enter apertures 13^a in the carrier and arranged and operated as follows: Said pin is supported in suitable bearings carried by frame 1 (see Figs. 12 and 13) and operated by a bell-crank lever 24, adapted to engage lugs or pins 23^a on the pin 23, the lever being suitably pivoted, as at 25. From the bell-crank 24 extends a rod 26, that is connected with an arm 27, pivotally carried by frame 1, as at 28. To arm 27 is pivotally connected a rod 29, (guided in suitable bearings, as 30, carried by frame 1,) which carries a finger 31, adapted to be engaged by a cam 32, secured to shaft 7. (See Fig. 14.) The cam 32 has a portion 32^a to engage and push finger 31 to the right in Fig. 14 to positively operate bell-crank 24 to push pin 23 into an aperture 13^a in carrier 13, and said cam has a surface 32^b to ride against finger 31 and hold the pin 23 in the last-named position for a certain length of time, (while a staple length is being pointed,) the finger 31 being free after the part 32^c of cam 32 passes therefrom. When the last-named action occurs, a spring 33, connected with the pin or another part of the device, serves to withdraw the pin and restores the connected parts to the idle position.

The parts above described provide convenient means for operating, locking, and releasing the carrier 13.

The wire 12 is fed to grippers on the carrier or disk and cut into lengths, and such lengths are held by the grippers and carried to the devices for pointing the ends, and means are provided for bending the pointed lengths into staple form and disengaging the completed staples, and in this connection we have shown three sets of gripping devices on carrier 13. As the clamping devices upon carrier or disk 13 are all similar, a description of one will suffice. A movable gripping member is indicated at 35 pivoted upon carrier 13, as at 36, and provided with a finger 37, projecting beyond the periphery of the carrier in position to engage a cam 38, carried by frame 1, whereby as carrier 13 rotates in the direction of the arrow *b* in Fig. 3 the finger 37 will engage cam 38 to open the gripper, as indicated in Fig. 4, and when finger 37 passes from said cam the gripper will close. In Fig. 6 is indicated a plunger 39, bearing against gripper 35 and pushed by a spring 40 to normally hold the gripper closed. The gripper shown is in the form of an arm of suitable dimensions cut through or forked at its free end at 35^a and provided with a groove 35^b, that leads to the space between the forks 35^c. The free end of the gripper (or its forks 35^c) is provided with a recess 35^d, adapted when the gripper is closed to aline with a corresponding recess 35^e, formed in or carried by carrier 13, whereby is provided a socket 35^f, Fig. 6, to receive a length of wire 12^a, from which the staple is to be formed, the gripper normally holding the wire in such socket. (See Fig. 3.) For convenience of manufacture we provide a block 41 for each gripper, which is secured in a corresponding recess 42 in the carrier 13, and said block may be made in two parts secured together by screws 43^b, screws 43^a holding the block on disk 13. (See Fig. 9.) At the part of block 41 contiguous to recess 35^e is a groove 41^a, that alines with the space 35^a between the forks 35^c of the gripper, Figs. 5 and 6, whereby when the gripper is closed the grooves 35^b, 35^a, and 41^a form a continuous groove to receive a staple-bending finger 43. The surface of carrier 13 between the blocks 41 is also grooved, as at 13^b, (see Figs. 1 and 9,) in line with the grooves 35^b, 35^a, and 41^a, whereby a continuous groove is provided around the periphery of carrier 13 to receive the finger 43. (See Fig. 10.)

The wire for the staples is fed to and through the sockets 35^f of carrier 13 while gripper 35 is closed, so as to project from opposite sides thereof, and is then cut off intermittently to produce lengths of wire for the staples. To this end the wire 12 is fed through a staple-guide 48, carried by frame 1, and the relation of the parts is such that when pin 23 locks disk 13 in the stationary position a socket 35^f will be alined with the guide 48 to receive wire therefrom. To cut off the wire into the desired lengths, a knife or cutter 49 is provided (see Figs. 1 and 3) adapted to coact with the edge of guide 48, which knife is secured to an oscillatory shaft 50, mounted in suitable bearings on frame 1, and in the example shown said knife is operated by the reciprocative member 20. To this end an arm 51 extends from shaft 50 into position to be engaged by an extension or pin 52, carried by member 20, a spring 53 connecting arm 51 with a stationary part, as frame 1 at 54. (See Fig. 3.) When member 20 moves to the right in Fig. 3, pin 52 and arm 51 move knife 49 upwardly to cut the wire 12, and as pin 52 passes from arm 51 spring 53 restores said arm and knife to the normal position. When pin 52 returns, it slides back behind arm 51. (See Fig. 4.) To provide for different lengths of wire to be projected from guide 48 for making staples of different size, said guide is made adjustable toward and from carrier 13, and to this end guide 48 is shown carried

by a slide 53, mounted upon frame 1 and provided with a clamp 54 to hold the guide in adjusted position, which clamp may consist of a screw having a handle 55, the screw being threaded in the frame to pass through a slot 56 in slide 53. As shown, the shaft 50 is journaled at one end in the body portion 48[a] of guide 48 and is adapted to slide in the bearing 1[×], the shaft 50 being confined by knife 49 and a collar 57 in the bearing at 48[a], so that as the guide is adjusted toward and from carrier 13 the knife 49 will be correspondingly adjusted, the shaft 50 sliding in bearing 1[×].

Any suitable means may be provided for feeding wire 12 to the sockets 35[f] of carrier 13, and for such purpose the following arrangements are shown: Upon a web or guide 53[a] of member 53, Figs. 1 and 15, is mounted a slide 60, that carries a gripper 61, pivotally supported upon said slide at 62, the gripper 61 having an under gripping-surface at 61[a], adapted to clamp the wire upon slide 60. The gripper 61 is normally pressed toward the wire 12 by a spring 63 acting against the arm 61[b]. When slide 60 moves toward guide 48, the gripper 61 acts upon the wire and pushes the same forwardly; but when the slide returns the arm 61 slides freely over the wire. To hold the wire rigidly during the return stroke of slide 60, there is provided a stationary gripper corresponding to 61, which is illustrated more clearly in Fig. 1[a], wherein the wire 12 rests upon a bed 63, and an arm 64, pivotally supported above the wire and provided with a gripping surface or teeth at 64[a], (the gripping-surface of 61 being similar,) bears upon the wire. The arm 64 is pivoted at 65 and held down upon the wire by a spring 66. The arrangement of the parts is such that wire 12 may freely pass to the left in Fig. 1[a] when drawn by the gripper 61; but when gripper 61 slides reversely arm 64 will grip wire 12 and prevent it from being pushed back, whereby gripper 61 may slide freely over the wire. The means shown for reciprocating slide 60 are as follows: To frame 1 is pivotally connected a lever 68, as at 69, which lever is pivotally connected with slide 60, as by a link 70, and to shaft 7 is secured a suitable cam 71, adapted to act upon a pin or roller 72 on lever 68, Fig. 1. A spring 73, connected with slide 60 and with frame 1, acts against cam 71. At the proper time cam 71 rocks shaft 68 to push slide 60 forwardly, and when cam 71 passes from pin 72 the spring 73 draws slide 60 back with a quick stroke, the feeding of the wire being caused by the direct action of cam 71, so that positive lengths of wire are always fed.

The means for sharpening or pointing the ends of lengths of wire carried by the grippers upon disk 13 are arranged as follows: When the wire length 12[a] reaches the position shown at A in Fig. 3, the ends of the wire are brought in line with cutters, and to firmly grip the wire during the pointing operation there is provided a plunger 75, carried in bearings in a bracket 76, supported by frame 1 and normally pressed by a spring 77 toward the grippers 35, adjusting-screw 78 being provided to regulate the tension of the spring. Thus when the gripper 35 slides under plunger 75 the latter will forcibly bear on the gripper to confine the length of wire 12[a] firmly in socket 35[f]. In line with the ends of the wire length 12[a] that project from opposite sides of disk 13 are rotative cutter-heads adapted to advance toward and retreat from the corresponding ends of the wire, and as the two cutter-heads are substantially alike a description of one will suffice. At opposite sides of frame 1 are located ways or guides 80, on which slides 81 are mounted to reciprocate, and said slides carry bearings 82, in which are journaled the shafts of cutter-heads 83, which have pulleys 84 85, alined, respectively, with the pulleys 5 6. The cutter-heads are shown more fully in Figs. 16 and 17. Said cutter-heads are shown provided with a block 86, having an axial bore 86[a] to receive the end of wire 12[a], and within said block is secured a cutter 87, shown as held in place by a clamp-block and screw 88 89, whereby the cutter may be readily adjusted, the cutter not being shown in Fig. 16. The inner surface of block 86, to which the inner end of aperture 86[a] leads, is beveled or inclined from the outer end of the head or block inwardly at an angle to the plane of the staple-wire 12[a], and thus at an angle to the axis of the cutter-head, and the cutter 8 7 lies upon such surface 86[b], whereby the cutting edge 87[a] is located at an angle to the axis of the wire 12[a]. (See Fig. 17.) The wire 12[a], entering the aperture 86[a], meets the edge 87[a] of the cutter, and thereby as the cutter rotates, the wire being held stationary, a conical or outwardly tapering point is cut upon the end of the wire, the cutter feeding toward the stationary wire. For convenience of manufacture the block 86 is made removable from the cutter-head 83, and a hardened insertion 86[b] is provided in which the aperture 86[a] is formed; but it is obvious that the aperture 86[a] and the insertion 86[b] could be formed directly in the cutter-head 83, if preferred. An oil-hole 83[a] in head 83 conducts oil to the cutter. By preference the cutter-heads 83 are made to rotate in opposite directions, so as to take rotary strain from the wire 12[a], clamped upon disk 13, and for this purpose one belt (indicated at 90) may run direct from pulley 5 to pulley 84, and the belt 91 from pulley 6 to pulley 85 may be crossed, as indicated in dotted lines in Fig. 1. In such case the cutting edges 87[a] of the cutters 87 face in opposite directions, and thereby points are simultaneously formed upon the opposite ends of wire 12[a].

The means shown for moving the cutter-heads simultaneously toward and from the wire 12[a], carried by disk 13, are as follows:

Upon a shaft 92, journaled in suitable bearings upon frame 1, is secured a rocker-arm or cranks 93, projecting from opposite sides of said shaft and connected by links 94 95, Fig. 10, with the slides 81, whereby as shaft 92 rocks said slides will be reciprocated. As a convenient means for rocking shaft 92 we have shown gears 96 97 connecting said shaft with a shaft 98, journaled in bearings on frame 1, (shown carried in a housing 99,) the shaft 98 having a pin 100 to coact with a cam 101 on shaft 7, Fig. 1, for rocking shaft 98. Thus as shaft 7 rotates the cam 101, through the devices described, will cause slides 81 to reciprocate.

As provision is made for supplying different lengths of wire to disk 13 for producing staples of different lengths, as before noted, provision is also made for adjusting the cutter-heads 83 toward and from disk 13 to accommodate such varying lengths of wire, while the cutter-heads 83 reciprocate a definite distance. To this end upon each slide is pivotally supported an arm 103, having a pivot or fulcrum point 104 connected to slide 81, the lower ends of said arms being pivotally connected to the links 94 95, the upper ends of said arms being adjustable. To hold the arms 103 in adjusted positions, we have shown apertures 105 at suitable distances apart, Fig. 10, provided in members 106, rigidly connected with slides 81, adapted to receive spring-controlled pins 107, carried by arms 103. As illustrated in Fig. 10, if the arms 103 are moved outwardly, their lower ends finding a fulcrum at the connection with links 94 95, the slides 81 will be similarly adjusted away from the wire 12^a, and, likewise, if the arms 103 be adjusted inwardly the slides 81 and the cutter-heads 83 will be moved toward the wire 12^a. In either event the links 94 95 remain in positive position with respect to shaft 92, and thereby equal feeding to and fro of the cutter-heads with respect to wire 12^a may always occur, notwithstanding the lateral adjustment of said cutter-heads with respect to said wire.

The finger 43 for bending the pointed wire lengths is shown as movably supported by an arm 44, hung upon stud 14, so as to oscillate to permit the staple that is bent by means of said finger, Fig. 7, to be ejected therefrom. When the sharpened or pointed length of wire is brought by a gripper into contact with finger 43, the wire first causes the latter to move to the left in Fig. 3 (the arm 44 turning on its pivot 14) until said arm is brought in contact with and pushes back a plunger 45, carried in a bearing 46, suitably arranged on frame 1, said plunger being normally pressed forward by a spring 47, bearing against the plunger and against an abutment at said bearing. (See Fig. 3.) Said arm 44 comes to rest against said bearing, the spring 47 thus being placed under tension. When carrier 13 rotates sufficiently far to cause staple 12^b, Fig. 7, to be bent, the staple will aline with the groove 41^a of block 41 and will be free to slide in such groove, which is sufficiently wide to receive the staple, (see Fig. 9,) and thereupon finger 43 will be free and spring 47 will push plunger 45, thus moving finger 43 downwardly with a sudden thrust until it is arrested by a stop, as $43^\times$, thereby discharging the staple from the finger and the carrier upon the incline 1^a.

The complete operation of the machine may be described as follows: Assume that the wire-receiving sockets 35^f are all empty and that carrier 13 is held in the position shown in Fig. 3 by the pin 23, the various parts all being in in their proper positions. The machine being started, wire will be fed into one socket and knife 49 will cut off a length of wire, the rotary cutters operating idly. Cam 32 and the connected devices next cause pin 23 to be withdrawn from carrier 13, (cam 101 causing the rotary cutters to be moved outwardly,) and carrier 13 is moved one step, bringing the length of wire in line with the rotary cutters, and the carrier is locked. The cutters 87 then move toward the ends of the wire held in line therewith, and the cutters operate to produce conical points on the wire, another length of wire being fed to a socket of disk 13, now held in line therewith, and cut by knife 49. The rotary cutters then recede from the pointed ends of the wire, and the carrier is rotated another step, the last cut wire length being brought in line with the cutters, the pointed wire carried below, and a new wire fed to the third socket on carrier 13, the same operations of cutting off one wire length and of pointing the ends of the previously-cut wire occurring. The parts will now be in the potitions shown in Fig. 3. The lowermost pointed wire is now ready to be bent into staple form, and during the next step of carrier 13 the pointed wire (indicated at *a* in Fig. 3) will be advanced into contact with finger 43, and finger 37 will engage cam 38 to open gripper 35, the motion of finger 43 being arrested by bearing 46, as indicated in Fig. 4. As carrier 13 continues to advance the jaws of block 41 pass by or straddle finger 43, and thereby cause the staple to be bent, as indicated in Fig. 7, and as soon as the staple is properly bent, so that it may freely pass through groove 41^a, the plunger 45 (which was previously pushed back by arm 44) springs forward, causing finger 43 to eject the staple 12^b from the groove 41^a, and the staple drops upon the base or receptacle 1^a. During the continued motion of disk 13 to the resting-point finger 37 passes away from cam 38 and the gripper 35 closes, as indicated in Fig. 3. It will be understood that after the three grippers have been supplied with staple-wire lengths appropriate operations upon the three wire lengths take place for each step or one-third rotation of carrier 13—that is to say, wire is fed from guide 48 and cut off by the cutter 49. A length of wire at the upper part of carrier 13 is pointed, and the pointed wire at

the lower part of the carrier is in position to be bent as the carrier advances and to be dislodged therefrom. The parts of course will all be properly timed to produce the several steps in the operations stated. It will thus be seen that for each one-third rotation of carrier 13 a completed staple having conical or outwardly-tapering points is produced and discharged from carrier 13.

While we have shown provision for operating upon three staple-wires in connection with carrier 13, it is obvious that more or less grippers and parts to coact therewith may be provided and properly arranged in connection with each other, if preferred, and that instead of feeding wire from a roll to the grippers and then cutting the wire into lengths previously-cut lengths of wire could be fed to the grippers. It will also be understood that the various details of construction may be altered and modifications made in the machine without departing from the spirit of our invention.

Having now described our invention, what we claim is—

1. A staple-making machine comprising a carrier provided with means for gripping wire, means for feeding wire to the gripping means, means for cutting the wire into lengths while held by the gripping means, cutters located on opposite sides of the carrier and out of line with the wire-feeding devices for pointing the ends of wire lengths projecting from the carrier, means for moving the carrier from the wire-receiving to the wire-pointing positions, and means for holding the carrier in such positions, substantially as described.

2. A staple-making machine comprising a rotative carrier provided with means for gripping wire, and a finger located in the path of the wire to coact with the moving carrier to bend the wire into staple form, during the movement of the carrier, said carrier having a groove for the passage of the finger during the bending of the wire, substantially as described.

3. A staple-making machine comprising a rotative carrier provided with means for gripping wire, a finger located in the path of the wire to coact with the carrier to bend the wire into staple form during the movement of the carrier, said carrier having a groove for the passage of the finger, means to open the gripper during the bending of the wire to permit the ends of the wire to approach each other, and means for ejecting staples from the carrier, substantially as described.

4. A staple-making machine comprising a carrier provided with a gripper to hold wire and having a circumferential groove, and a finger adapted to enter said groove and to engage a wire held by the gripper to bend the pointed wire into staple form, by and during the movement of the carrier, and means to release the hold of the gripper upon the wire upon the engagement of the finger with the wire, substantially as described.

5. A staple-making machine comprising a carrier provided with means for gripping wire, a device arranged in the path of movement of the wire held by the gripper arranged to come in contact with the wire and bend it into staple form, and means constructed and arranged to thrust said device to eject the finished staple, substantially as described.

6. A staple-making machine comprising a carrier provided with a plurality of grippers to hold lengths of wire, means for intermittently rotating said carrier, means for locking the carrier in operative positions, wire feeding and cutting devices alined with one gripper of the carrier when held stationary, wire-pointing devices alined with another gripper when the carrier is held stationary, and means for operating the pointing devices, substantially as described.

7. A staple-making machine comprising a carrier provided with a plurality of grippers to hold lengths of wire, means for intermittently rotating said carrier, means for locking the carrier in operative positions, wire feeding and cutting devices alined with one gripper of the carrier when held stationary, wire-pointing devices alined with another gripper when the carrier is held stationary, and means located in the path of a pointed wire adapted to bend the same into staple form during the movement of the carrier from one stationary position to another, substantially as described.

8. A staple-making machine comprising a carrier provided with a plurality of grippers to hold lengths of wire, means for intermittently rotating said carrier, means for locking the carrier in operative positions, wire feeding and cutting devices alined with one gripper of the carrier when held stationary, wire-pointing devices alined with another gripper when the carrier is held stationary, a finger located in the path of the pointed wire adapted to engage the wire and cause the same to be bent during the travel of the carrier from one stationary position to another, the carrier having a groove to coöperate with the finger, and means to cause staples to be ejected from the carrier, substantially as described.

9. A staple-making machine comprising a rotative carrier, a gripper pivotally connected therewith and provided with a forked end adapted to coact with part of the carrier to hold lengths of wire, means for pointing the wire lengths when held by the gripper, a finger adapted to engage the pointed wire lengths, means for supporting said finger in operative position, and means for opening the gripper whereby its forked end will straddle said finger to permit free passage of the carrier past the finger, the carrier having a groove to permit the passage of the finger, substantially as described.

10. A staple-making machine comprising a

rotative carrier provided with a circumferential groove, a gripper pivotally supported upon the carrier and provided with a groove and a forked end alined with the groove of the carrier, means to open and close the gripper, means to feed wire to the gripper, means for pointing wire lengths held by the gripper, and a finger adapted to enter said grooves and pass between the forks of the gripper to engage wire held by the gripper to bend it into staple form, substantially as described.

11. A staple-making machine comprising a rotative carrier provided with a circumferential groove, a gripper pivotally supported upon the carrier and provided with a groove and a forked end alined with the groove of the carrier, means to open and close the gripper, means to feed wire to the gripper, a finger adapted to enter said grooves and pass between the forks of the gripper to engage wire held by the gripper to bend it into staple form, and means for thrusting the finger to eject staples, substantially as described.

12. A staple-making machine comprising a rotative carrier, a gripper pivotally carried thereby and adapted to coact with part of the carrier to hold wire lengths, means for feeding wire to the gripper, a finger adapted to engage wire to bend it into staple form, an arm carrying said finger and movably supported concentric with the axis of the carrier, and a spring to coact with said arm to thrust the finger to eject staples from the carrier, the carrier having a groove to permit the passage of the finger, substantially as described.

13. A staple-making machine having a rotative carrier provided with means for gripping wire, means for feeding wire to the gripper, a guide for the wire located adjacent to the carrier, means for adjusting said guide laterally with respect to the carrier, a knife supported adjacent to the guide to be adjusted therewith for cutting wire held by the carrier, and means for pointing such wire, substantially as described.

14. A staple-making machine comprising a rotative carrier provided with a plurality of grippers to hold wire, means for intermittently rotating said carrier, means for holding the carrier in different positions, means for feeding wire to the grippers, rotary cutters located on opposite sides of the carrier, and means for moving said cutters toward and from the carrier to operate upon the ends of wire held thereby, the means for feeding wire to the carrier and for moving the cutters toward and from the wire being arranged to operate while the carrier is held in one position, substantially as described.

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Witnesses:
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