

W. E. WADE.
LASTING MACHINE.
APPLICATION FILED NOV. 8, 1900.

944,116.

Patented Dec. 21, 1909.
5 SHEETS—SHEET 1.

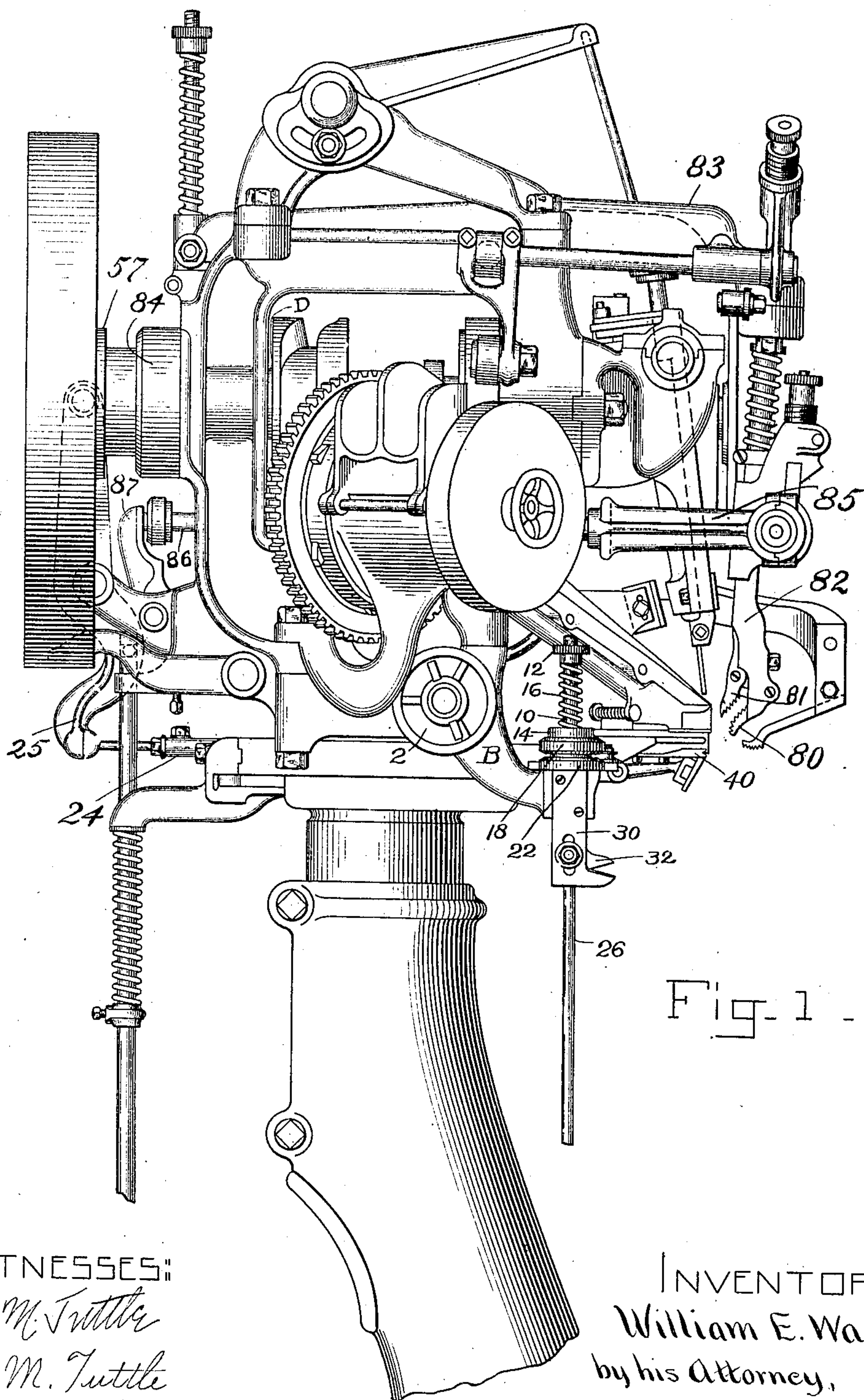


Fig. 1

WITNESSES:
M. M. Tuttle
A. M. Tuttle

INVENTOR:
William E. Wade
by his Attorney,
W. B. Tuttle

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6 SHEETS—SHEET 2.

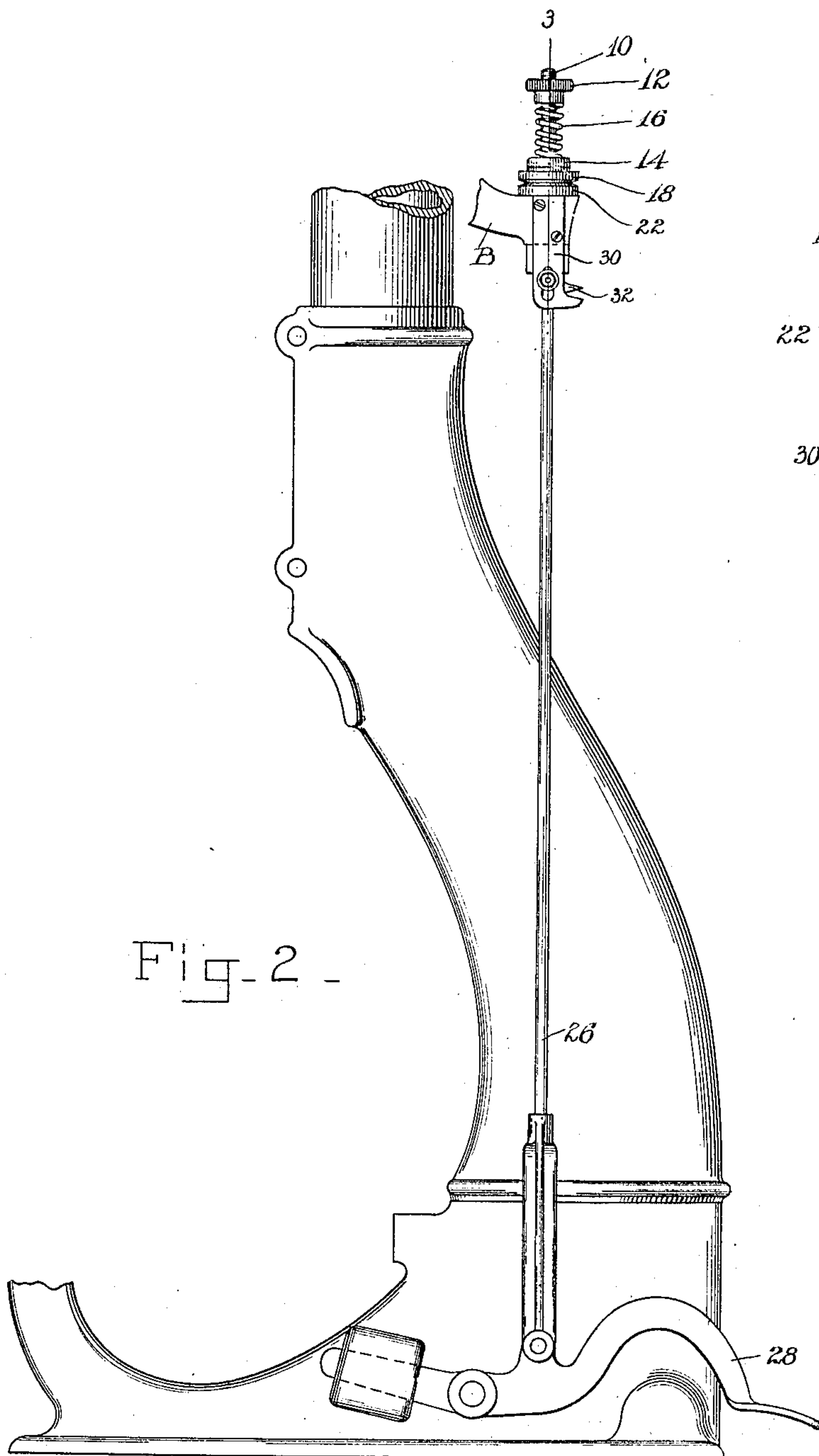


Fig. 2 -

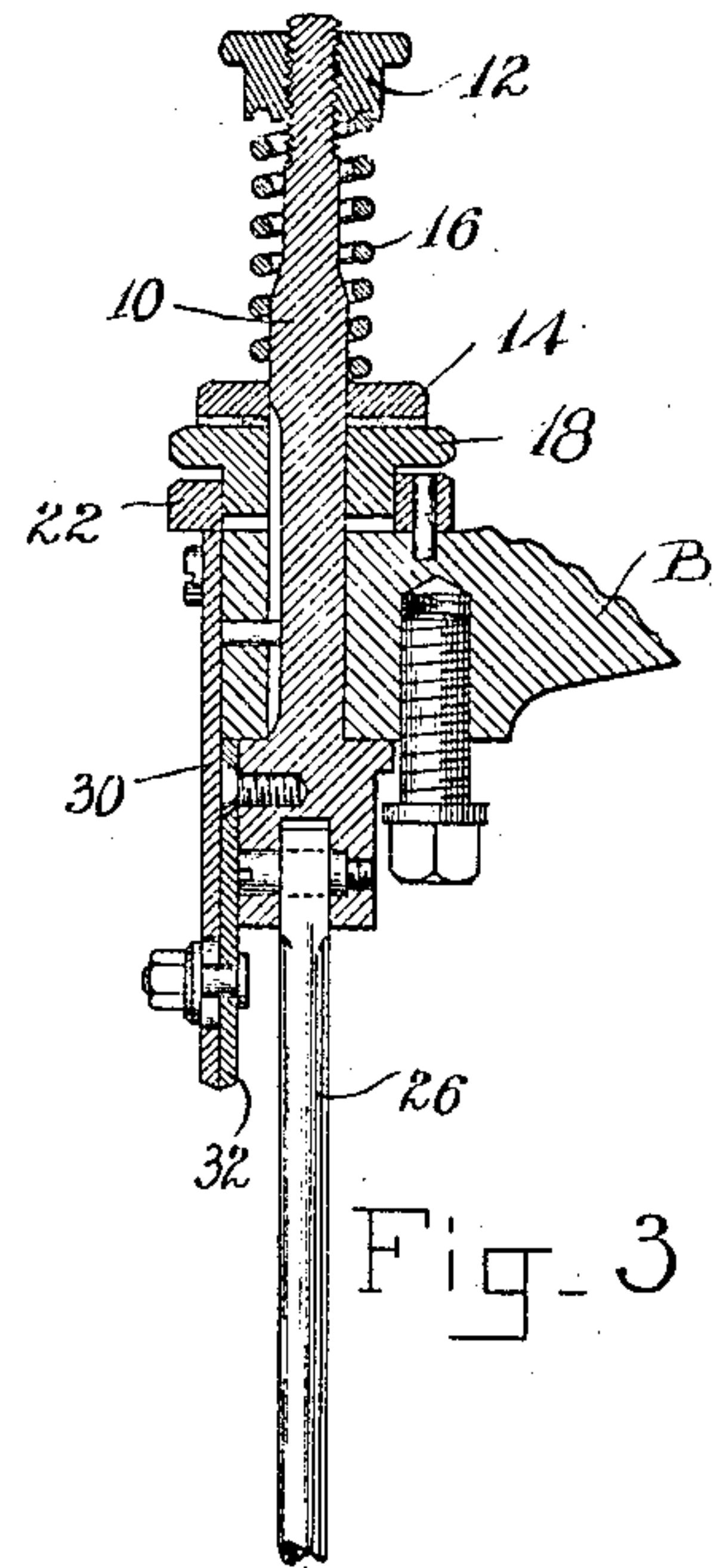


Fig. 3 -

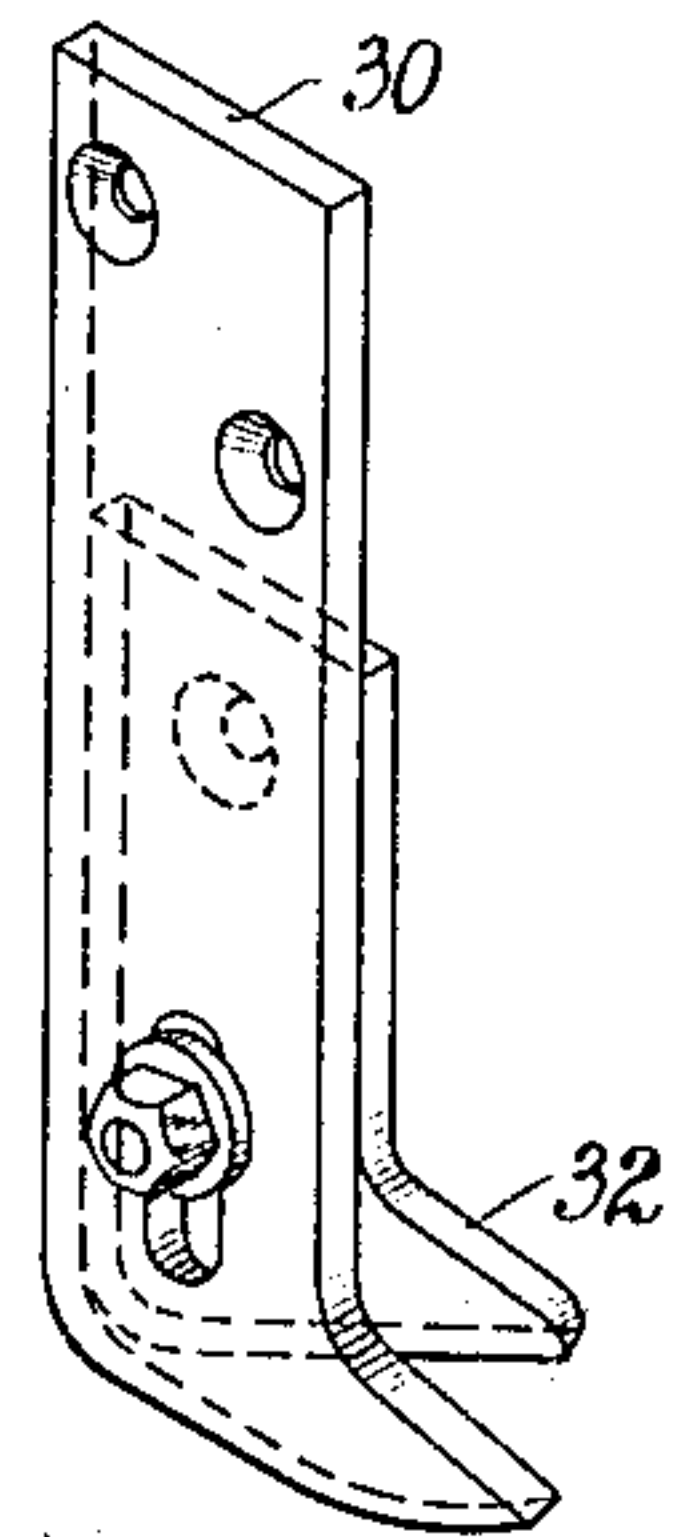


Fig. 4 -

WITNESSES:
M. M. Tuttle
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William E. Wade
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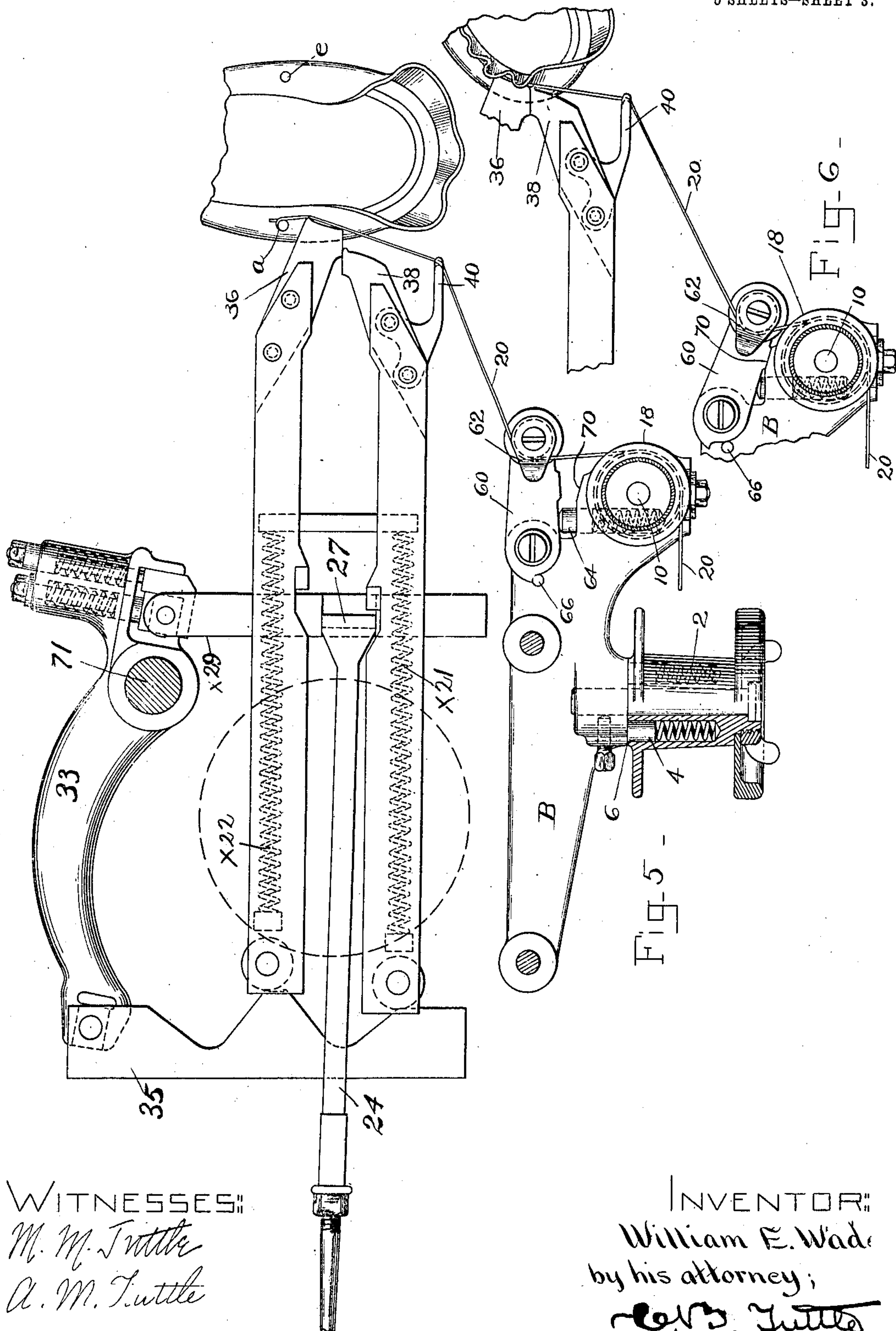
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9 SHEETS—SHEET 4.

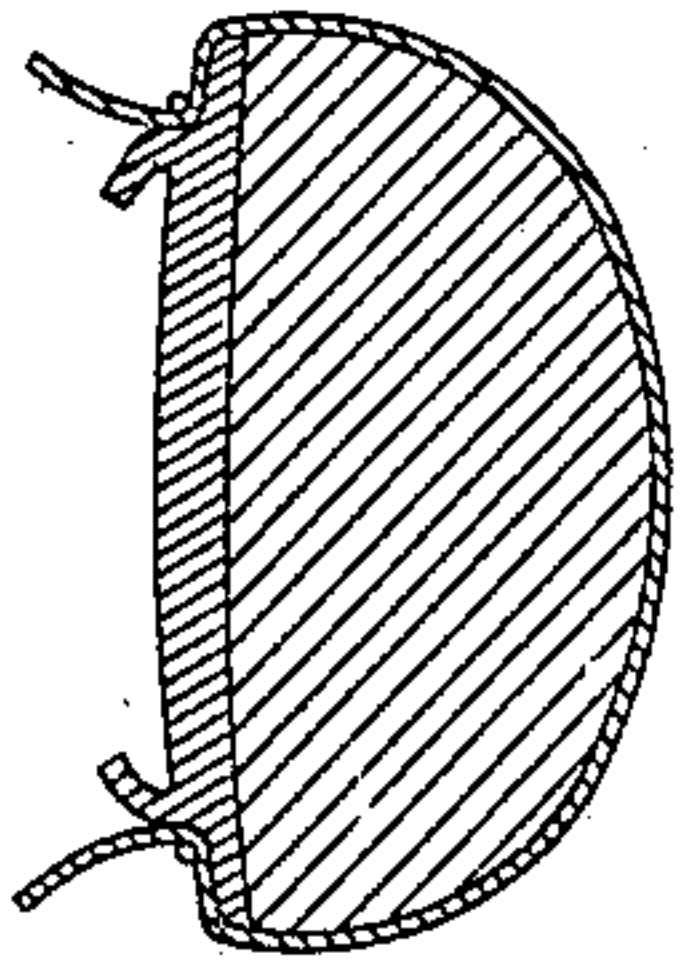


Fig. 9

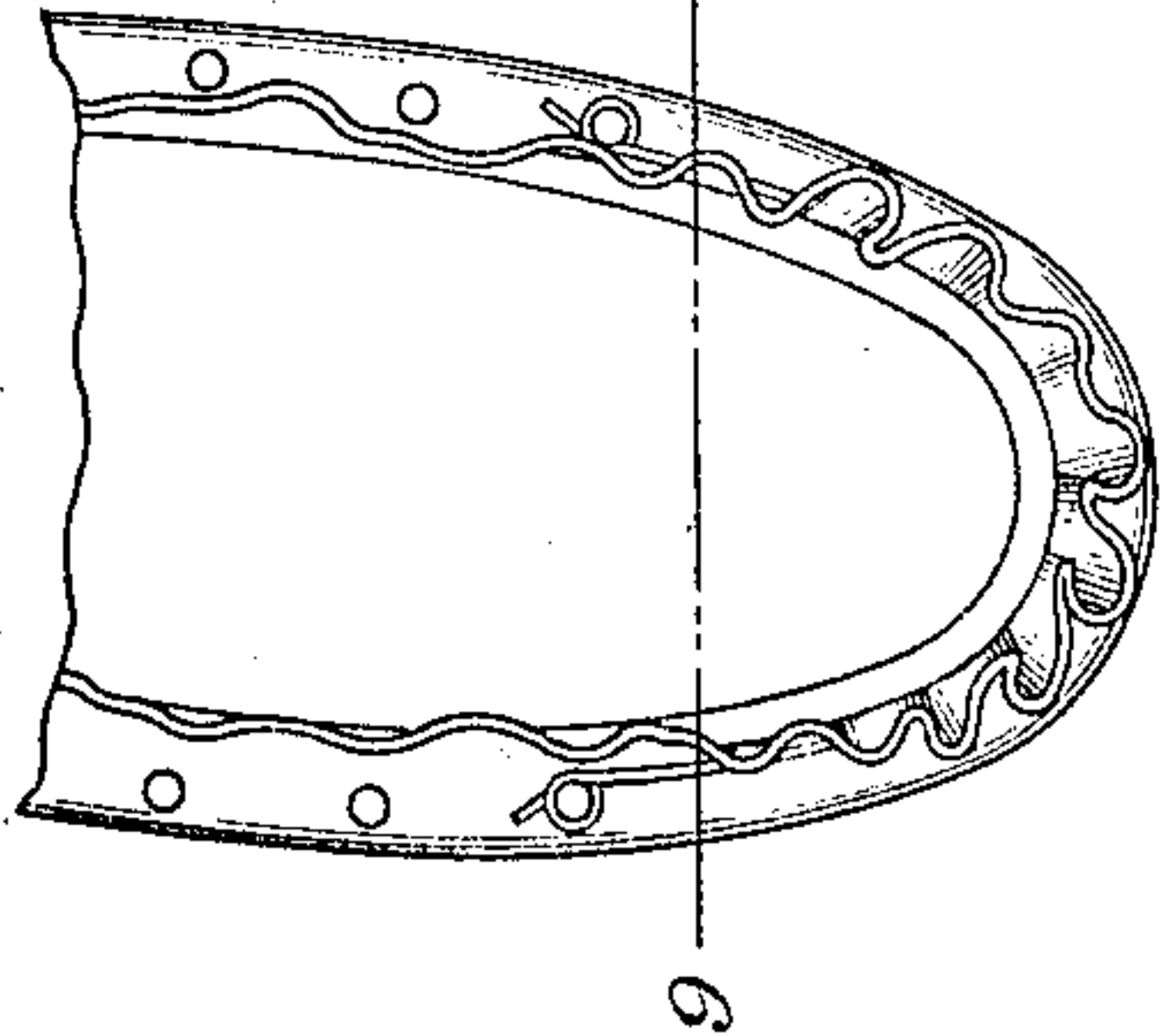


Fig. 8

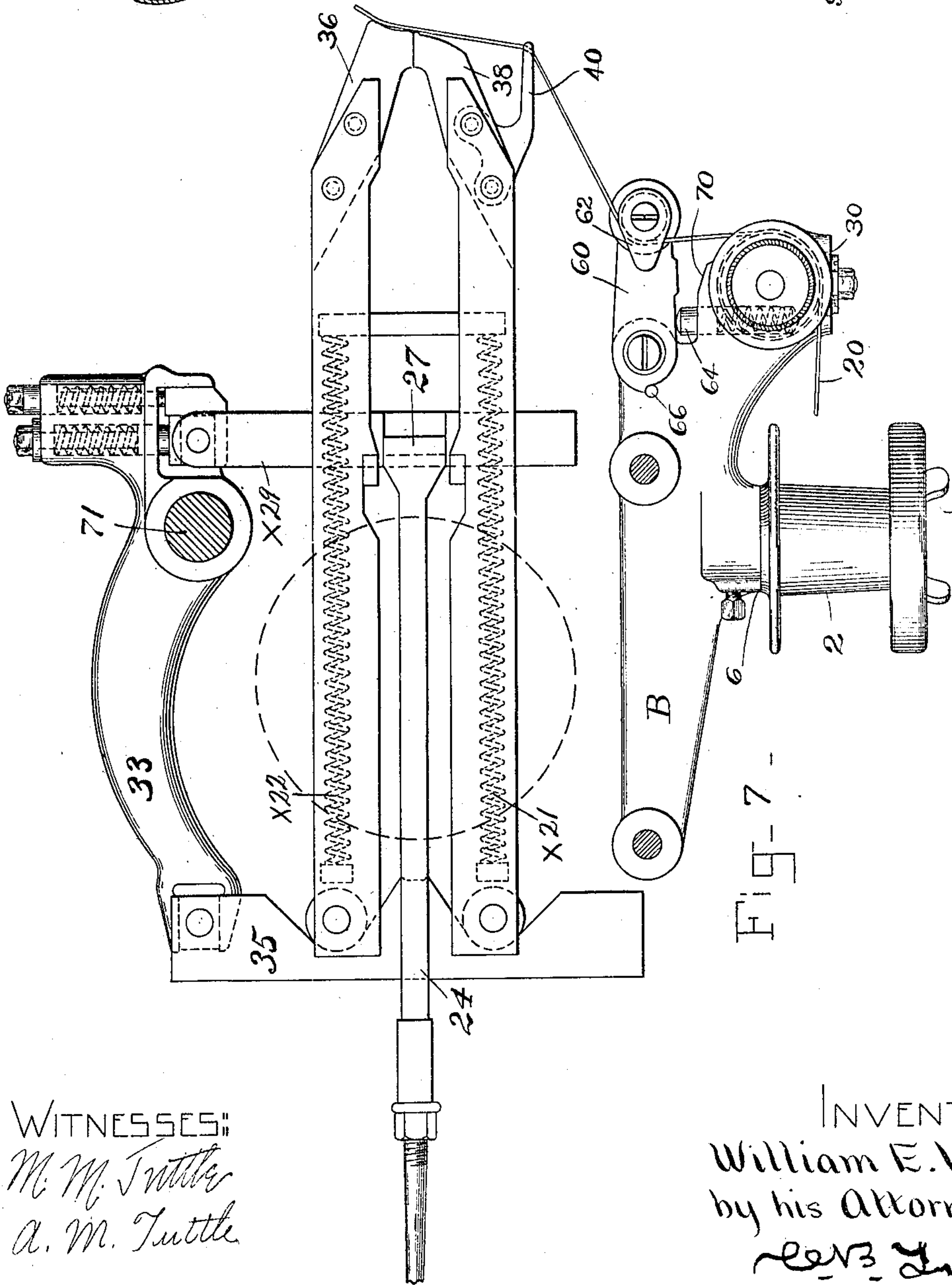


Fig. 7

WITNESSES:
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5 SHEETS—SHEET 5.

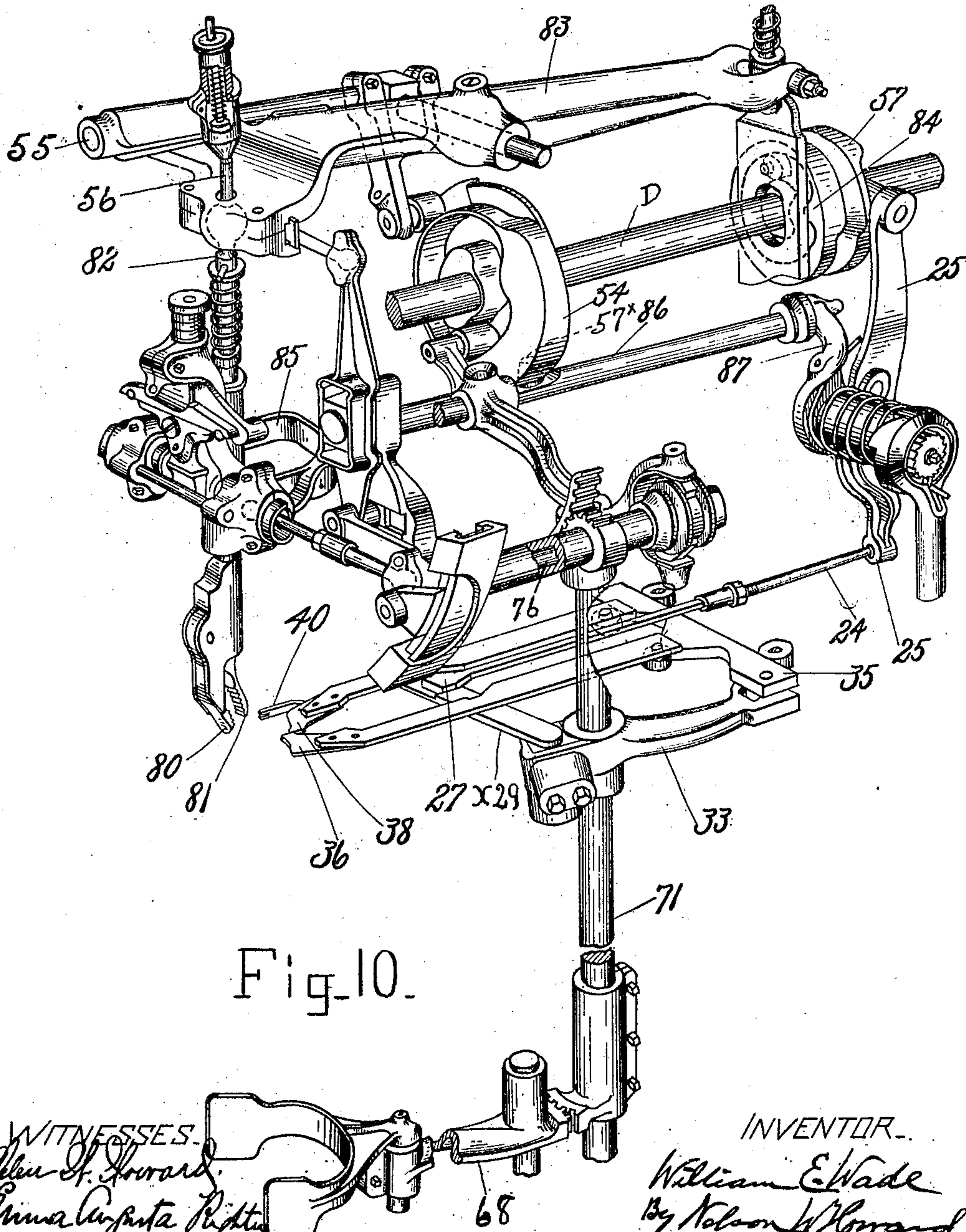


Fig. 10.

WITNESSES:
Wm. H. Howard
Anna Augusta Righter

INVENTOR.
William E. Wade
By *Nelson H. Howard*,
Associate Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM E. WADE, OF ROCKLAND, MASSACHUSETTS, ASSIGNOR TO THE UNITED SHOE MACHINERY COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF NEW JERSEY.

LASTING-MACHINE.

944,116.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed November 8, 1900. Serial No. 35,882.

To all whom it may concern:

Be it known that I, WILLIAM E. WADE, of Rockland, county of Plymouth, Commonwealth of Massachusetts, have invented certain Improvements in Lasting-Machines, of which the following, read in connection with the accompanying drawings, is a specification.

This invention relates to lasting machines and particularly to that type of lasting machines by which the upper is worked over a last step by step by the operation of the machine on different portions of upper materials successively.

The invention as herein shown is applied to a lasting machine similar to that shown in United States Letters Patent No. 584,744, of June 15, 1897, to which reference may be had for a more complete description of the construction and the several operations of the machine than is necessary to present in connection with the present invention.

This invention is an improvement upon the machines shown in United States Letters Patent No. 696,717 and No. 696,740, of April 1, 1902, and it has for its object to provide improved means for applying wire or other suitable continuous material, which will herein be referred to as wire, to a shoe for holding the worked-over upper material in lasted position.

A very important feature of this invention consists in providing a machine for working an upper over a last with means for feeding wire to bind the worked-over portions of upper in lasted position.

In the present construction the machine comprises means for superimposing wire upon the worked-over portions of upper material and has provision for advancing the wire automatically from a wire holder, whereby the operator is relieved of the labor heretofore required for drawing the wire from the wire holder.

In the embodiment of the invention herein shown a reciprocating presser is employed for forcing the worked-over portions of upper material into the angle of union between the feather and lip of the innersole of a welted shoe and a wire supporter is mounted on the reciprocating presser and coöperates therewith and preferably with a fixed presser in superimposing the wire in position to bind the upper into said angle of union or against the lip of the

innersole. The wire supporter mounted upon and moving with the reciprocating presser serves to pull the wire from the wire holder and advance or feed the wire into position to be superimposed. By this construction the wire is advanced at each operation of the wire-superimposing means, and, in the machine to which the invention is shown as applied, the advancing or feeding of the wire also occurs normally at each operation of the over-working mechanism.

It will be understood that the invention is not limited to a construction in which the wire is advanced and superimposed by the same or closely associated parts, for obviously it is within the scope of my invention to advance the wire by means of mechanism which is entirely independent of the mechanism for superimposing the wire.

A further feature of the invention consists in providing the machine with mechanism for taking up slack wire after each operation of advancing and superimposing the wire and before the next wire-advancing operation.

Still a further feature of the invention consists in providing improved means for producing tension on the line of wire supply, whereby too free delivery of wire from the wire holder is prevented. Preferably, also, means is provided under control of the operator for varying the tension on the wire. As herein shown, connections are arranged between the tension mechanism and a foot lever whereby the tension may be increased at the will of the operator to enable him, by manipulating the shoe to which the free end of the wire is attached as hereinafter explained, to draw the wire tightly about the worked-over portions of upper material.

In accordance with another feature of my invention, I have provided means for rendering the wire-advancing mechanism operative or inoperative at the will of the workman. In the machine herein illustrated mechanism is provided for causing the over-working means to crimp or plait the upper to take care of surplus over-worked material at certain portions of the shoe, as at the toe end. Preferably, and as herein shown, means is provided for rendering the wire-advancing mechanism operative when the plaiting mechanism is operated.

Other features of the invention including certain details of construction and combina-

tions of parts will be hereinafter described and pointed out in the claims.

In the accompanying drawings, in which the same reference characters indicate similar parts:—Figure 1 is a side elevation of a machine embodying the present invention; Fig. 2 is a side elevation of the base of the machine and certain parts concerned with the present invention and which later will be more fully described; Fig. 3 is a section on line 3 of Fig. 2; Fig. 4 is a perspective view of the wire-cutting devices with which the machine is equipped; Fig. 5 is a plan view of the work pressers, the wire holder, the take-up, and other parts connected with the invention; Fig. 6 is a similar view showing certain of the parts in a different position from that shown in Fig. 5; Fig. 7 is a view similar to Fig. 5 and illustrates the positions occupied by certain parts when the wire-advancing mechanism has been rendered inoperative; Fig. 8 is a bottom plan view of the forepart of a lasted shoe; Fig. 9 is a section of line 9—9 of Fig. 8; and Fig. 10 is a perspective view showing particularly the mechanism employed in the described machine for actuating the grippers.

In the machine to which the invention is herein illustrated as applied, the upper is manipulated over the last by means comprising gripper members 80, 81 which are supported by carrier 82 suspended from the front end of the lever 83, by which vertical movements are imparted to the grippers for updrawing the upper. The updraw lever 83 is fulcrumed in the frame of the machine and is connected at its rear end (see Figs. 1 and 10) to a cam 84 on the main shaft D. The grippers are closed by a cam 54 on the shaft D which acts through a rockshaft 55 to depress a bar 56 for moving the gripper member 81 toward the member 80. The gripper carrier 82 is guided through a yoke 85 mounted on the front end of a horizontal bar 86, the rear end of which bar is engaged by a spring-actuated arm 87 by which the grippers are pressed forwardly for drawing the upper over the last bottom. A cam face on the side of block 54 engages a stud 57* on a bar 86 for drawing the grippers toward the machine into position to grip the upper on the edge of the last bottom.

For the best results in manipulating the upper over the last at the toe, and sometimes at other portions of a shoe, the grippers require to be moved laterally and turned for plaiting the upper, and to this end a knee lever 68 has connections through a rockshaft 71 with a shaft 76 for throwing into and out of operation the mechanism for moving the grippers laterally and turning them to plait the upper. These several mechanisms for actuating and controlling the grippers are fully illustrated and described in detail in said Letters Patent No. 584,744, to which

reference may be had for a complete understanding of the construction and arrangement of the mechanisms. The illustrated machine also comprises pressers 36 and 38 for forcing the upper material into the angle of union between the feather and lip of the inner sole of welted shoes. The pressers are arranged for longitudinal movement toward and from operative position and are actuated rearwardly toward their inoperative position by springs x^{21} , x^{22} . A slide bar 35 is arranged to engage rolls on the rear ends of the pressers, and has notches into which the rolls enter when the bar occupies the position shown in Fig. 7. Inclined faces connect the notches with the higher portions of the bar, and by shifting the bar longitudinally the pressers are advanced from their inoperative position to their operative position, shown in Fig. 5. The shifting of the bar 35 is effected by a lever 33 having connection with the rockshaft 71 before described as being manually controlled for the purpose of rendering the gripper operative or inoperative for plaiting the upper. In the machine shown, means is provided for reciprocating one of the pressers when the pressers occupy their operative position. This means comprises a driver 24 arranged, as shown in Figs. 1 and 10, to be actuated by a lever 25, the upper end of which is in engagement with a cam 57 on the main shaft D. The driver has a head 27 which is guided in a slide x^{20} having connection with the lever 33 on rockshaft 71 before referred to. The adjustment of the rockshaft which causes the pressers 36 and 38 to assume their inoperative position also moves the slide x^{20} (as shown in Fig. 7) so that the driver head will reciprocate between the pressers without actuating either of them. An adjustment of the rockshaft which advances the pressers into operative position also shifts the slide x^{20} to place the driver head, as illustrated in Fig. 5, in position to engage a shoulder on the presser 38 and impart to that presser an advance movement toward the shoe at each operation of the machine. Reverse movement of the presser 38 is effected by the spring x^{21} . In its advance movement the presser 38 engages the portion of upper material being acted upon by the grippers and forces it into the angle of union between the feather edge and lip of the innersole. The presser 36 preferably remains at rest upon a portion of the upper material previously worked-over.

The construction and operation of the pressers as above described is substantially the same as is described in the Letters Patent No. 584,744 before mentioned. The present invention contemplates that the upper material thus manipulated into lasted position shall be held around the toe of the shoe by a strand of wire or other continuous

material extending from a tack on one side of the shoe around the toe to a tack on the opposite side, the wire binding the successively-manipulated portions of upper material against the lip.

In the machine shown the wire is supplied from a reel 2 mounted on a stud on the frame B of the machine, as shown in Figs. 1 and 5, and has its motion retarded by friction between a spring-pressed plunger 4 carried by the reel and the face 6 of the frame. The tension means for acting upon the line of wire supply comprises a rod 10 mounted in the frame B, as shown in Fig. 3. A spring 16 is held under compression between a nut 12 on the upper end of the rod and a disk 14. Resting upon the frame B is another disk 22, and between said disks is a drum 18, the hub of which extends into the disk 22 and the flange of which overlaps said disk so that the wire 20 passing from the reel around the drum (as shown in Fig. 5) is gripped between the disk 22 and the flange of the drum with a force dependent upon the degree of compression of the spring 16. Preferably the rod 10 is arranged to be moved longitudinally in the frame at times to increase the compression of the spring 16 and thereby increase the tension on the wire. To this end the rod 10 is extended below the frame where it is provided with a suitable head to limit its upward movement, and a connecting rod 26 extends from the rod 10 to a treadle 28, by which the rod 10 can be pulled downwardly for applying increased tension to the wire.

The free end of the wire is, in practice, secured to a tack at one side of the shoe, and the shoe presented in the hands of the operator in the position shown in Fig. 5, where the reciprocating presser, in its advanced movement will engage the strand of wire and superimpose it on the upper for holding in position the successively-overworked portions of upper. The shoe is advanced and turned step by step for presenting the different parts of the upper in position to be overworked and for the wire to be superimposed for securing said portions. In the present embodiment of the invention the wire is supported and guided by a device 40 which, as herein shown, is secured to the presser 38 and partakes of the reciprocating movements of said presser.

The supporting device 40 deflects the wire from a straight line, and at each advance of the reciprocating presser serves to pull the wire from the wire holder and advance or feed it toward position to be superimposed. Of course the wire guide as it advances and carries the wire toward the shoe draws upon the portion extending to the shoe as well as upon the portion running to the tension and so tightens the wire into binding relation to the upper between the shoe and the presser

38, which, as it advances, crowds the upper and the wire into the angle between the feather and the lip of the innersole and firmly seats the wire which is thereafter held in position by the presser 36. It will be understood that in the illustrated machine the wire is advanced at each operation of the upper-manipulating means and the wire-superimposing means, and that the wire-advancing means is operative when the upper-plaiting mechanism is operative, and is inoperative when the upper is not being plaited.

The amount of wire drawn from the wire holder at each feed movement thereof is approximately equal to what is required for superimposing at the next operation of the machine. In order to take up any superfluous or slack wire after each wire-superimposing operation, the wire is made to pass around a hook 62 on a swinging arm 60 which is pivoted on the machine frame, as shown in the drawings, and is acted upon by a spring-pressed plunger 64 for holding it normally in the position shown in Figs. 5 and 7, with a shoulder on its hub against a stud 66. When the presser and wire supporter advance, the pull on the wire will first overcome the pressure of the spring plunger 64 and turn the arm 60 into the position shown in Fig. 6, in which it engages the face 70 on the frame. Continued advance of the wire-feeding means will then draw the wire through the tension means from the line of wire supply. When the presser and wire supporter retreat from the shoe, the spring plunger 64 will force the swinging arm toward the position shown in Figs. 5 and 7, thereby taking up any wire not required for binding the portion of upper manipulated into lasted position by the last operation of the machine. When the lasting of the toe of the shoe has been completed, the wire is wrapped around a tack *c* to secure it and then is cut from the line of wire supply. Cutters for severing the wire are conveniently carried by the frame B. To this end a cutter blade 30 is directly secured to the frame, as shown in Figs. 2 and 3, and a blade 32 is movably connected to the blade 30 and is secured to the head of the rod 10, whereby it may be actuated by the treadle 28 for cutting wire.

In the use of the machine for lasting the toe of a shoe, the knee lever 68 is actuated for turning the rockshaft 71 to render the grippers operative for plaiting the upper. This actuation of the knee lever also advances the pressers 36, 38 into operative position and shifts the driver head 27 into position to engage and actuate the presser 38. The free end of the wire is then fastened to the tack *a* and the shoe positioned in proper relation to the grippers and the presser, the wire necessary to permit this

positioning of the shoe being drawn from the wire holder against the normal tension of the spring 16 determined by the adjustment of nut 12. When the machine is started the grippers pull the upper over the last and the presser 38 is advanced to press the upper pulled by the grippers into the angle of union between the feather and lip of the innersole and to superimpose the wire in position for binding the portion of upper in over-worked position. As the presser 38 advances, the wire supporter 40 is also carried forwardly and pulls or feeds the wire from the wire holder. When the presser and wire supporter retreat, the arm 60 takes up any wire not required by that operation of the machine. After each operation the workman advances the shoe the desired distance to present another portion of the upper in position to be operated upon, and in advancing the shoe he may manipulate it so as to draw the wire tightly about the upper. The treadle 28 may, at such times, be depressed for applying additional tension to the line of wire supply to enable the superimposed wire to be drawn as firmly as desired about the over-worked portions of upper. When the lasting of the toe is completed, the wire is secured to tack *e* and cut from the line of wire supply.

Having explained the nature of my invention and fully described a preferred construction embodying the invention, I claim as new and desire to secure by Letters Patent of the United States:—

1. A machine for working an upper over a last, comprising overworking mechanism, and mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for advancing the wire at each operation of the overworking mechanism.

2. A machine for working an upper over a last, comprising mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for automatically advancing the wire simultaneously with the operation of superimposing said wire.

3. A machine for working an upper over a last, comprising overworking mechanism, and means for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for advancing the wire intermittently in time relation with the operation of the overworking mechanism.

4. A machine for working an upper over a last, comprising overworking mechanism, mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for advancing the wire at each operation of the overworking mechanism, and

means for creating a tension on the line of wire supply.

5. A machine for working an upper over a last, comprising overworking mechanism, mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for advancing the wire under tension at each operation of the overworking mechanism, and means for varying the degree of tension on the wire.

6. A machine for working an upper over a last, comprising overworking mechanism, mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for advancing the wire, and a take-up mechanism acting on the line of wire supply.

7. A machine adapted for working an upper over a last by repeated operations of the machine, comprising mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said machine having provision for feeding the wire, and means to suspend the feeding of the wire during continued operations of the machine.

8. A machine for working an upper over a last, comprising mechanism movable toward and from operative position for superimposing wire or like continuous material in position for binding the overworked upper, means to put said mechanism into operative position, and means to take up the wire automatically when said mechanism is in inoperative position.

9. A machine for working an upper over a last, comprising mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said mechanism including means movable toward and from the last for feeding the wire, combined with means for taking up the wire when said first-mentioned means is moved away from the last.

10. A lasting machine, comprising means for gripping and pulling the upper over a last, means including a wire guide for superimposing wire in position for binding the upper, and means for advancing and retracting the wire guide at each operation of the gripping mechanism.

11. A lasting machine adapted for working on an upper by repeated operations of the machine, comprising means for superimposing wire or like continuous material in position for binding the upper, and a wire supply, said machine having provision for drawing the wire from the wire supply at each operation of the wire superimposing mechanism.

12. A lasting machine adapted for working on the upper by repeated operations of the machine, comprising means for superim-

posing wire or like continuous material in position for binding the upper, said machine having provision for advancing the wire at each operation of the wire-superimposing mechanism, and a device arranged for taking up the wire between each operation of the superimposing mechanism.

13. A lasting machine adapted for working on the upper by repeated operations of the machine, comprising means for superimposing wire or like continuous material in position for binding the upper, and a work presser, said machine having provision for advancing the wire at each operation of the work presser.

14. A machine for working an upper over a last, comprising a work presser adapted to operate on different parts of the work progressively, and mechanism for superimposing wire or like continuous material in position for binding the overworked upper, said mechanism being mounted on said work presser and comprising a guide for the wire.

15. A lasting machine adapted for working on the upper by repeated operations of the machine, comprising a work presser, means to advance and retract the work presser at each operation of the machine, and mechanism connected with said work presser to be advanced and retracted therewith for superimposing wire or like continuous material in position for binding the upper.

16. A machine for working an upper over a last and superimposing wire or like continuous material in position for binding the overworked upper, comprising means for crimping or plaiting the upper, and means for advancing the wire to said plaiting means combined with means for rendering said wire-advancing means operative when the plaiting means is operated.

17. A machine for working an upper over a last and superimposing wire or like continuous material in position for binding the overworked upper, comprising means for crimping or plaiting the upper, and means for advancing the wire intermittently when said plaiting means is operated.

18. In a machine for working an upper over a last, means for superimposing wire in position for binding the overworked upper, means for advancing the wire, means for automatically retarding the advance movement of said wire, and means for rendering said wire-retarding mechanism operative or inoperative.

19. In a machine for working an upper over a last comprising grippers and actuating mechanism therefor, including means for causing the grippers to plait the upper, the combination with a wire-supporting guide, of means for actuating said guide to advance the wire when the grippers actuating mechanism is operative for causing the

grippers to plait the upper, said guide-actuating mechanism being inoperative when the grippers are not operative to plait the upper.

20. A machine for working an upper over a last, comprising means for manipulating different parts of the upper successively, means for holding wire or like continuous material, and means for superimposing said wire in position for binding the upper, said superimposing means acting at each operation of the machine to draw from the wire supply the required length of wire.

21. In a machine of the class described, the combination with means for working an upper over a last and means for superimposing wire in position for binding the overworked upper, of means for holding the wire, and means for advancing the wire.

22. In a machine for working an upper over a last and superimposing wire in position for binding the overworked upper, the combination with overworking mechanism, of means for advancing the wire at each operation of the overworking mechanism.

23. In a machine of the class described, the combination with means for working an upper over a last and means for superimposing wire in position for binding the overworked upper, of means for holding wire, and automatic means for advancing wire in time relation with the overworking and superimposing operations.

24. In a machine for working an upper over a last and superimposing wire in position for binding the overworked upper, the combination with means for working the upper over the last, of means for advancing the wire and superimposing said wire at each operation of the overworking mechanism.

25. In a machine for working an upper over a last and superimposing wire in position for binding the overworked upper, the combination with overworking mechanism, and means for advancing the wire, of means for applying tension to the line of wire supply.

26. In a machine for working an upper over a last and superimposing wire under tension in position for binding the overworked upper, the combination with overworking mechanism, and means for advancing the wire, of means under control of the operator for varying the tension on the wire while the machine is running.

27. In a machine for working an upper over a last and superimposing wire in position for binding the overworked upper, the combination with overworking mechanism, of means constructed and arranged for advancing the wire to be superimposed in time relation to the overworking mechanism and take-up mechanism arranged to act on the line of wire supply.

28. In a machine for working an upper over a last, means for superimposing wire in position for binding the overworked upper, means for advancing the wire to be superimposed, and means under control of the operator for suspending the feeding of the wire during repeated operations of the machine.

29. In a machine for working an upper over a last into position to be held by superimposed wire, the combination with overworking mechanism, of means constructed and arranged for advancing the wires to be superimposed.

30. In a machine for working an upper over a last comprising grippers and actuating mechanism therefor, the combination with means adapted to be rendered operative for causing the grippers to plait the upper, of a holder for a reel of wire, the end of which is adapted to be attached to the shoe being operated upon, means operative when the wire is so attached for advancing the wire from the reel, and means for controlling simultaneously the operation of the plaiting means and the wire-advancing means.

31. A machine for working an upper over a last, comprising grippers and actuating mechanism therefor, combined with a reel for supporting wire for binding the upper in overworked position, and means for turning the reel to discharge wire therefrom.

32. A machine of the class described, having means for working an upper into position to be held by a wire anchored at one end to the shoe, means for holding the wire under tension which allows the wire to be advanced as the overworking operation proceeds, means for advancing the wire, means under control of the operator for increasing the tension on the wire, and a fulcrum about which the shoe can be moved for tightening the wire about the overworked upper.

33. In a machine for working an upper over a last into position to be held by a superimposed wire anchored at one end to the shoe, the combination with overworking means, and means for giving up the wire against tension, of means for advancing and positioning the wire about the overworked upper, and a fulcrum about which the shoe may be turned for tightening the wire about the shoe.

34. In a machine for working an upper over a last into position to be held by a superimposed wire anchored at one end of the shoe, the combination with grippers, of a presser carrying a guide for the wire, and means for actuating the grippers and for

actuating the presser and the guide to advance the wire and position it in binding relation to the shoe, substantially as described.

35. In a machine for working an upper over a last into position to be held by a superimposed wire anchored at one end to the shoe, the combination with the grippers, of the reciprocating wire advancing device 40, the oscillating take-up 60, and the tension device, substantially as described.

36. A machine of the class described having, in combination, means for resting a shoe, means for working an upper over the toe portion of a last into position to be secured by a binder of wire or other continuous material anchored to a tack at one side of the shoe and adapted to extend around the toe to the other side, means to hold the strand of wire under tension, a wire guide engaging the wire between the anchor and the tension means, and automatically operating means to actuate the guide toward the shoe to draw upon the wire between the anchor and the guide.

37. A machine of the class described having, in combination, means for pressing an upper into position over a last bottom to be held by a binder anchored to the shoe, a tension device engaging the binder, additional means to carry the binder toward the shoe and tighten it, said pressing means being formed and arranged to assist in determining the position of the binder relatively to the overworked upper, and means operated automatically for actuating the binder-carrying means and an element of the pressing means in timed relation.

38. A machine of the class described having, in combination, means for pressing an upper into position over a last bottom to be held by a binder anchored to the shoe, a binder guide, and means to actuate the guide to draw the binder that is between the presser and the shoe into position to hold the upper.

39. In a machine of the class described, the combination with means for working an upper over the toe portion of a last, of separate means operated automatically for drawing a binder into position to hold the upper, said overworking means comprising a wiper adapted to hold the binder down upon the upper while the binder is being drawn into holding position.

Signed by me at Boston, Massachusetts
this 3d day of November, 1900.

WILLIAM E. WADE.

Witnesses:

NELSON W. HOWARD,
MATTHIAS BROCK.

It is hereby certified that in Letters Patent No. 944,116, granted December 21, 1909, upon the application of William E. Wade, of Rockland, Massachusetts, for an improvement in "Lasting-Machines," an error appears in the printed specification requiring correction, as follows: Page 6, line 58, the word "of" should read *to*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of January, A. D., 1910.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.