(No Model.)

10 Sheets—Sheet 1.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

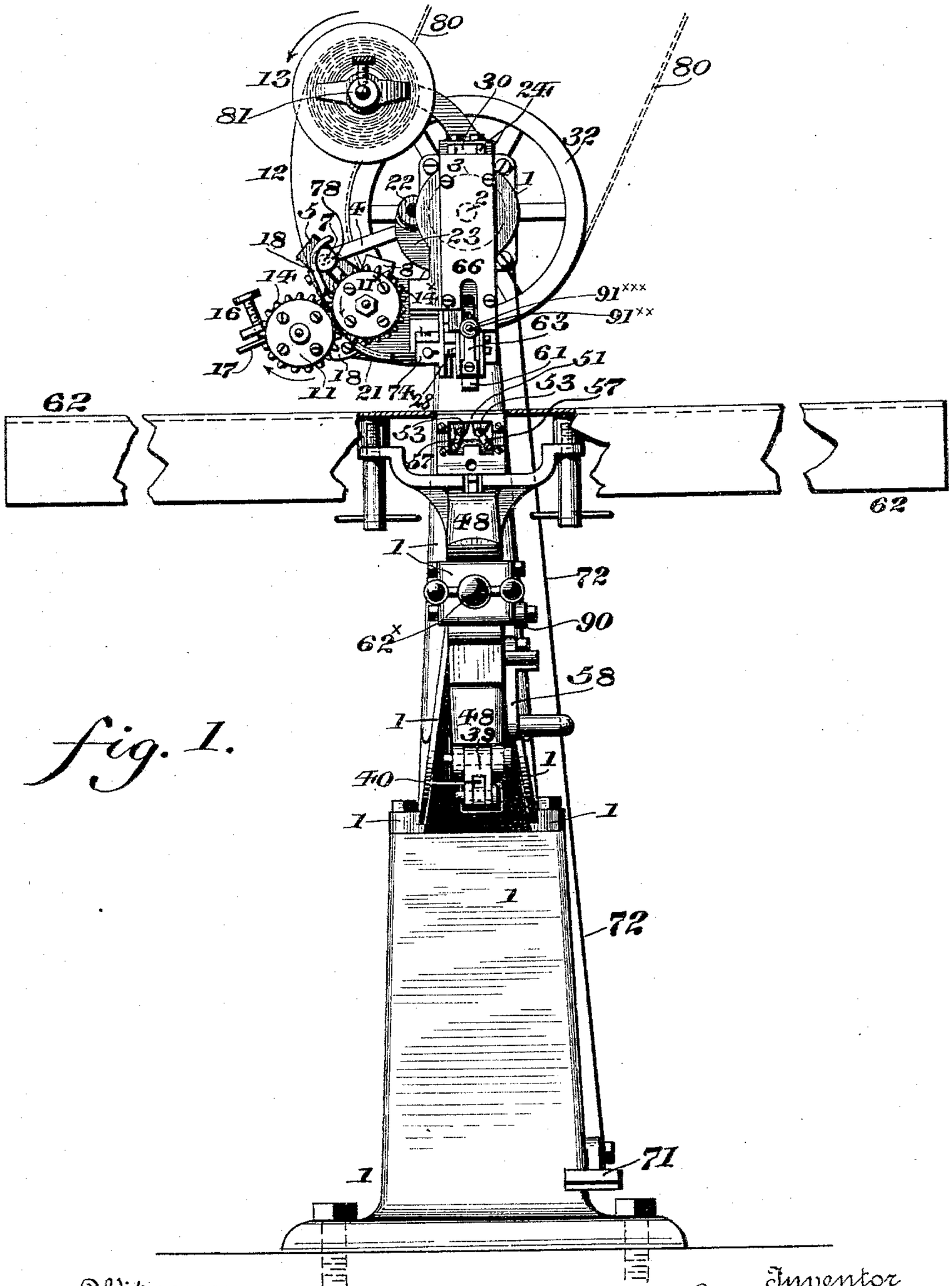


fig. 1.

Witnesses
L. Douville,
P. F. Eagle.

Inventor
Eldridge R. Johnson
By Joshua Diedersheim
Attorney

(No Model.)

10 Sheets—Sheet 2.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 2.

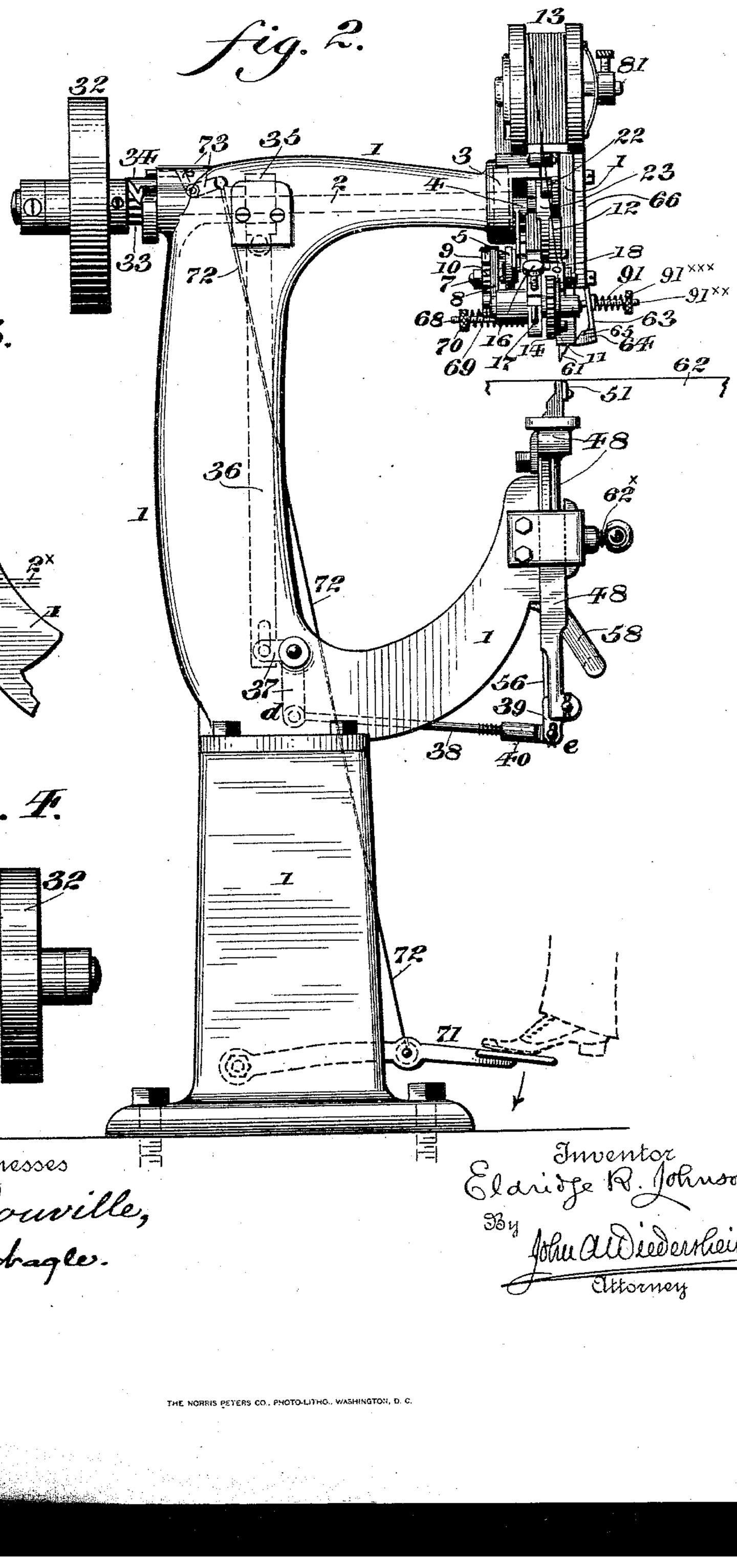


fig. 3.

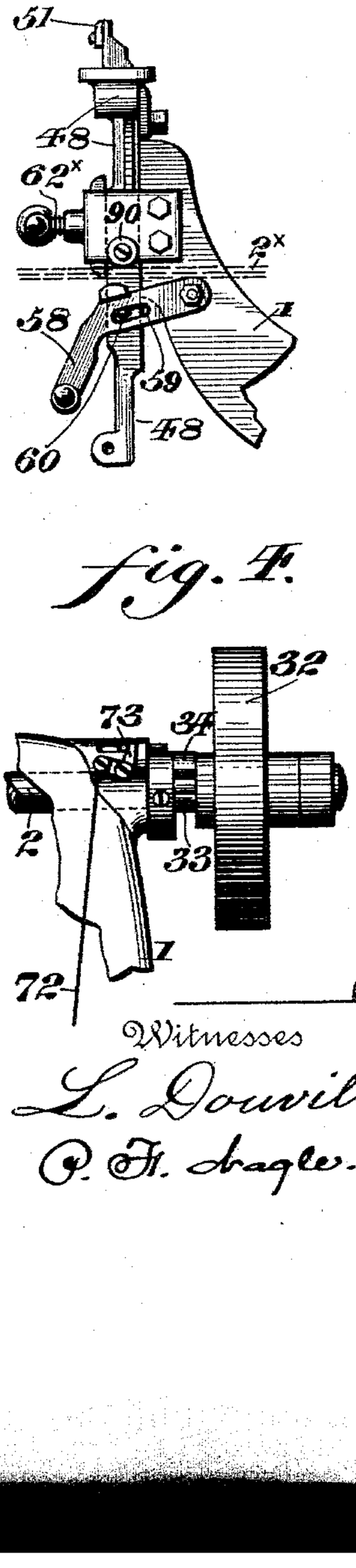


fig. 4.

Witnesses

L. Douville,

P. H. Bagley.

Inventor

Eldridge R. Johnson

By John A. Wiedersheim

Attorney

(No Model.) 10 Sheets—Sheet 3.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 9.

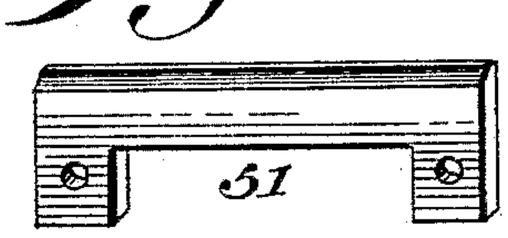


fig. 10.

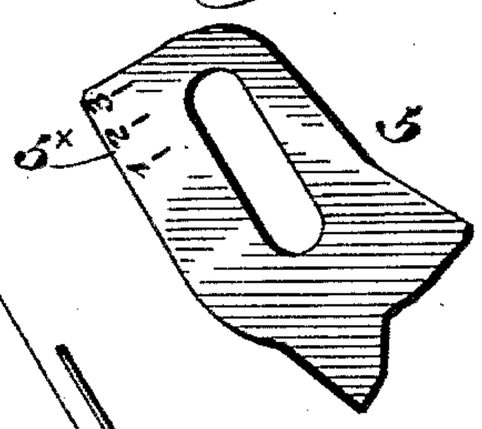


fig. 5.

fig. 5½.

fig. 11.

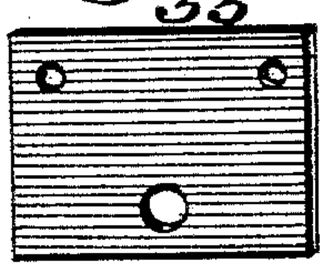
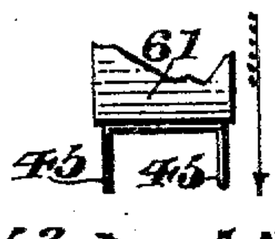


fig. 12.

fig. 13.

fig. 14.

fig. 15.



Witnesses
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Inventor
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Attorney

(No Model.)

10 Sheets—Sheet 4.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 6.

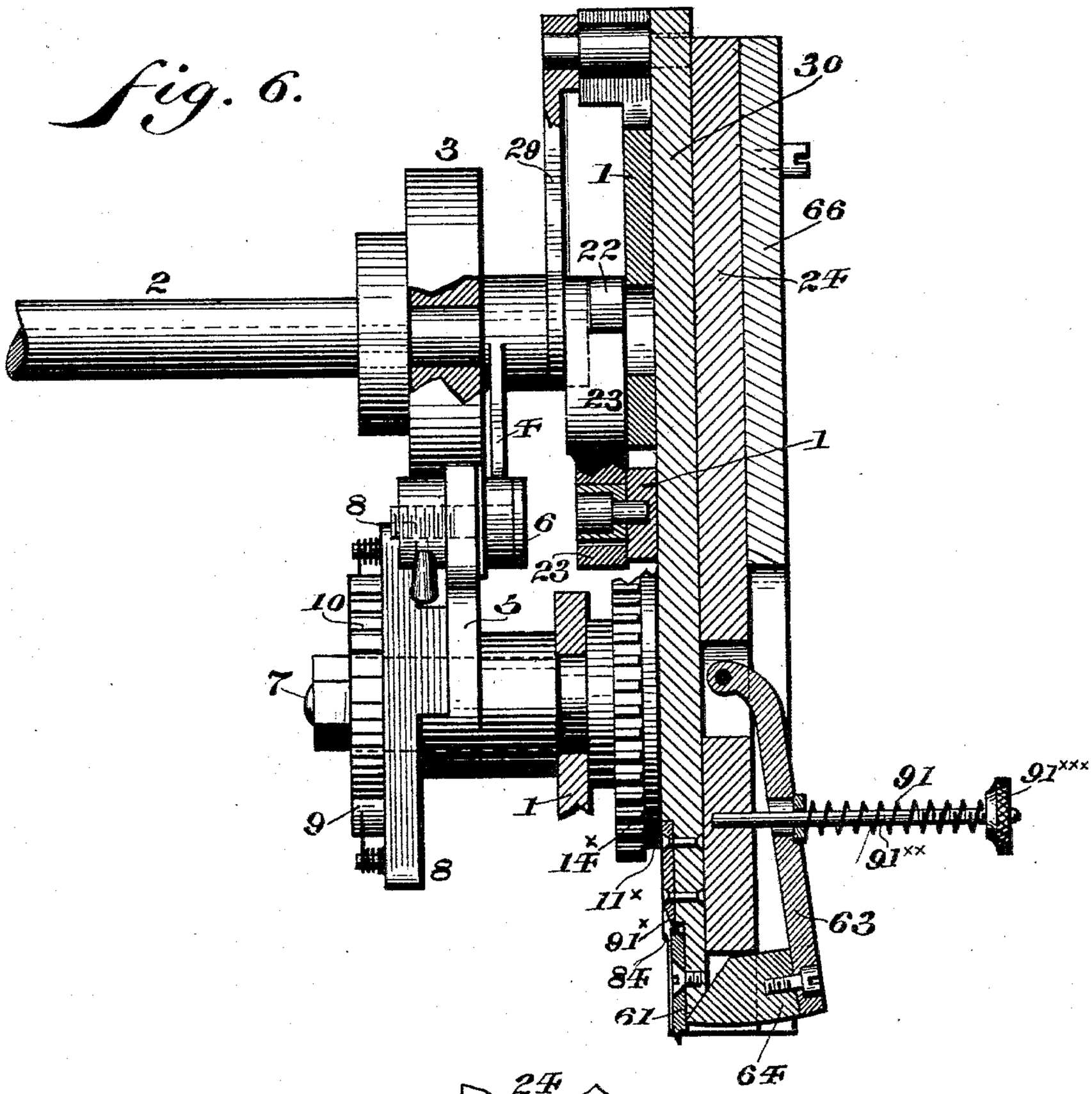
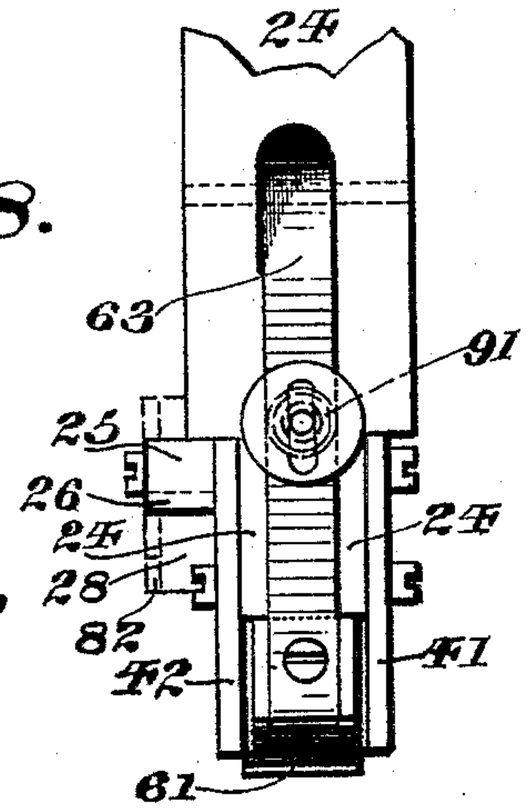


fig. 8.



Witnesses
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Attorney

(No Model.) 10 Sheets—Sheet 5.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 7.

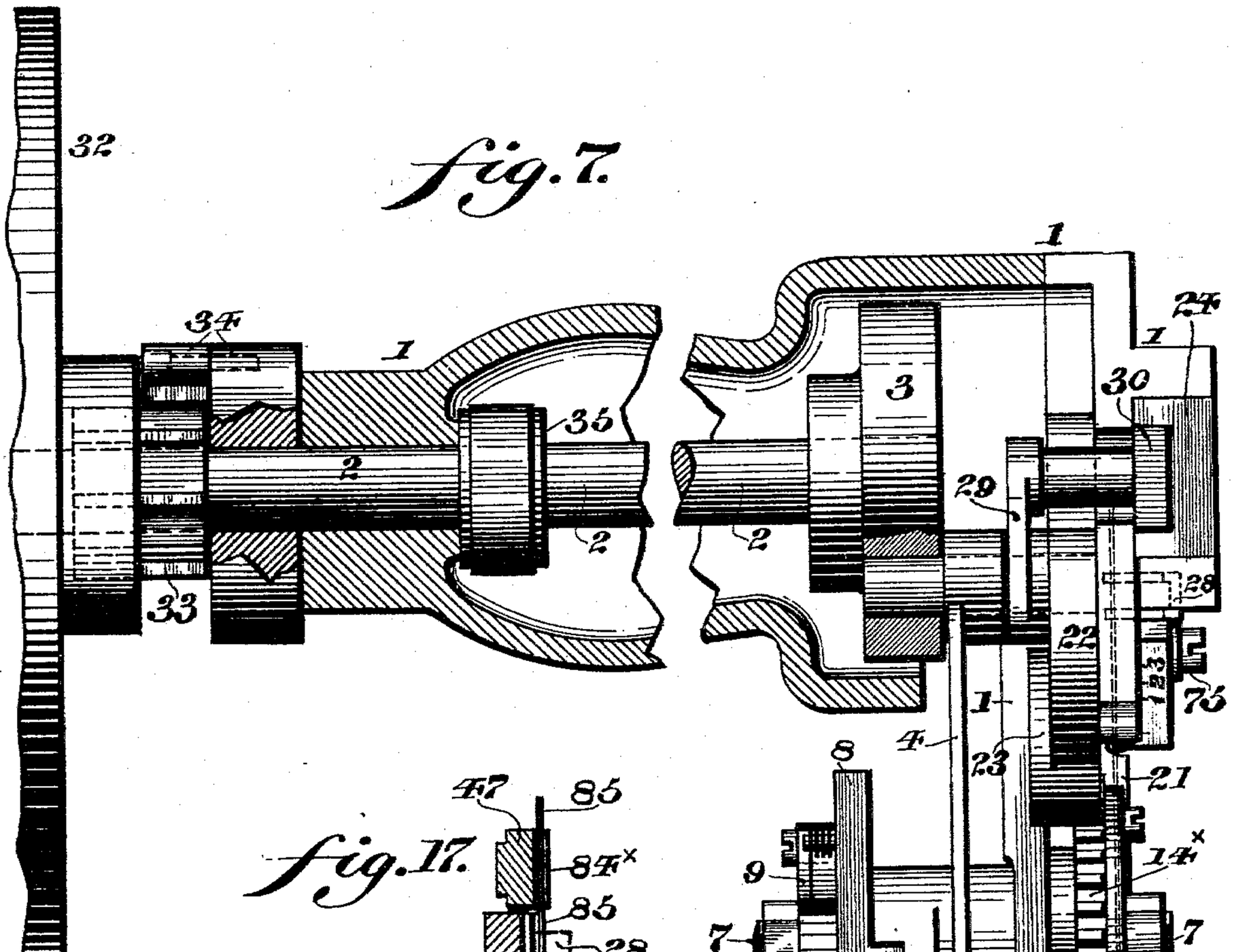
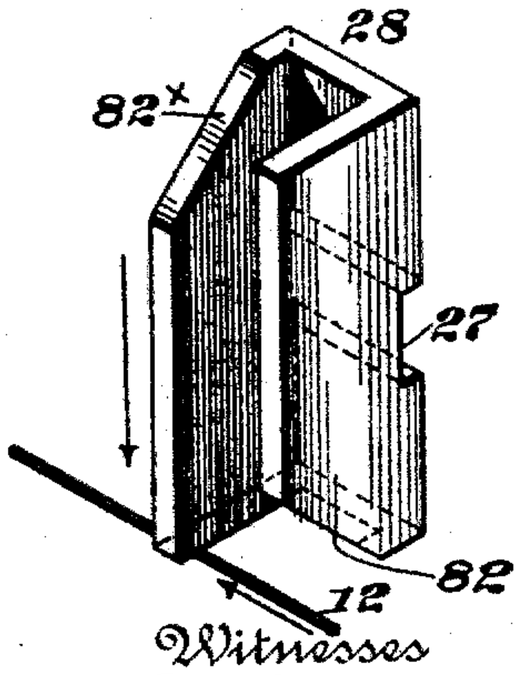


fig. 17.

fig. 16.



Witnesses

L. Douville,

C. H. Eagle.

fig. 18.

Inventor

Eldridge R. Johnson

John A. Wiedersheim

Attorney

(No Model.) 10 Sheets—Sheet 6.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 19.

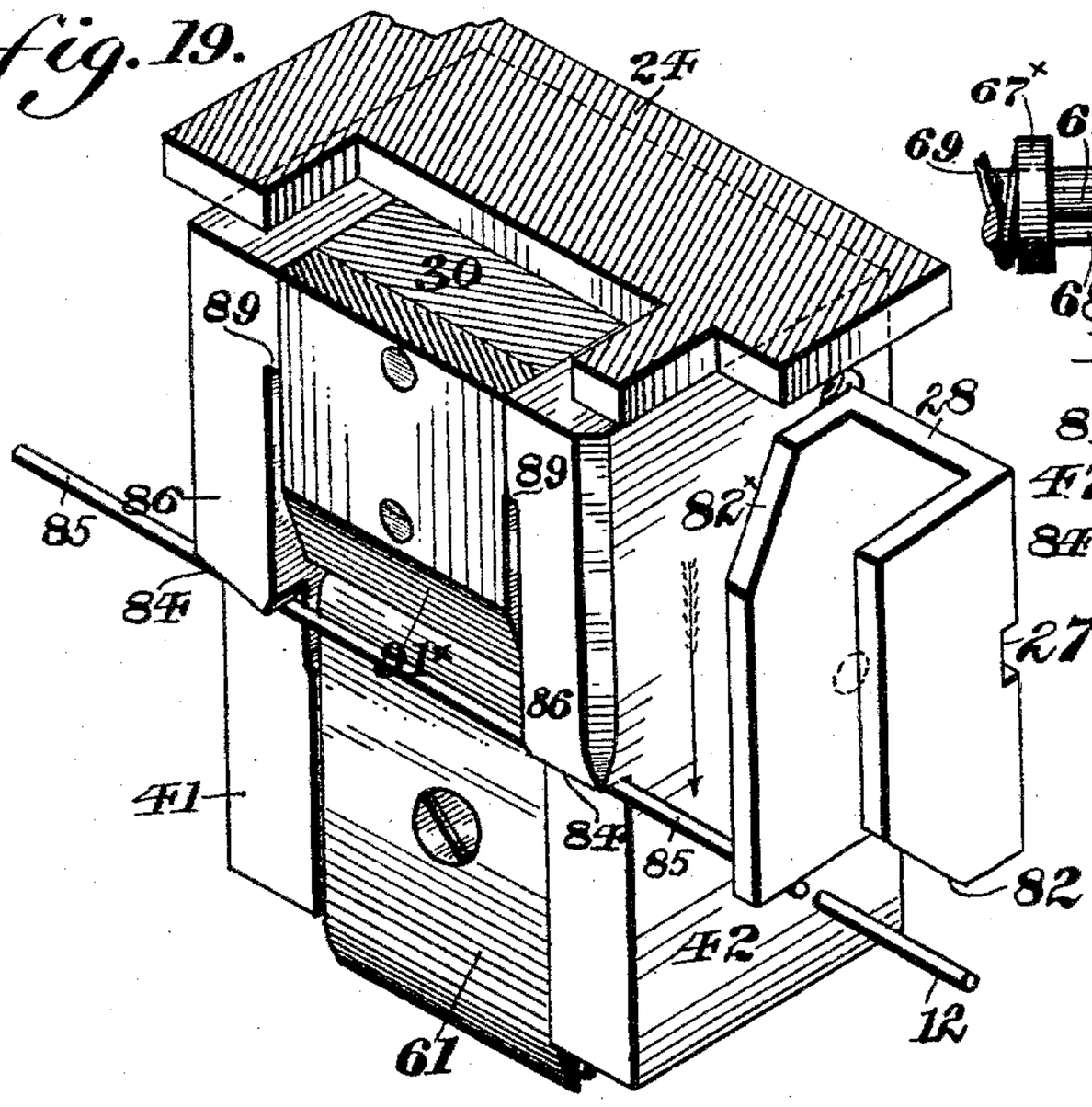


fig. 20.

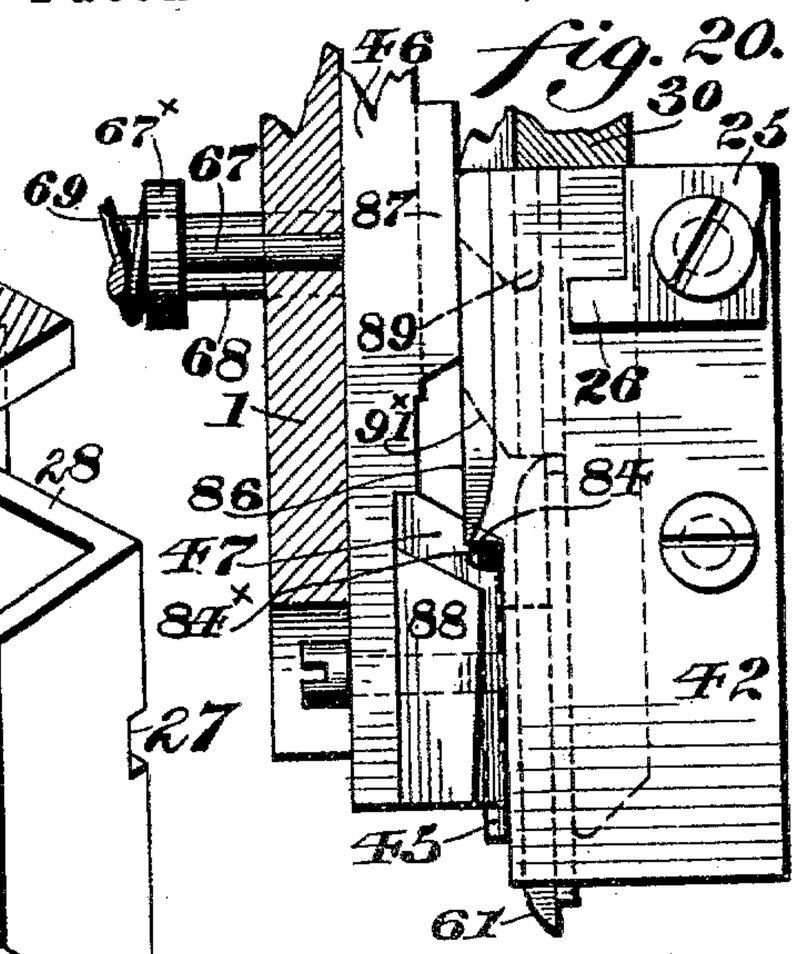


fig. 22.

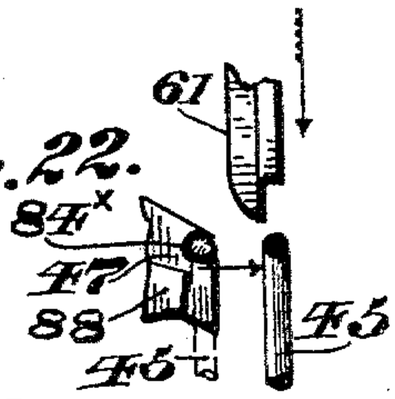


fig. 21.

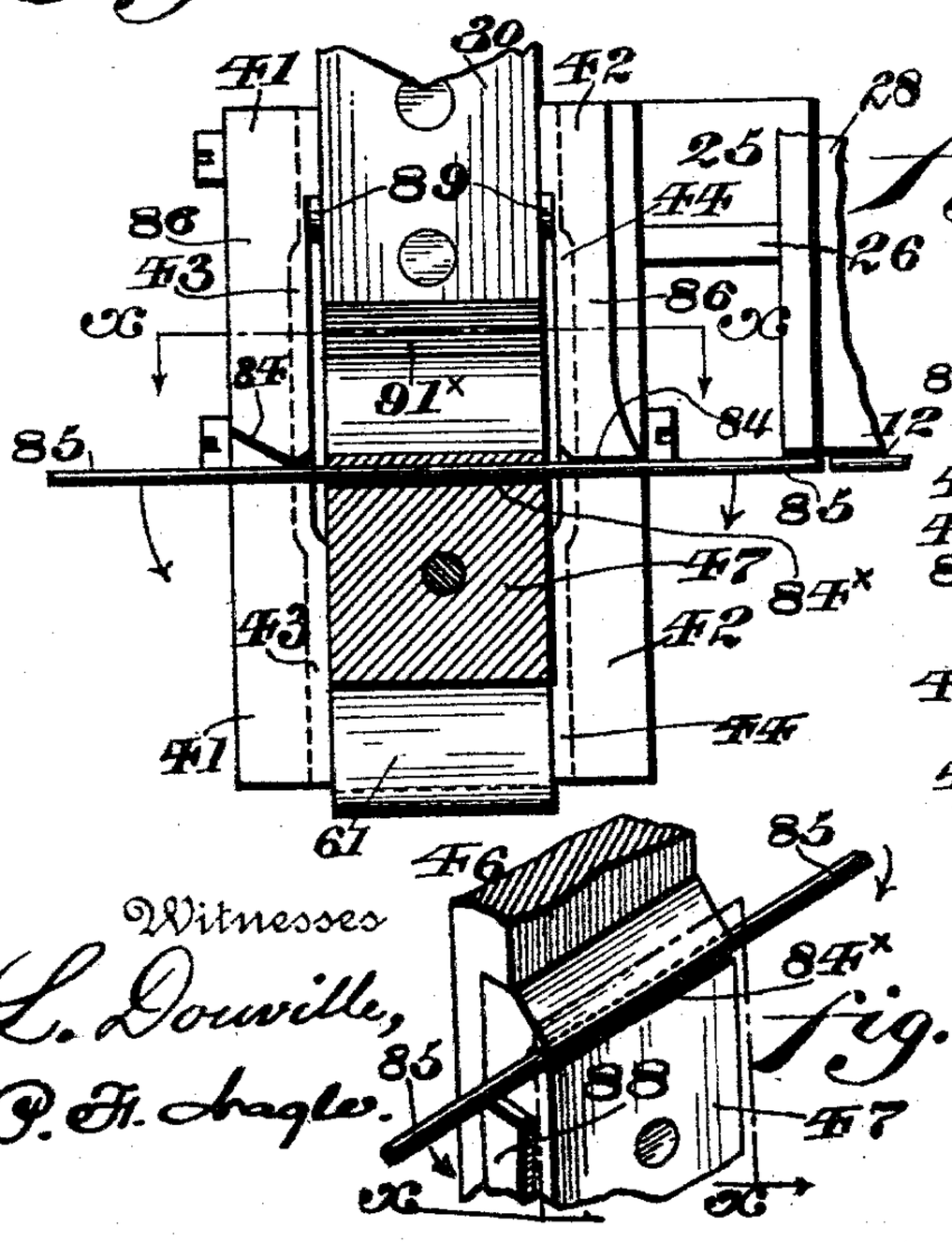


fig. 23.

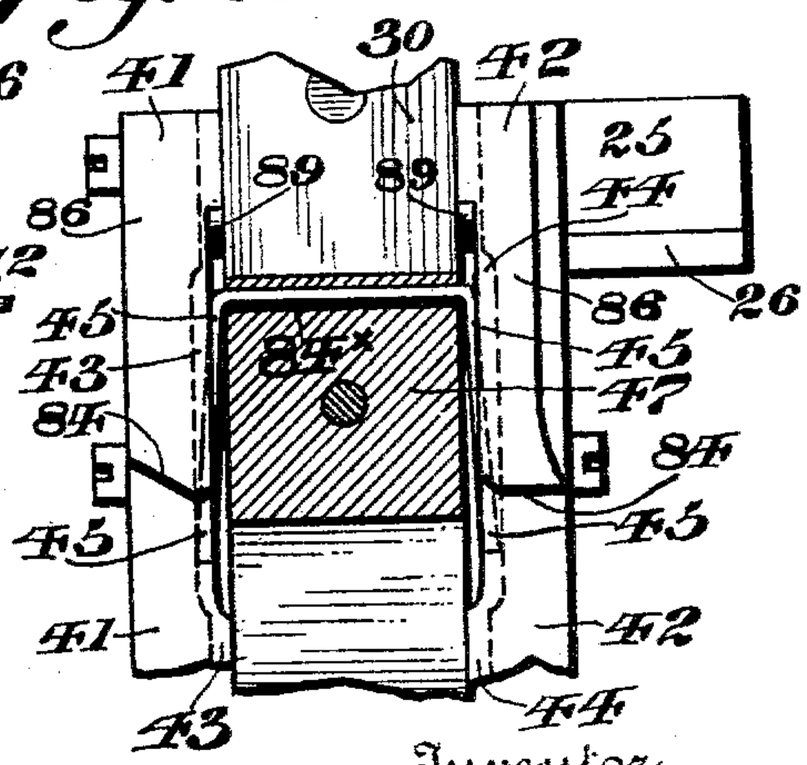


fig. 24.

Witnesses
L. Douville,
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(No Model.) 10 Sheets—Sheet 7.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 25.

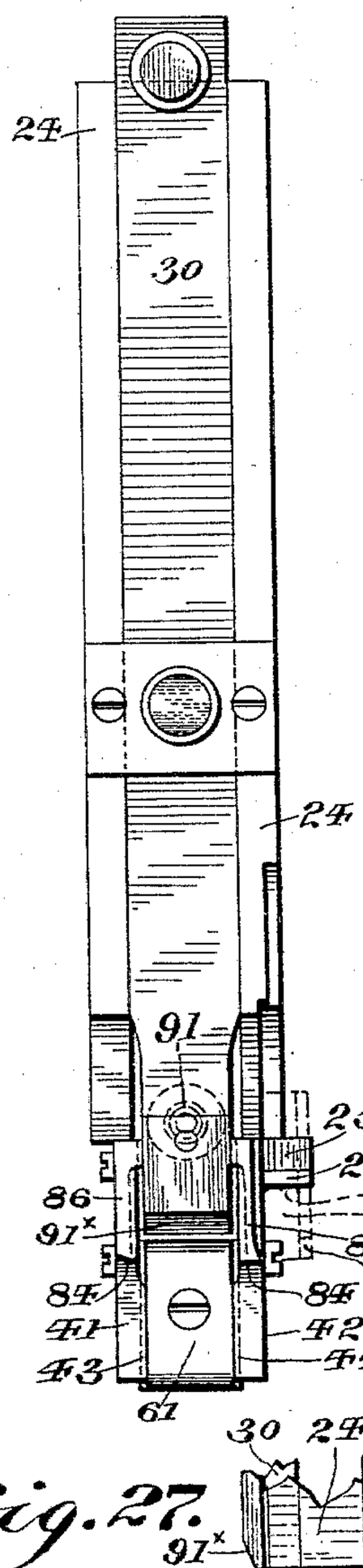


fig. 26.

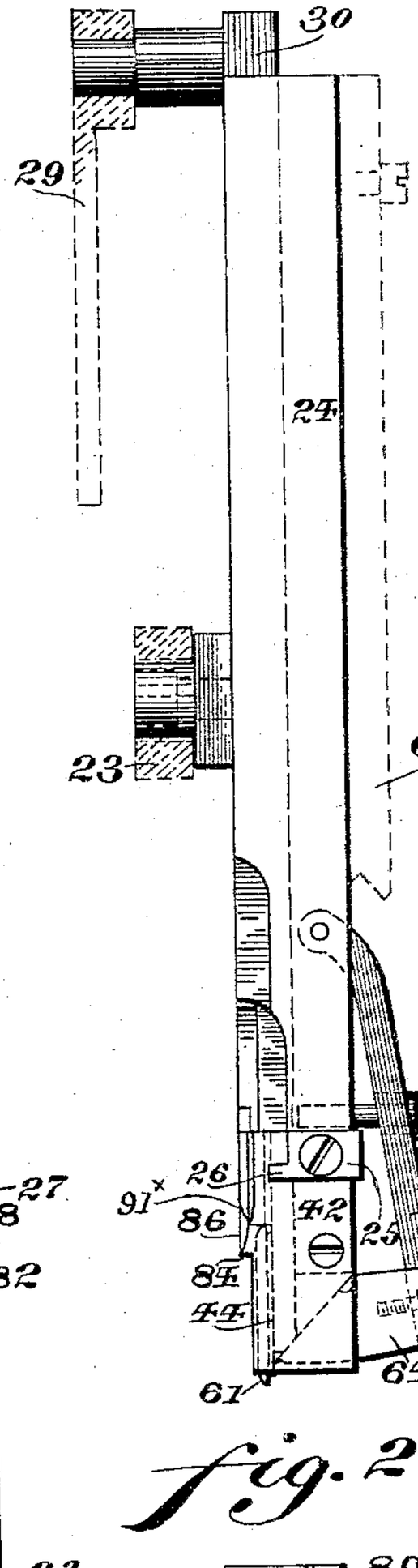


fig. 29.

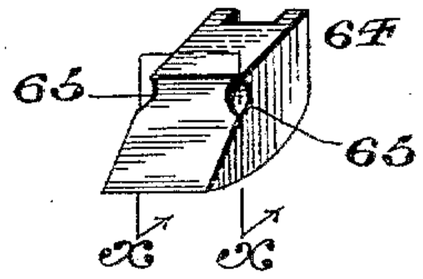


fig. 30.

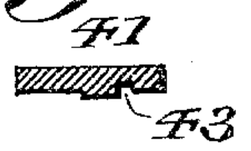


fig. 31.

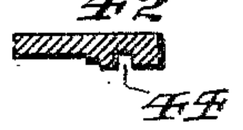


fig. 27.

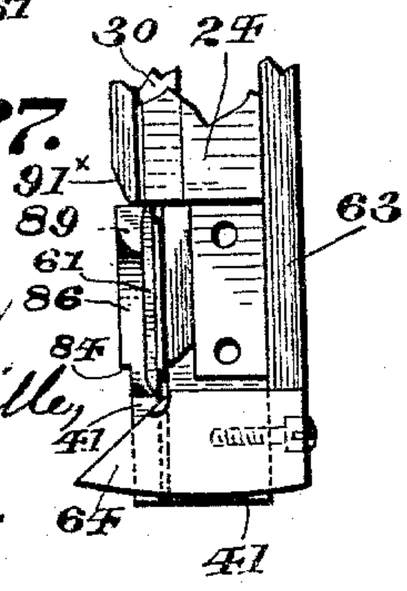
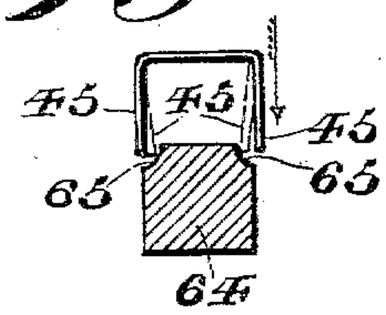
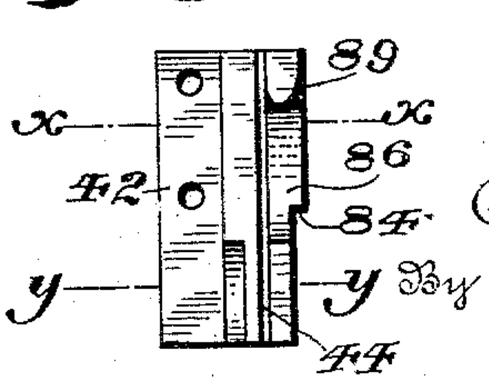


fig. 28.

fig. 32.





Witnesses
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Inventor
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John A. Wiedersheim.
Attorney

(No Model.) 10 Sheets—Sheet 8.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 33.

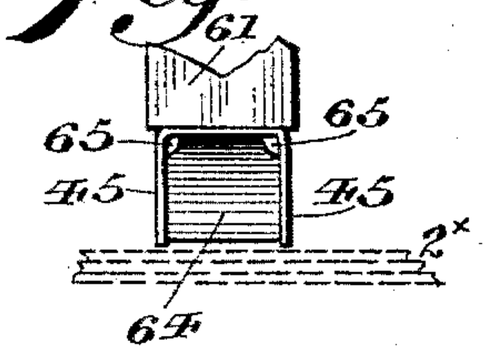


fig. 34.

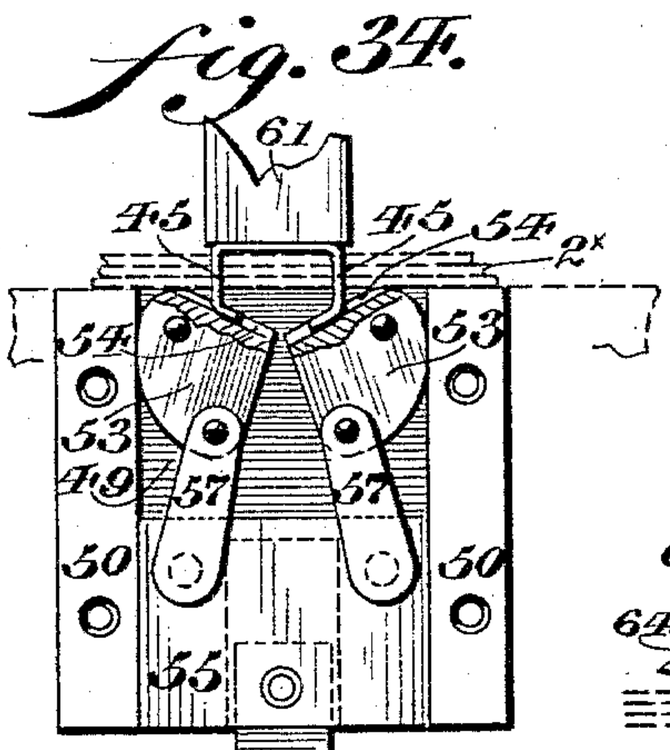


fig. 36.

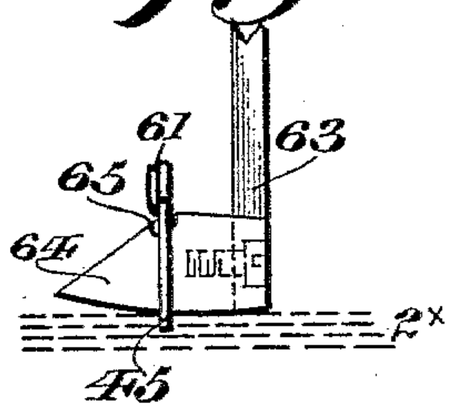


fig. 37.

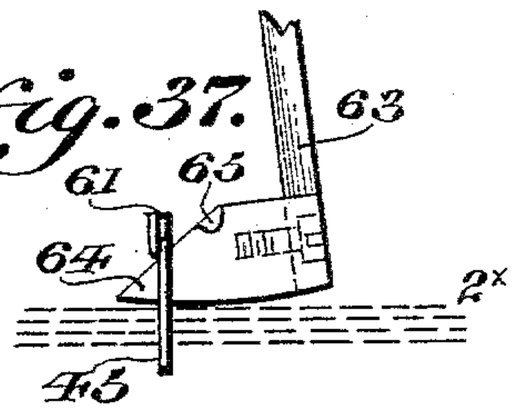


fig. 46.

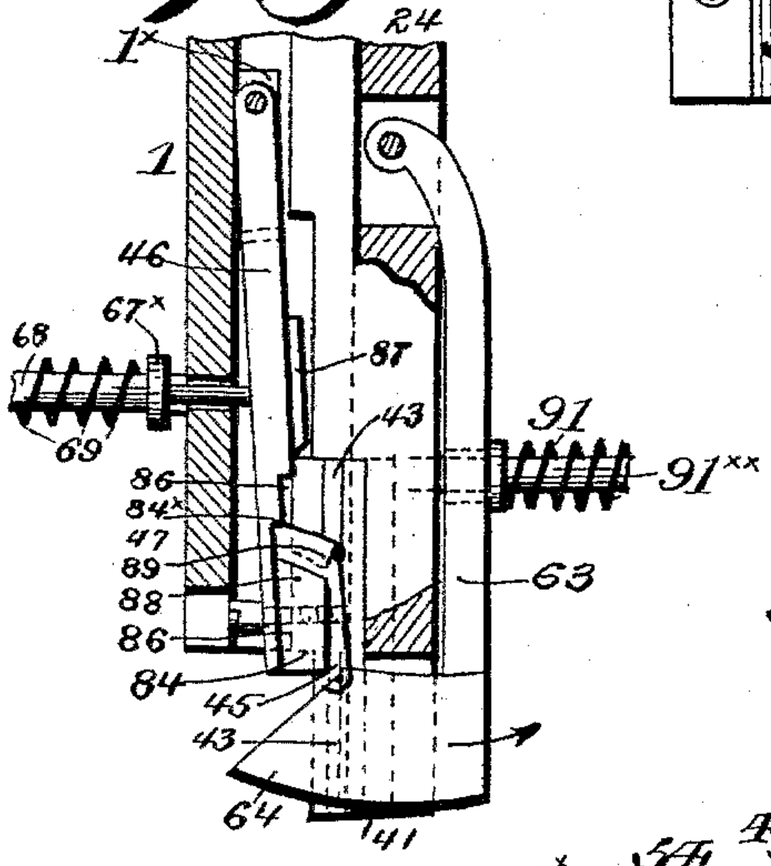


fig. 38.

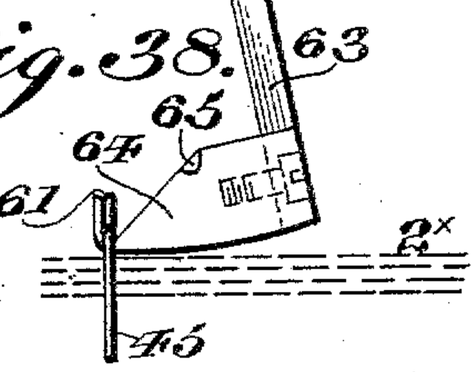
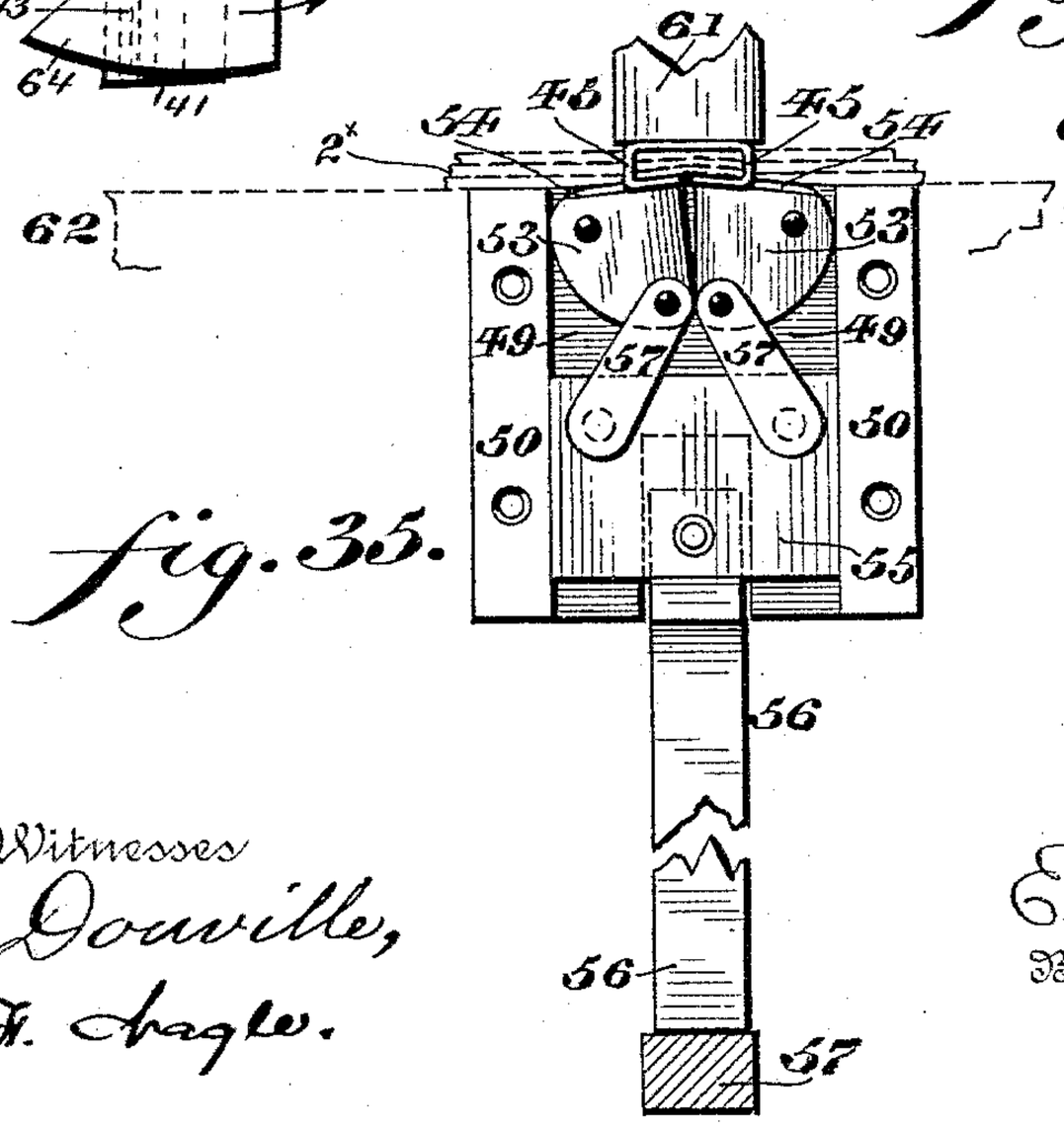


fig. 35.



Witnesses
L. Douville,
P. F. Eagle.

Inventor
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By John A. Diedersheim.
Attorney.

(No Model.) 10 Sheets—Sheet 9.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 39.

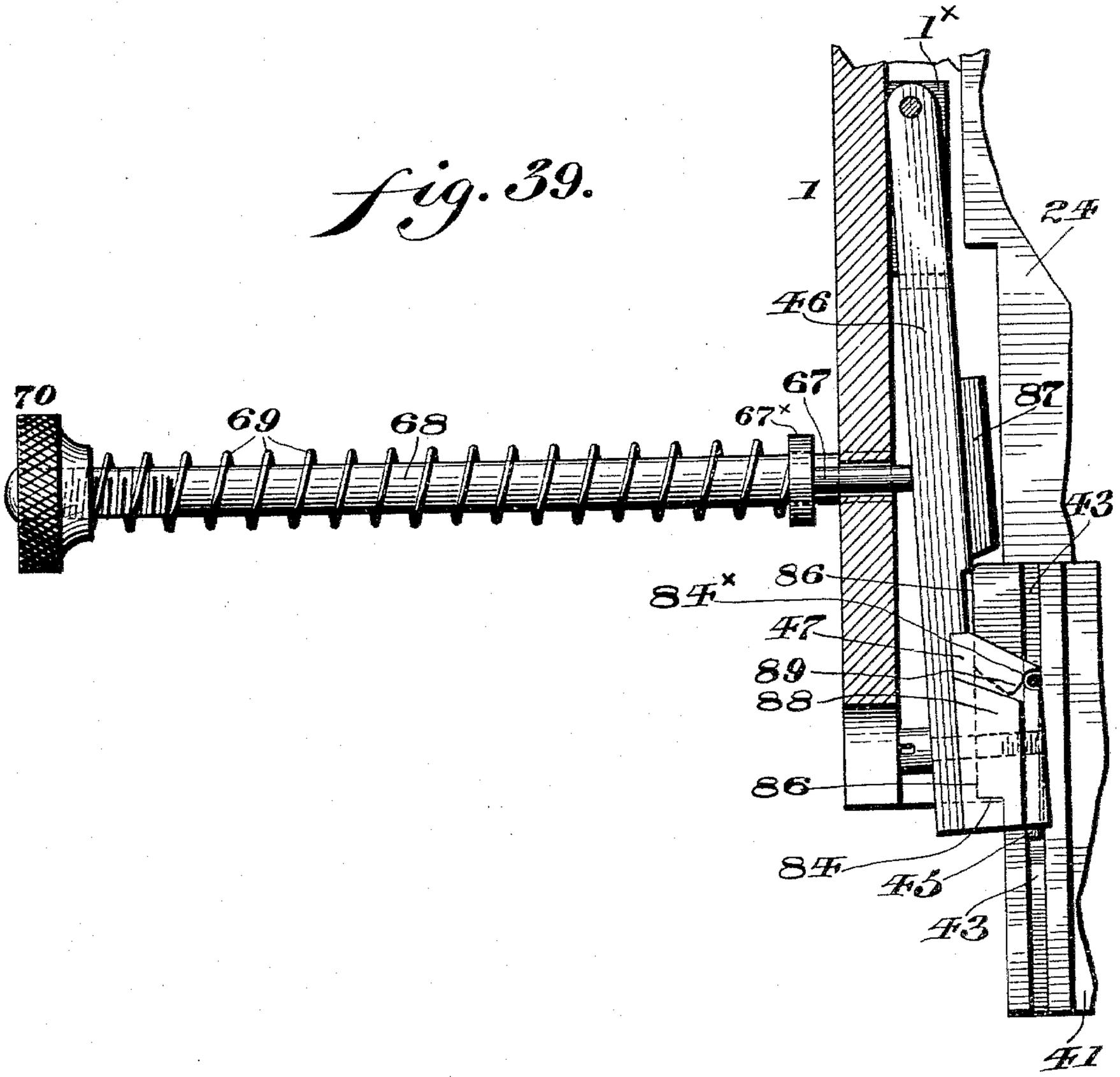
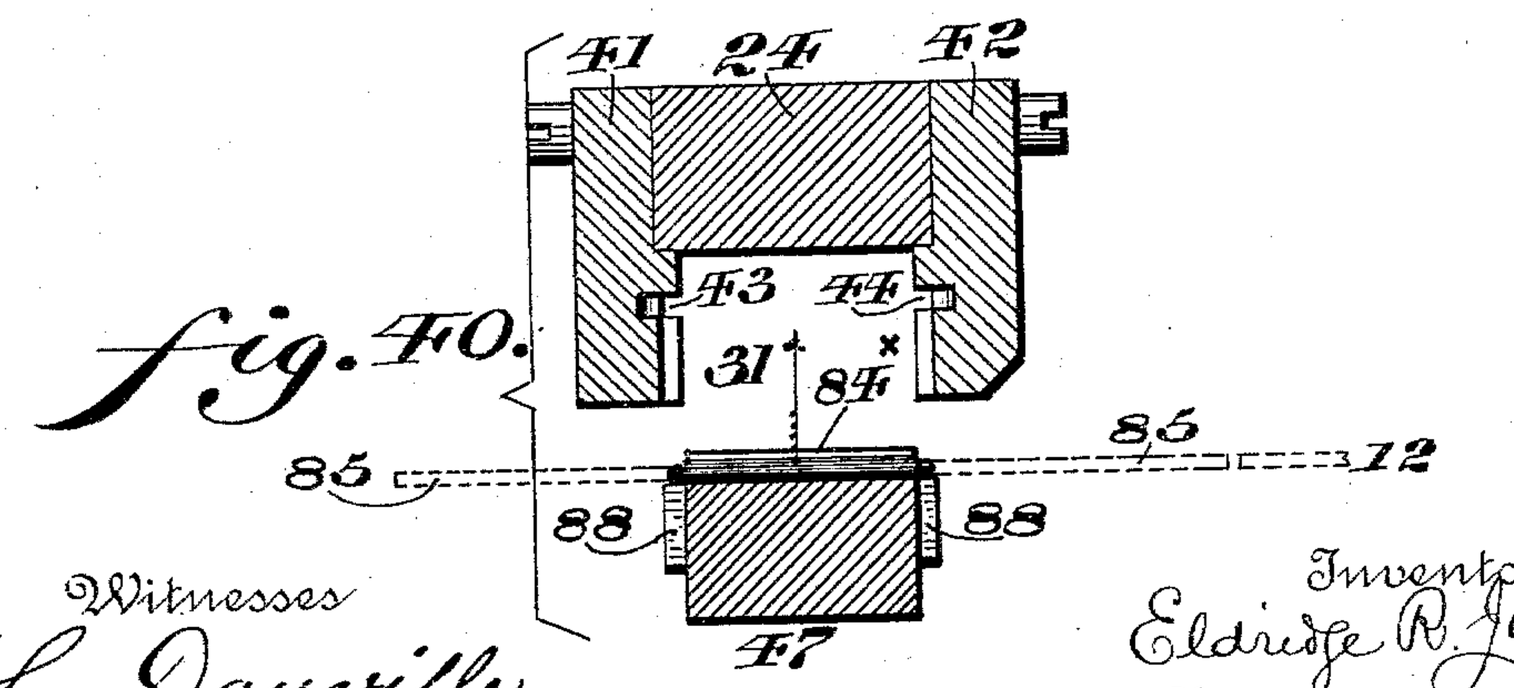


fig. 40.



Witnesses
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Inventor:
Eldridge R. Johnson.
By: John A. Wiedersheim
Attorney

(No Model.) 10 Sheets—Sheet 10.

E. R. JOHNSON.

STAPLING MACHINE.

No. 597,773. Patented Jan. 25, 1898.

fig. 41.

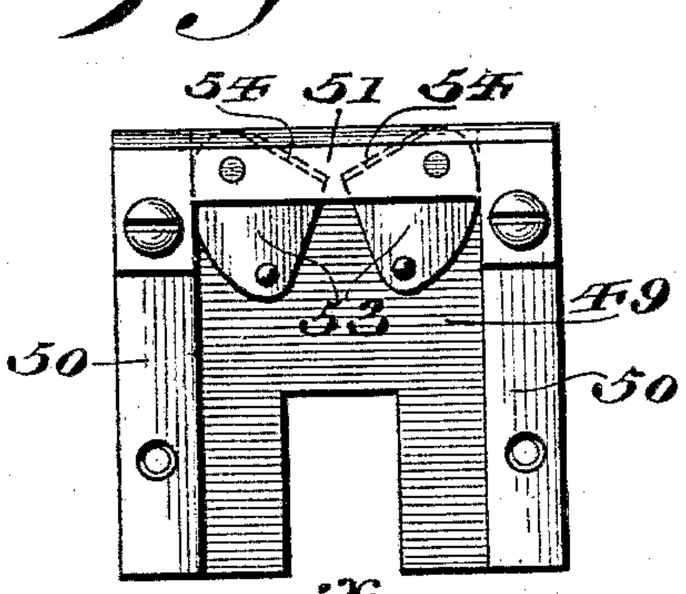


fig. 42.

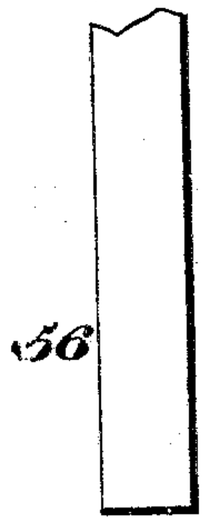


fig. 43.

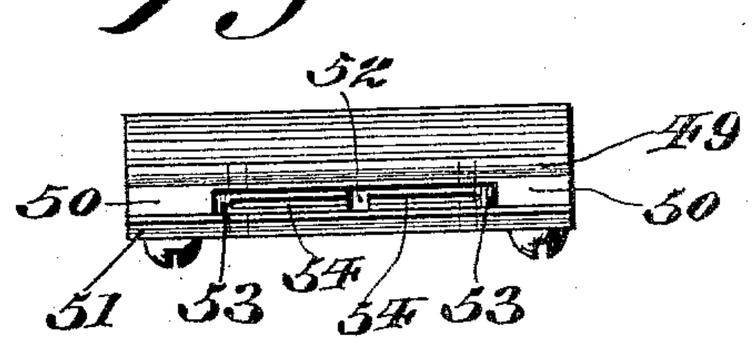


fig. 44.

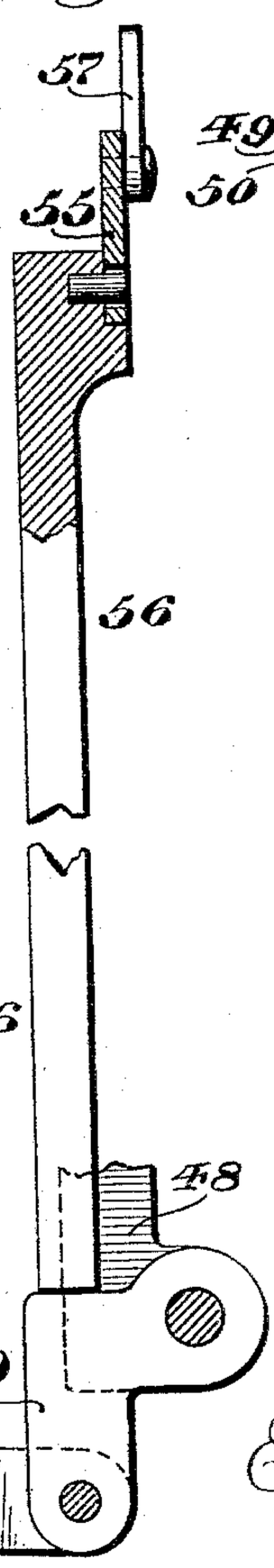


fig. 43½.

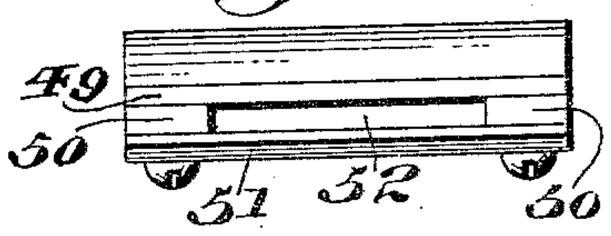
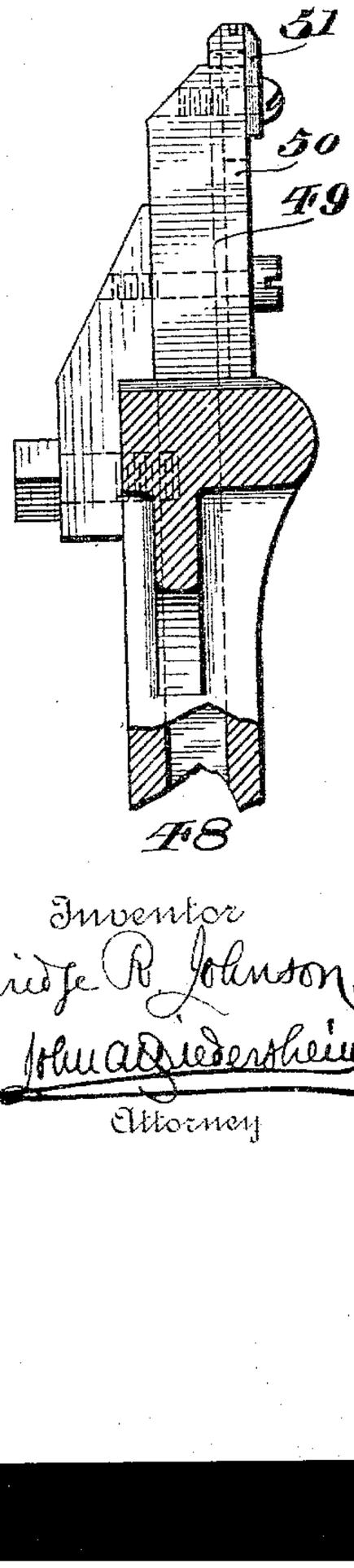


fig. 45.



Witnesses
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P. F. Eagle.

Inventor
Eldridge R. Johnson.
By John A. Wiedersheim.
Attorney

UNITED STATES PATENT OFFICE.

ELDRIDGE R. JOHNSON, OF CAMDEN, NEW JERSEY, ASSIGNOR TO THE NEW JERSEY WIRE STITCHING MACHINE COMPANY, OF NEW JERSEY.

STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 597,773, dated January 25, 1898.

Application filed October 2, 1895. Serial No. 564,376. (No model.)

To all whom it may concern:

Be it known that I, ELDRIDGE R. JOHNSON, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Improvement in Wire-Stitching Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in the wire-stitching machine for which Letters Patent of the United States No. 496,314 were granted on the 25th day of April, 1893; and it consists of novel means whereby wire may be cut and formed into a staple and also means for driving the staple into the desired article and clenching the legs of the same thereto.

It also consists of a novel form of wire-cutter so constructed that the complicated mechanism and numerous cams now employed are dispensed with, thereby greatly reducing the cost of manufacturing the machine and lessening the liability of parts thereof to get out of order, all of which will be fully described in the following specification.

Figure 1 represents a partial end elevation and partial vertical section of a wire stapling, inserting, and clenching machine embodying my invention. Fig. 2 represents a side elevation of the machine. Fig. 3 represents a side elevation of the clenching device of the machine opposite to that shown in Fig. 2. Fig. 4 represents a side elevation of the clutch mechanism of the machine. The remaining figures are on an enlarged scale. Fig. 5 represents a side elevation, partly in section, of the upper portion of the machine on an enlarged scale. Fig. 5½ represents an end view of a detached portion of the machine, showing adjusting means for the shaft of one of the feeding-rollers. Fig. 6 represents a partial side elevation and partial vertical section of a portion of the machine, showing the operative means for the feed-rollers, also for the cutter-bar and wedging-block. Fig. 7 represents a partial plan view and partial horizontal section of a portion of the machine, showing parts as in Fig. 5 on an enlarged scale. Fig. 8 represents an end elevation of a portion of the machine, showing the means employed for preventing the legs of the staple from inwardly bending when penetrating the article to be stitched. Figs. 9 to 15, inclusive, represent detail views of the machine, showing portions of the mechanism for clenching the staples. Fig. 16 represents a perspective view of a wire-cutter employed in the apparatus. Fig. 17 represents a horizontal section of a detached portion of the machine. Fig. 18 represents a side elevation of a portion of the cutter shown in Fig. 16, which severs the wire to be formed into a staple, said cutter being shown in three different positions and the corresponding effect of each of the same on the wire after it has been cut. Fig. 19 represents a perspective view, partly in section, of a detached portion of the machine and also a portion of the wire to be formed into a staple and a part of the cutter shown in Fig. 16. Fig. 20 represents a partial side elevation and partial vertical section of a detached portion of the machine. Fig. 21 represents a partial front elevation and partial vertical section on line $x\,x$, Fig. 24, of detached portions of the machine. Fig. 22 represents a view of detached portions of the machine. Fig. 23 represents a view of the parts shown in Fig. 21, but in different positions. Fig. 24 represents a perspective view of a portion of the machine, partly in section. Fig. 25 represents a front elevation of a detached portion of the machine. Fig. 26 represents a view of the parts shown in Fig. 25, but at a right angle thereto. Fig. 27 represents a side elevation of a detached portion. Fig. 28 represents a side elevation of a detached portion of the machine. Fig. 29 represents a perspective view of a detached portion of the machine. Figs. 30 and 31 represent horizontal sections on lines $x\,x$ and $y\,y$, respectively, in Fig. 28. Fig. 32 represents a vertical section on line $x\,x$, Fig. 29, and a staple adjacent thereto. Fig. 33 represents a view of detached portions of the machine. Fig. 34 represents a front elevation of the device employed for clenching a staple, the parts being shown in their normal positions. Fig. 35 represents a front elevation of the parts shown in Fig. 34, the same being in their operative positions. Figs. 36, 37, and 38 represent side elevations in three different positions of a detached portion of the machine. Fig. 39 represents a partial side elevation and partial vertical section of a detached portion of the machine. Fig. 40 represents a horizontal section of detached

portions on line $x\,x$, Fig. 21. Figs. 41 and 42 represent front elevations of the parts that constitute the clenching device. Fig. 43 represents a plan view of the parts shown in Fig. 41. Fig. 43½ represents a plan view of a detached portion of the machine. Fig. 44 represents a side elevation of the parts shown in Fig. 42 and is partly in section, the same being taken on line $x\,x$ in said Fig. 42. Fig. 45 represents a partial side elevation and partial vertical section of a detached portion of the machine. Fig. 46 is a partial side elevation and partial vertical section of a portion of the machine, showing the relative position of the anvil and staple-supports.

Similar numerals and letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, 1 designates the frame of the machine, in which is journaled the main driving-shaft 2, the latter having secured to it in any suitable manner a crank-wheel 3, which has pivotally connected with it near its periphery one end of a link 4, so that the rotation of the shaft 2, and consequently that of the wheel 3, will impart an oscillating motion to said link, and the latter will thereby rock an arm 5 with which the other end of the link 4 is pivotally connected, as at 6, said end being adjustable relatively to the shaft 7, suitably journaled in the frame A and on which said arm is loosely mounted. (See more particularly in Fig. 5.)

The arm 5 is provided with lateral extensions 8, (see Figs. 5, 6, and 7,) which carry the spring-actuated dogs 9, which engage with the teeth of a ratchet-wheel 10, secured to the shaft 7, so as to impart an intermittent rotary motion to said wheel, and consequently to the gear-wheels $14^{\times}$ and 14, and the feed-rollers 11 and $11^{\times}$, which draw the wire 12 to be formed into staples, from a reel 13 or other source of supply, which reel in the present case is mounted upon the shaft 81, which is suitably supported in a bracket secured to the upper part of the frame 1.

The feed-rollers 11 and $11^{\times}$ are secured to the gear-wheels 14 and $14^{\times}$, respectively, which mesh with each other, so as to cause said feed-rollers to rotate in the proper direction, as indicated by the arrows a and b in Fig. 5.

The shaft 15, on which is mounted the feed-roller 11, is eccentrically connected with the disk $15^{\times}$, so that said roller may be brought nearer to or farther from the roller $11^{\times}$ in order that the space between said rollers may be adjusted relatively to different thicknesses of wire and also to flatten a wire, if so desired. The portion or disk $15^{\times}$ which has the shaft 15 secured thereto is loosely mounted in the frame 1, so as to be rotated and permit the adjustment hereinbefore described.

The shaft 15 is held in an adjusted position by a set-screw 16, which passes through a portion of the frame 1 and abuts against a stem 17, which is secured to and projects from the disk $15^{\times}$ when the shaft 15 is eccentrically mounted, as has been stated.

Pivoted to the frame 1 by an axis $18^{\times}$ is an adjustable guide 18, which directs the wire 12 from the reel 13 to the feed-rollers 11 and $11^{\times}$ and is made adjustable to the said rollers, so as to prevent kinking of the wire when the same is being drawn from the reel by said feed-rollers, said guide 18 being held in an adjusted position by a clamping-screw 19, which passes through a slot 20 in said guide into the frame 1.

Firmly secured to the frame 1 is an auxiliary guide 21, which directs the wire 12 to the cutting and staple-forming devices to be hereinafter described.

Pivoted to the crank-wheel 3 on the stud $3^{\times}$, on which the link 4 is mounted, is a link 22, which is also pivoted to a lever 23, which latter is pivoted, as at $23^{\times}$, to the frame 1, and is connected with a vertical sliding bar 24, so as to impart a rising-and-falling motion to the latter, for a purpose to be hereinafter described.

The bar 24 is provided with a block 25, formed with a lip 26, which is adapted to enter a groove 27 (see Figs. 5, 8, and 16) in the wire-cutter 28, so as to cause said cutter to rise and fall with the bar 24, to which said cutter is secured, said bar 24 being guided in the frame 1.

Pivoted to the wheel 3 on the same stud with the link 22 and lever 23 is a link 29, which is also connected with a sliding bar 30 and imparts a rising-and-falling motion to the same, said bar 30 being guided within a channel 31 (see Fig. 40) in the rising-and-falling bar 24, the object of said bar 30 being hereinafter described.

Loosely mounted on the driving-shaft 2 is a driving-pulley 32, provided with one member 33 of a clutch mechanism, said member rotating with the pulley 32, so that when the member 33 is caused to engage with the remaining member 34 of the clutch mechanism said member 34, which is secured to the shaft 2, will cause said shaft to rotate, and consequently impart motion to the several parts of the machine.

Secured to the shaft 2 is an eccentric 35, which imparts an up-and-down motion to a rod 36, (see Fig. 2,) which is connected with an elbow-lever 37, which is pivoted to the frame of the machine, and is connected by a rod 38 and sleeve 40 with an elbow-lever 39, (see Figs. 2 and 44,) so that the rotation of the eccentric 35 will cause motions to be imparted to the elbow-lever 39, the latter being mounted on the bar 48, to be hereinafter referred to.

The rod 38 has the end which enters the sleeve 40 screw-threaded, so that by properly rotating said rod 38 the distance between the points d and e (see Fig. 2) may be brought closer together or moved farther apart, as required, for the purpose of an adjustment.

Secured to the bar 24 are plates 41 and 42,

(see Figs. 19, 20, 21, 23, 28, 30, 31, 40, and 41,) whose inner sides are provided with grooves 43 and 44, respectively, to receive the legs 45 and retain them in position within said plates previous to being driven into an article $2^{\times}$ to be stapled or stitched.

Pivoted to a lug $1^{\times}$ on the frame 1 is a spring-actuated arm 46, (see Figs. 5, 20, 24, and 39,) to which is secured an anvil 47, on which the wire, after being cut, is bent into a staple, as will be hereinafter described, and thereby formed.

Loosely fitted in the frame 1 is an adjustable bar 48, (see Figs. 1, 2, 3, and 45,) which is provided with a device for clenching the staples after the same have been driven through an article $2^{\times}$ to be stitched, the same consisting of a plate 49, provided with flanges 50, and a cross-bar 51, (see Figs. 9, 41, and 43,) it being noticed that a space 52 exists between said plate 49 and bar 51, as clearly shown in Fig. 43½.

Pivoted to the plate 49 are plates 53, whose upper faces are formed with grooves 54, (see more particularly Figs. 12 and 13,) which receive the legs of the staple when the said legs are being clenched, as clearly shown in Figs. 34 and 35, and thereby retain said legs in position on the plates 53.

Fitted between the flanges 50 is a sliding head 55, which is secured to a bar 56, which latter is guided in the bar 48 and rests on the upper limb of the elbow-lever 39, (see Fig. 44,) so that said bar 56 may be raised by the latter when the same is actuated by the eccentric 35 and connected parts, and consequently operate the head 55, which has pivoted to it the links 57, which are also pivoted to the plates 53, so as to impart a partial rotary motion to the latter and thereby clench the legs of the staple after the same have penetrated the article $2^{\times}$ to be stitched. (See Figs. 34 and 35.)

Referring to Fig. 3, 58 designates a lever, which is mounted on the frame 1 and provided with a slot 59 to receive a stud 60 on the bar 48, so that when said lever 58 is either raised or lowered a similar motion will be imparted by the same to said bar 48, so that the distance between the upper edge of the clenching device carried by the same and the under side of a driving-plate 61, which bears against a staple when the same is being driven into an article to be stitched, may be adjusted relatively to the thickness of the article $2^{\times}$ to be stitched, it being noticed, as in Fig. 6, that the driving-plate 61 is secured to the bar 30, so that when either a rising or a falling motion is imparted to said bar, as hereinbefore described, a similar motion will be transmitted to said driving-plate 61, so that when the latter is in its lowermost position it has driven the legs 45 of a staple entirely through the article $2^{\times}$ to be stitched and has caused a portion of said legs 45 to occupy the grooves 54 in the plates 53, as clearly shown in Fig. 35.

Secured in any suitable manner to the bar 48 is a table 62, which, as is evident, will move either up or down with the bar 48 when the same is raised or lowered for the purpose of adjustment relatively to the thickness of the article $2^{\times}$ to be stitched, it being noticed that the upper edge of said table is on a line with the upper edge of the clenching device, as clearly shown in Figs. 1 and 2. The bar 48 is held in an adjusted position by a clamping-screw $62^{\times}$. (See Figs. 1 and 2.)

Pivoted to the bar 24 is a spring-actuated arm 63, which is provided with a wedge-shaped block 64, which occupies for a time the space between the legs 45 of a staple to prevent said legs 45 from bending inwardly when the same are penetrating the article $2^{\times}$ to be stitched, (see Figs. 6, 29, 32, 33, 36, 37, and 38,) the said block 64 being formed with recesses 65, which prevent any possibility of the legs 45 of a staple from striking the upper face of said block and which act as deflectors to direct said legs to the sides of the block 64 should the space between the points of said legs be less than the width of the block, as shown in dotted lines in Fig. 32.

The bar 24 is held in position in the frame 1 by a plate 66, secured to said frame. (See more particularly Figs. 1, 2, and 6.)

Bearing against the pivoted arm 46 are fingers 67, (see Figs. 5 and 39,) which project from a head $67^{\times}$, guided on a rod 68, encircled by a spring 69, which normally keeps said fingers in the position shown in Fig. 39, so that the staple carried by the anvil 47 on said arm 46 will be brought by the same in a line with the grooves 43 and 44 in the plates 41 and 42, (see more particularly Figs. 2 and 39,) for a purpose to be hereinafter described. The force exerted by the spring 69 on the fingers 67 may be regulated by a nut 70 on the rod 68.

Pivoted to the frame 1 is a treadle 71, which is connected in the present instance by a rod 72 with an elbow-lever 73, which is pivoted to the frame 1 and operates the member 34 of the clutch mechanism so as to either start or stop the machine.

The cutter 28 (see Fig. 5) is guided on a plate 74, which may be moved in a horizontal direction on the frame 1 for the purpose of its adjustment relatively to the length of the wire to be cut, said plate being held in position by means of a clamping-screw 75. On the frame 1 is an index 76, the same being adjacent to the plate 74, which is graduated for adjusting the length of wire to be cut off. On the link 4 is an index 77, which is adjacent to graduations $5^{\times}$ on the arm 5 for setting said link in order to adjust the throw of said arm. The pivot 6 consists of the screw 78 and nut 79, the latter being provided with a handle $79^{\times}$ for convenience of rotating said nut.

80 designates a driving-belt for imparting motion to the pulley 32.

The lower end of one side of the cutter (see Figs. 16 and 18) has a bevel or inclined face 82, which when said cutter is lowered is

adapted to contact with the wire and force the same rearwardly for purposes to be hereinafter explained. On the plates 41 and 42 are shoulders 84, whose faces are adapted to come in contact with the ends 85 of the wire, as shown in Fig. 21. The swinging anvil 47 is provided with a groove $54^{\times}$ for the end of the wire 12 previous to its being cut. On the plates 41 and 42 are the projections 86, and on the arm 46 are the projections 87. On the bar 30 is an inclined face $91^{\times}$, the same being adapted to contact with the projection 87 on the arm 46, as will be hereinafter explained. The said cutter 28 is also provided with a second inclined face $82^{\times}$, which may be used in place of the inclined face 82 when the latter becomes worn out, (see Fig. 16,) it being evident that in such case the cutter must be reversed.

83 designates a groove in the auxiliary guide 18 for the location of the wire 12.

On the sides of the anvil 46 are the projections 88, (see Figs. 20, 24, 39, and 40,) against which a portion of the legs of a staple bears, so that the same cannot slip off said anvil when the latter is moving from the position shown in Fig. 20 to that shown in Fig. 39.

On the projection 86 is a tooth 89, (see Figs. 28 and 39,) the same serving as an additional means for retaining the staple within the grooves 43 and 44, and on the frame 1 is a projection 90, which projection, in connection with the lever 58, holds the article to be stitched in position, as afterward explained.

An adjustable spring 91 bears against the arm 63.

The operation is as follows: The reel 13, which is provided with any suitable form of tension device, is placed in position on the frame 1, and the end 12 of the wire from said reel is inserted by hand in the guide 18, and the point of said wire is then brought between the feed-rollers 11 and $11^{\times}$ and then inserted in the auxiliary guide 21, as clearly shown in Figs. 1 and 5. The size of the staples having been decided upon, the next step is to adjust certain parts of the machine relatively to the same, the staples in the present instance being of the largest size made by the machine. The plate 74, which also serves as a gage, is moved nearer to or farther from the anvil 47, according to the required length of the wire to be cut and formed into a staple, the desired length of the wire being indicated by the graduations on said gage when a predetermined number on the gage is made to register with the index 76 on the frame 1. When the plate 74 and consequently the cutter 28, which slides thereon, have been adjusted relatively to the length of the wire to be cut, said plate is then secured in its adjusted position by the clamping-screw 75. The link 4 is then adjusted on the arm 5, so that the index 77 on the former will register with the number on the arm 5 at $5^{\times}$ corresponding to that taken on the gage on the plate 74. The link 4 is then secured in position by the screw 78 and nut 79 of the pivot 6, it being evident that the length of the wire as fed by the rollers 11 and $11^{\times}$ will be longer or shorter, according to the relative positions of the throw of the arm 5. A portion of the article $2^{\times}$ to be stitched is then placed between the lever 58 and a projection 90 on the frame 1. (See dotted lines in Fig. 3.) The lever 58 is then raised by hand and carries with it the bar 48 and connected parts until said lever 58 comes in contact with said article $2^{\times}$, which, occupying the space between it and the projection 90, prevents said lever from being further raised. This will cause the space between the upper edge of the clenching device and the under side of the driving-plate 61 when in its lowermost position to be separated a distance equal to the thickness of the article $2^{\times}$ to be stitched. When the bar 48 is in its adjusted position, it is held in place on the frame 1 by tightening the screw 62. The slot 59 in the lever 58 is a trifle wider than the diameter of the pin 60, which projects from the bar 48 and enters the same. The object of this is to permit the lever 58 to drop a trifle when the same is let go. By this means the article $2^{\times}$ may be readily removed from between said lever 58 and the projection 90. Power is imparted to the pulley 32 by the driving-belt 80 or other suitable means, and the treadle 71 is depressed and, owing to its connection with the clutch mechanism hereinbefore described, will cause the members 33 and 34 to interlock, and the shaft 2 will consequently be rotated and will consequently impart motion to the wheel 3 and eccentric 35 thereon. The wheel 3 in rotating will impart a rocking motion to the arm 5, due to the link 4, whereby a similar motion will be imparted to the extensions 8 of said arm, whereby the pawls 9 thereon will rotate the wheel 10, thus imparting intermittent rotary motion to the shaft 7 and also to the gear-wheel $14^{\times}$ and feed-roller $11^{\times}$, secured thereto, the gear-wheel 14 and the feed-roller 11 thus feeding the required length of wire to be formed into a shape through said rollers, it being evident that the ratchet-wheel 10, shaft 7, gear-wheels 14 and $14^{\times}$, and feed-rollers 11 and $11^{\times}$ are at rest when the arm 5 is moving backward in order that the dogs 9 thereon may again engage the teeth of the ratchet-wheel 10 for evident purposes. If the wire should kink in the process of feeding, the trouble can be easily remedied by properly adjusting the guide 18, as has been stated. When the desired length of wire to be formed into a staple has been fed by the rollers 11 and $11^{\times}$, the bar 24 is lowered by the rotation of the wheel 3, due to the link 22, the lever 23, and the bar 24. The bar 24, as hereinbefore stated, has connected with it the cutter 28, so that when said bar is lowered the cutter will likewise be lowered, and in its descent will come in contact with the section of the wire 12 in its path and cut the same, it being evi-

dent that said cutter occupied originally a position above the wire 12, as clearly shown in Fig. 5, in which the parts that operate the cutter are removed, so as to illustrate more clearly the parts that are behind them, the position of the cutter 28 on the bar 24 being shown in dotted lines in Figs. 8 and 25. The bar 24 and consequently the cutter 28 thereon continue to descend after the wire has been cut. The beveled or inclined face 82 on said cutter is brought in contact with the wire 12 in its path and is forced by said inclined face behind the cutter, so as to permit the wire 12 to advance when fed by the rollers 11 and $11^{\times}$, as the feeding of said wire for a subsequent staple takes place before the cutter 28 ascends. If it were not for the inclined face 82, the end of the wire 12 continuous of the wire from the reel 13 would abut against said cutter and cause said end of wire to curl or bend and thereby produce bad results.

The action of the inclined face 82 on the end of the wire above referred to is clearly illustrated in Fig. 18, it being seen by referring to said figure that when the cutter 28 comes in contact with the end of the wire 12 the relative positions of the cutter and wire will be as shown at *w* in said figure. After the cutter 28 has severed the wire 12 and has accomplished a portion of its downward movement the inclined face 82 comes in contact with the wire 12, as shown at *x* in said Fig. 18, and said wire will be moved in the direction of the arrow *h* by the further descent of the cutter 28. When the cutter 28 has been lowered to its full extent, the end of the wire 12 which is continuous of the wire in the reel 13 will be caused to occupy a position in the rear of the cutter 28, as shown at *y*, it having been moved by the inclined face 82 into this position from its original one shown in dotted lines at *z*. By this means it will be seen that there can be no possibility of the point of the wire 12 striking the cutter 28 when said wire is being fed.

Referring now to Fig. 17, when the end of the wire 12 has been brought into the position shown at *y* in Fig. 18 said wire is caused to occupy the groove 83 in the auxiliary guide 21, the depth of said groove being sufficient to permit the wire 12 to occupy the same when said wire has been moved laterally from *w* to *y* in Fig. 18. The end of the wire 12 previous to being cut occupies a groove $84^{\times}$ in the swinging anvil 47, (see Figs. 5, 17, 20, 24, and 40,) said wire having been fed and guided into this position by the rollers 11 and $11^{\times}$ and guides 12 and 18, respectively. The bar 24, which was in its elevated position, is now lowered, owing to its link connection with the wheel 3, and the plates 41 and 42, secured to said bar, will, as is evident, also be lowered. Said plates in their descent will cause the shoulders 84 on said plates to come in contact with the ends 85 of the wire in the anvil 47. (See more particularly Fig. 21.) The further descent of said plates will bend the ends 85 of the wire in the anvil 47, and thereby form the legs 45 of a staple. (See Fig. 23.) When the bar 24 has reached its lowermost point, the projections 86 on the plates 41 and 42, which were in contact with the projections 87 on the arm 46, (see Figs. 5 and 20,) no longer contact therewith, thus permitting the arm 46 and anvil 47 connected thereto, and which carries a finished staple, to be moved from the position shown in Fig. 20 to that shown in Fig. 39, the motion being imparted to said arm 46 by the fingers 67, which bear against the same, due to the influence of the spring 69. When the anvil 47 is in the position shown in Fig. 39, the staple thereon is brought by the same on a line with the upper and deepest portions of the grooves 43. (See also Fig. 23.) The object in making the upper portions of said grooves 43 deeper than the lower ones is to permit the staple to spring off the anvil 47 and enter said grooves 43, it being evident that the legs of a staple naturally tend to separate a trifle after first being bent into position. The legs when in the anvil are prevented from yielding to this tendency by their being in contact with the sides of the anvil 47 and the inner walls of the projections 86 on the plates 41 and 42, but slips off said anvil 47 when the same has been moved away from said projections 86, as clearly shown in Fig. 39. The bar 30 and consequently the driving-plate 61 thereon are now lowered by the action of the wheel 3 and connected parts, it being noticed that the staple when brought into the grooves 43 and 44, as hereinbefore described, occupies a position in a plane directly below said driving-plate 61. (See Fig. 22.) The driving-plate 61 in its downward movement comes in contact with the staple and drives the same through the article to be stitched. When the driving-plate 61 first comes in contact with a staple, the space between the limbs of the same is occupied by a portion of the block 64, (see Figs. 33 and 36,) said block preventing the bending inwardly of the legs 45 of the staple when the same is being driven, as hereinbefore described. The driving-plate 61 in farther descending carries with it the staple and drives the same into the article $2^{\times}$ to be stitched, (see Fig. 37,) the portion of a staple resting on the inclined face of the block 64 gradually moving the same, owing to said inclination, in the present case to the right, and causing said block to gradually leave the space between the legs 45 of a staple, as clearly shown in Fig. 37. A spring 91, (see Fig. 26,) which normally keeps said arm 63 in the position shown in Fig. 27, yields under the influence of the lower end of the descending bar 30 and thus permits the block 64 to be removed from the space between the limbs 45 of a staple. When the bar 30 is up, the spring 91 restores said arm to its normal position, said spring being sustained on the rod $91^{\times\times}$ while passing freely through the arm 63 and is secured to the bar

24, the tension of said spring being regulated by the nut $91^{\times\times\times}$ on said rod. When the driving-plate 61 has completed its downward movement, the block 64 is entirely removed from the staple (see Fig. 38) and the legs of the latter have fully penetrated the article to be stitched.

When a staple has been fully driven into an article to be stitched, a portion of its legs come in contact with the plates 53. (See Fig. 34.) The eccentric 35 and connected parts now raise the bar 56, which carries with it the head 55, and owing to its link connections with the plates 53 moves the latter on their pivots, so as to occupy the position shown in Fig. 35, thereby clenching the legs of a staple on the article, as clearly shown in said Fig. 35. The inclined face $91^{\times}$ on the bar 30 will contact with the projection 87 on the arm 46 when said bar 30 is lowered and overcome the pressure of the spring 69, which locates and temporarily retains said arm in the position shown in Fig. 39 and thereby causes the anvil 47 on said arm to be restored to its normal position in order to receive another piece of wire to be formed into a staple. (See Fig. 20.)

The operation hereinbefore described is repeated in the formation, driving, and clenching of subsequent staples.

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

1. In a wire-stitching machine, a frame, a driving-shaft with a crank-wheel thereon, feeding-rollers mounted on said frame, a rocking arm having a link connection with said crank-wheel, dogs mounted on said arm and engaging a ratchet-wheel on the shaft thereof, the adjustable guide 18 pivoted to said frame and leading to said feeding-rollers, and having the slot 20 therein, the clamping-screw 19, and a reciprocating cutter.

2. In a wire-stitching machine, a cutter having sides with a connecting portion having a transverse groove therein, the opposite ends of the said sides having beveled faces.

3. The feed-rollers in combination with the wire-guide 18, and the screw 19, said guide having a slot 20, through which said screw passes into the frame for holding said guide and adjusting the same, substantially as described.

4. In a wire-stitching machine, a frame, feed-rollers mounted thereon, a swinging slotted guide for wire fed to said rollers, a clamping-screw in said slot and frame for clamping said guide in adjusted position, and an auxiliary guide firmly secured to the frame at the discharging end of said first-mentioned guide.

5. In a wire-stitching machine, a frame, a rotatable shaft with a crank-wheel connected therewith, a link connected by a wrist-pin with said crank-wheel, a lever pivoted to said frame and with said link, a vertically-sliding bar pivoted to said lever, the block 25 on said bar and provided with the lip 26, a wire-cutter secured to said bar and having a groove in which said lip enters.

6. In a wire-stitching machine a frame with the rotatable shaft 2 mounted thereon, the eccentric 35 on said shaft, the rising-and-falling rod 36 connected with said eccentric, the elbow-lever 37 having one limb united by a slot-and-pin connection with said rod 36, the rod 38 pivotally connected with the other limb of said lever, the elbow-lever 39 adjustably connected with said rod 38, the bar 56 resting on the lever 39, the adjustable bar 48 loosely fitting in the frame and guiding said bar 56, the head 55 on said rod 56, the plate 49, the links 57 pivoted to said head and the plates 53 pivoted to said links and to plate 49 and guided between the flanges 50 of said plate 49, said plates 53 having grooves in their upper faces to receive the legs of the staple.

7. In a wire-stitching machine, a frame, a rotatable shaft with a crank-wheel thereon, a stud on said wheel, the lever 23 pivoted to said frame, the link 22 pivotally connected with said lever and stud, the sliding bar 24 guided on said frame, the block 25 connected with said bar and provided with the lip 26, and a cutter connected with said block having a groove in which said lip 26 enters, said parts being combined substantially as described.

8. In a wire-stitching machine, a frame, the anvil 47, the slotted plate 74 adjustable relative to said anvil, the cutter 28 sliding on said plate, the clamping-screw 75, the arm 5 with the adjustable link 4 thereon connected with an operating-shaft and having an index thereon, corresponding to a gage on the plate 74.

9. In a wire-stitching machine, a frame, a rotatable shaft, a rising-and-falling bar operated by said shaft, the spring-actuated arm 63 pivoted to said bar, the wedge-shaped block 64 connected with said arm, said block having the recesses 65 therein.

10. In a wire-stitching machine, a frame, a rotatable shaft mounted thereon, the rising-and-falling bar 24 operated by said shaft, the cutter 28 on said bar, the spring-actuated arm 46 pivoted to said frame, an anvil secured to said arm, the rod 68 having a finger 67 projecting from the head $67^{\times}$ guided on said rod and bearing against said arm 46, and the spring 69 encircling said rod and bearing against said head, and a nut on said rod.

11. The vertically-sliding bar 24, the spring-actuated arm 63 pivoted thereto, and the wedge-shaped block 64 carried by said arm, said block having recesses 65 for guiding and deflecting the legs of a staple, substantially as described.

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