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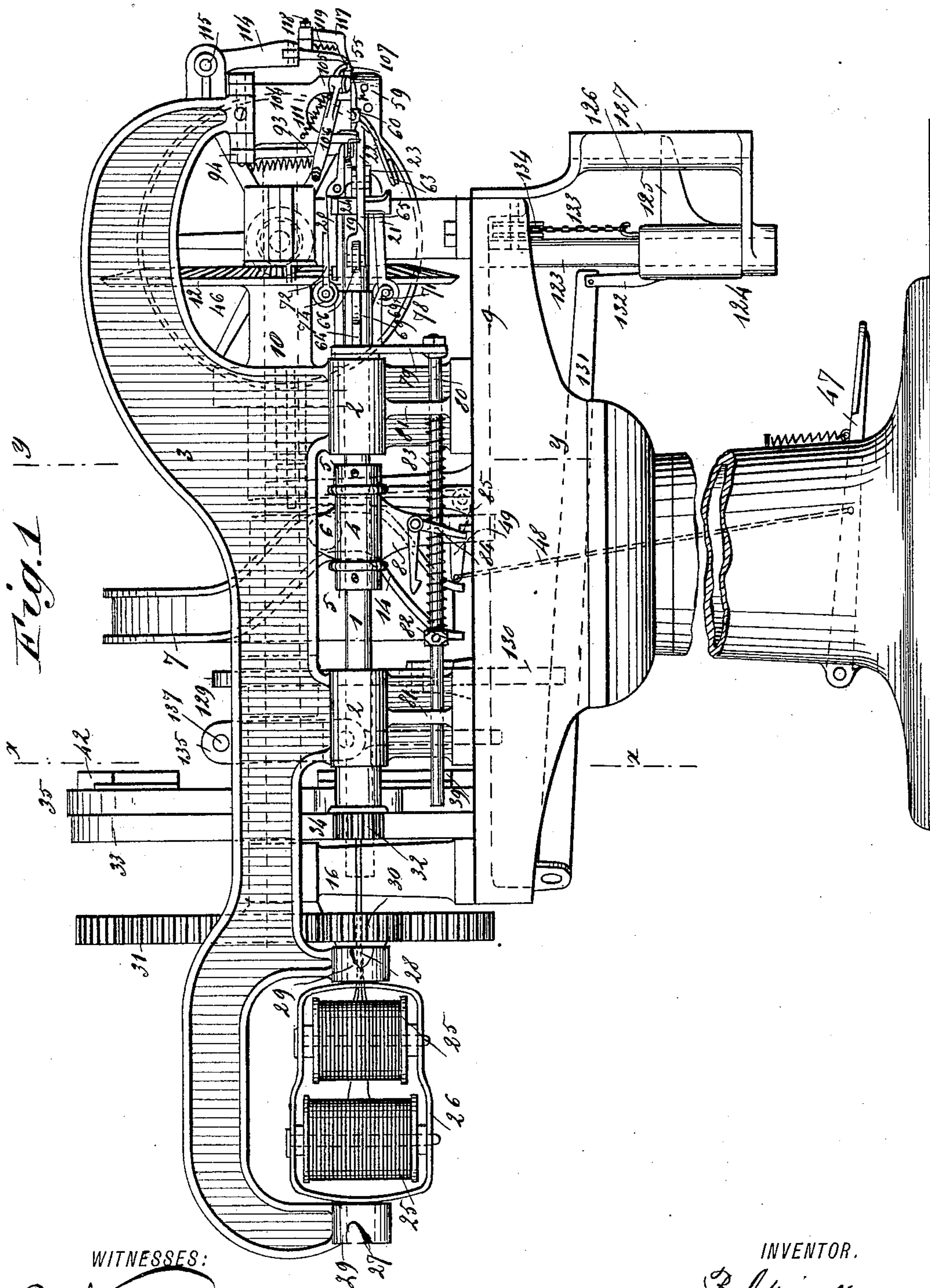
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



WITNESSES:

*C. Neveux*  
*Coedgwick*

INVENTOR.

*B. Adriance*

BY

*Munn & Co*

ATTORNEY

(No Model.)

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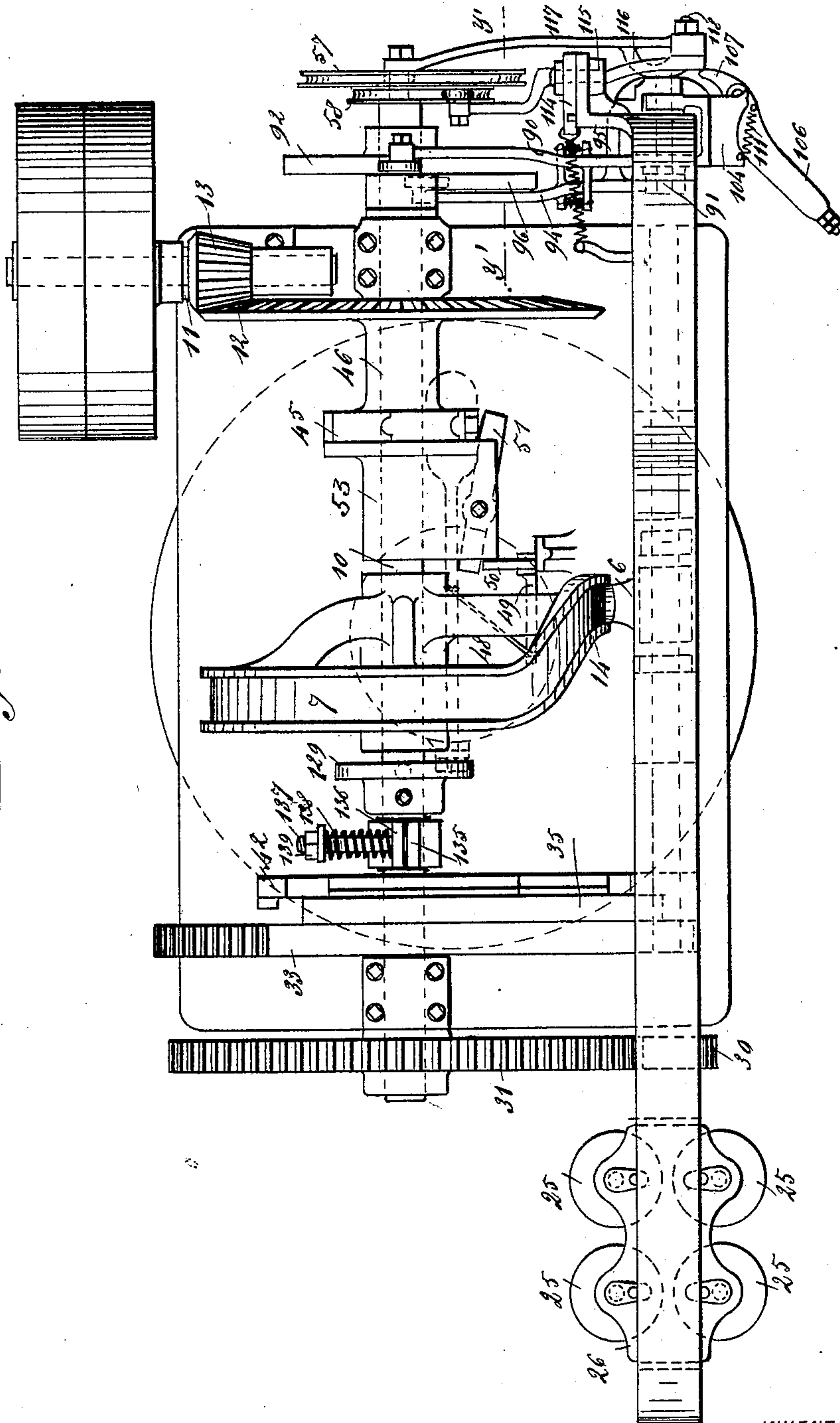
B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.

Fig. 2



WITNESSES:

*C. Neveu*  
*C. Sedgwick*

INVENTOR.

*B. Adriance*

BY

*Munn & Co*

ATTORNEY

(No Model.)

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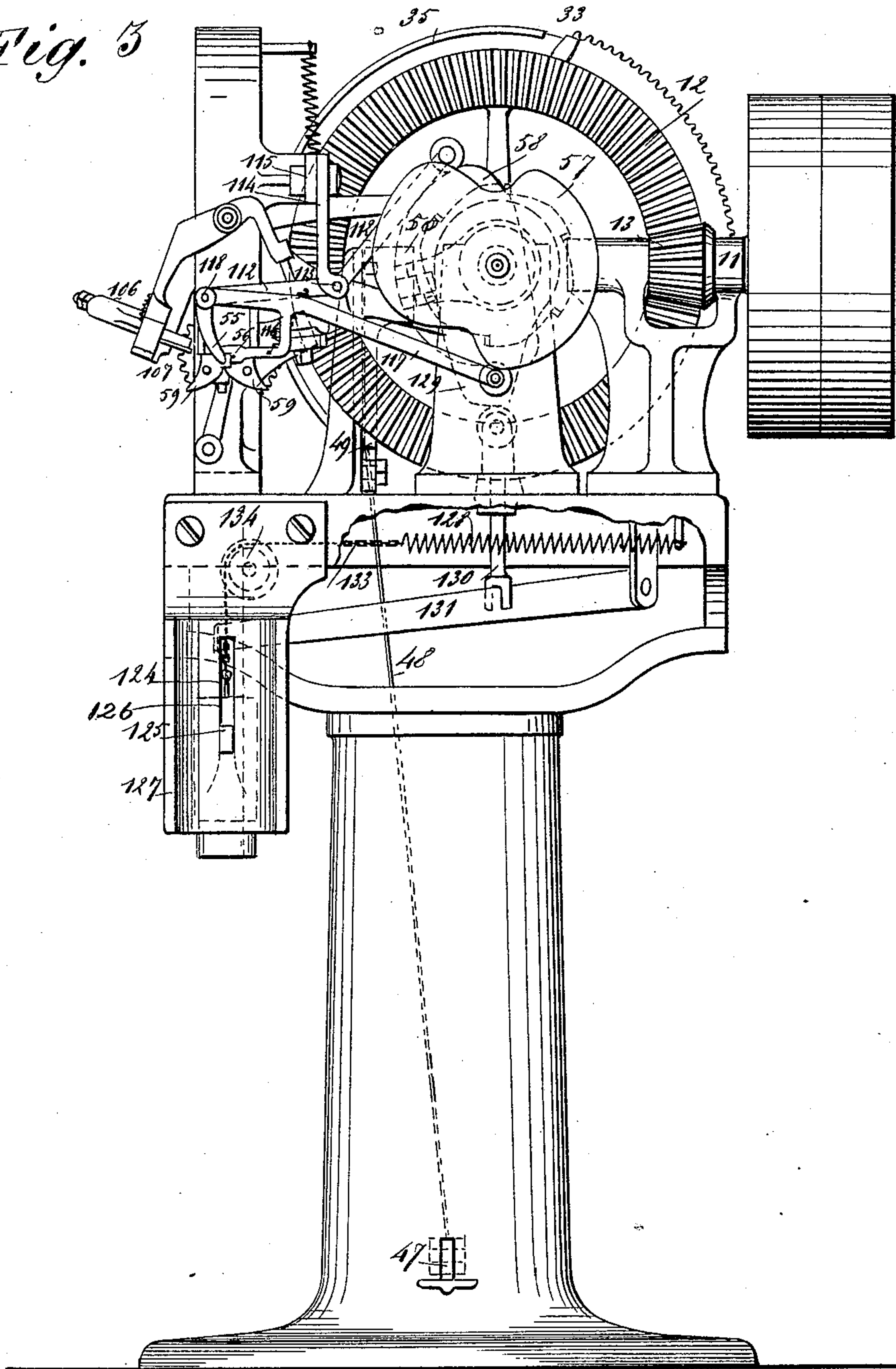
B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.

*Fig. 3*



WITNESSES:

*C. Neveux*  
*C. Sedgwick*

INVENTOR:

*B. Adriance*  
BY *Munn & Co*

ATTORNEYS.



(No Model.)

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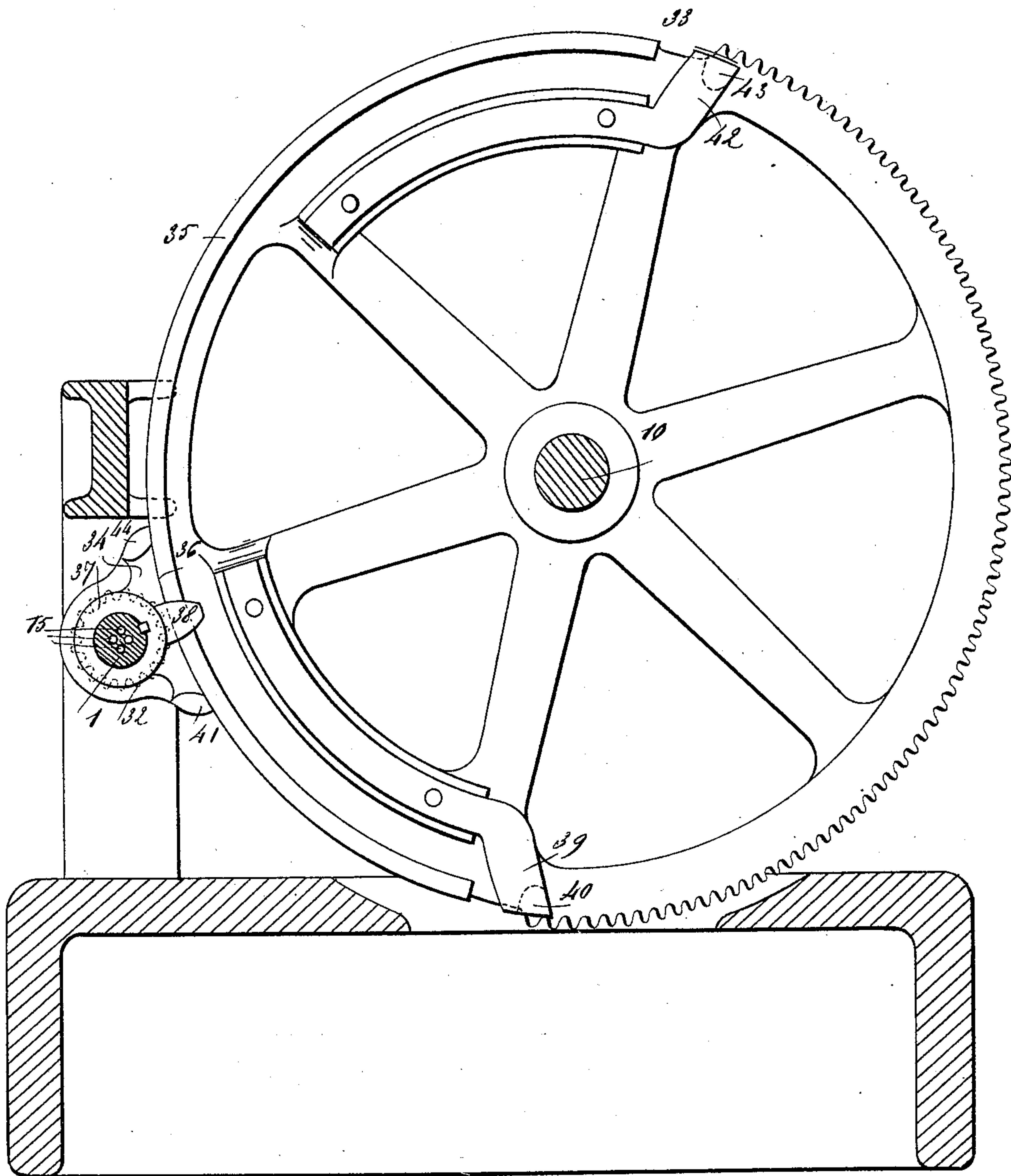
B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.

*Fig. A*



WITNESSES:

*C. Neveu*  
*C. Sedgwick*

INVENTOR,

*B. Adriance*

BY

*Munn & Co*

ATTORNEY.

(No Model.)

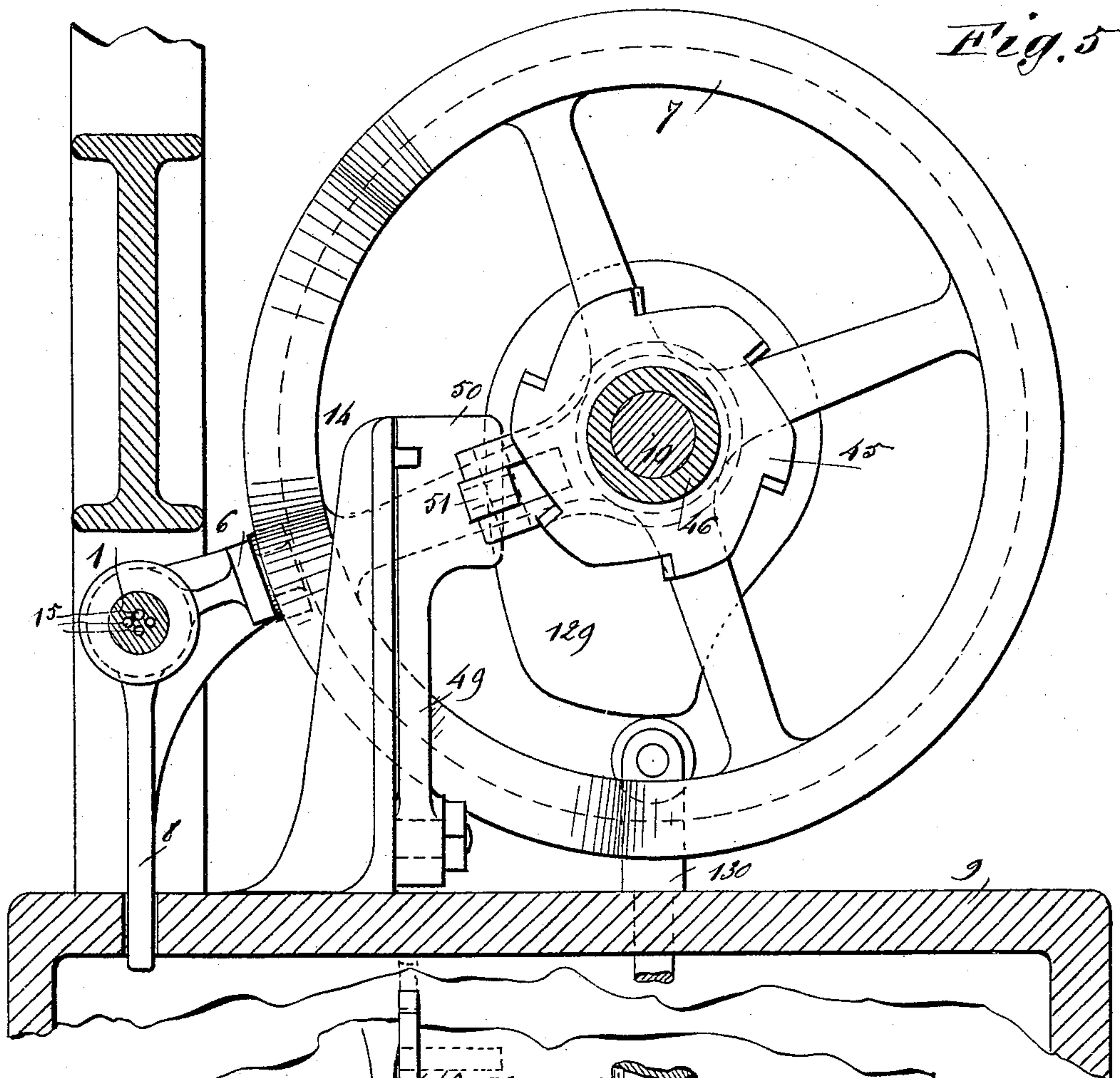
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B. ADRIANCE.

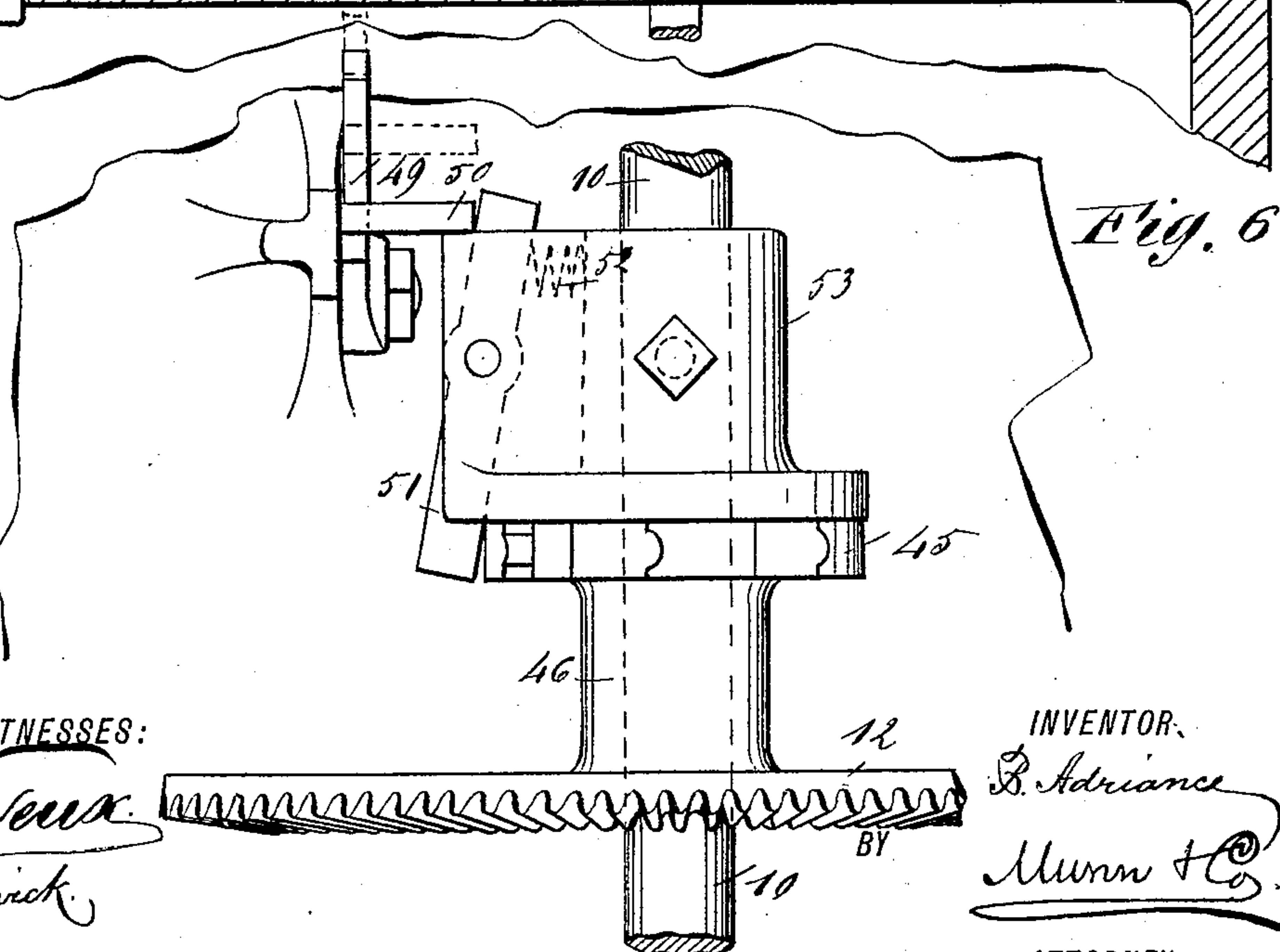
# MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



*Fig. 5*



*Fig. 6*

**WITNESSES:**

C. Neveu.

C. Sedgwick.

**INVENTOR,**

P. Adriance

Munn & Co.

**ATTORNEY,**

(No Model.)

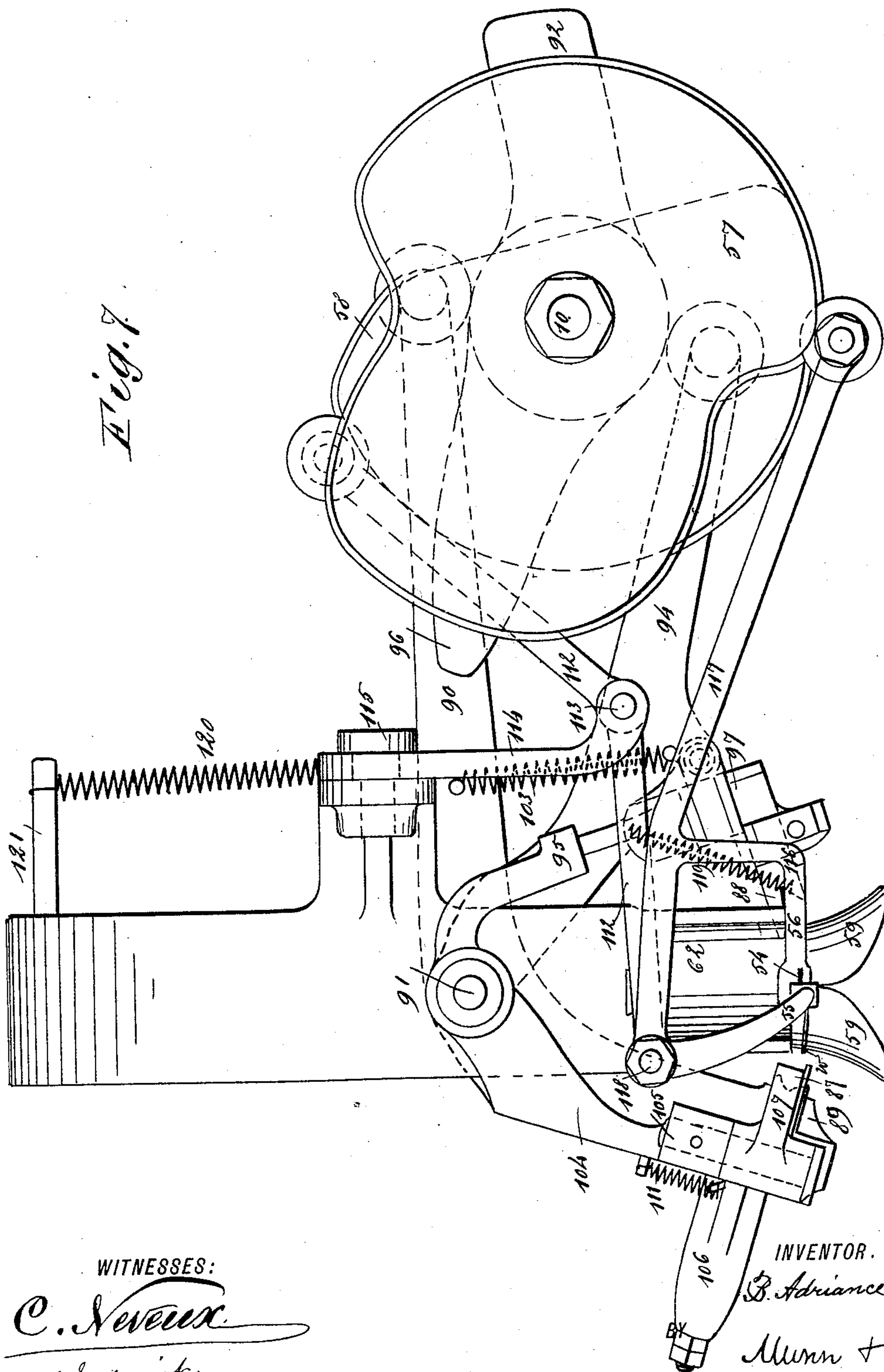
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



WITNESSES:

*C. Neveux*  
*W. Sedgwick*

INVENTOR.

*B. Adriance*

*Munn & Co*

ATTORNEY.



(No Model.)

16 Sheets—Sheet 7.

B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.

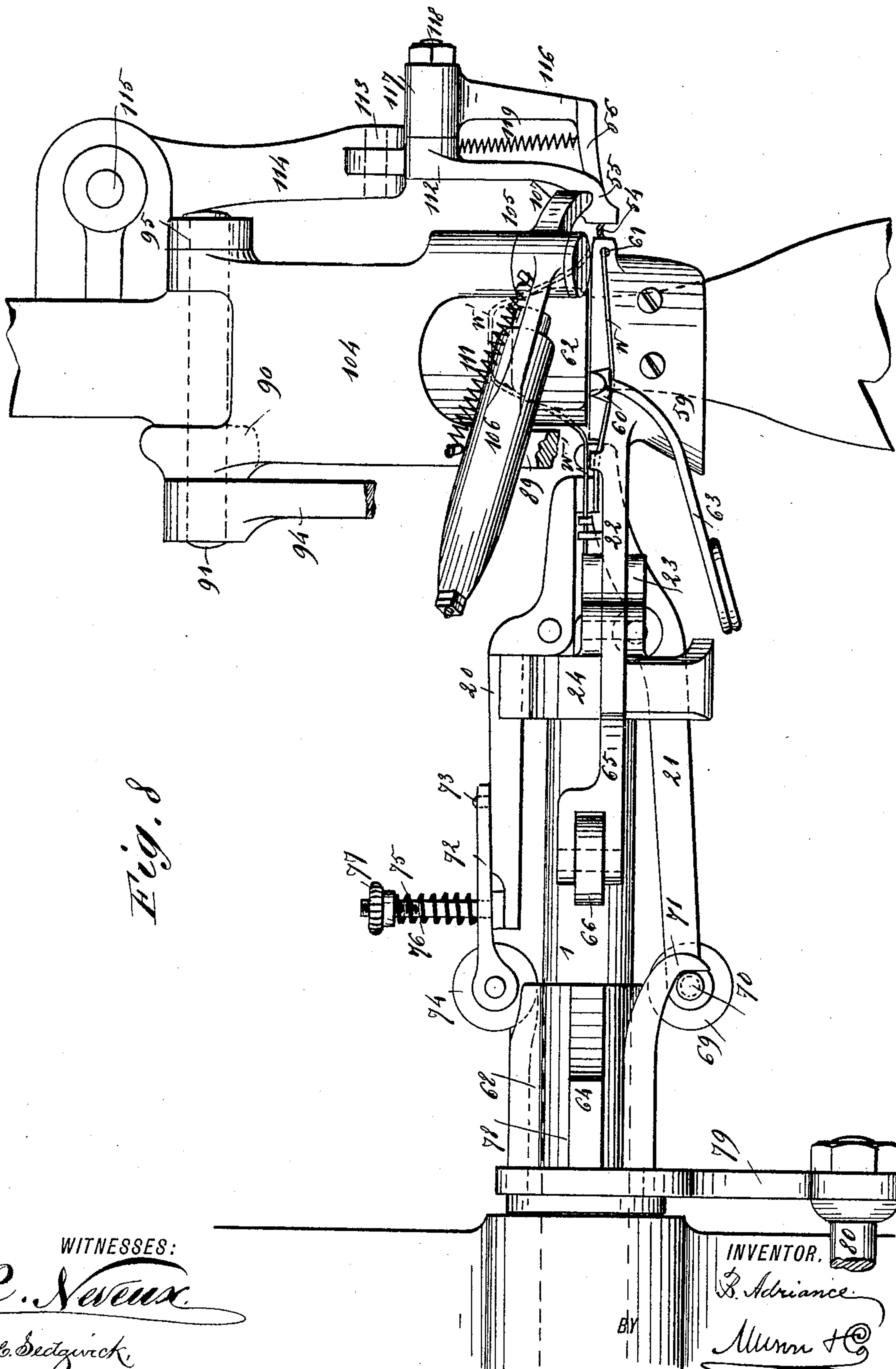


Fig. 8

WITNESSES:

*C. Neveu*  
*C. Sedgwick*

INVENTOR.

*B. Adriance*

BY

*Munn & Co*

ATTORNEY.

(No Model.)

16 Sheets—Sheet 8.

B. ADRIANCE.

# MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.

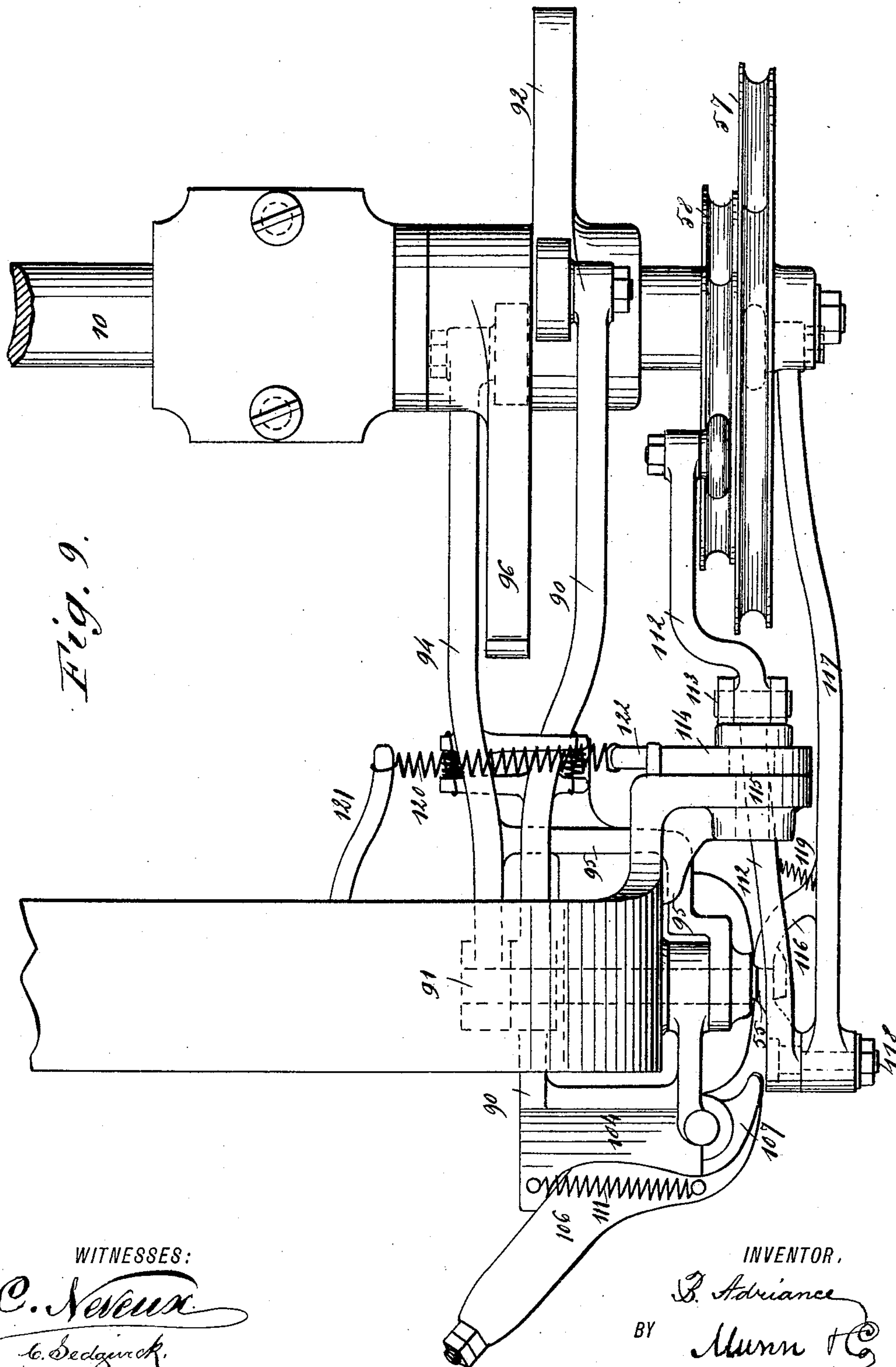


Fig. 9.

**WITNESSES:**

C. Nevins  
C. Sedgwick.

***INVENTOR,***

B. Adriance  
Munn & Co

BY

ATTORNEY,



(No Model.)

16 Sheets—Sheet 9.

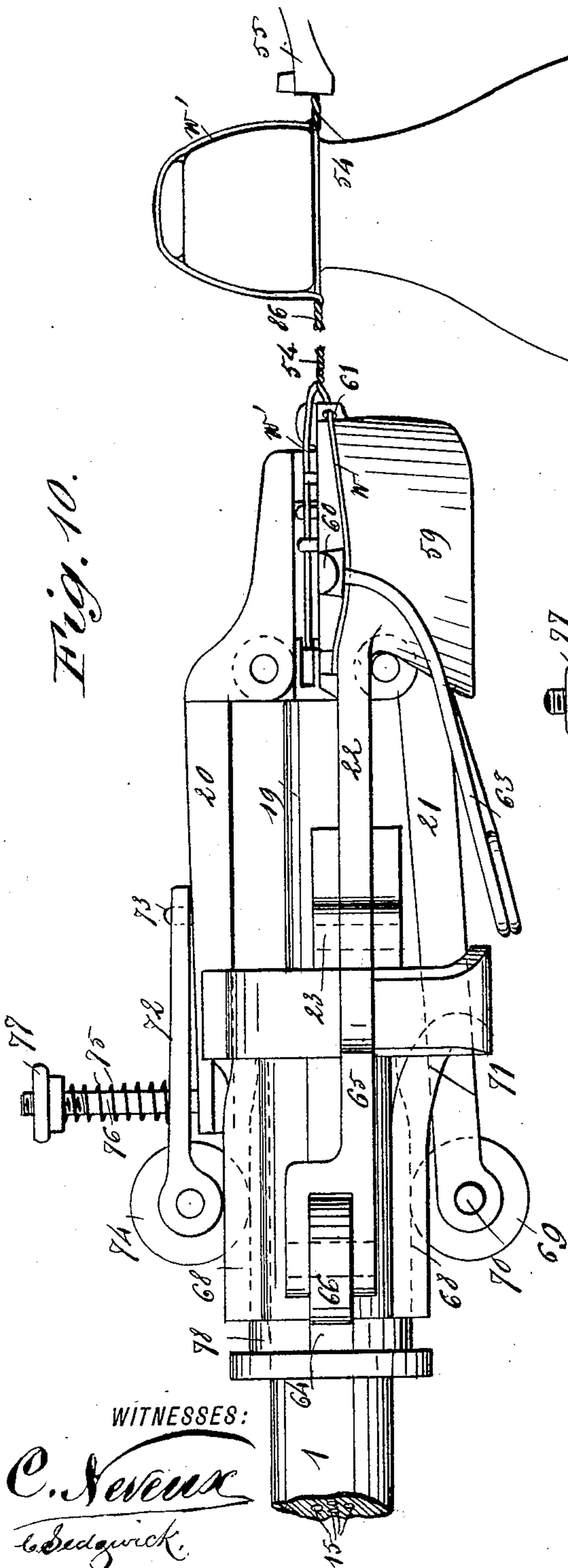
B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.

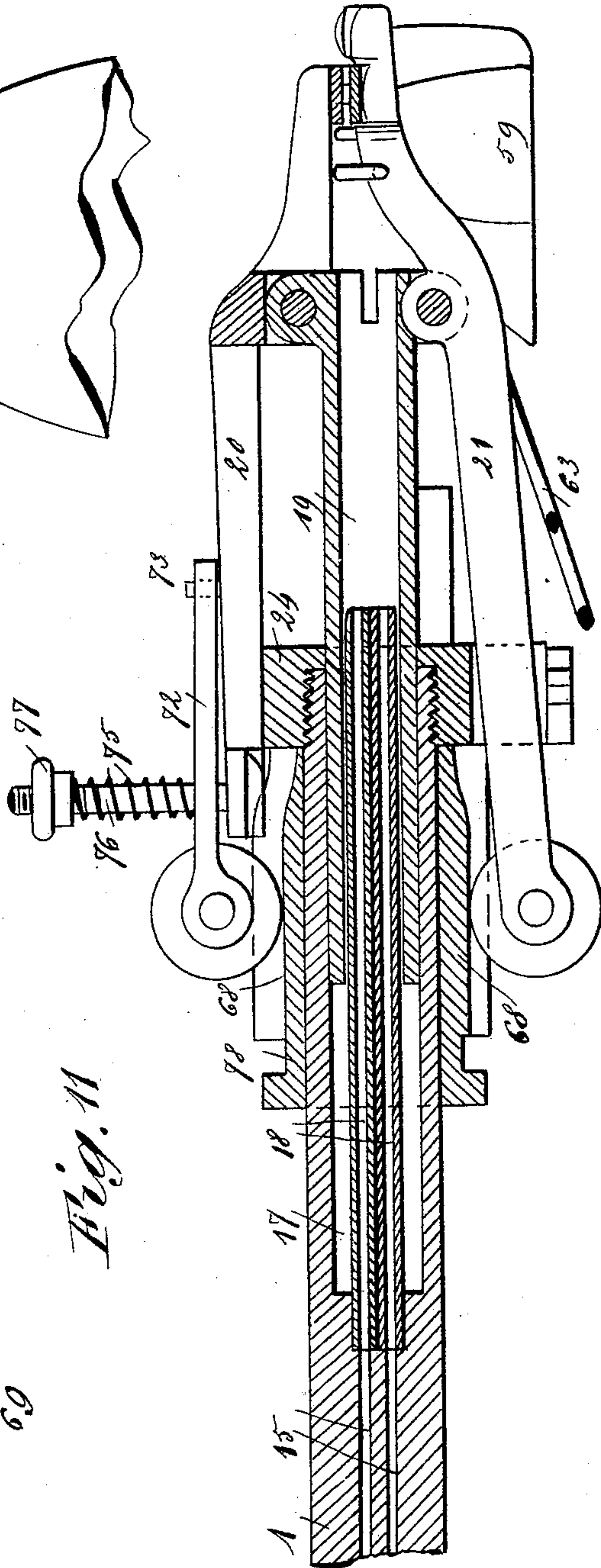
Fig. 10.



WITNESSES:

C. Newell  
Bedgwick.

Fig. 11



INVENTOR,

B. Adriance  
BY Munn & Co

ATTORNEY.

(No Model.)

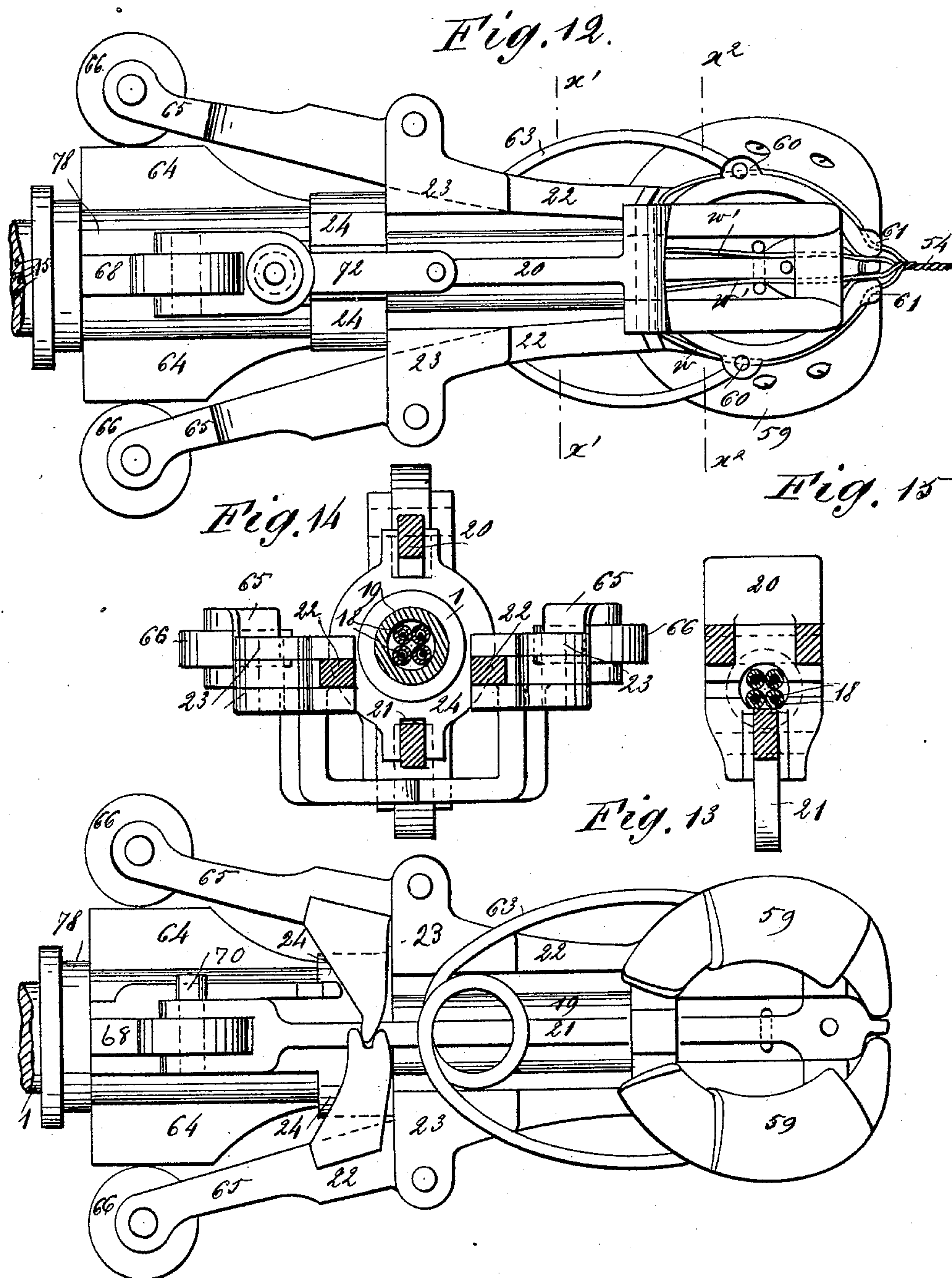
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



WITNESSES:

*C. Neveu*  
*C. Sedgwick*

INVENTOR,

*B. Adriance*

BY

*Munn & Co*

ATTORNEY.



(No Model.)

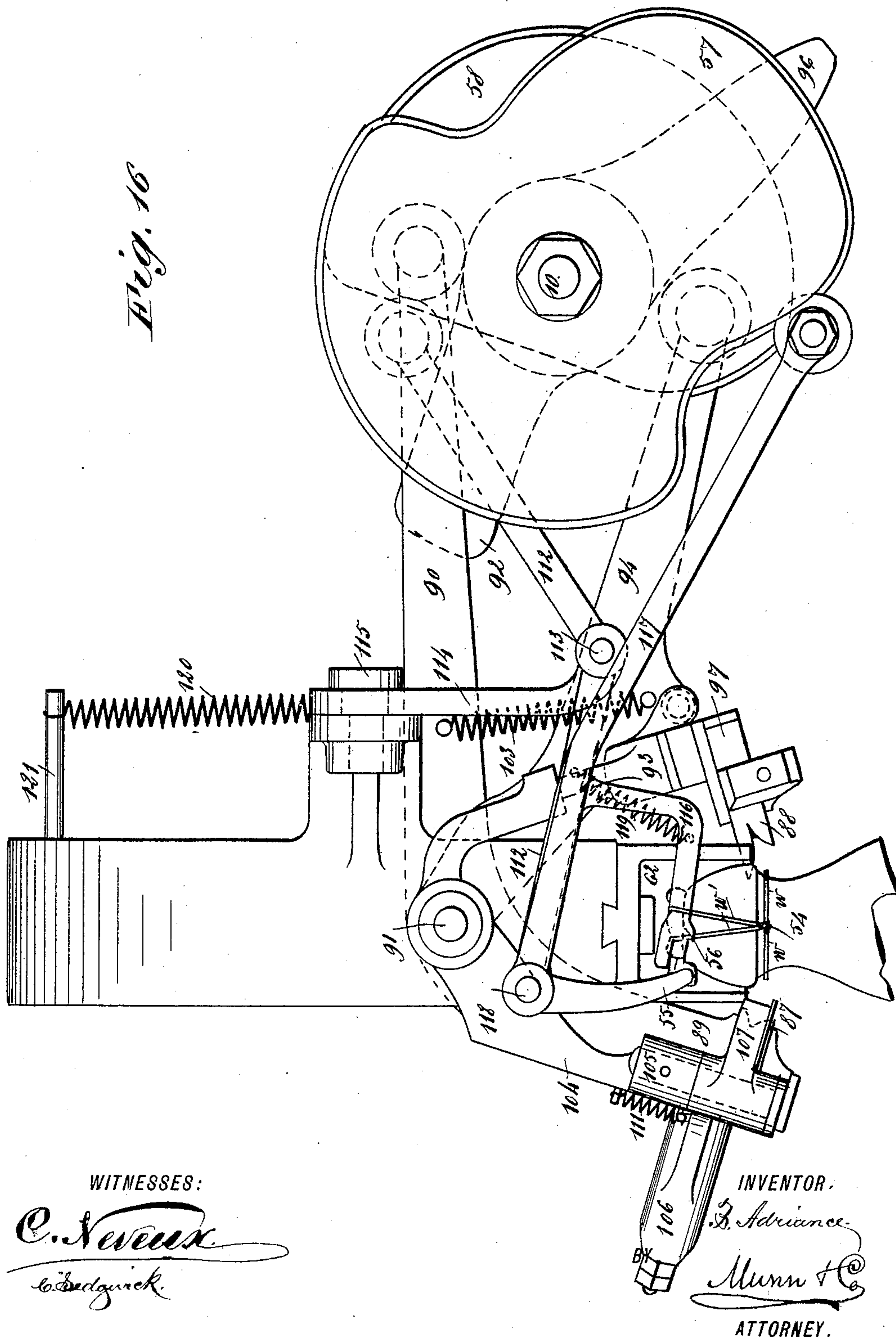
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.





(No Model.)

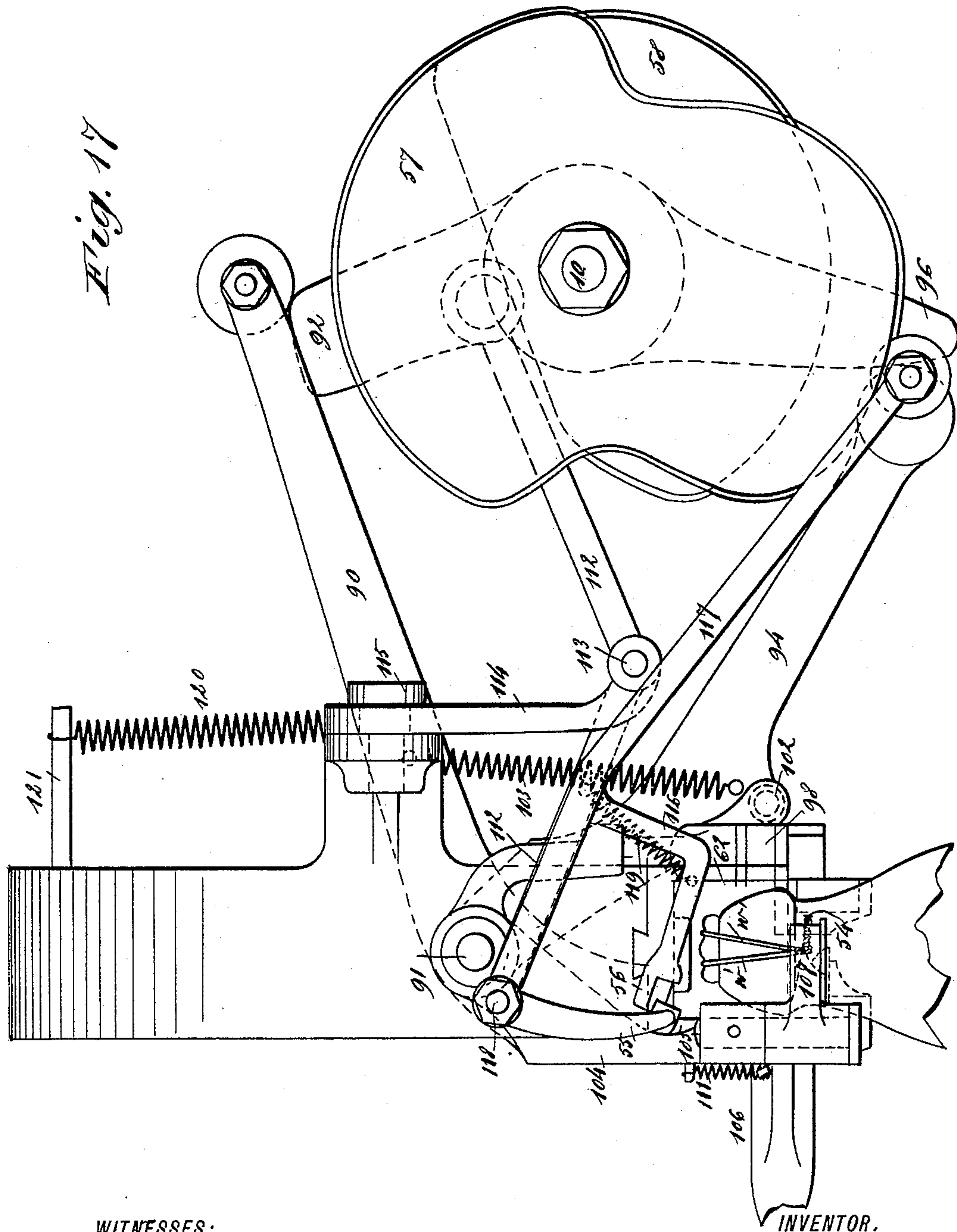
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



WITNESSES:

*C. Severin*  
*to Sedgewick*

INVENTOR.

*B. Adriance*

BY

*Munn & Co*  
ATTORNEY.

(No Model.)

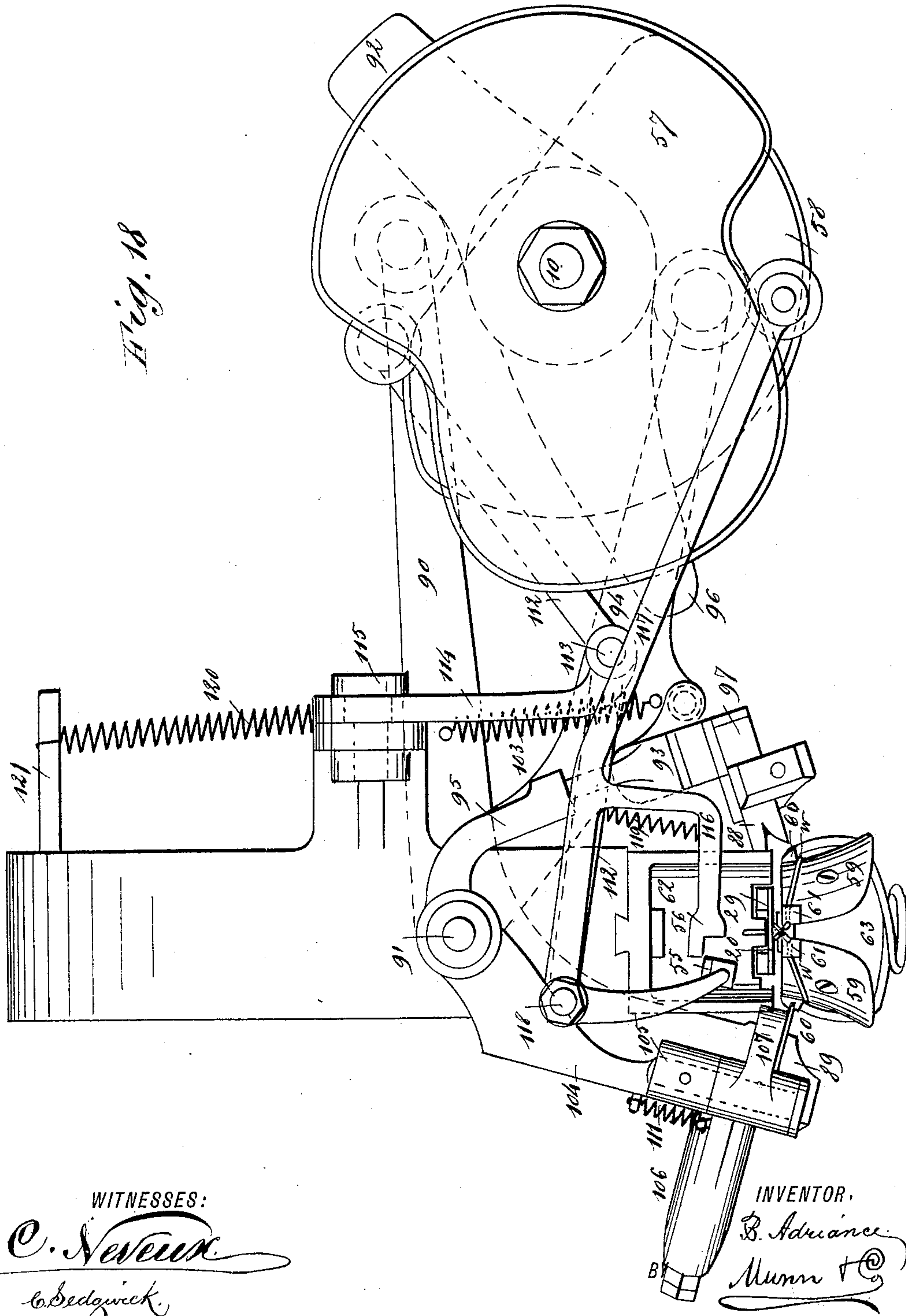
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



(No Model.)

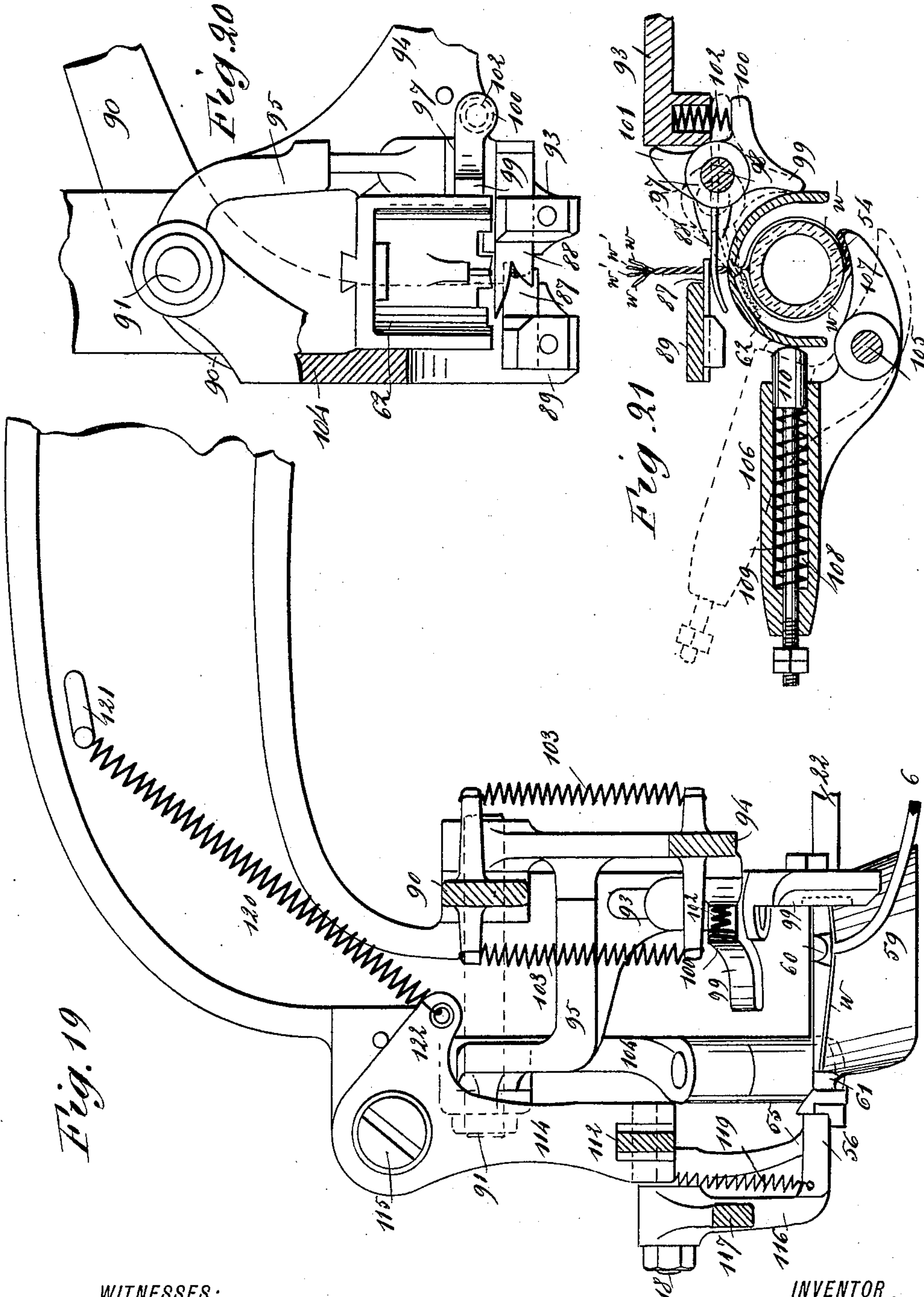
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B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



WITNESSES:

*C. Severux*  
*G. Sedgwick*

INVENTOR.

*B. Adriance.*  
BY *Munn & Co*

ATTORNEY.



(No Model.)

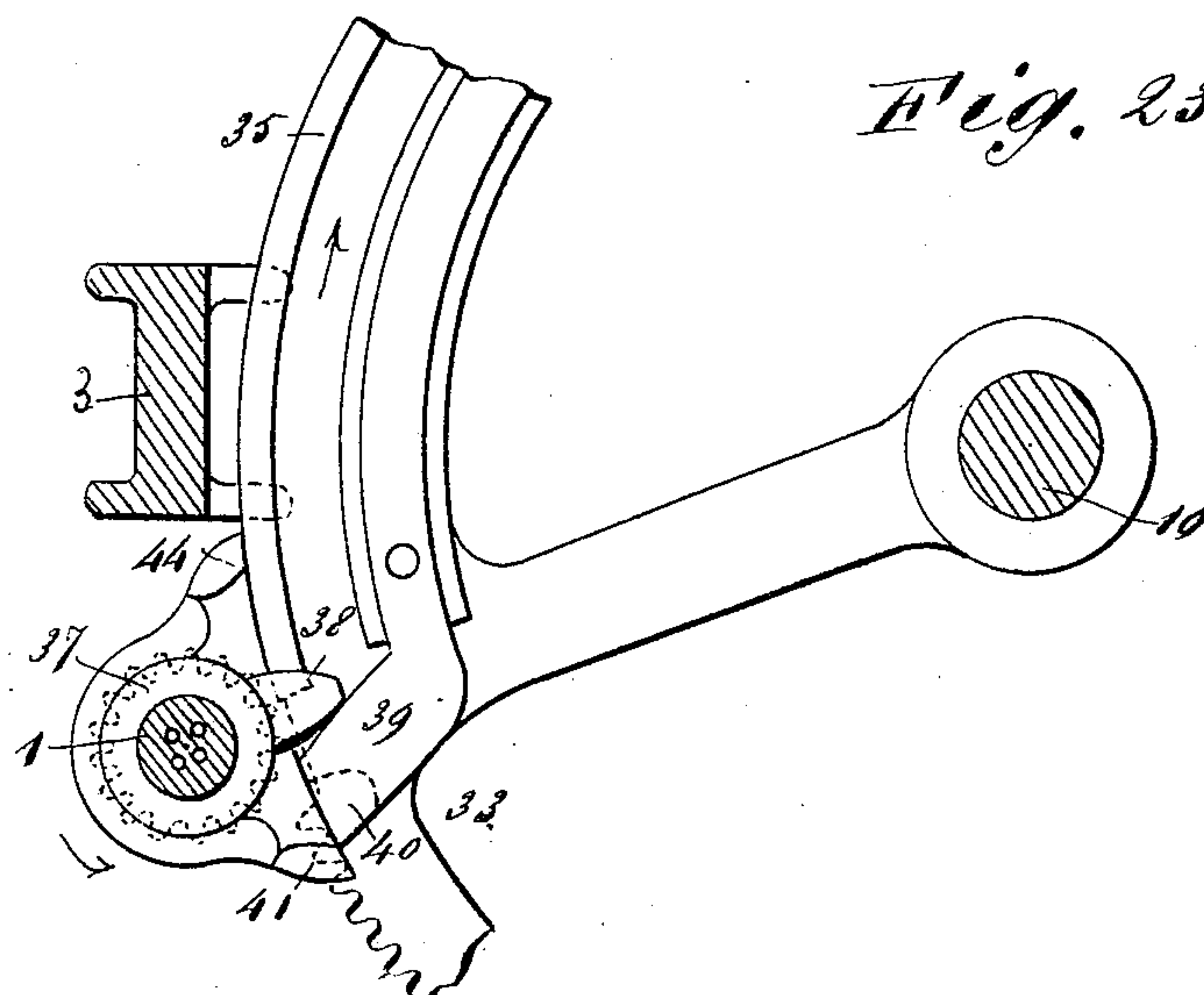
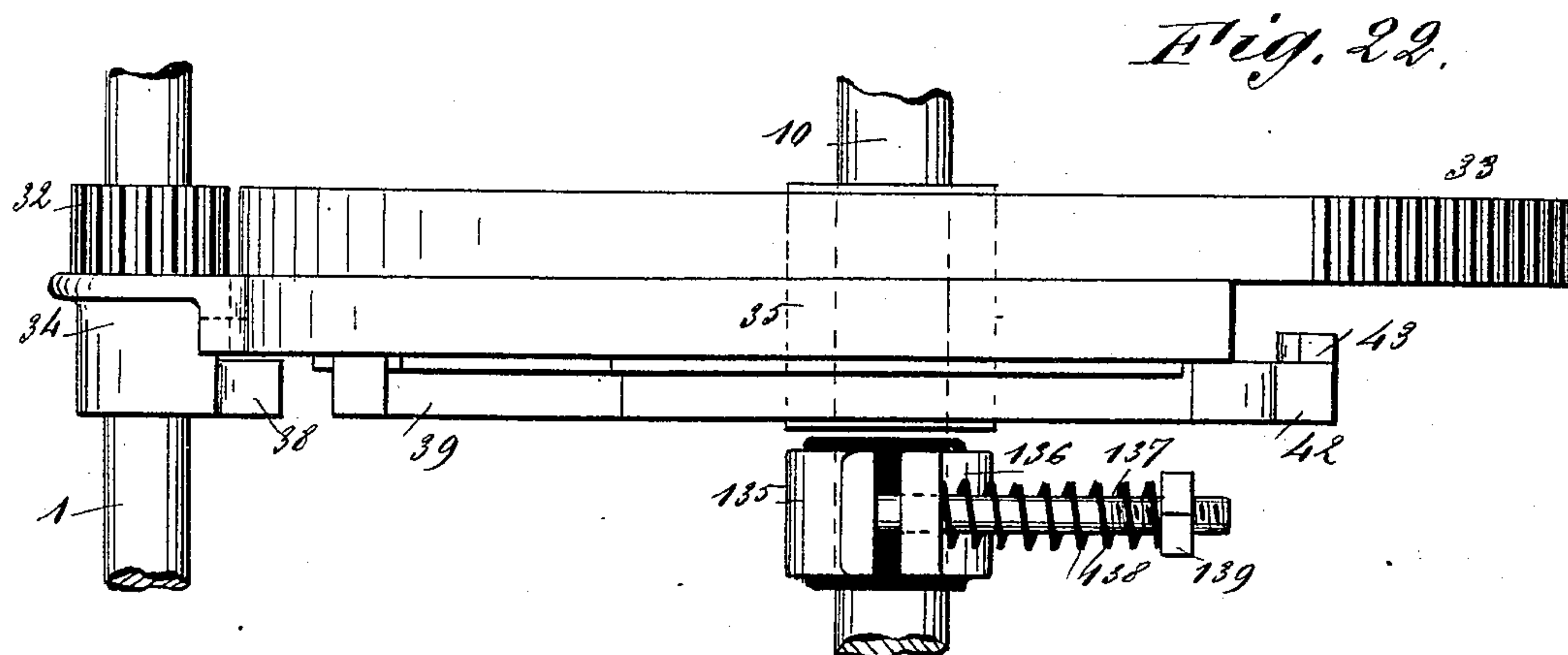
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B. ADRIANCE.

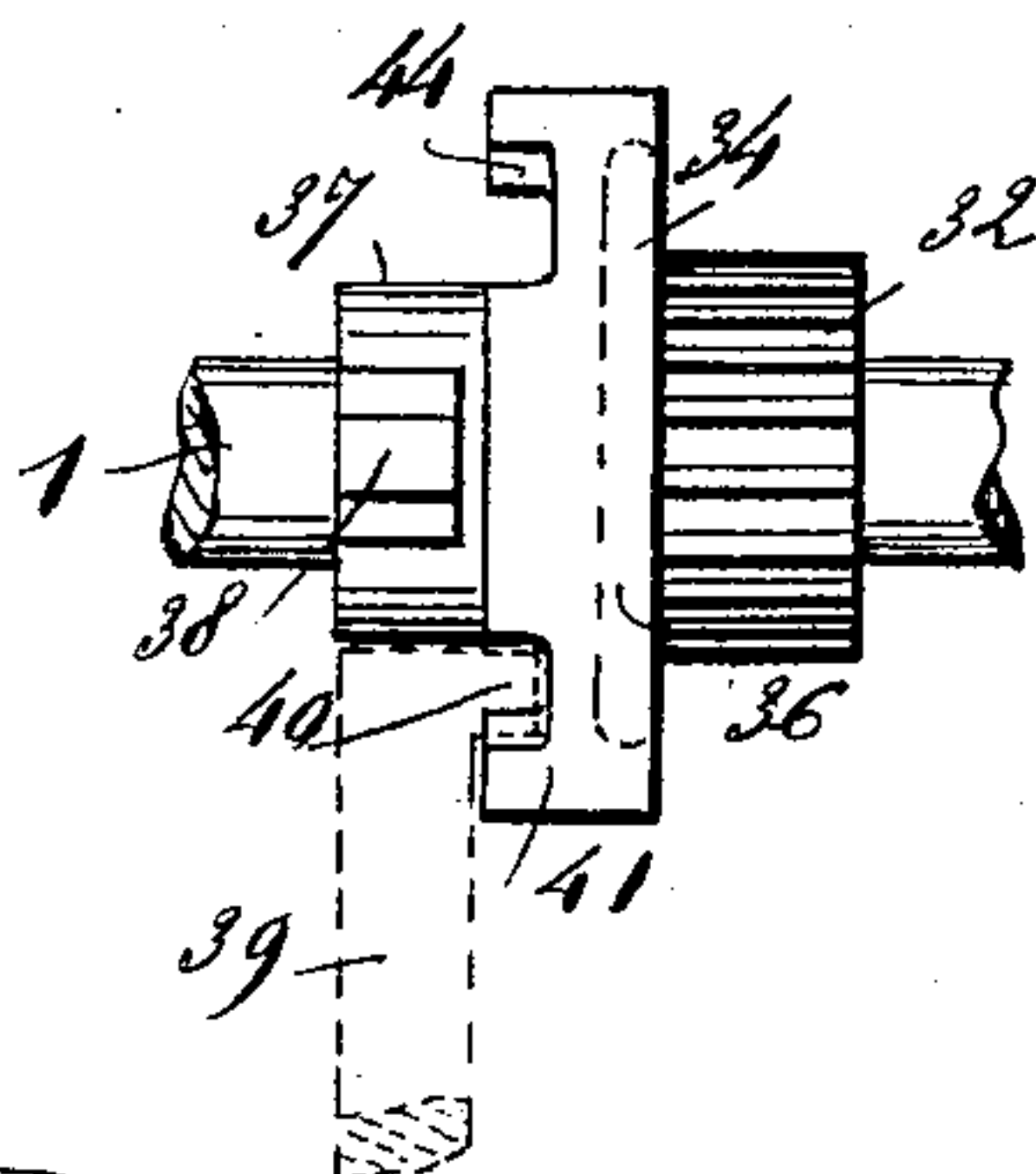
MACHINE FOR WIRING CORKS IN BOTTLES.

No. 390,742.

Patented Oct. 9, 1888.



*Fig. 24*



WITNESSES:

*C. Neveu*  
*C. Sedgwick*

INVENTOR.

*B. Adriance*  
*Munn & Co*

BY

ATTORNEY.

(No Model.)

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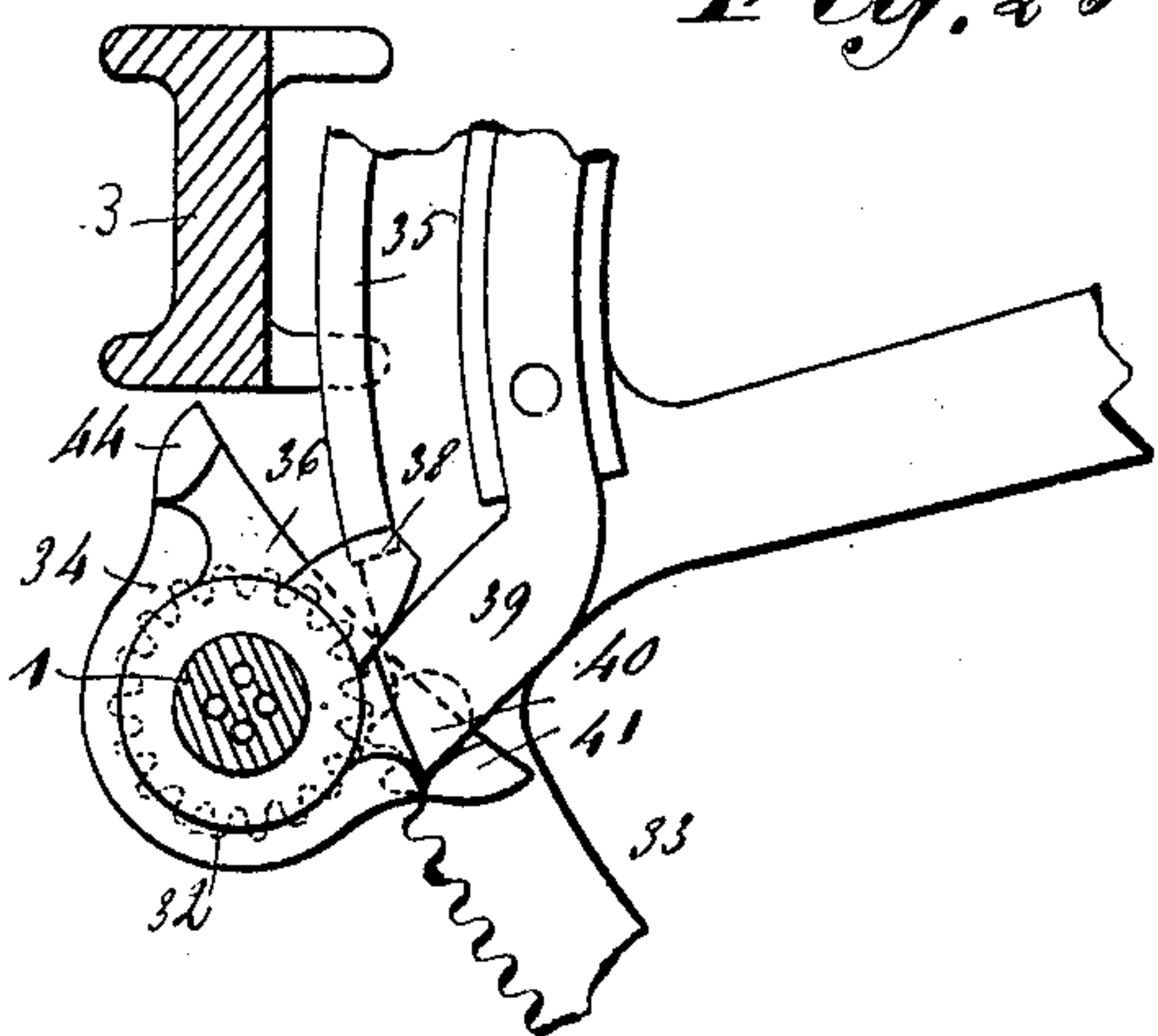
B. ADRIANCE.

MACHINE FOR WIRING CORKS IN BOTTLES.

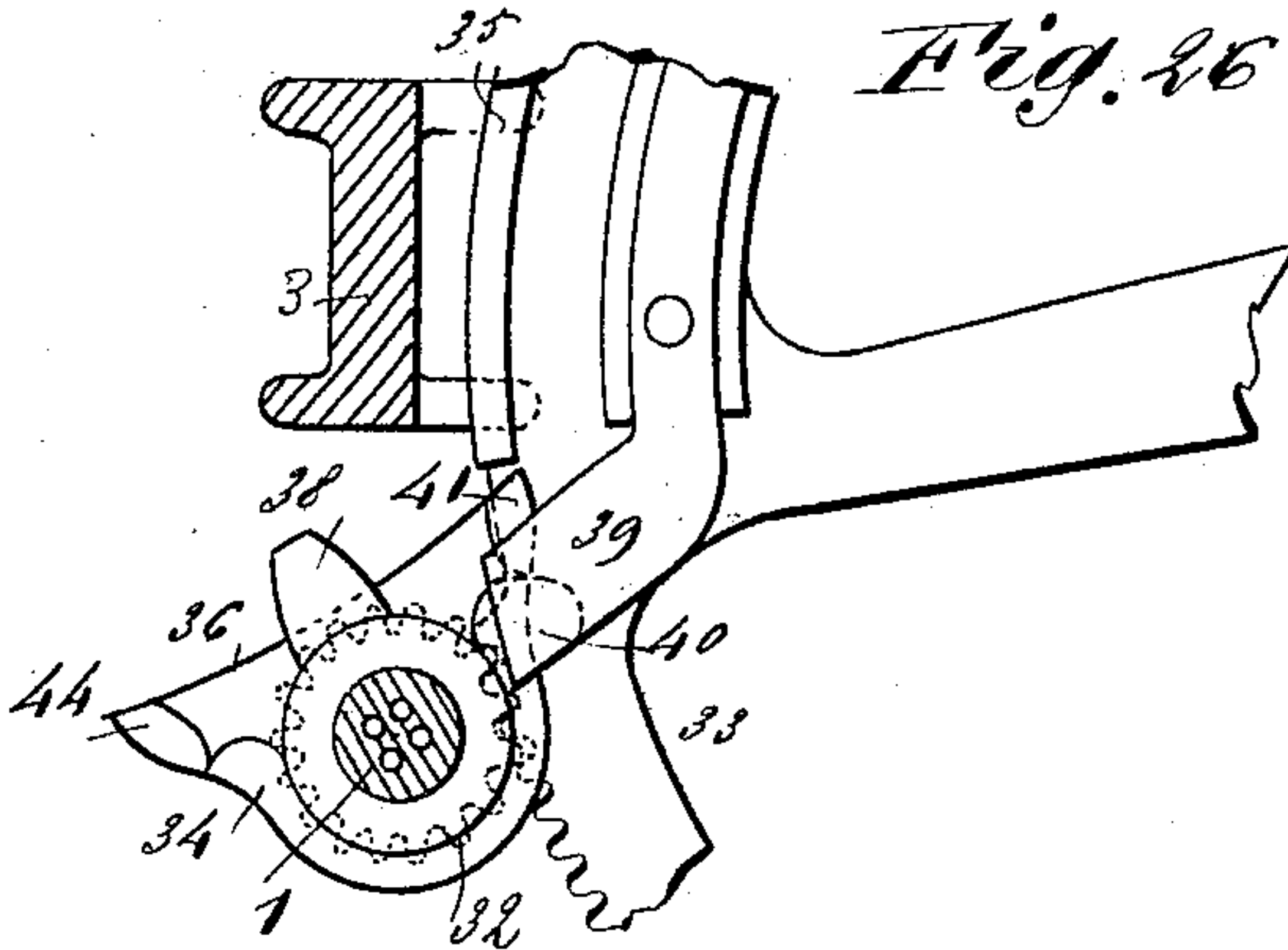
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Patented Oct. 9, 1888.

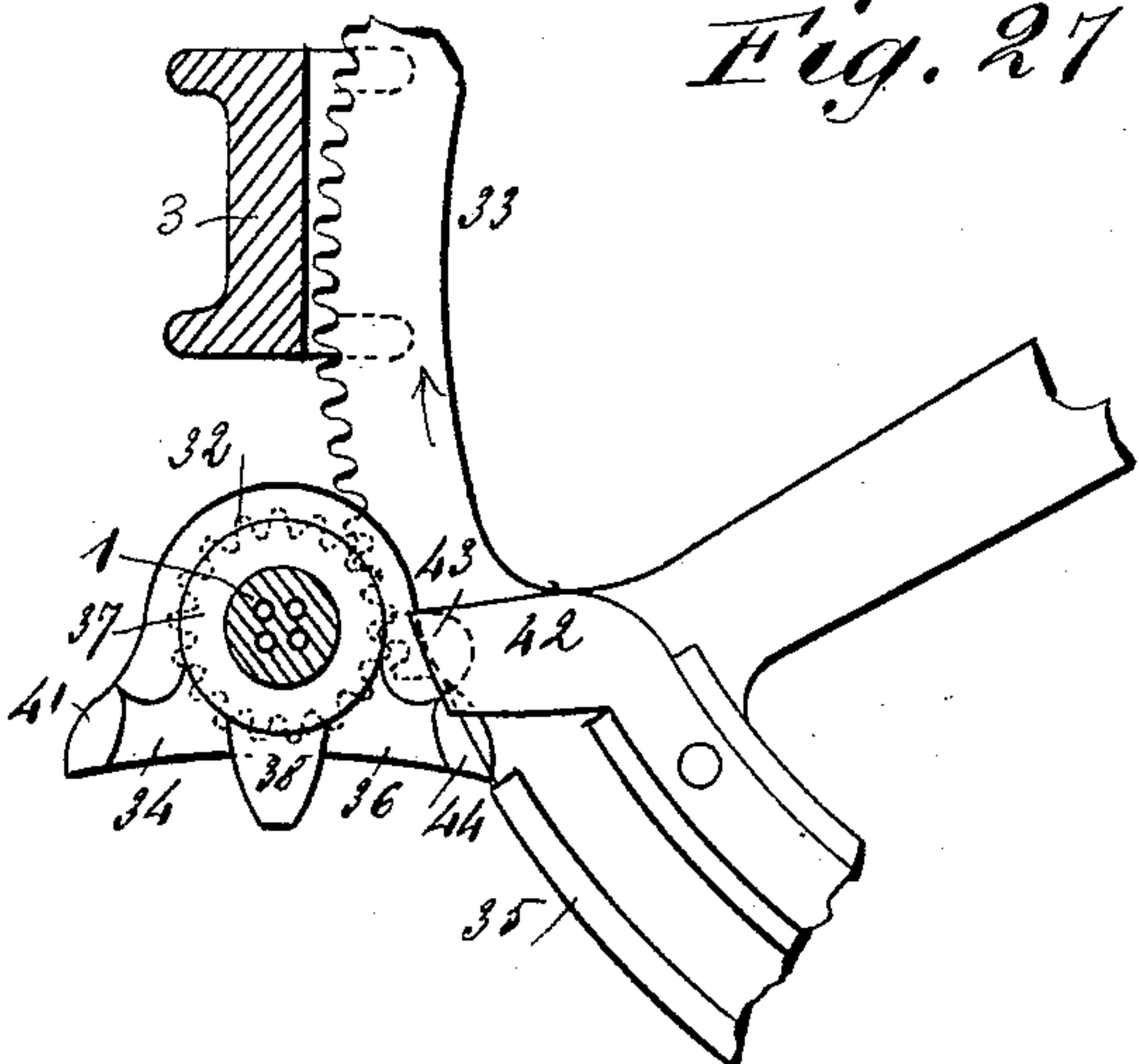
*Fig. 25*



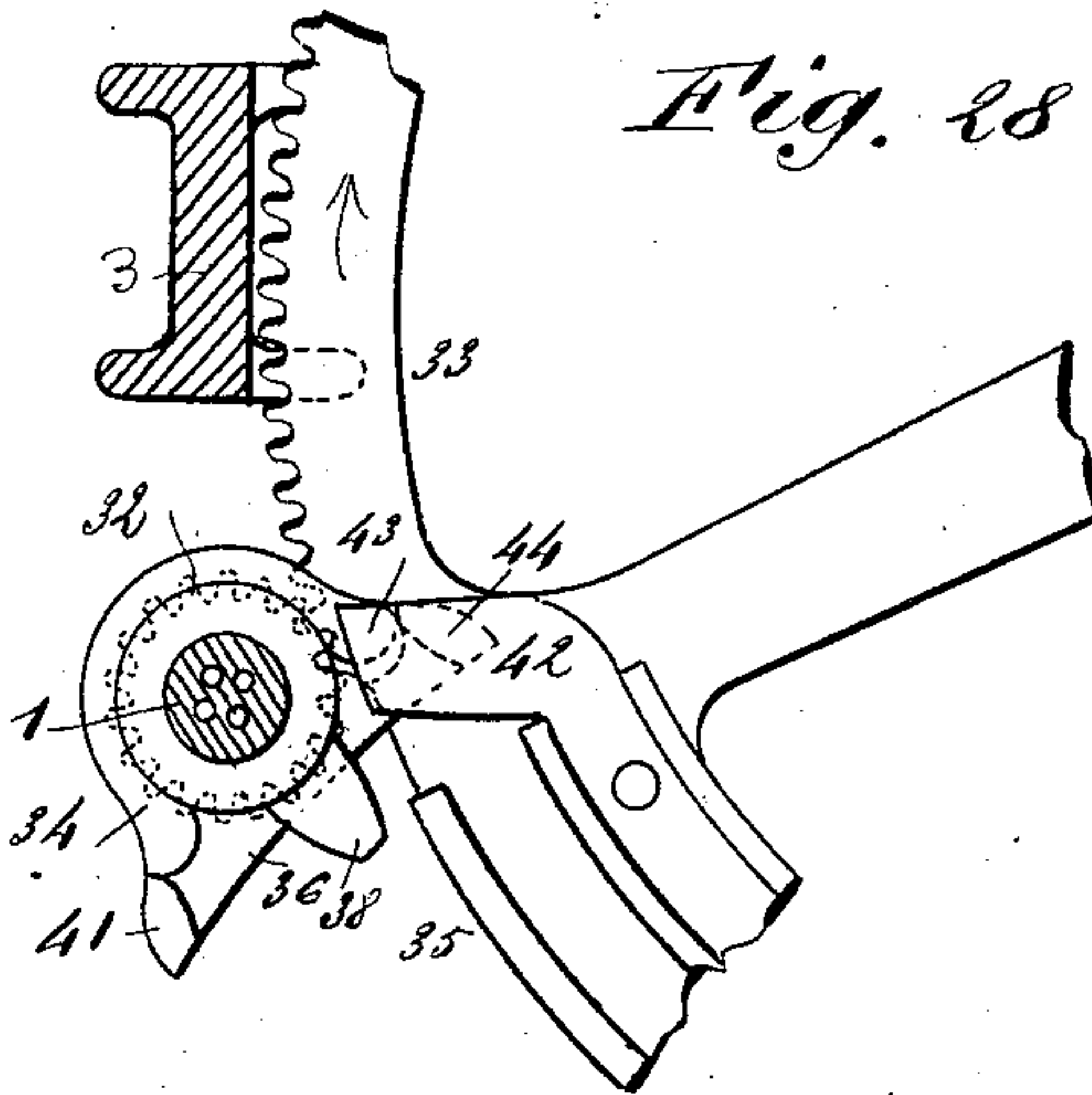
*Fig. 26*



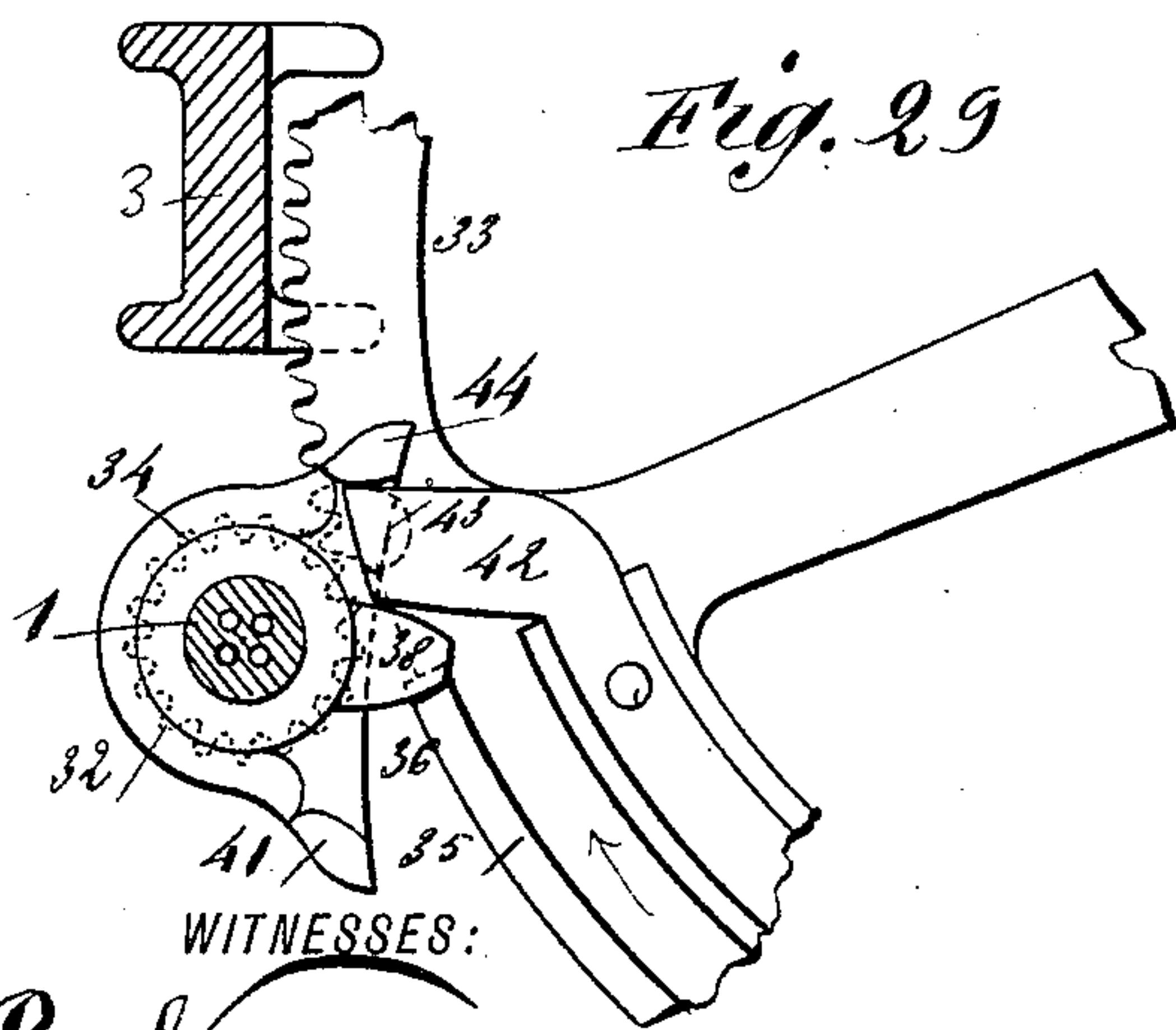
*Fig. 27*



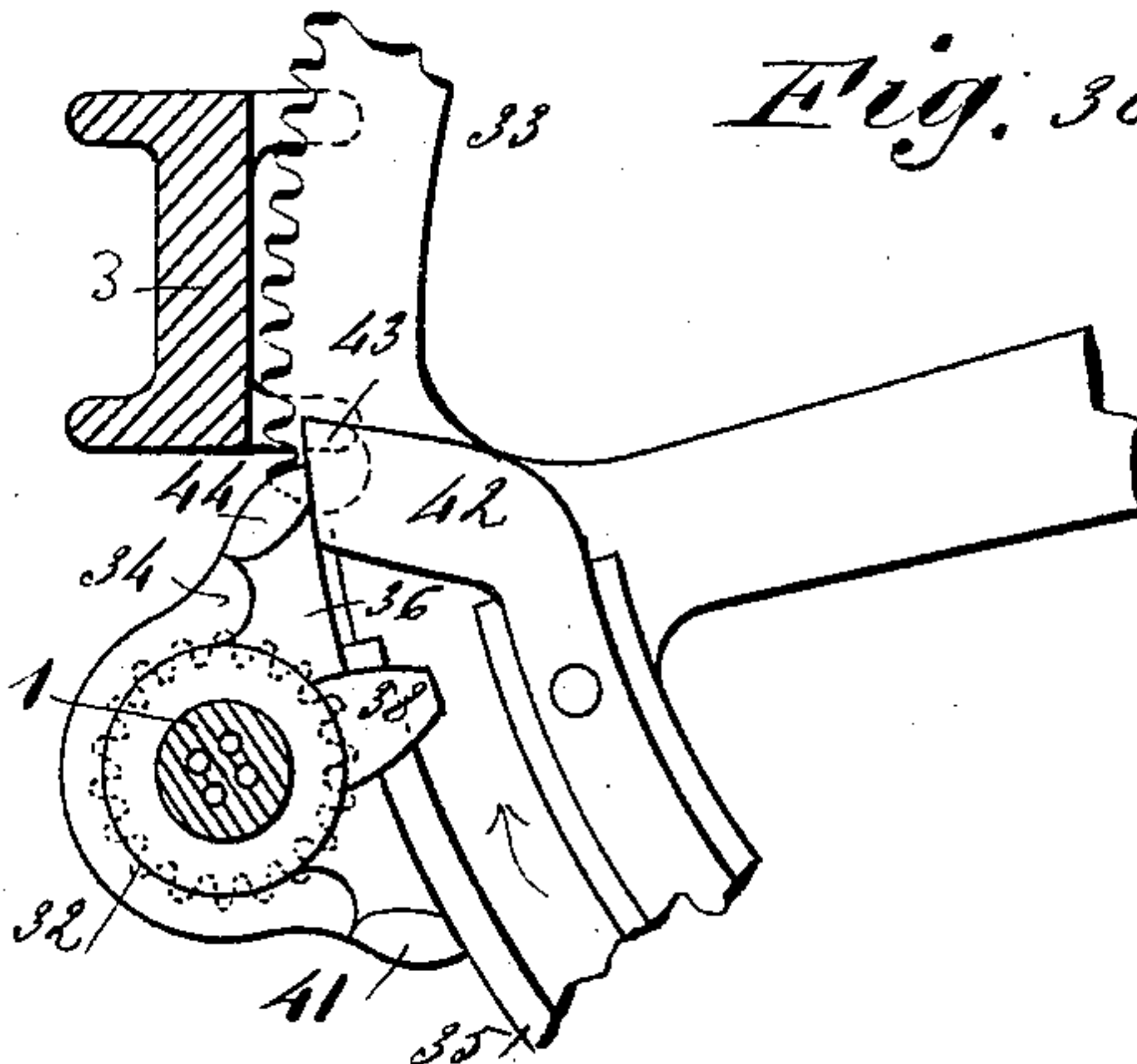
*Fig. 28*



*Fig. 29*



*Fig. 30*



WITNESSES:

*C. Swann*  
*Co. Sedgwick*

INVENTOR,

*B. Adriance*

BY

*Munn & Co*

ATTORNEY.



# UNITED STATES PATENT OFFICE.

BENJAMIN ADRIANCE, OF BROOKLYN, ASSIGNOR TO THE ABBOTT MANUFACTURING COMPANY, OF NEW YORK, N. Y.

## MACHINE FOR WIRING CORKS IN BOTTLES.

SPECIFICATION forming part of Letters Patent No. 390,742, dated October 9, 1888.

Application filed June 13, 1888. Serial No. 276,997. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN ADRIANCE, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machine for Wiring Corks in Bottles, of which the following is a full, clear, and exact description.

This invention relates to certain improvements upon the machine illustrated, described, and claimed in Letters Patent No. 364,202, granted to me June 7, 1887, and in the patents named in said patent.

My present invention consists, principally, in means for imparting to the intermittently-rotated spindle a varying velocity of rotation—an accelerated motion at the start and a retarded motion at the finish—thereby avoiding shock and strain upon the mechanism carried by the spindle.

The invention also consists in means for locking the spindle against axial movement while it is being moved longitudinally, and of means for operating the twisting-pliers and clamping or tension jaws for holding and releasing the wires.

The invention also consists in the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of my improved machine for wiring corks in bottles. Fig. 2 is a plan view of the same. Fig. 3 is a front elevation, a part of the frame being broken away. Fig. 4 is a sectional elevation taken on the line  $x x$  of Fig. 1. Fig. 5 is a sectional view on the line  $y y$  of Fig. 1. Fig. 6 is a detail plan view of a portion of the main power gear, main shaft, and the automatic lock or clutch for stopping the machine after each revolution of the main shaft. Fig. 7 is an enlarged front elevation showing the twisting-pliers, the front nippers, the outer bender, one wire-cutter, and the operating-cams, the nippers being shown in position grasping the outer twist of the wires. Fig. 8 is a side elevation of the same, showing a portion of the spindle, the tension clamps or jaws, and a bottle in position between the twisting-pliers. Fig. 9 is a plan

view of the parts shown in Fig. 7. Fig. 10 is a side elevation of the nippers holding the outer twist, the wire passed over the cork in the bottle, the twisting-pliers, the tension jaws or clamps, and a portion of the spindle. Fig. 11 is a sectional elevation showing the spindle, twisting-pliers, and tension-clamps. Fig. 12 is a top plan view of the same. Fig. 13 is an inverted view of the parts shown in Fig. 12. Fig. 14 is a transverse sectional view on line  $x' x'$  of Fig. 12. Fig. 15 is a similar view on the line  $x'' x''$  of Fig. 12. Fig. 16 is a front elevation of the parts shown in Fig. 7, the nippers being elevated to the position they assume at the time the outer bending device descends to bend down the outer twist close to the bottle. Fig. 17 is a similar view of the same, the outer bender being at its lowermost position to bend down the outer twist. Fig. 18 is a similar view showing the relative position of the nippers, outer bender, and twisting-pliers at the time the latter are brought forward to position to receive the bottle. Fig. 19 is an enlarged sectional elevation on line  $y' y'$  of Fig. 2. Fig. 20 is a detail view showing the end of the main frame and socket to receive the neck of the bottle and the cutters in position to sever the wire after the twist is formed. Fig. 21 is a detail sectional plan view showing the socket for the neck of the bottle, the outer bender, and the cutters, and showing, also, the neck of a bottle and the wire twisted thereon. Fig. 22 is a plan view of the mutilated gear for intermittently revolving the spindle, the flange and shoe for locking said spindle while at rest, and also the arms attached to the mutilated gear for slowly starting and stopping the spindle. Fig. 23 is a detail side view of the same, the spindle, a part of the main frame and main shaft being shown in section. Fig. 24 is a front elevation of the shoe and a portion of the spindle. Figs. 25 and 26 are detailed views of the mutilated gear and parts attached thereto, and the spindle and the shoe secured thereon, showing the different positions of the shoe in starting the revolution of the spindle; and Figs. 27, 28, 29, and 30 are similar views of the same parts, showing the positions of the shoe in stopping and locking the spindle.

Referring to Fig. 1 of the drawings, 1 repre-



sents the spindle held in bearings 2 2 on the main frame 3. Placed upon the spindle 1 is the sleeve 4, held from movement on the spindle by the collars 5 5, secured to the spindle by set-screws. At one side of the said sleeve 4 is formed the stud 6, (see Fig. 2,) which enters the groove of the large cam 7. An arm 8, Fig. 1, is formed at the lower side of the said sleeve 4, which enters a slot in the table 9 (see Fig. 5) to act as a stay to prevent the sleeve from turning with the spindle and cam 7. The said large cam 7 is secured to the main shaft 10, revolved from the power-shaft 11 by beveled gear-wheels 12 and 13, and said cam 7 is formed with a lateral curve, 14, for moving the spindle 1 longitudinally. The said spindle 1 is formed with four longitudinal passages, 15, (see Fig. 10,) through which the wires *w w'* pass, and at its front end it is made hollow back for a short distance, as shown at 17, Fig. 11, and in this hollow portion of the spindle four tubes, 18, are secured with their passages coinciding with the passages 15, so that the wires pass from passages 15 directly through the tubes 18. In the annular space surrounding the tubes 18 is fitted loosely the short tube 19, (see Fig. 11,) to which the clamping or tension jaws 20 21 are hinged, and which operate as hereinafter described.

22 22 are the twisting jaws or pliers for carrying the side wires, *w w'*, around the neck of the bottle, and are pivoted between the cheek pieces or projections 23, made a part of the collar 24, which is screwed to the front end of the spindle 1, as shown in Fig. 11.

The construction of the clamping-jaws 20 21 and the twisting-pliers 22 22, and their operation with each other and with the other parts of the machine, will be hereinafter fully described.

25 25 represent four spools of wire held in the spool-frame 26, which is provided at each end with a gudgeon, 27 28, journaled in the bearings 29. A pinion, 30, is attached to the gudgeon 28, which meshes with the gear-wheel 31 on shaft 10 for slowly and continuously revolving the spool-frame 26 while the parts are in operation, to prevent twisting of the wire between the spindle 1 and the said spool-frame. The gudgeon 28 is hollow, and the wires from the spools pass through the same to the spindle 1, each passing through one of the passages 15 in said spindle and one of the tubes 18.

The spindle 1 is revolved intermittently (to turn the jaws 20 21 and twisting pliers 22 22) by means of the pinion 32 and the mutilated gear-wheel 33. The pinion 32 is attached to the spindle 1 by a feather and is loosely applied to permit the longitudinal movement of the spindle, and when the spindle 1 and pinion 32 are at rest they are rigidly held from turning by the holding block or shoe 34 and the semi-circular rim or flange 35, attached to or made a part of the mutilated gear-wheel 33. This mutilated gear-wheel, 33, with its said rim 35 and the holding-shoe 34, are clearly shown in Figs. 4

and 25 to 30. From Fig. 4 it will be seen that the cogs of the said mutilated gear-wheel 33 constitute about one-half the circumference of the said wheel, and that the said rim 35 likewise comprises about one-half the circumference of the said wheel and is opposite to the cogs. This figure also shows the curved face 36 of the shoe 34 against the outer curved surface of the rim 35, so that the spindle 1 is held rigidly from turning, while the revolution of the mutilated gear is in no manner interfered with. It is obvious that this holding action will continue while the rim 35 is in contact with the shoe 34. Upon the boss 37 of the holding-shoe 34 is formed the projection or lug 38, which stands in the path of the projection or arm 39, which is attached to or made a part of the mutilated gear 33. The object of the said projection 38 and arm 39 is to act as independent means for revolving the spindle 1 at the interval between the time the rim 35 passes the spindle and the time the first cog of the mutilated wheel 33 comes in contact with the pinion 32. Fig. 25, compared with Figs. 4 and 23, shows the spindle 1 and shoe 34 receiving rotary motion from the projection 38 and arm 39. This rotary motion is slow—the same speed as the mutilated gear 33—and it serves the important purpose of setting the spindle 1 and parts connected thereto at its front end in motion before the rapid revolution produced by the gears begins, thus avoiding all injurious jar and shock which, without this independent slow movement, would ensue, to the damage of the machine. The momentum or sudden forward movement which the spindle 1 might otherwise receive from the stroke or first contact of the arm 39 with the lug 38 is prevented by the projection 40 on the arm 39 (see Fig. 24) and the corresponding projection 41 of the shoe 34. The action of these two projections 40 41 is clearly illustrated in Figs. 25 and 26, wherein it will be seen that the initial movement of the shoe swings the projection 41 of the shoe back of the projection 40, and thus acts to prevent the shoe and spindle from being thrown forward by the stroke of arm 39, which would untine the machine. In this manner it will be seen that the spindle 1 when at rest is positively held by the shoe, and when revolved is acted upon by positive means and is given an accelerated motion in starting.

After the spindle 1 has been rapidly revolved the requisite number of times to cause the parts attached at its front end to twist the wire, it is essential (to prevent jar and injurious shock) that it be brought gradually to a state of rest, in position for the shoe to be held by the rim 35, and for this purpose I attach the arm 42 to the mutilated gear 33. This arm is diametrically opposite to the arm 39, as shown in Fig. 4, and acts upon the opposite end of the shoe 34 to retard it and the spindle after the last cog of the said mutilated gear-wheel 33 leaves the pinion 32. The said arm is formed with the projection 43, (shown



clearly in Fig. 22,) and the shoe 34 is formed with the projection 44. As the last cog leaves the pinion 32, the projection 44 swings partially around the projection 43, as shown in Fig. 28. The first contact checks the momentum of the spindle, and then the upward movement of the projection 43, in contact with the inner curved edge of the projection 44, (indicated in Fig. 29,) slowly turns the shoe 34 and spindle 1 to the position shown in Fig. 30, where the flange 35 again engages with the shoe 34 to firmly hold it and the spindle from turning. While the spindle 1 is thus held by the shoe 34 and flange 35 the twisting-pliers are both held on the same horizontal plane, and the cam 7 at this time moves the spindle forward to carry the tension jaws 20 21 and twisting-pliers 22 22 to the position shown in Figs. 1 and 8, and at this time the machine is thrown out of gear—that is, all of the parts remain at rest except the power-shaft 11, beveled gear-wheels 12 13, and the notched disk or clutch 45, (shown in Figs. 2, 5, and 6,) formed in this instance as a part of the boss 46 of the said beveled gear-wheel 12.

To put the machine in gear, the operator must press down upon the treadle 47, (see Figs 1 and 3,) connected by the rod 48 to the lower arm of the bell-crank lever 49. (See Figs. 5 and 6.) The upper arm of this bell-crank lever 49 is formed into a plate, 50, which serves to automatically disengage the clutch-lever 51 from the clutch-disk 45 at each revolution. When the said treadle is pressed down, the plate 50 is carried beyond the end of the lever 51, as indicated in dotted lines in Fig. 6, so that the spring 52 will force the opposite end of the lever into engagement with one or the other of the notches of the clutch-disk 45. The sleeve 53, to which the lever 51 is pivoted, is made fast to the shaft 10, so that when said lever engages the clutch-disk the shaft 10, cam 7, and mutilated gear-wheel 33 will make one complete revolution.

As above mentioned, when the last-named parts are at rest the spindle 1 will have been carried forward by the lateral curve of the cam 7 to the position shown in Figs. 1 and 8. In this position the tension-jaws 20 21 and twisting-pliers 22 22 will have carried the wires forward and thrust the outer twist, 54, between the outer nippers, 55 56, which are closed by the large cams 57 58 on shaft 10 upon the said twist 54 to hold the same, as shown in Figs. 7, 8, and 10. The outer ends of the twisting-pliers 22 22 are curved to compass the neck of a bottle, and are formed with the flaring flanges 59 59, to facilitate the insertion of the neck of a bottle up between the curved portions of the said pliers, as shown in Fig. 8, and the said flanges are each formed with a guide-lug, 60, and pointed guide-eye 61 for the side wires, *w w*. The side wires, *w w*, reach from the jaws 20 21 to the guide-eyes 61 61, so that when the neck of a bottle is thrust up between the pliers 22 22 the central wires, *w' w'*, will be drawn across the top of the

cork, as shown clearly in Figs. 8, 10, and 16, while the side wires, *w w*, will be held by the curved portions of the pliers 22 22 around the neck of the bottle. After the neck of the bottle has been thrust up between the pliers 22 22 it is held by the fixed socket 62, which acts as an abutment to retain the bottle against the strain upon the wires in twisting. The bottle being thus inserted, the operator presses down upon the treadle 47 and puts the machine in gear. The cam 7 now moves the spindle 1 backward, which carries the pliers 22 22 backward. In this movement the said pliers 22 22 open outward from contact with the neck of the bottle, and are then closed on the opposite side of the neck by the action of the spring 63. This closed position of the pliers 22 22 is illustrated in Figs. 10, 11, 12, and 13, which represent the anti-friction rollers 66 66 of the extensions 65 65 of the pliers resting against the cams or inclines 64 64. The tension-jaws 20 and 21 will now also be closed upon the wires by the cams or inclines 68 68. (Shown clearly in Figs. 10 11.) When thus closed by the said spring 63, the points of the pliers 22 22 come close to and in contact with the front ends of the jaws 20 21, so that the further backward movement of the spindle 1 and the pliers 22 22 forces back also the jaws 20 and 21, all of said pliers and jaws now being a short distance from the neck of the bottle, as shown in Fig. 10. As the said jaws recede, they are closed snugly upon the wires by their rear ends being spread by riding back upon the inclines or cams 64 64 and 68 68. (Shown in Figs. 8, 10, 11, 12, and 13.) The pliers 22 22 are formed with the rear extensions, 65 65, above mentioned, having anti-friction rollers 66. The jaw 21 is provided at its rear end with the anti-friction roller 69, and with a side projection, 70, to engage with the hook 71, Fig. 8, for the purposes hereinafter described. The jaw 20 is made in two parts—that is to say, it is provided with the plate 72, secured to the main part of the jaw by the rivet 73. (See Fig. 8.) The rear end of the plate 72 is provided with the anti friction roller 74, and said jaw is acted on by a coiled spring, 75, placed on the rod 76, attached rigidly to the jaw and passing up through the plate 72. A thumb-nut, 77, is placed on rod 76, by which the pressure of the spring 75 may be regulated for regulating the pressure of the jaw upon the wires when the jaws and pliers are closed by the cams or inclines 64 68, as indicated in Fig. 10. The said cams or inclines 64 68 are made integral with the sleeve 78, placed loosely upon the front end of the spindle 1. This sleeve is connected by the arm 79 to the rod 80, (see Fig. 1,) held in bearings in the plates 81 81. Upon this rod is placed the collar 82 and coiled spring 83, which acts to constantly force the rod 80, arm 79, and sleeve 78 backward as far as the arm 79 and sleeve 78 will permit, the same bringing up against the bearing 2.

84 represents a bell-crank catch or dog piv-



oted to the arm 8 of the sleeve 4. When the spindle 1 is moved backward by the cam 7 to the position indicated in dotted lines, Fig. 1, the said catch 84 engages with the collar 82, so that when the spindle 1 is moved forward the rod 80, arm 79, and sleeve 78 will also be moved forward until the lower member of the bell-crank catch strikes the lug 85 on the table 9 and releases the collar 82, whereupon the spring 83 will force the said rod, arm, and sleeve 78 back to the position shown in full lines in Fig. 1. From this figure and Fig. 8 it will be seen that the pliers 22 stand in front of the jaws 20 and 21, so that the latter will not interfere with the insertion of the bottle. When the pliers and jaws and sleeve 78 are in the position shown in Fig. 12, the points of all of the jaws and pliers are clustered together and are pressed snugly upon the wires by the cams or inclines 64 68. It is in this latter position that the jaws are forced forward to draw the wires forward and insert the front twist, 54, between the nippers 55 56, and to keep the jaws and pliers pressing upon the wires to thus draw them forward is the purpose of causing the sleeve 78 and its cams or inclines to move forward with the jaws. Otherwise the jaws would release the wires at the wrong time. The front twist, 54, being inserted between the nippers 55 56 and the nippers closed upon the twist, the necessity for the pressure of the jaws upon the wires no longer exists; but, on the contrary, the wire should be free to furnish the necessary slack to draw around the neck of the bottle and over the cork, and the jaws 20 21 must be drawn back somewhat from the front nippers out of the way of the neck of the bottle. The stud 85 is therefore arranged in such position that as soon as the nippers 55 56 are closed upon the front twist it will trip the catch 84 and release the rod 80, whereupon spring 83 will force back the said rod, arm 79, and sleeve 78, thus withdrawing the inclines or cams thereof from under the rear ends of the pliers and jaws, and in its backward movement the above-mentioned hook 71, which is a part of the sleeve 78, strikes the projection 70 (see Fig. 8) and draws the jaws 20 21 backward from a position close to the nippers 55 56 back to the position shown in Figs. 1 and 8.

Now when the bottle is inserted and the machine started the pliers 22 22 are drawn back, carrying the side wires, *w*, around the neck of the bottle until the points of the pliers 22 strike the points of the jaws 20 21, as shown in Fig. 11. Then the pliers and jaws move back together to the position shown in Fig. 10, their rear ends riding upon the cams or inclines, which force outward their rear ends and close their front ends firmly upon the wires. At this position the spindle is started in its revolution, first by the coaction of the shoe 34 and arm 39 and then by the cog-teeth of the mutilated gear-wheel 33 and pinion 32. The spindle 1 and jaws 20 21 under ordinary circumstances will be given five complete revolutions, when

they will be brought slowly to rest and held by the shoe 34, flange 35, and arm 39, as above described. The pliers and jaws will then occupy the position shown in Fig. 10, with that portion of the wire between the jaws and the bottle tightly twisted, closing the wire snugly up to the neck of the bottle and over the cork, and forming a twist a half-inch or more in length. This twist is now to be cut previous to the next forward movement of the spindle, pliers, and jaws for wiring another bottle. This cutting forms the front twist, 54, and the inner stub-twist, 86. For thus cutting the twisted wire I employ the two oppositely-arranged knives 87 88. (See Figs. 7, 16, 18, 20, and 21.) The knife 87 is attached to the lower arm or extension, 89, of the curved knife lever or stock 90, which is fulcrumed on the shaft 91, and is operated by the cam 92 on the main shaft 10, Fig. 7, so that when the upper end of the said lever or stock 90 is elevated by the said cam to the position shown in Fig. 17 the said knife 87 will be brought down to the twisted wire, as shown in Fig. 21.

The knife 88 is carried by the extension or lower arm, 93, of the opposite knife lever or stock, 94, also fulcrumed upon the shaft 91. The extension or arm 93 is made a part of the side arm, 95, which forms the front fulcrum of the said knife lever or stock 94, as shown in Figs. 9 and 18. The outer end of said knife lever or stock is depressed by the cam 96 on main shaft 10 at the same time the upper knife-stock is elevated by the cam 92, so as to bring the knife 88 in contact with the twisted wire opposite to the knife 87 and sever the wire. The two knives are by preference notched to be more effective in cutting, as illustrated in Fig. 20.

The knife 88, besides serving to cut the wire, also serves to bend down the inner twist next to the neck of the bottle. For this purpose said knife is held in the rotating block or tumbler 97, journaled on a stud, 98. (See Fig. 21.) This tumbler is formed with three projections, 99 100 101. Projection 100 is acted upon by a spring, 102, which normally holds the knife 88 in the position shown in full lines in Fig. 21. The projection 101 serves as a stop to limit the rearward movement of the said tumbler. The projection 99 is arranged above the knife 88, to strike against the outer surface of the fixed socket 62, which receives the neck of the bottle, as shown in Fig. 21. Just at the time the twisted wire is severed the said projection 99 strikes the outer surface of the said socket and swings the said tumbler and the knife 88 toward the neck of the bottle, as shown in dotted lines in Fig. 21, thus bending the inner twist down to the bottle. This done, the cams 92 96 pass the outer ends of the knife levers or stocks 90 94, which are returned for another operation by the springs 103, which are attached to the levers, as shown in Fig. 19.

The knife lever or stock 90 is formed with a side extension, 104, (shown clearly in Figs. 7 and 8,) and this extension is formed with the



bearing or pivot 105, on which the outside bender, 106, is pivoted for bending down the outer twist, 54, as shown in Fig. 21. The said bender is formed with the finger 107 in front of its pivot 105, and with the cavity 108 on the opposite side and back of the pivot 105. In this cavity is placed the spring 109 and the plunger 110, which is forced outward by the said spring. The outer end of the plunger is designed to strike the socket 62, in which the neck of the bottle is held, as shown in Fig. 21, so as to furnish a yielding abutment for turning the bender upon its pivot 105 from the position shown in dotted lines to that shown in full lines. The bender, being attached to the knife stock or lever 90, is carried toward the bottle at the same time the knife 87 is carried forward to effect the cutting of the twisted wires, and when the outer end of the plunger 110 strikes the socket 62 the finger 107 is swung toward the bottle and strikes the twist 54 and bends it down, as clearly indicated in Fig. 21. The said bender is drawn back by the spring 111. (See Fig. 7.)

The front nipper, 55, is attached to the bent lever 112, fulcrumed at 113, at the lower end of the plate 114, pivoted to the main frame of the machine on a stud, 115. The opposite nipper, 56, is formed in this instance as a doubly-bent elbow projection, 116, made a part of the lever 117. (See Fig. 8.) This lever 117 is pivoted at one end to the lever 112 by a bolt, 118. The outer ends of the levers 117 and 112 are provided with anti-friction rollers and run in contact, respectively, with the cams 57 and 58, secured upon the shaft 10. These cams are grooved at their edges, and the levers are held in contact with the cams by the spring 119, which connects the two levers. The cams 57 and 58 are of the peripheral outline shown clearly in the drawings, and they act not only to open and close the nippers 55 and 56, to grasp and release the outer twist, but they also serve to lift the said nippers from the position shown in Figs. 7 and 8, where they grasp the wire, to the position shown in Fig. 17, where they stand above the neck of the bottle and outer bender, 106, so as not to interfere with the action of the bender or with the removal of the wired bottle from the machine. Besides these two movements, the said levers 112 and 117 have also an out-and-in swinging movement, produced by plate 114, its pivot 115, and the spring 120, attached to the stationary arm 121 and the side projection, 122, of the plate 114. (Shown clearly in Fig. 19.) The object of this horizontal swinging movement is to facilitate the insertion of the outer twist between the nippers and to avoid strain and breakage from contact with the nippers of the twisting-jaws in their outward movement.

The nippers are lowered from the elevated position shown in Fig. 18 to that shown in Fig. 7 immediately after the outer bender, 106, and the cutting-knife recede, and just before the spindle 1 and twisting-jaws are moved

forward by the cam 7, so that the outer twist will be placed between the nippers, upon which they will then be firmly closed by the cams 57 and 58, for the purposes above described.

Referring to Figs. 1 and 3, 123 represents a vertical shaft at the bottom of the main frame of the machine. On this shaft is placed loosely a sleeve, 124, formed with the projection 125, which reaches through a slot, 126, in the curved guide-frame 127, which holds the bottle from lateral movement while being wired. The sleeve 124 and projection 125 are normally held elevated by a weight or spring, 128, but are depressed by the cam 129 on the shaft 10, (see Figs. 1, 2, 5, and dotted lines Fig. 3,) which cam acts on the arm 130, connected to the lever 131, which lever is connected to the arm 132 of the sleeve 124, as shown in Fig. 1. The spring 128 is connected to the said sleeve 124 by the chain 133, which passes over the pulley 134. The cam 129 passes the arm 130 just at the time the twisting-jaws are in position to receive the neck of the bottle, so that to insert the bottle the attendant has simply to hold it in the frame 127 upon the projection 125, when at the proper time it will be automatically lifted up between said jaws and held in the proper position.

135 and 136, Figs. 1, 2, and 22, represent the two jaws of a brake applied to the shaft 10 to prevent the shaft and parts connected thereto from turning of their own accord after the clutch-bar 51 is disengaged from the clutch-disk 45. The brake-jaw 135 is provided with a rod, 137, which passes through a corresponding orifice in the opposite brake-jaw 136, and on said rod is placed the coiled spring 138, which closes the brake-jaws upon the shaft, and the pressure may be regulated by turning the nut 139 at the outer end of the rod 137 to increase or diminish the pressure of the spring.

In Figs. 10, 12, and 14 the jaws 22 22 are shown provided with arms 140 141. These project from the under surface of the jaws and are bent to form right angles, as shown in Fig. 14, and they interlock or "knuckle" together, as shown in Fig. 13, one being formed with a point, 142, the other being formed with a recess, 143, to receive the point 142, as shown in said Fig. 13. The object of these arms is to always keep the jaws 22 22 in the proper relative position to each other, as they are operated upon their pivots and moved longitudinally.

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

1. In a machine for wiring corks in bottles, the combination, with the longitudinally-movable spindle carrying jaws for holding and twisting the wires, of a mutilated gear and pinion for intermittingly revolving the spindle and jaws, and a shoe and a curved flange operating in connection therewith for holding the spindle from rotating after the mutilated gear passes the pinion, substantially as described.



2. The mutilated gear applied to the main shaft and provided with a concentric flange arranged diametrically opposite to the cog-teeth of the mutilated gear, in combination  
5 with a spindle carrying jaws for holding and twisting the wires, means for moving said spindle longitudinally, a pinion applied to the spindle in line with the mutilated gear, and a shoe applied to the spindle in line with the  
10 said flange for holding the spindle from rotating, substantially as described.

3. The combination, with the spindle carrying jaws for holding and twisting the wires, means for moving said spindle longitudinally,  
15 and a mutilated gear for rotating said spindle intermittently, of the shoe 34, attached to the spindle, and an arm attached to the mutilated gear to act in conjunction with the said shoe for starting the rotation of the spindle at  
20 a slow speed, substantially as described.

4. The longitudinally-movable spindle 1, carrying jaws for holding and twisting the wires, and having pinion 32 and shoe 34, formed with projections at its ends, and with the pro-  
25 jection 38, in combination with the mutilated gear 33, flange 35, and stopping and starting arms 39 42, substantially as described.

5. The shoe 34, attached to the longitudinally-movable spindle 1, carrying jaws for  
30 holding and twisting the wires, said shoe having projections 38, 41, and 44, in combination with the pinion 32, mutilated gear 33, flange 35, and arms 39 and 42, formed with projections to engage with the projections 41 44 of  
35 the said shoe, substantially as described.

6. The intermittently-rotating spindle 1, a cam for moving said spindle longitudinally, and wire-holding jaws at the front end of said spindle, and a spring-actuated sliding rod,  
40 80, means for moving the same longitudinally forward with the spindle, and a trip, 85, for releasing said rod, in combination with the sleeve 78, connected to the said rod and formed with inclines or cams for closing the wire-hold-  
45 ing jaws upon the wires, the said sleeve being carried back by the said rod, so as to release the wires, substantially as described.

7. The combination, with the intermittently-rotated and longitudinally-movable spindle 1  
50 and the wire-holding jaws carried at the front end of said spindle, of the sliding sleeve 78, having cams or inclines formed thereon, the rod 80, arm 79, spring 83, and catch 84, arranged to move the said rod forward with the  
55 forward movement of the spindle, substantially as described.

8. The intermittently-rotated and longitudinally-movable spindle 1, recessed at its front end and provided with the twisting-pliers 22  
60 22, pivoted thereto, in combination with the short tube 19, fitted within the spindle and having the tension-jaws 20 21 pivoted thereto, substantially as described.

9. The spindle 1, recessed at its front end and having the twisting-pliers 22 22 pivoted thereto, and the tube 19, having the tension-  
65 jaws 20 21 pivoted thereto, in combination

with the sliding sleeve 78, formed with inclines or cams for closing the twisting-pliers and tension jaws upon the wires, substantially as de- 70 scribed.

10. The spindle 1, recessed at its front end and having the twisting-pliers 22 22 pivoted thereto, the short tube 19, having the tension-  
75 jaws 20 21 pivoted thereto, and the sliding sleeve 78 placed on the spindle and connected to the tension-jaws, in combination with means, substantially as described, for drawing back the said sleeve and the tension-jaws, substan-  
80 tially as described.

11. The rotating spindle 1, having passages 15 for the wires and recessed at its front end, at 17, and provided in said recess with the tube 19, in combination with the jaws 20 21, piv-  
85 oted to the said tube, the jaws 22 22, attached to the spindle, and means, substantially as described, for moving said tube and jaws longitudinally, substantially as described.

12. The tension-jaws 20 21, pivoted to the tube 19, in combination with the plate 72, piv-  
90 oted to the jaw 20, the rod 76, spring 75, placed therein and acting on plate 72, and the sleeve 78, formed with the incline or cam 68, substantially as described.

13. The spindle 1, provided at its front end 95 with the twisting-pliers 22 22, means, substantially as described and shown, for intermittently revolving said spindle and for moving it longitudinally, in combination with the  
100 sliding tension-jaws 20 21, pivoted upon an independent sliding tube or support, whereby they are adapted to be moved backward independently of the twisting-pliers, substantially as described.

14. The twisting-pliers 22 22, curved at their 105 front ends, and each formed with the curved and outwardly-flaring flange 59, substantially as shown and described.

15. The front nippers, 55, pivoted to a horizontally-swinging plate, 114, in combination 110 with the cams 57 58 for raising and lowering and opening and closing said nippers, substantially as described.

16. The lever 112, pivoted at 113, and provided at its front end with the nipper 55, and 115 the lever 117, formed with arm 116 and nipper 56, and pivoted at its front end to the lever 112, in combination with the cams 57 58, and the spring 119, connecting said levers, substantially as described. 120

17. In a machine for wiring corks in bottles, the plate 114, pivoted to the main frame and acted upon by the spring 120, the lever 112, pivoted to the plate 114, the lever 117, pivoted 125 to the lever 112, the nippers 55 56 and bent arm 116, in combination with the cams 57 58, secured to shaft 10 for operating the nippers to grasp and release the outer twist, substantially as set forth.

18. The longitudinally-moving spindle carry- 130 ing jaws, the shaft 10, provided with a notched clutch-disk, 45, acting with the gear 12, placed loosely upon the said shaft, the sleeve 53, fast on the shaft and provided with the lever 51,



the bell-crank lever 49 50, treadle 47, and connecting-rod 48, in combination with means, substantially as described, for rotating the spindle, and means, substantially as described, 5 for moving it longitudinally, as set forth.

19. The spindle and jaws for holding and twisting the wire, the shaft 10, gear-wheel 12, automatic clutch 45, 49, 50, 51, and 53, treadle, and connecting-rod, in combination with the 10 brake-jaws 135 136 and means, substantially as described, for rotating the spindle and moving it longitudinally, as set forth.

20. The spindle carrying jaws, the slotted guide-plate 127, vertical shaft 123, and sleeve 15 124, having projection 125, in combination with the spring 128 and chain 133 for elevating the sleeve, the lever 131, rod 130, cam 129 on shaft

10, and means, substantially as described, for rotating the spindle and moving it longitudinally, as set forth. 20

21. The knife arm or extension 93 of the knife-lever 94, provided with a stud or pivot, 98, in combination with the rotating block 97, placed on said pivot and carrying the knife 88, and formed with projections, one acted 25 upon by a spring, 102, the other arranged to strike the socket 62 for swinging the knife 88 toward the neck of the bottle for bending down the inner twist, substantially as shown and described.

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