

No. 639,946.

Patented Dec. 26, 1899.

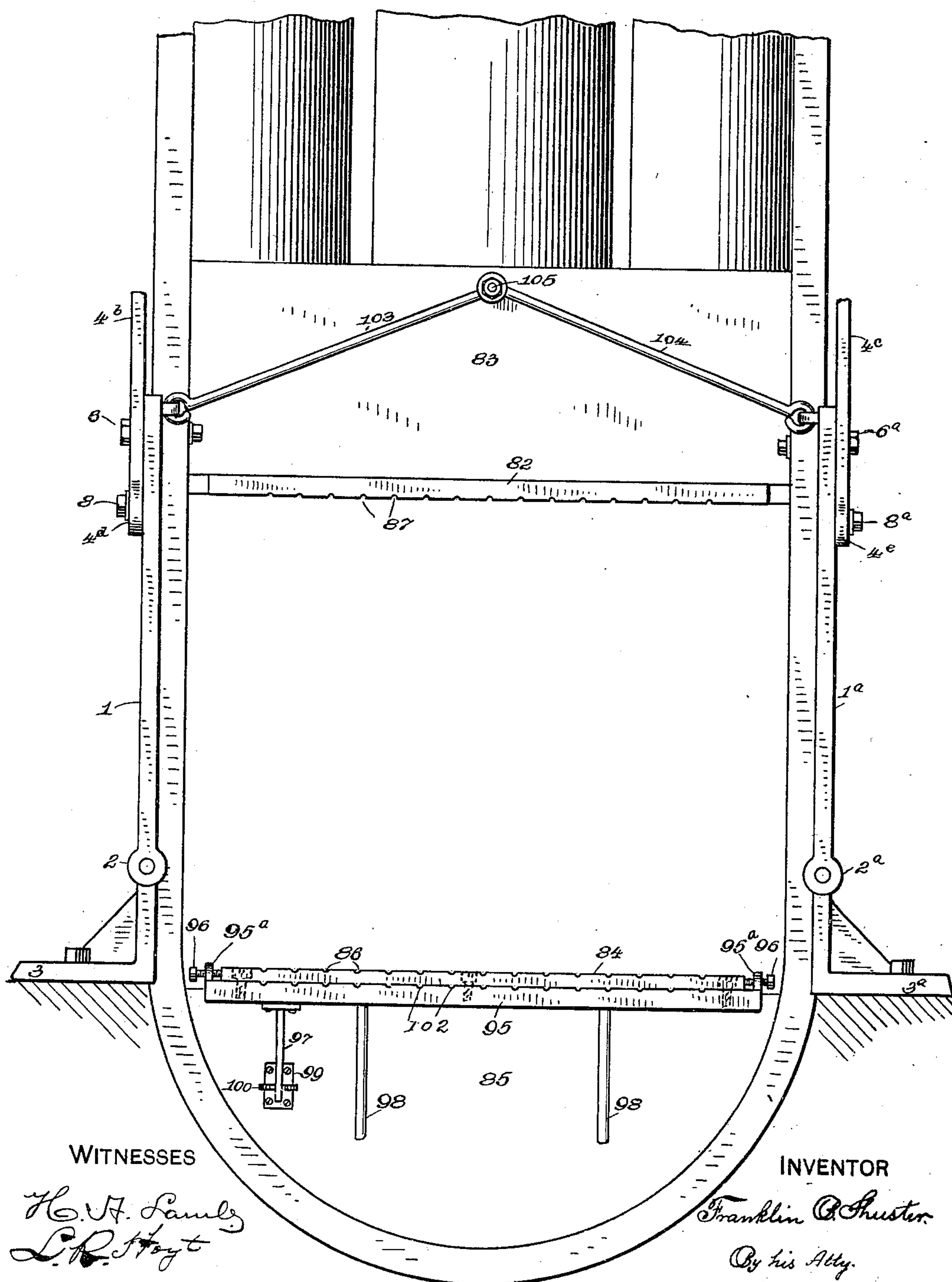
F. B. SHUSTER.
BALE TYING DEVICE FOR COMPRESSORS.

(Application filed Mar. 15, 1899.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1



WITNESSES

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4 Sheets—Sheet 2.

Fing. 2

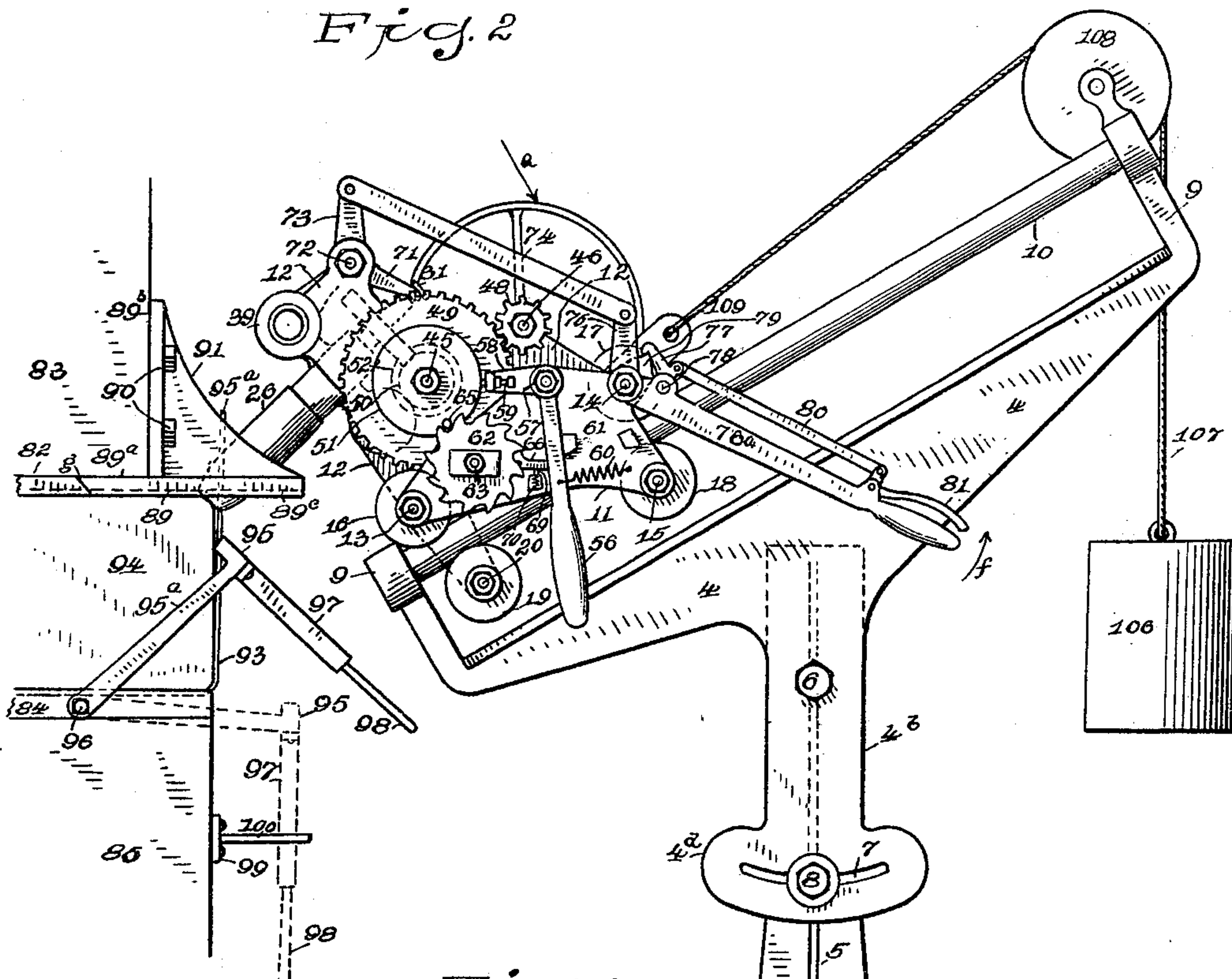


Fig. 3

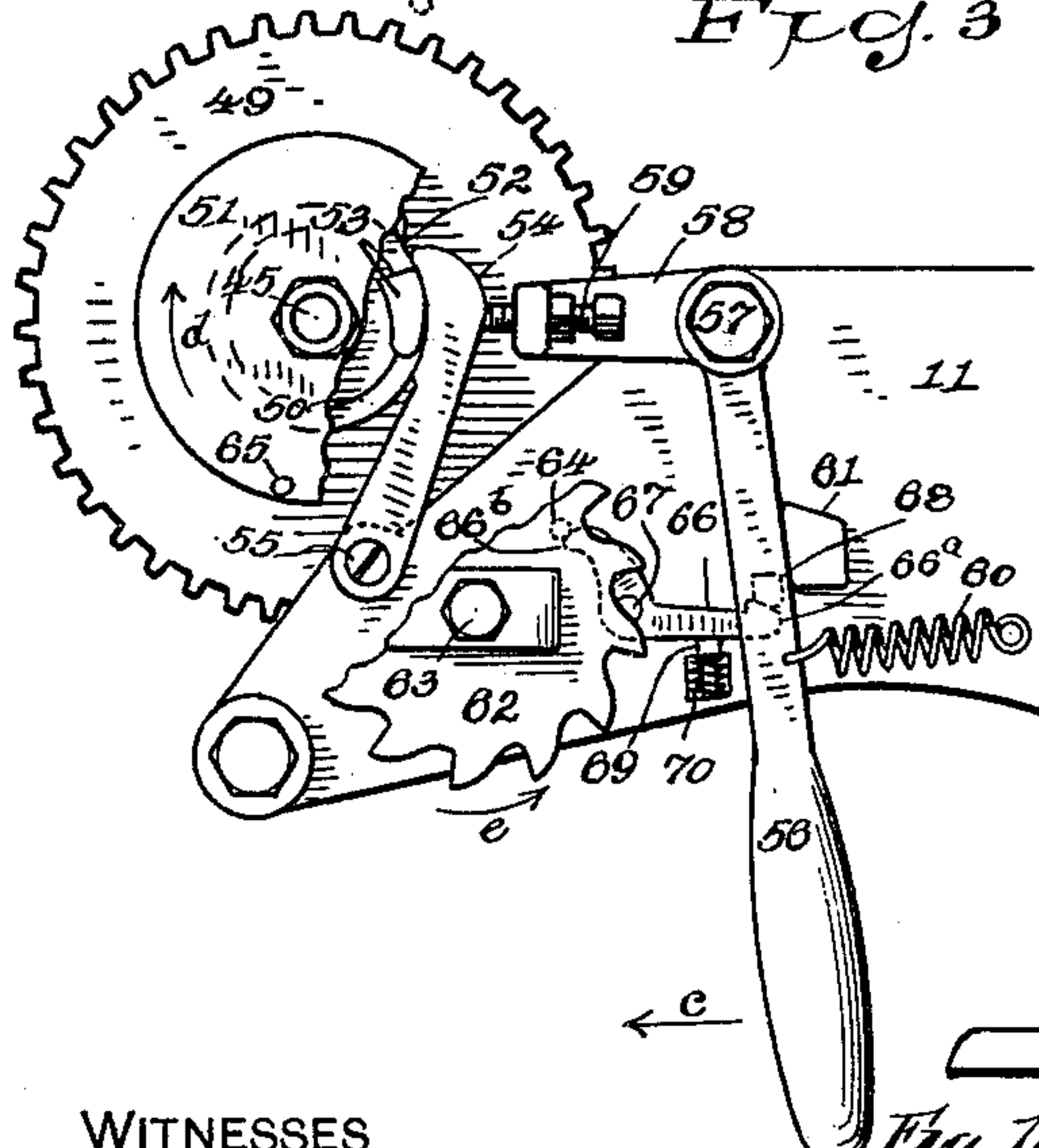
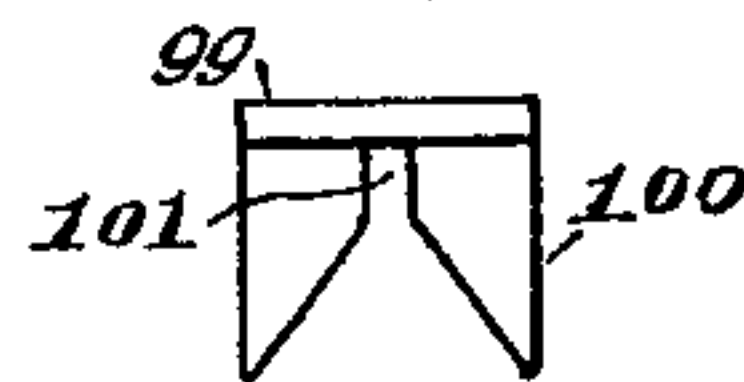


Fig. 4.



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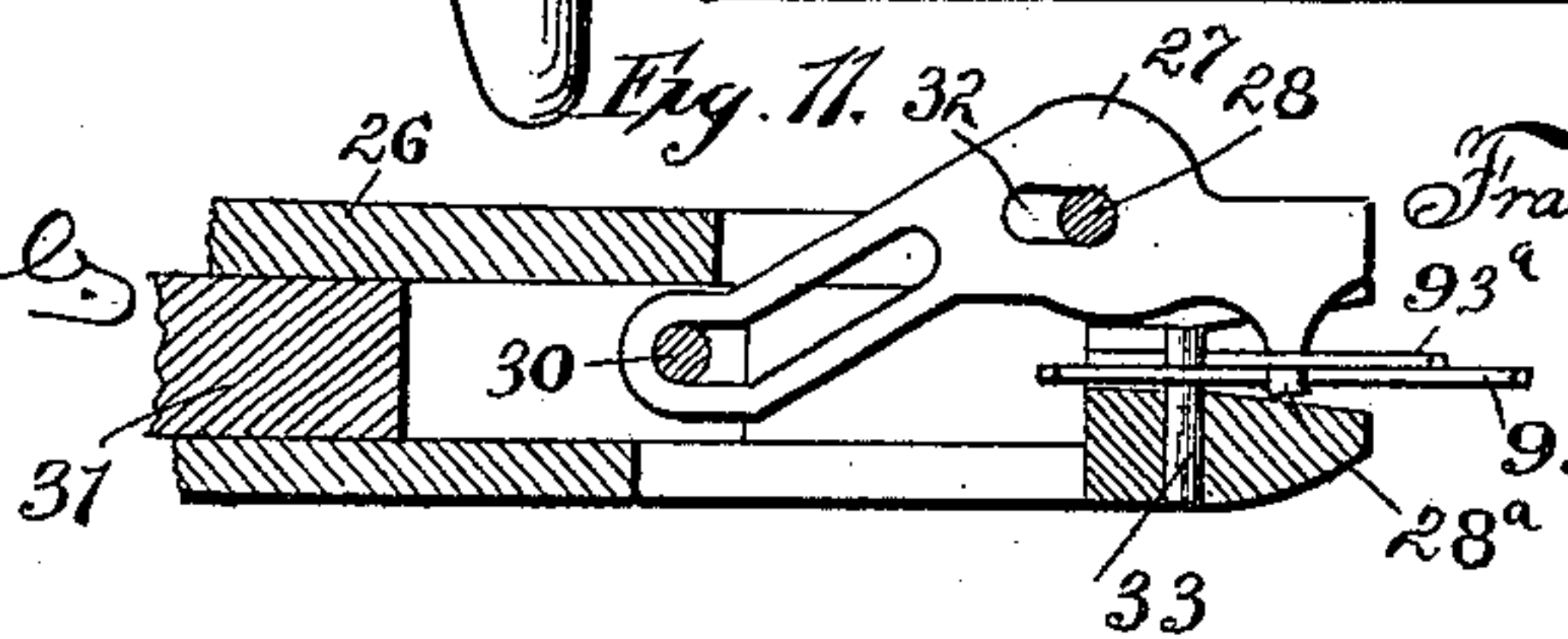
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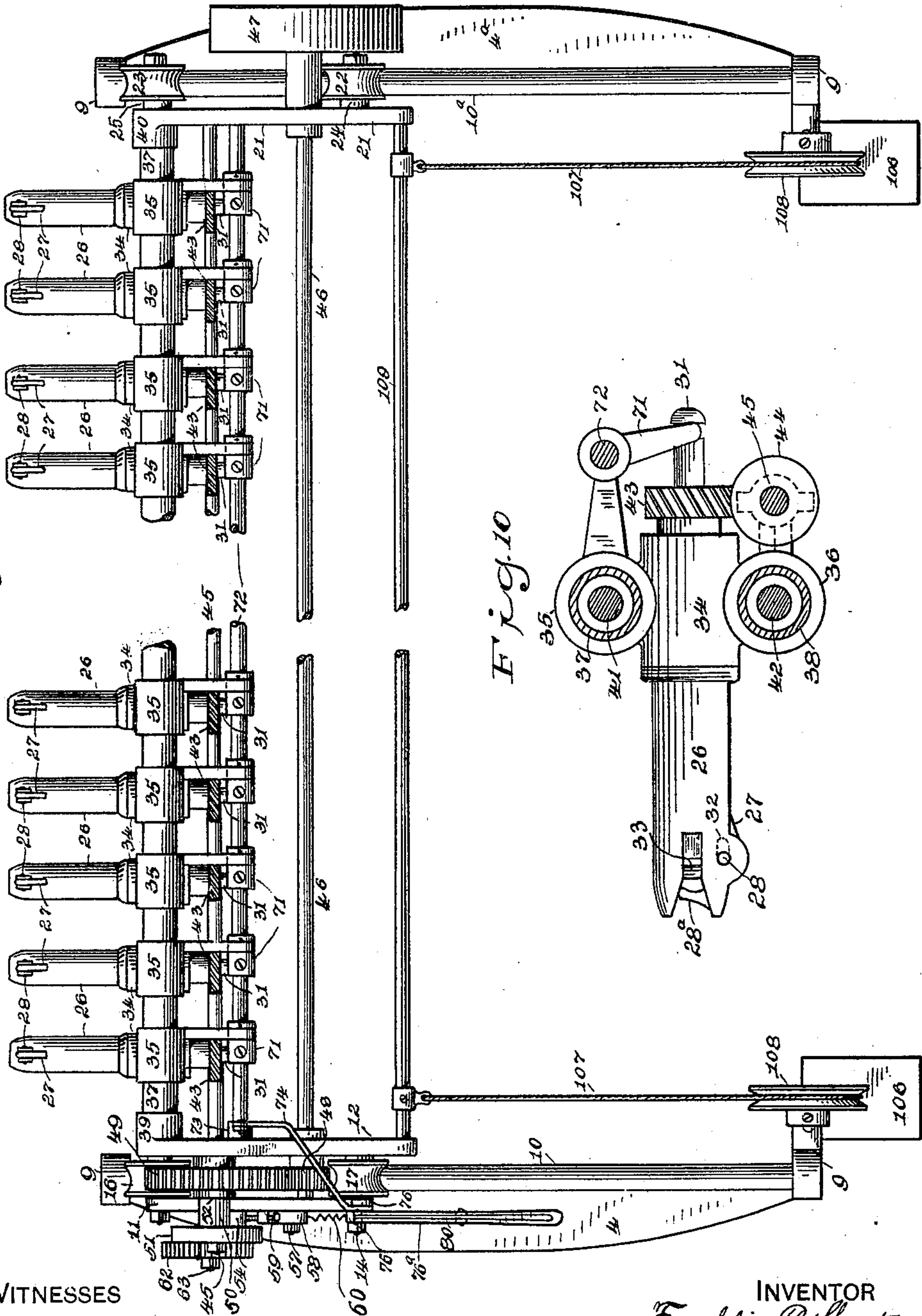
BALE TYING DEVICE FOR COMPRESSORS.

(Application filed Mar. 15, 1899.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 5.



WITNESSES

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BALE TYING DEVICE FOR COMPRESSORS.

(Application filed Mar. 15, 1899.)

(No Model.)

4 Sheets—Sheet 4.

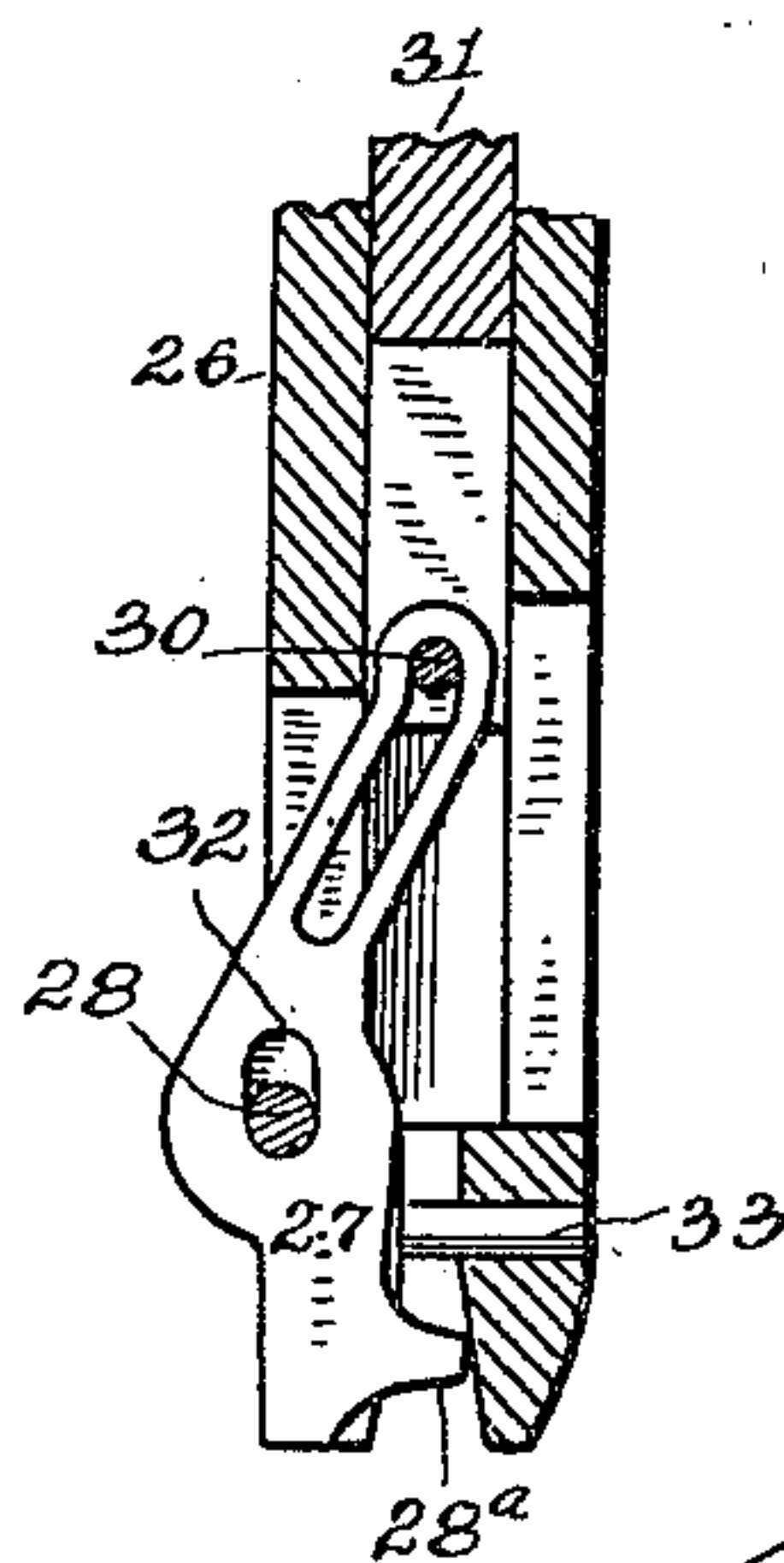
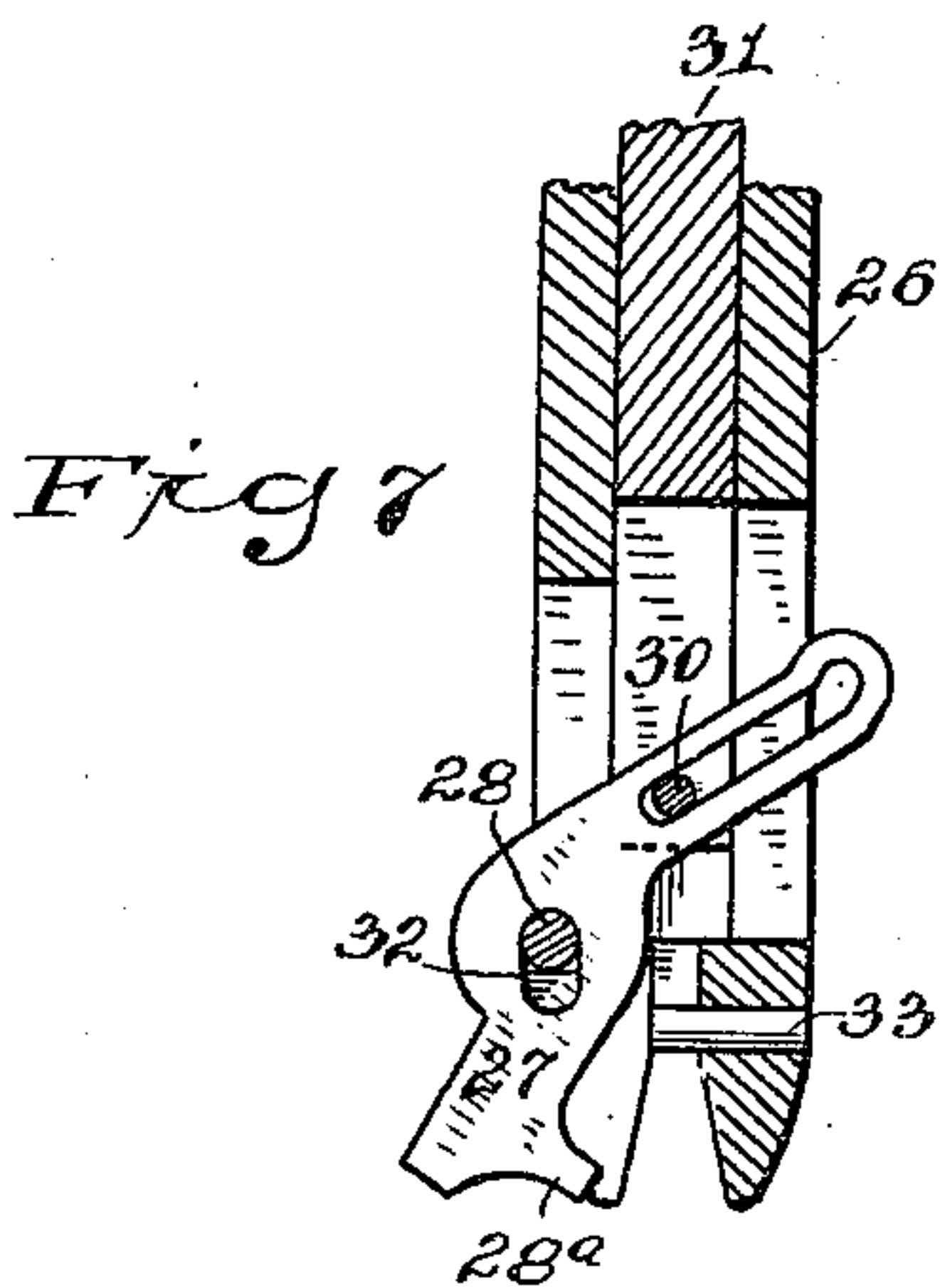
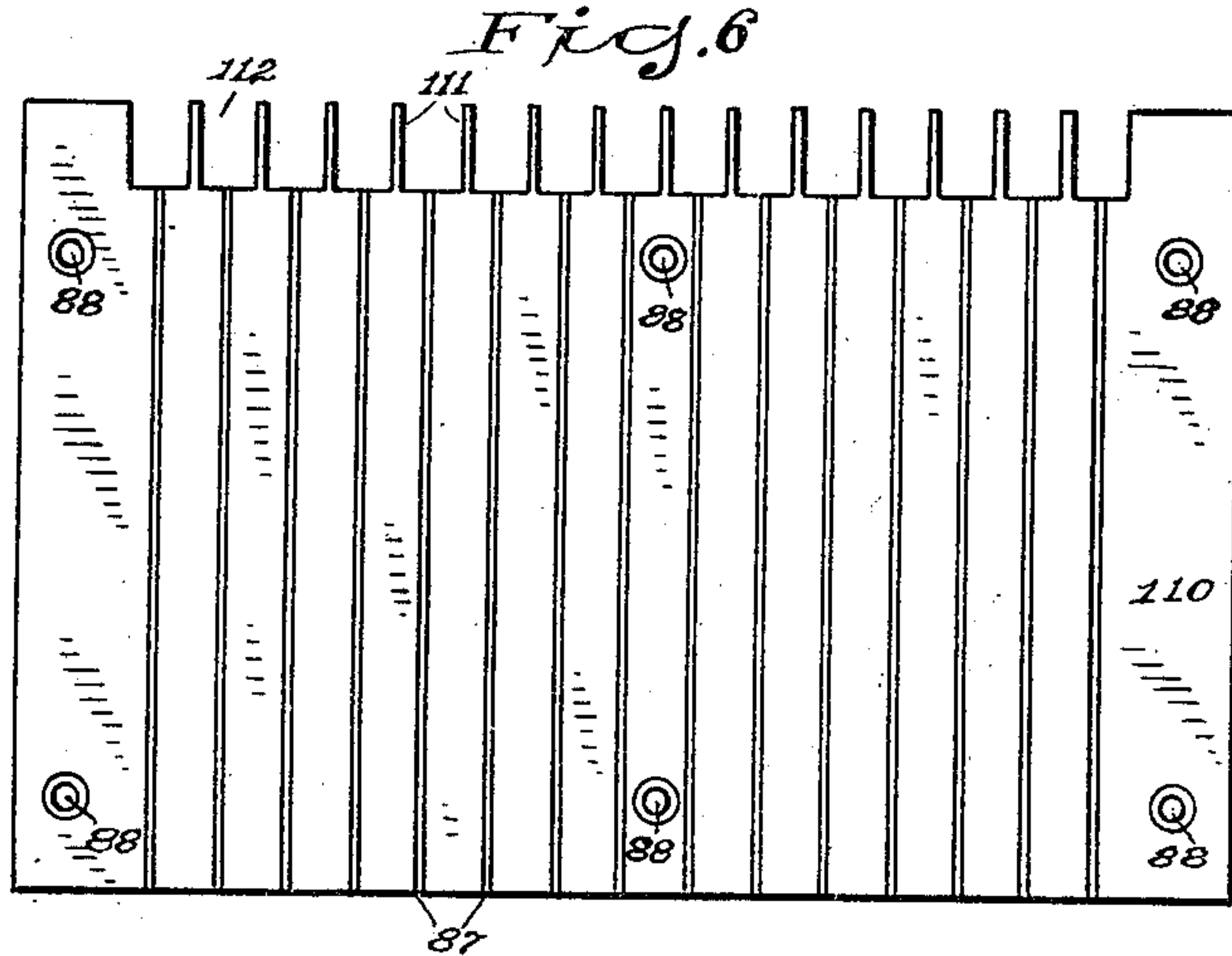
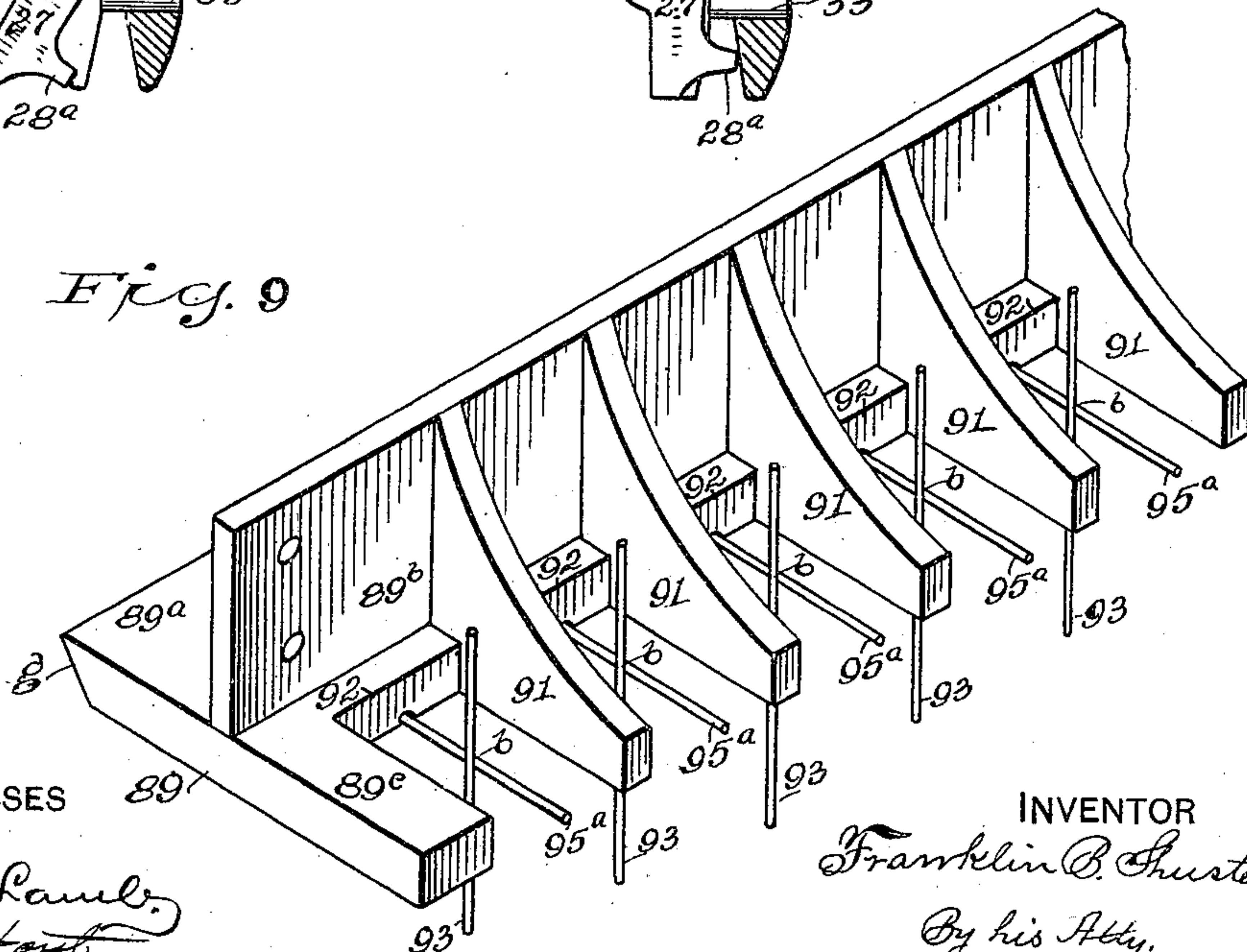


Fig. 9



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANKLIN B. SHUSTER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO
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BALE-TYING DEVICE FOR COMPRESSORS.

SPECIFICATION forming part of Letters Patent No. 639,946, dated December 26, 1899.

Application filed March 15, 1899. Serial No. 709,136. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN B. SHUSTER, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Bale-Tying Attachments for Compressors, of which the following is a specification.

My invention relates to an improvement in a bale-tying machine to be connected to that class of compressors adapted to reduce the size of cotton-bales or merchandise of like character and is an improvement on the application filed September 22, 1898, Serial No. 691,651.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 is a broken front elevation of a compressor with a part only of the mechanism relating to the bale-tying device connected thereto. Fig. 2 is a side elevation of the bale-tying machine with the wire-twister mechanism at its lowest point and engaging with the bale, a broken section of which is shown, together with a broken section of a bale and the compressor. Fig. 3 is a broken enlarged detail view of the clutch mechanism that controls the number of revolutions of the wire-twisting mechanism. Fig. 4 is a detail plan view of a slotted guide adapted to project from the face of the movable part of the press to receive an arm depending from the wire-folder, so as to keep the grooves therein in proper relation with the wire-grooves of the lower supplementary platen. Fig. 5 is an upper broken plan view of the wire-twister mechanism looking in the direction of *a*, Fig. 2. Fig. 6 is a modified detail plan view of the under surface of the supplementary platen of the upper or immovable part of the press. Fig. 7 is a broken detail sectional view of one of the twister-spindles and rod for operating the twister-lever, said lever shown as raised. Fig. 8 is a view similar to that shown at Fig. 7 except that the twister-lever is closed. Fig. 9 is a broken detail perspective view of an extension to the upper supplementary platen and a broken series of wires representing the legs of the bale-tie in the proper position to

be grasped and twisted by the wire-twister devices. Fig. 10 is a detail side elevation of one of the twister devices and sectional view of the operating and supporting rod therefor. Fig. 11 is a detail sectional view of one of the twister-spindles and rod for operating the lever, the twister-lever being closed.

Its construction and operation are as follows:

1 and 1^a represent the supporting-standards for the twister mechanism. These standards are hinged at the point 2 and 2^a just above the feet 3 and 3^a for the purpose hereinafter to be more fully described.

4 and 4^a are frames having the legs 4^b and 4^c, which are adjustably secured to the upper part of the supporting-standards in the following manner, viz: 5, Fig. 2, is a vertical slot in the standards, through which pass the bolts 6 6^a. The lower ends of the legs of the frames terminate in the segments 4^d 4^e. 7 is (one only being shown) a radial slot through these segmental ends, through which pass the bolts 8 8^a and also through the vertical slot 5. This arrangement not only enables the said frames to have a vertical but a radial adjustment as well. 9 are upturned projections of the said frames, and 10 10^a are rods which serve as tracks, upon which the carriage for the twisting mechanism runs to and from the compressor.

Still referring to Fig. 2, 11 is a front plate and 12 is a back plate connected together by means of the studs 13, 14, and 15. (See also Fig. 5.) Loosely mounted on these studs and between the said plates are the grooved rolls 16, 17, and 18. 19 is another roll mounted on the stud 20, which stud projects from an arm of the back plate 12, thus making four rolls engaging with the rod 10, two above and two below the same. 21 is a plate on the opposite side of the machine similar in construction to the back plate 12 just described, which supports four rolls, two of which only, 22 and 23, are shown mounted on the studs 24 and 25 and engaging rod 10^a.

Referring to Fig. 10, 26 is one of a series of spindles, each carrying the locking-lever 27, pivotally supported on the pin 28 and provided at the forward end with the finger 28^a,

adapted to operate transversely across the open mouth of the spindle. The tail of the locking-lever (see Figs. 7 and 8) is slotted to receive the pin 30 of the forked end of the lever-operating rod 31.

The improvement in the twisters consists in the elongated bearing 32, so that when the finger 28^a is down, as shown at Fig. 8, and beyond or inside the point *b*, Fig. 9, of the intersection of the wires the finger 28 of the locking-lever can be carried in by the rod 31, and thus hold the cross-wires firmly against the pin or kicking-post 33.

By means of the elongated bearing or slot 32 the lever 27 is dropped down the length of the slot below the kicking-post 33, so as to catch the crossed wires, and then as the operating-rod 31 is drawn upward the lever 27 is raised the full length of the elongated bearing or slot, as shown in Figs. 8 and 11, and the finger of the locking-lever is drawn upward toward the kicking-post, so as to hold the wires securely.

Referring to Fig. 10, 34 is a bearing in which the spindle 26 is adapted to rotate. 35 and 36 are hubs integral with said bearing. These hubs are securely fastened to the large tubular rods 37 and 38. Four bosses project inward from the plates 12 and 21, two of which, 39 and 40, are shown at Fig. 5. These bosses are hollow to receive the ends of the said tubular rods. 41 and 42, Fig. 10, are tie-rods to connect the tubular rods firmly to the said side plates 12 and 21. 43 is a spiral gear mounted on the inner end of the spindles 26 to engage with the spiral gear 44, mounted on the twister gear-shaft 45, which shaft is journaled in the side plates 12 and 21, as shown at Fig. 5. 46 is another rod or driving-shaft, also journaled in these side plates, having on one end the driving-pulley 47 and on the other end the pinion 48. (See also Fig. 2.) This pinion registers with the large gear 49, mounted loosely on the sleeve 50, (shown also at Fig. 3,) which sleeve is secured to the rod 45. This sleeve has two flanges 51 and 52.

53 is the head of a locking-bolt whose body portion (not shown) is arranged parallel with the shaft 45 and is journaled in the flange 52, extending through the same and also through the gear 49, and is provided with means whereby to engage with the notch in the bore of said gear, so as to couple up said gear with the shaft 45. However, such clutching feature is well known and needs no further description here.

The means for throwing the large gear in and out of engagement with the shaft 45 is clearly shown at Fig. 3.

54 is a short arm pivotally supported on the screw 55 of the plate 11.

56 is a handle-lever pivotally supported on the bolt 57. 58 is a short arm of this lever and carrying at its outer end the adjusting-screw 59.

60 is a retractile spring to keep the handle-

lever against the stop 61, in which position the locking-bolt 53 is thrown out of engagement with the gear 49, and such gear will then run free.

In operating the machine the shaft 46, pinion 48, and gear 49 run continuously, and it is only when said gear is coupled to the said shaft by means of the bolt 53 that the rod 45 rotates and through the medium of the spiral gears 43 and 44 rotates all of the wire-twister spindles 26. 62, Fig. 3, is a dial-wheel rotatably mounted on the bolt 63 of the plate 11. Projecting from the inner vertical face of this dial-wheel is the pin 64, adapted to be engaged by the pin 65 of the flange 51. 66 is a pawl mounted on the pin 67, having the raised projection 66^a, adapted to be engaged by the pin 68 on the inner face of the lever 56. Throwing the handle-lever 56 forward in the direction of arrow *c* will of course cause the adjusting-screw 59 to move away from the bolt 53, which bolt will drop back and engage with the large gear 49, as before mentioned, and cause shaft 45 to rotate and carry with it the flange 51 in the direction of arrow *d*. Therefore every revolution of this flange will, through the action of its pin 65, move the dial-wheel 62 one tooth in the direction of arrow *e*. When the dial-wheel has made a complete revolution, the pin 64 will engage the forward curved end 66^b of the pawl 66 and throw down its opposite end and release the handle-lever 56, so as to bring said lever under the influence of the spring 60, and thus throw the upper end of the handle-lever forward to disengage the locking-bolt from the gear 49 and bring the twisters to a state of rest.

69 is a spring-bolt actuated by the spring 70 to keep the tailpiece of the pawl 66 elevated, so as to throw the curved end of such pawl back of the pin 64, as shown, in readiness to be acted on by said pin when the dial-wheel is again rotated. The number of teeth in said dial-wheel determines the number of twists in the ends of the bale-tie. The machine is geared up so that when there is sufficient number of twists, or, in other words, when the ends of the bale-tie have been twisted about each other a sufficient predetermined number of times the twister-spindle will stop rotating.

The rod 31, Figs. 2 and 10, that opens and closes the locking-lever 27, as before described, is operatively connected to the arm 71, and this arm is secured (see also Fig. 5) to the shaft 72, journaled in the side plates 12 and 21. Mounted on said shaft is the arm 73, to which is pivoted the bar 74, which in turn is pivoted to the arm 76 of the handle-lever 76^a. 77 is a hook-pawl pivoted on the pin 78 of said handle-lever. Said hook-pawl is adapted to engage with the angular projection 79 of the plate 11 when the said handle-lever is moved in the direction of arrow *f*, which movement of said lever will keep the locking-lever-controlling rod 31 in an ele-

vated position, as shown at Fig. 2. The bar 80, connecting the pawl 77 with the handle 81, will release said pawl and allow the handle-lever 76^a to drop and depress the rod 31 and open the locking-lever, as shown at Fig. 7.

As the cotton-presses now in use have wide grooves in the faces of the upper and lower platens, adapted to receive the present style of wide sheet-iron bands, it is impracticable to use these wide grooves for wire. Therefore I propose to furnish for such presses supplementary platens, as shown at Fig. 1, 82 being one of such platens attached to the upper press-platen 83, and the other supplementary platen 84 secured to the lower or movable press-platen 85. 86 and 87 are the grooves in such supplementary platens for the wire bale-ties. Each of said platens is furnished with the holes 88, Fig. 6, to receive screws for attaching them to the permanent platens of the press.

In Figs. 2 and 9 is shown an attachment to be connected to the upper supplementary platen 82 for the purpose of enabling the twister-spindles to engage the intersecting wires of the bale-tie close to the bale. For this purpose the said supplementary platen 82 is shortened, and the front edge is preferably beveled to match the beveled edge *g* of the angle iron or extension 89. This extension has the tailpiece 89^a of the same thickness as the supplementary platen, and it is also provided with the vertical leg 89^b to rest against the front face of the press-platen 83 and is secured thereto by the bolts 90. The base 89^c of this extension also projects beyond the bale. The projecting ribs 91 serve to keep the corner of the bale down, and thus prevent the cotton or its bagging interfering with the twister-spindles. This will leave the opening 92 to admit the mouth or end of the said twister-spindles. The under side of this extension is grooved to correspond with the grooves in the platen.

The bale-tie is U-shaped with one leg longer than the other, as fully shown and described in my former applications, and in Fig. 2 the longer leg 93 is shown carried up against the bale 94 by means of the folder 95, so as to cause said leg 93 to cross its companion leg 93^a, as shown at Fig. 9. Now the twister-spindles 26 can engage the wires over the corner of the bale and rotate without coming in contact with the front edge of the platen, while the said extension and the projecting ribs thereof will serve to keep the jute bagging down.

Presses that have been in use for some time become so racked and worn by constant use that there will be considerable lateral movement both to the upper, or, what is supposed to be the stationary, part of the press and the lower platen or movable part. This tendency to side play will seriously affect the operation of the independent twisting mechanism attached to the floor in front of the press. To counteract this tendency, I have so constructed my present twister mechanism that it will

move with the press, and thus keep the intersection of the bale-tie legs in line with the twister-spindles. For this purpose I make the screws 96, on which the arms 95^a of the folder 95 swings, long enough to permit of a lateral movement to the said folder. These screws are secured to the lower supplementary platen 84, as shown at Figs. 1 and 2.

97 is an arm projecting from the under side of the folder and is placed to one side of the handle 98 of said folder.

99 (see also Fig. 4) is a bracket adapted to be attached to the face of the lower platen 85, as shown at Fig. 1. 100 is a projection of said bracket having the slot 101 adapted to receive the arm 97, and when such arm is in said slot the folder 95 will be in its normal position—viz., with its wire-grooves 102 in line and registering with the grooves 86 of the supplementary platen 84, as shown at Fig. 1. When, therefore, the lower platen in its upward movement to compress a bale of cotton and the strain incidental thereto has caused the platen to shift laterally in either direction, the operator will wait until the said lower platen has reached its highest point, when he will raise the folder by means of the handles 98 until the arm 97 is carried out of the bracket 99. Then by means of a lateral movement of the holder on its supporting-screws 96 the grooves of said holder can be brought into alinement with the grooves in the supplementary platen and catch the wires and fold them against the bale, as shown at Fig. 2.

To counteract the lateral movement of the upper platen, I have provided the two stay-rods 103 and 104, Fig. 1, pivotally supported on the bolt 105 of the upper press-platen 83, the other end of said rods being pivotally attached to each of the standards 1 and 1^a. Now when the upper part of the press moves to one side or the other the standards, as well as the twisting mechanism which they carry, will by reason of the hinged joints 2 and 2^a move in time therewith, and thus bring the twister-spindles directly in line with the intersecting point of the wires. The beveled mouth of the bracket 99 is wide enough to insure the engagement of the arm 97 and carry such arm into the slot 101, when the folder is dropped, so that the normal position of such folder is reestablished—viz., with its grooves in line with the grooves of the supplementary platen when the strain is removed and the press-platen is again lowered for the reception of another bale.

106 are weights (see Figs. 2 and 5) attached to the wire ropes 107, which ropes pass over the pulleys 108 and are connected with the rod 109 of the plates 12 and 21. These weights serve as a counterbalance for the movable part of the twister mechanism operatively mounted on the rods 10 and 10^a, so that a slight effort will move such mechanism in either direction. At Fig. 2 the mechanism is shown at its lowest point in readiness to engage and twist the wire bale-tie. When this

operation is completed, the said mechanism is pushed up the inclined rods to its highest position, so as to be out of the way. When, therefore, the bale is compressed and the folder has turned up the lower leg of the bale-ties, the twister mechanism is moved down the inclined rods and the open mouth of the spindles 26 will embrace the cross-wires, as before stated, and when in this position the handle-lever is moved forward and causes a rotatory movement to be imparted to such spindles, which spindles will make as many revolutions as is represented by the number of teeth in the dial-wheel 62. When the spindles cease rotating, they will always stop so as to leave the open mouth of such spindles in a vertical position in readiness to engage with the next bale tie-wires. By this construction the twisting and stopping thereof is made automatic.

At Fig. 6 is shown a modification of the extension shown at Fig. 9. In this construction the supplementary platen 110 is in every respect like the upper platen shown at Figs. 1 and 2, except that it has an increased length equal to the extension shown at Fig. 9. The openings 111 correspond to the openings in said extension and the thin partitions 112 perform the same office as the ribs or braces shown in said figure. While this construction (shown at Fig. 6) will serve the same purpose as the said extension, it is more expensive to cut out this thick plate than it would be to add the cast extension. However, either may be used.

The supplementary platens, as before mentioned, are an essential feature in connection with presses already in use, as it is by far the cheapest way in which to equip such presses so as to use the wire bale-ties and the twisting mechanism. Therefore this feature I attach considerable importance to, whether or not openings are provided to admit the twister-spindles or an extension is used provided with openings for the same purposes.

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

1. In a bale-tying machine adapted for use in connection with a bale-compressor, a series of wire-twisting devices, and a carriage upon which the twisting devices are mounted at an angle, combined with a suitable support for the carriage, and which is also placed at an angle, and upon which support the carriage is moved back and forth in relation to the compressor, substantially as shown.

2. The combination, in a bale-tying machine adapted for use in connection with a bale-compressor, of a series of wire-twisters mounted at an angle upon a traveling carriage also placed at an angle, and adapted to operate to and from the compressor, a driving-shaft journaled in said carriage, means for transmitting a rotary motion from said shaft to the said twisters and means substantially as

shown on said carriage for operating the locking-levers of said twisters, for the purpose set forth.

3. The combination, in a bale-tying machine adapted for use in connection with a bale-compressor, of a series of rotatable wire-twisters mounted at an angle to the bale being formed upon a traveling carriage, also mounted at an angle to the bale, and adapted to move to and from the compressor, a driving-shaft journaled in said carriage, gears for transmitting movement from said shaft to the twister gear-shaft and from the latter to the twisters, means whereby said movement is automatically stopped after said twisters have made a certain number of predetermined revolutions, for the purpose set forth.

4. The combination, in a bale-tying machine adapted for use in connection with a bale-compressor, of a series of rotatable wire-twisters mounted upon a traveling carriage adapted to move to and from the compressor, a driving-shaft journaled in said carriage, gears for transmitting motion from said driving-shaft to the twister gear-shaft and from the latter to the twisters, a dial-wheel registering with said twister-shaft, means for locking the driving-shaft with the twister gear-shaft and means for effecting the release of said shaft after a predetermined number of revolutions of the twisters, substantially as set forth.

5. The combination, in a bale-tying machine, of the character described, of a series of twister-spindles adapted to engage and effect a twist in the free ends of a wire bale-tie, gears mounted on said twister-spindles, a twister gear-shaft carrying gears to register with the twister-spindle gears, a driving-shaft carrying a pinion or gear to register with a driving-gear connected with the said twister gear-shaft and means for locking said gear to said twister gear-shaft, a dial-wheel rotatably connected with said twister gear-shaft, a handle-lever adapted to lock said shaft with the driving-shaft, means for locking said lever so that, when the twister-spindles have made a certain number of revolutions, the said handle-lever is released and the twister-spindles brought to a standstill, substantially as set forth.

6. In a bale-tying machine, the combination with the rotatable mechanism, of a series of wire-twister spindles and a driving-shaft therefor, of a gear registering with a gear of said shaft and normally running idle therewith, means for locking said gear to the twister-spindle mechanism, a handle-lever whereby such locking is effected and means for locking such lever, a dial-wheel and means for rotating the same, means provided on said wheel for releasing said handle-lever when the said twister-spindles have made a certain number of revolutions for the purpose set forth.

7. In a bale-tying machine, the combination, with the supporting-frame carrying the wire-twisting mechanism, of standards for supporting said frame, means whereby said frame is

adapted to have a vertical and a radial movement on said standards and means whereby it is secured thereto, substantially as set forth.

8. In a wire bale-tying machine adapted to be used in connection with a compressor, the combination with the bale-tying mechanism and the supporting-standards therefor, of a jointed connection in said standards and means for connecting said standards so that, the bale-tying mechanism will have a lateral movement equal to the movement of the compressor, substantially as described.

9. In a bale-tying machine adapted for use in connection with a compressor, a platen combined with a wire bale-tying folder pivoted to the lower platen, screws upon which the folder is supported and by means of which the folder is given a lateral movement to compensate for the lateral movement of the lower platen, substantially as specified.

10. In combination with a wire bale-tying machine and a compressor, a supplementary platen having grooves in its outer face to admit the bale-tie, said supplementary platen projecting beyond the platens of the press so as to overhang the bale and keep the corner of such bale down to the level of the compressed surface of said bale, there being openings in said supplementary platen to admit the twister-spindles of the bale-tying mechanism, substantially as set forth.

11. In combination with a wire bale-tying machine and a compressor, a supplementary platen attached to the press-platen and having grooves in its outer face to admit the bale-tie, said supplementary platen made shorter than the press-platen, an extension attached to such press-platen, a tailpiece of such extension to match with said supplementary

platen, said extension adapted to project beyond said press and overhang a bale, there being openings in such projecting portion to admit the twister-spindles of the bale-tying mechanism.

12. In combination with the upper and lower platens of a compressor, supplementary platens removably secured to the press-platens, said supplementary platens provided with grooves in their outer faces of sufficient size to freely admit a wire bale-tie, for the purpose set forth.

13. In a bale-tying attachment for compressors, a supporting-frame for the carriage, placed at an angle, guide-rods secured to said frame, a traveling carriage placed upon said supporting-frame at an angle to the bale being formed, and a series of twisting devices also carried at an angle to said carriage, combined with trolley-wheels mounted on said carriage so as to engage the upper and under side of said rods, substantially as specified.

14. The combination, in a rotary wire-twister spindle of a bale-tying machine and mechanism for operating the rotary wire-twister spindle, of a locking-lever pivotally supported near the open mouth of said spindle, and an elongated bearing provided in said lever whereby a longitudinal movement is effected, for the purpose set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 14th day of March, A. D. 1899.

FRANKLIN B. SHUSTER.

Witnesses:

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