No. 833,758. PATENTED OCT. 23, 1906.

F. B. SHUSTER.

WIRE STRAIGHTENING AND CUTTING MACHINE.

APPLICATION FILED DEC. 20, 1902.

5 SHEETS—SHEET 1.

Fig. 1.

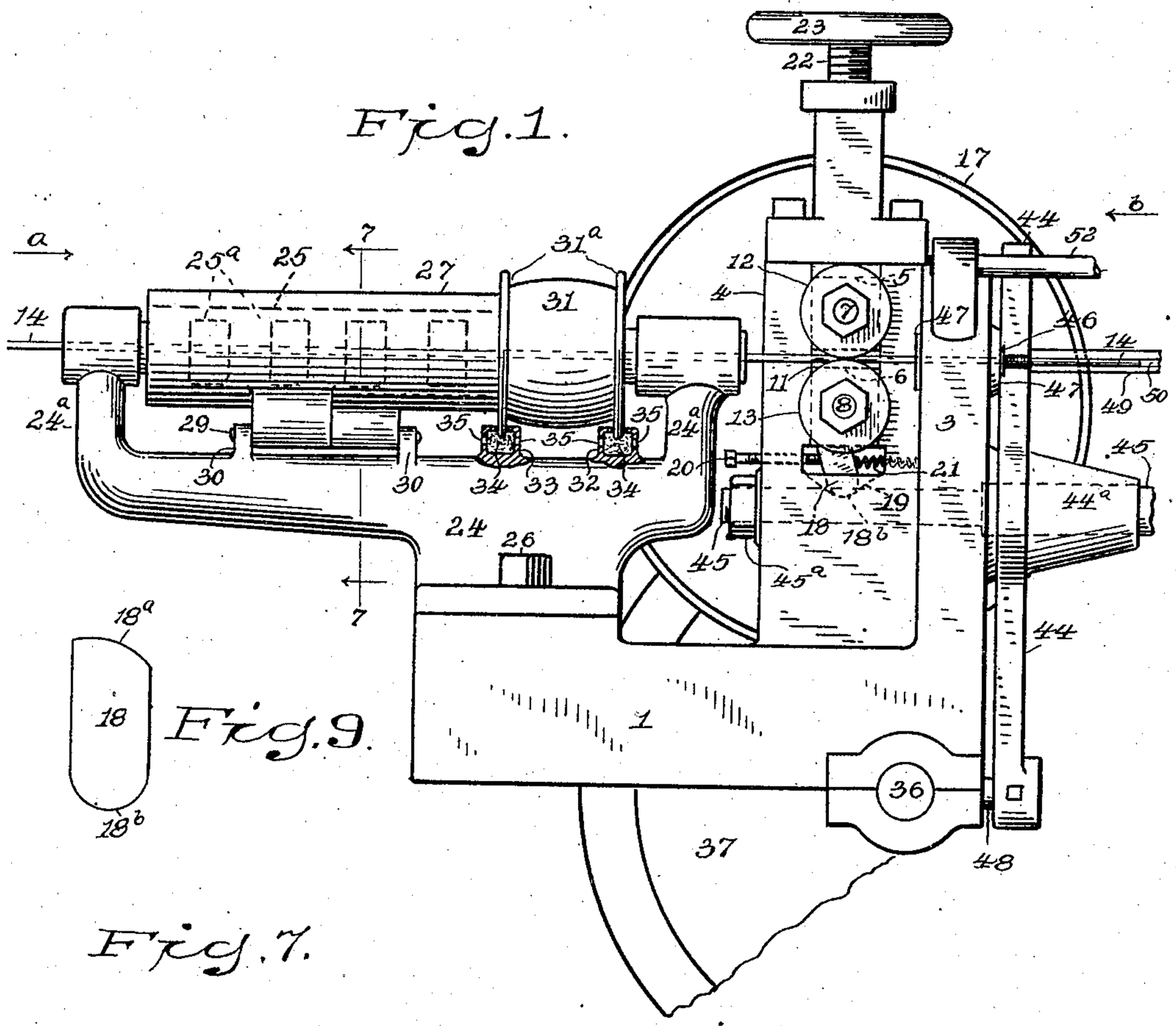


Fig. 9.

Fig. 7.

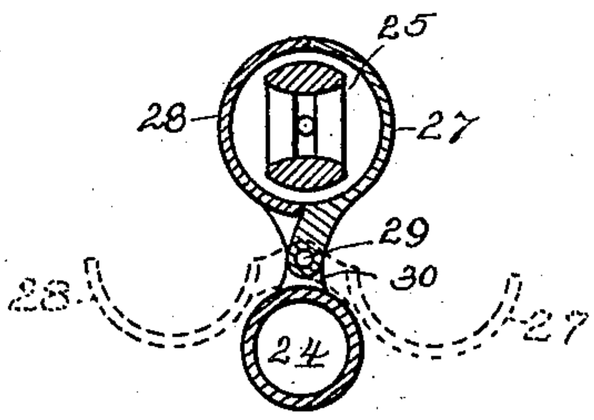


Fig. 8.

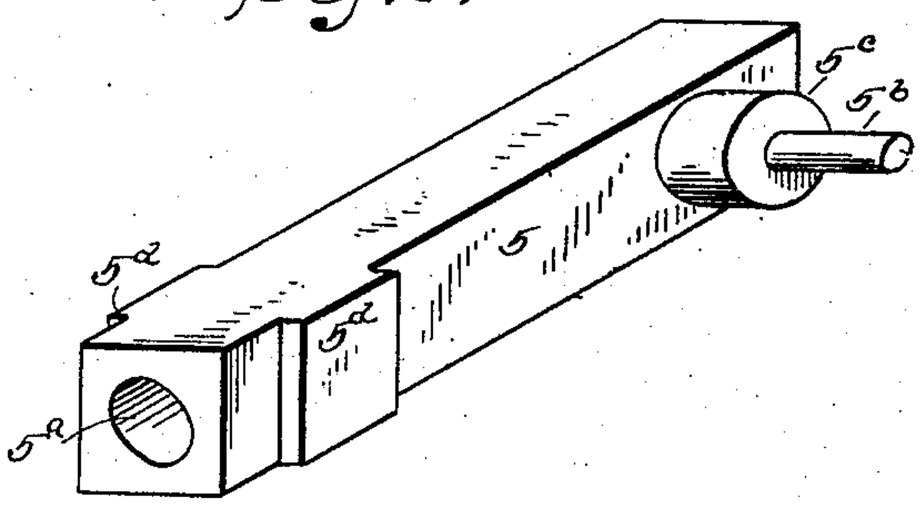
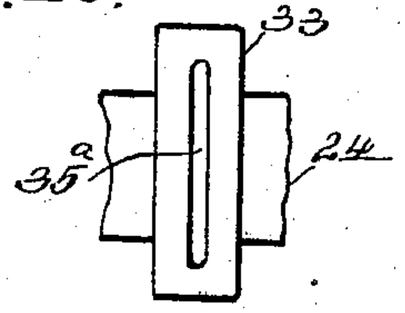


Fig. 10.



WITNESSES:

H. A. Lamb.

S. J. Chesbee.

INVENTOR

Franklin B. Shuster

BY Geo. D. Phillips

his ATTORNEY

No. 833,758. PATENTED OCT. 23, 1906.

F. B. SHUSTER.

WIRE STRAIGHTENING AND CUTTING MACHINE.

APPLICATION FILED DEC. 20, 1902.

5 SHEETS—SHEET 2.

Fig. 2

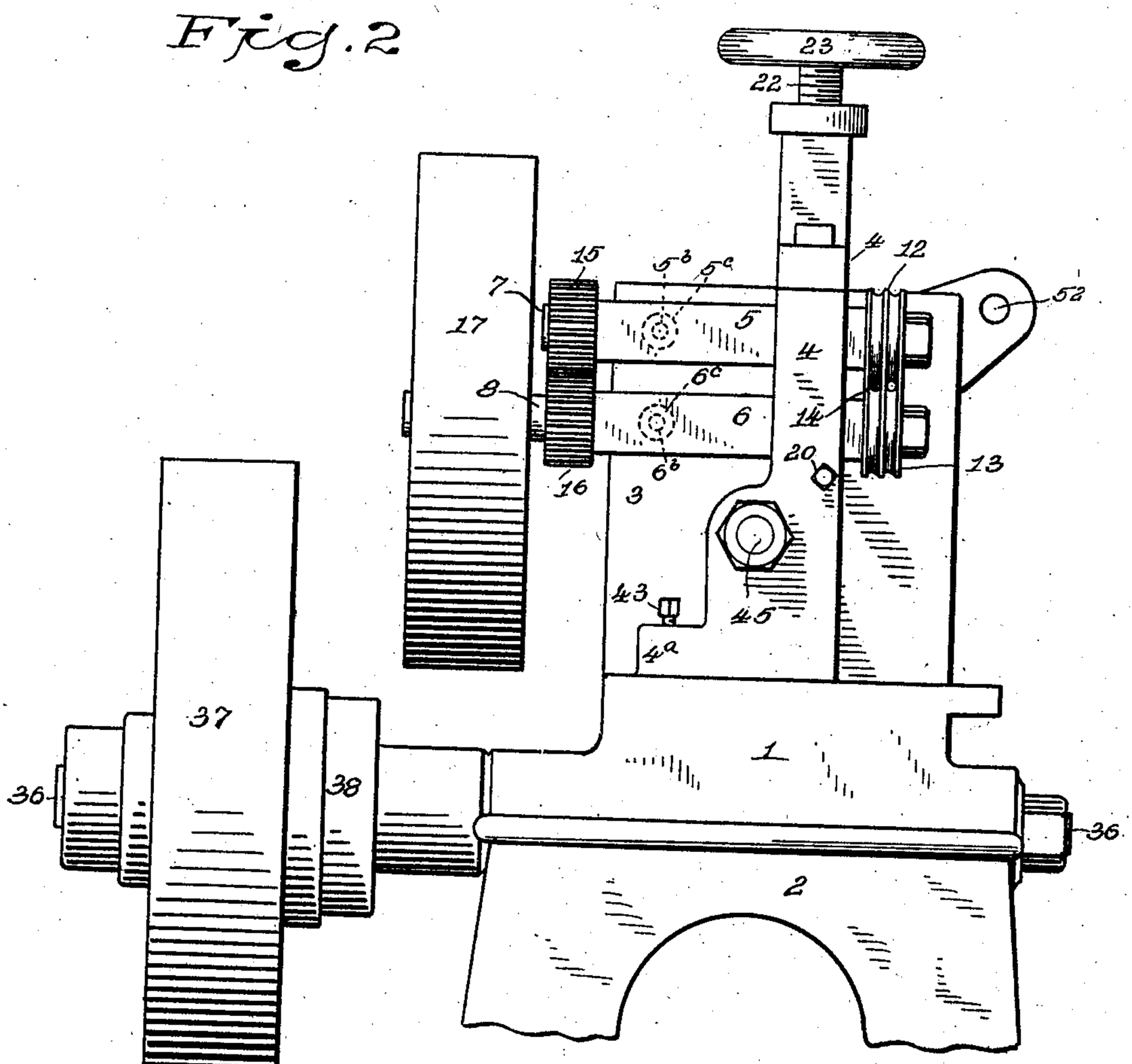


Fig. 5.

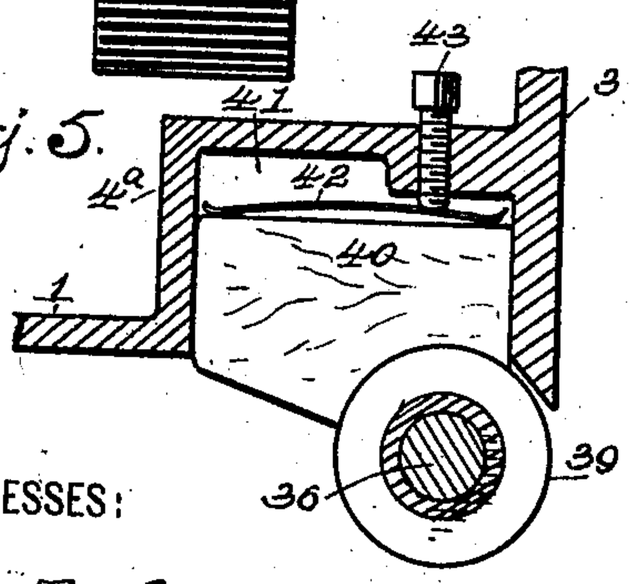
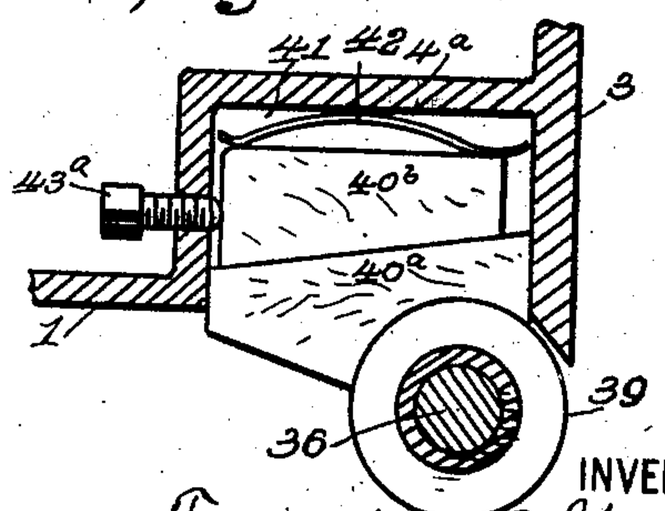


Fig. 6.



WITNESSES:

H. A. Lamb.

S. J. Chaffee.

INVENTOR

Franklin B. Shuster.

BY Geo. O. Phillips.

his ATTORNEY

No. 833,758. PATENTED OCT. 23, 1906.

F. B. SHUSTER.

WIRE STRAIGHTENING AND CUTTING MACHINE.

APPLICATION FILED DEC. 20, 1902.

5 SHEETS—SHEET 3.

Fig. 3.

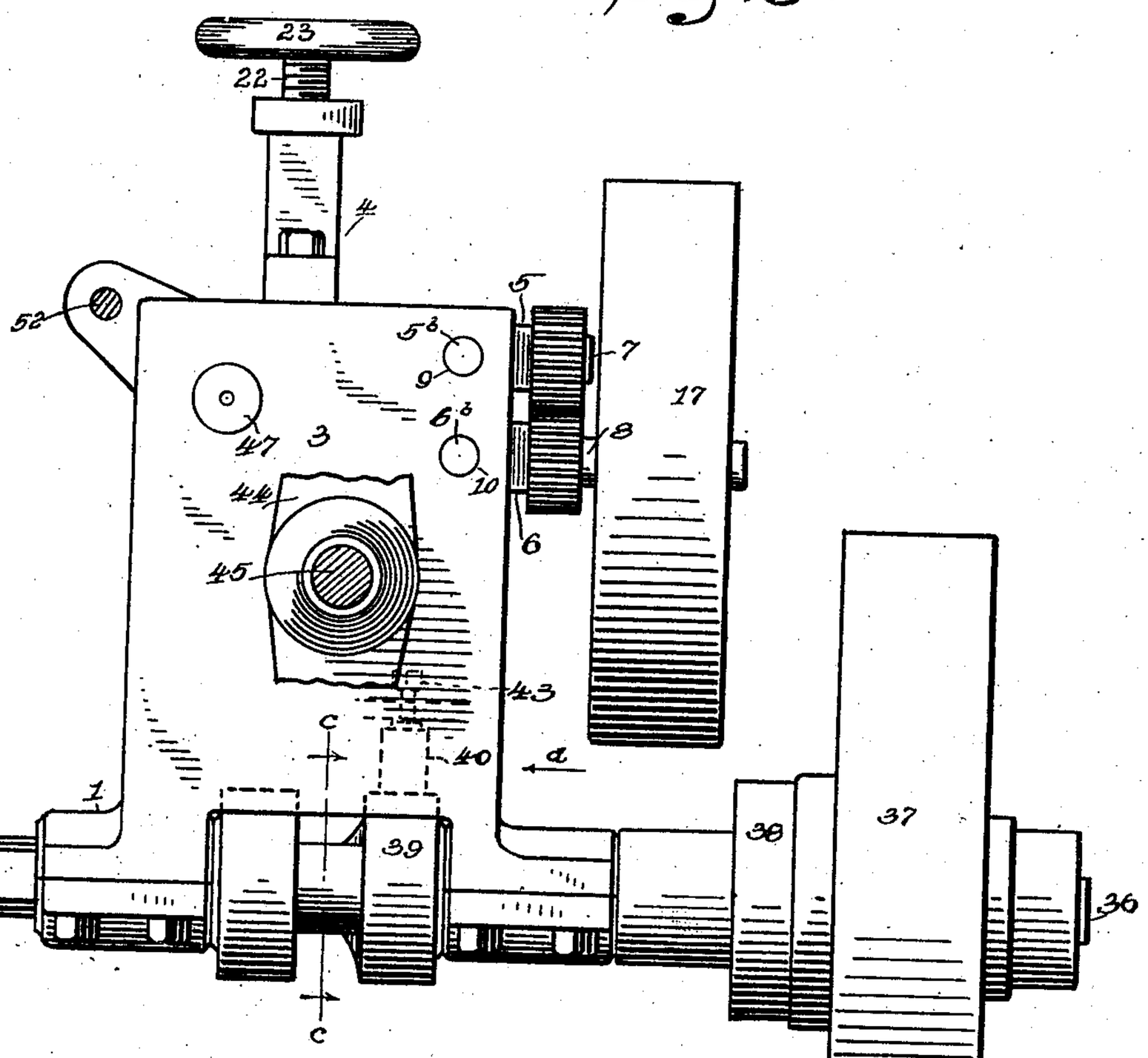
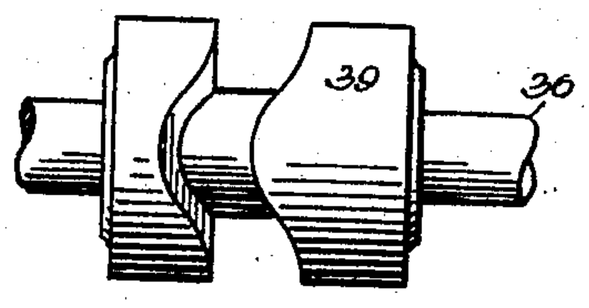


Fig. 4.



WITNESSES:

H. A. Lamb.

S. J. Chaffee.

INVENTOR

Franklin B. Shuster

BY Geo. D. Phillips.

his ATTORNEY

No. 833,758. PATENTED OCT. 23, 1906.

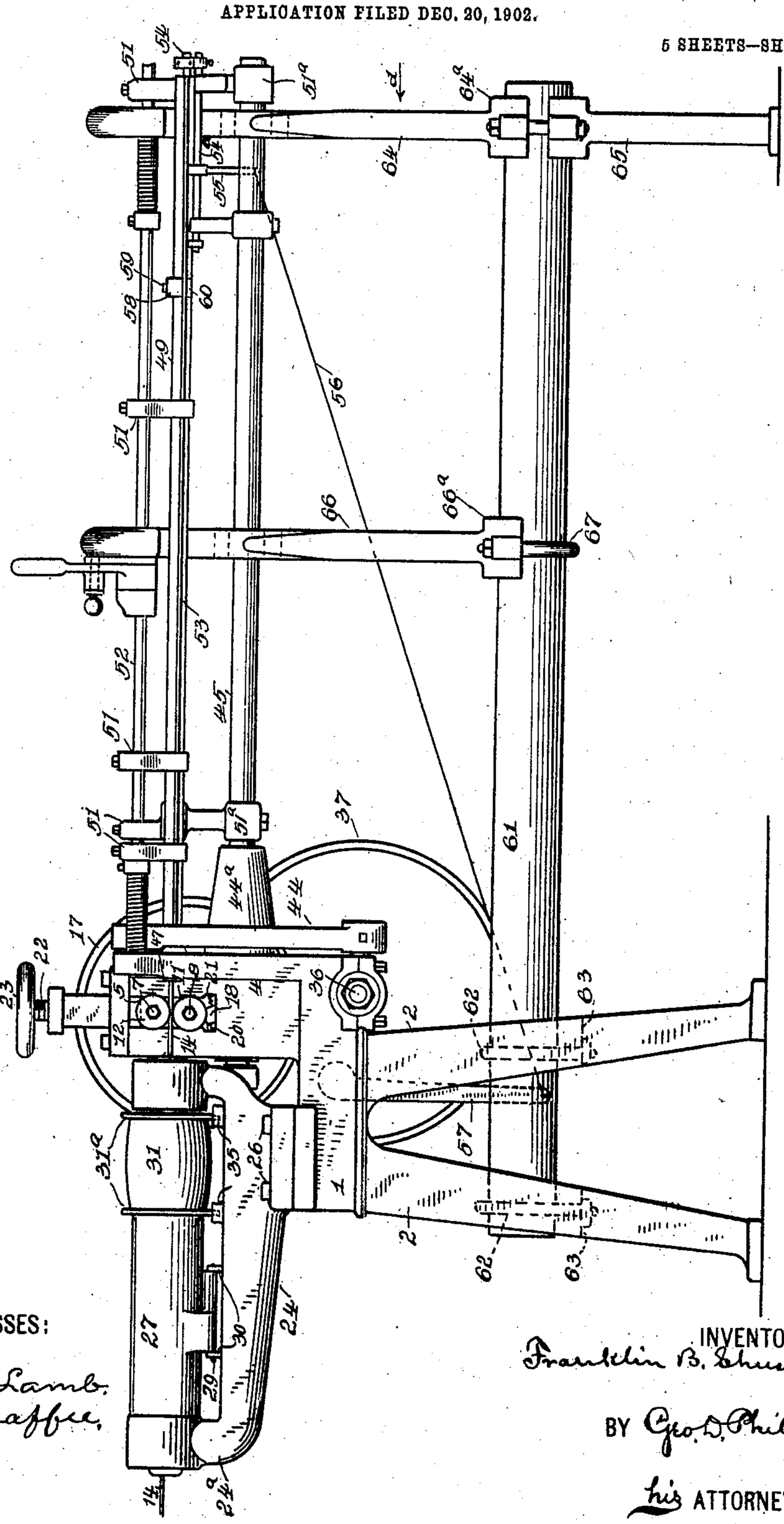
F. B. SHUSTER.

WIRE STRAIGHTENING AND CUTTING MACHINE.

APPLICATION FILED DEC. 20, 1902.

5 SHEETS—SHEET 4.

Fig. 11



WITNESSES:

H. A. Lamb.
S. J. Chaffee.

INVENTOR

Franklin B. Shuster,

BY Geo. D. Phillips.

his ATTORNEY

No. 833,758. PATENTED OCT. 23, 1906.

F. B. SHUSTER.

WIRE STRAIGHTENING AND CUTTING MACHINE.

APPLICATION FILED DEC. 20, 1902.

5 SHEETS—SHEET 5.

Fig. 12

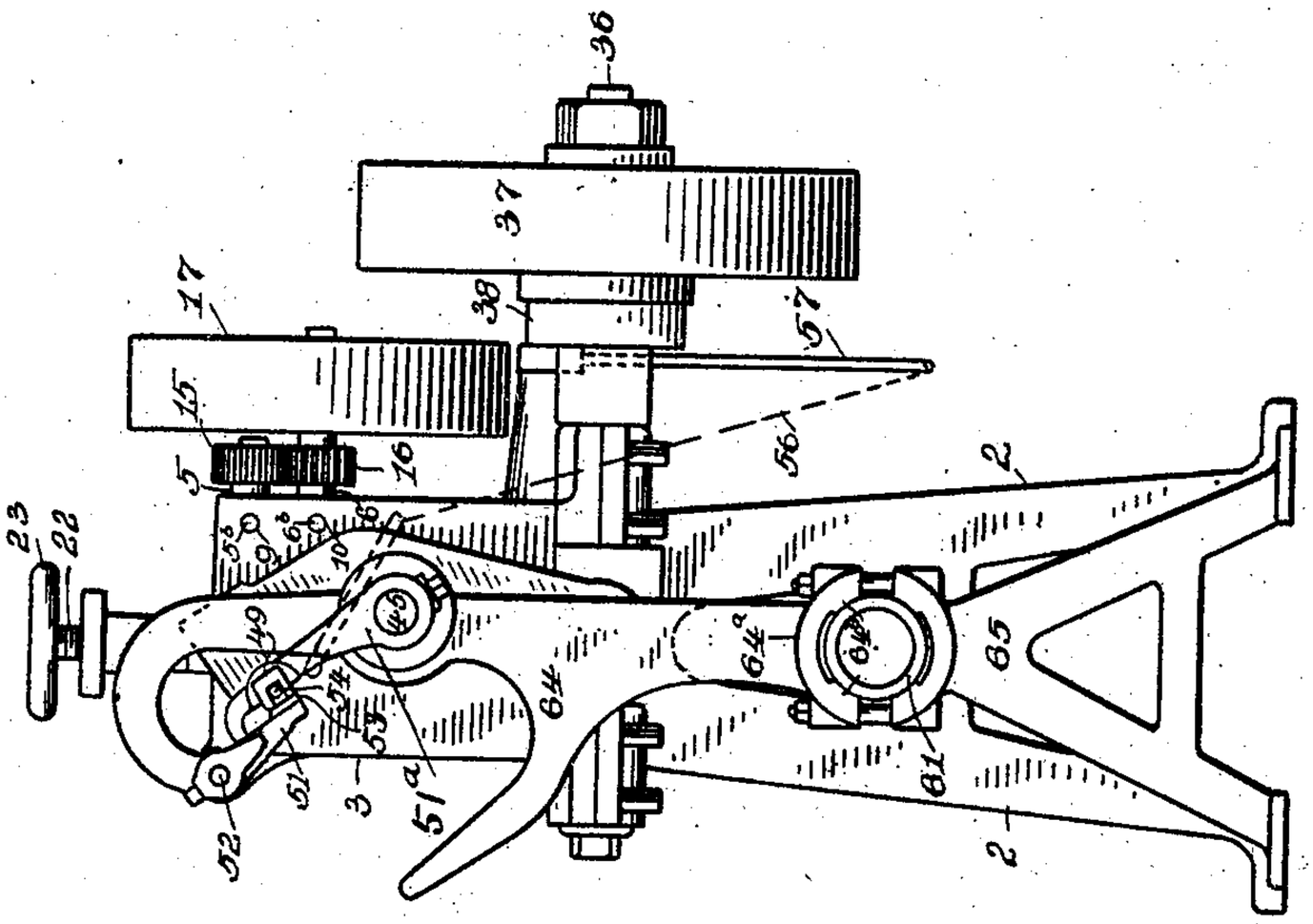


Fig. 13

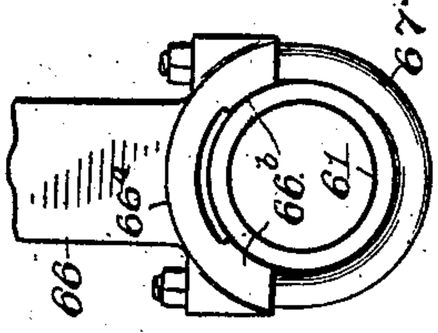


Fig. 14

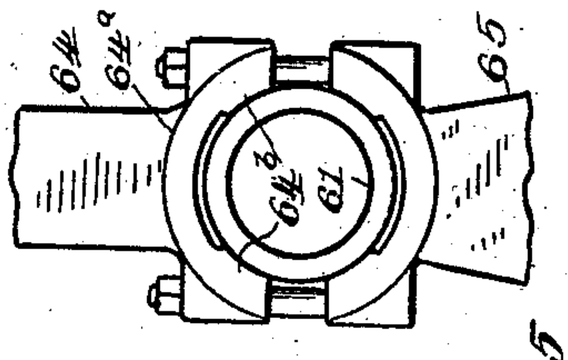


Fig. 15

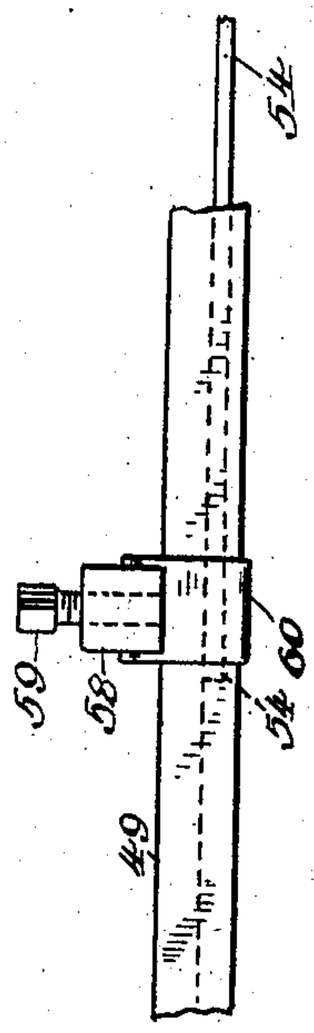
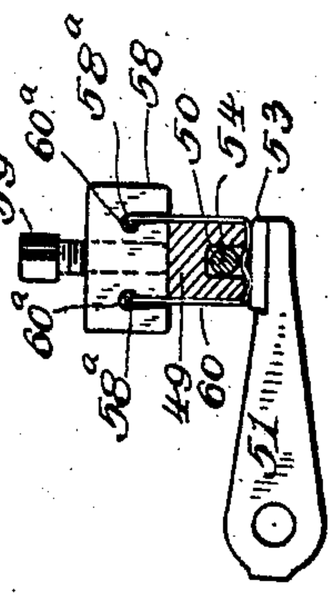


Fig. 16



WITNESSES:

H. A. Lamb.
S. J. Chaffee.

INVENTOR
Franklin B. Shuster.

BY Geo. D. Phillips.

his ATTORNEY

UNITED STATES PATENT OFFICE.

FRANKLIN B. SHUSTER, OF NEW HAVEN, CONNECTICUT.

WIRE STRAIGHTENING AND CUTTING MACHINE.

No. 833,758. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed December 20, 1902. Serial No. 135,989.

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 certain new and useful Improvements in Wire Straightening and Cutting-Off Machines, of which the following is a specification.

My invention relates to an improvement in wire straightening and cutting-off machines; and it consists in certain details of construction to be more fully set forth in the following specification.

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

Figure 1 represents a side elevation of the combined head and bed of the machine with the rotary wire-straightener mounted on the bed with a broken view of the rock-shaft and apron-shaft. Fig. 2 is a rear elevation of the machine looking in the direction of arrow *a* of Fig. 1, also broken view of the machine-legs. Fig. 3 is a front elevation of the machine and sectional view of the guide-bar shaft and apron-shaft looking in the direction of arrow *b* of Fig. 1, also broken view of the wire-cutting-off lever. Fig. 4 is a front detail view of the cam for operating the wire-cutting-off arm and broken view of the wire-cutting-off shaft. Fig. 5 is a broken sectional view of the machine-head and a sectional view of the cutting-off shaft through line *c c* of Fig. 3, showing a brake applied to the wire-cutting-off cam. Fig. 6 is a modified construction of the brake shown at Fig. 5. Fig. 7 is a sectional view of the rotary wire-straightener and its hinged cover and base of said straightener through line 7 of Fig. 1. Fig. 8 is a perspective detail view of one of the roll-shaft boxes. Fig. 9 is a detail view of the lift-cam for the wire-feed-roll boxes. Fig. 10 is a broken view of the frame of the wire-straightener head and upper plan view of one of the absorbent-holding receptacles integral with said frame. Fig. 11 is a side elevation of the machine, showing the manner of attaching the work-receiving fork-brackets to the pipe extension. Fig. 12 is an end elevation of the machine looking in the direction of arrow *d* of Fig. 11. Fig. 13 is a detail broken end elevation of one of the work-receiving brackets clamped to the extension-pipe. Fig. 14 is an end elevation of the extension-pipe with a broken view of the front standard of the machine and front work-receiving bracket. Fig. 15 is a broken detail view of the wire-guide bar with the wire-stop-rod adjustable support thereon. Fig. 16 is a cross-sectional view of the wire-guide bar with an end elevation of the wire-stop adjustable support and a detail view of one of the fingers connected to the guide-bar cover.

The construction and operation are as follows:

1 represents the bed of the machine; 2, the legs; 3, the vertical head; 4, the wire-roll standard integral with said head and bed. 5 and 6 are long boxes, one a duplicate of the other (see also Fig. 8) and having the hole 5^a therethrough to receive the short roll-shafts 7 and 8, Fig. 1. These boxes are each provided with the studs 5^b and 6^b, Figs. 2 and 3, adapted to be journaled in the holes 9 and 10 of the head 3. Referring again to Figs. 2 and 8, 5^c and 6^c are projecting bosses of the roll-shaft boxes, whose outer faces are adapted to rest against the inner vertical face of the head 3. 5^d, in Fig. 8, represents enlarged wings or portions near the opposite end of these boxes, which are adapted to fill the vertical slot on opening 11, Fig. 1, in the standard 4 and yet be capable of vertical adjustment thereon. 12 and 13 are the feed-rolls for the wire 14. These rolls are mounted on one end of the shafts 7 and 8, while the gears 15 and 16 at the opposite end connect said shafts in rotatable relations with each other. 17 is the driving-pulley for said shafts and their rolls. Heretofore in wire straightening and cutting-off machines double standards carrying the boxes (four in number) of the feed-roll shafts were used, and as often as the size of the wire run through the machine was changed it was of course necessary to change the vertical position of the feed-rolls. To insure the engagement of the feed-roll-shaft gears for the different vertical positions it was necessary to make the teeth of these gears long enough to meet these varying positions. This construction had a tendency to weaken the gears and cause frequent breakage. Then, again, the four independent boxes were difficult to adjust and keep in alinement with the wire-feeding line.

With my improved construction only one standard is required in which, as before mentioned, the forward ends only of the boxes are mounted and adjusted, while their opposite ends are permanently located in one position, thus leaving their forward ends free to be adjusted to the feeding-line of the wire,

while the vertical position of the ordinary tooth-gears 15 and 16 are not perceptibly changed. This not only makes a handier construction, but it is decidedly cheaper.

To vertically adjust the forward ends of these boxes, I employ the device shown at Figs. 1 and 9, which consists of the block 18, having the cam-face 18ª and the rounded end 18ᵇ, which rounded end is adapted to rest in the rounded bottom of the recess 19 of the feed-roll standard 4. This recess is in direct alinement with the vertical slot or opening 11 of said standard. The bottom face of the lower box 6 rests on the cam end 18ª of this block. 20 is an adjusting-screw in the rear face of the standard 4, whose point engages the vertical face of the block 18, whereby it is radially operated to raise or lower the boxes 5 and 6. 21 is a spring adapted to maintain the engagements of the block 18 with its adjusting-screw 20. 22 is the feed-roll-adjusting screw, carrying the wheel-handle 23.

Heretofore the frame carrying the wire-straightener head was made an integral part of the bed of machines of this character. This narrowed down the use of the machine to a very limited capacity as regards different sizes of wire, which necessitated the purchasing of a number of machines to do the work. Again, there might be a limited use for the cutting-off part of the machine, but a more extensive use for the wire-straightener in other parts of the establishment if it could only be detached. Therefore extra straightening-machines had to be kept on hand to meet such requirements. In my improved machine I have constructed it so that the straightener-frame carrying the straightener-head can be readily attached and detached from the bed of the machine and the straightener used separately or changed for another of a different size. At Fig. 1 is shown a detachable wire-straightener, consisting of the frame 24, having the uprights 24ª, in which the journals of the rotary straightener-head 25 are supported after the manner of all wire-straighteners of this class. 26 is one of the bolts for temporarily securing the frame to the bed of the machine.

Another very important feature in connection with the wire-straightener head is the means I employ to do away with the nuisance caused by the oil flying out of the die-opening 25ª during the rapid rotary motion of the head 25. This I accomplish by means of the two semicircular covers 27 and 28, Figs. 1 and 7, pivotally supported on the pin 29 of the ears 30, which ears are integral with the frame 24. These covers completely embrace the head 25 and effectually prevent the escape of oil.

Another very important feature has been added to my improved machine whereby the oil is kept away from the driving-pulley 31 of the straightener-head. In the present style of straighteners the oil creeps onto the driving-pulley and not only causes the belt to slip but the oil soon rots the belt, and frequent breakages result thereby. To overcome this difficulty, I have provided the two receptacles or boxes 32 and 33, which are integral with the frame 24 of the rotary straightener-head. These receptacles are filled with cotton-waste 34 or other like absorbent material, with which the flanges 31ª of the pulley 31 come in direct contact, so as to effectually prevent the oil working up onto said pulley. These receptacles are provided with the holes 35 in the sides thereof for the removal of the old material and the introduction of new. 35ª, Fig. 10, is a slot in the top surface of these receptacles for the insertion of the flanges 31ª of the pulley 31. I have also provided means whereby friction is applied to the wire-cutting-off shaft so as to bring such shaft to a dead stop just as soon as the cut-off lever carrying the cutting-tool presently to be described has performed its work.

36 is the cutting-off shaft driven by the pulley 37 mounted thereon. 38 represents the usual clutch mechanism, which, being old, requires no special mention. 39 is the cut-off cam mounted on this shaft, which instead of being composed of two collars having cam-faces adjustably mounted on said shaft is made of one piece of metal, as shown at Fig. 4.

Referring to Figs. 3 and 5, 40 is a wooden friction-block inserted in the recess 41 of the bed of the machine. A portion of this block is made to conform to the circular periphery of the cam 39, while the ends of said block adjustably engage the walls of the recess 41. 42 is a curved spring whose ends rest on the said block, and 43 is an adjusting-screw adapted to store up sufficient tension in said spring so as to insure the proper frictional contact between the block 40 and the cam 39. By means of this arrangement the cutting-off shaft is prevented from throwing by when under the rapid rotative influence of the driving-pulley 37, and the cutting-off lever 44 is held in open position after having cut off a section of the wire and maintained in such position until another section of wire is ready to be cut off. The cut-off lever 44 is securely mounted on the rock-shaft 45 and carries at its upper end, Fig. 1, the usual cut-off knife 46, which knife operates against the outer face of the wire-guide 47 in the usual manner. The lower end of arm 44 carries the stud 48 to engage with the cam 39, whereby said arm is actuated. 49 is the usual apron-shaft connected with the forward part of the machine. (Not shown.)

A modification of this friction device is shown at Fig. 6, wherein the two wedge-shaped blocks 40ª and 40ᵇ are used in place of one block, as shown at Fig. 5. In this

modified construction the adjusting-screw 43ª bears against one end of the block 40ᵇ, whose inclined face bears against the inclined face of the lower block 40ª. The spring 42 in this construction is interposed between the upper block and the ceiling of the recess 41.

Heretofore in machines of this character the cutting-off lever 44 was mounted on a short shaft journaled in the machine-head 3, and the end of the rock-shaft 45 was anchored in the boss 44ª of the cutting-off lever. In my present improved machine the end of the rock-shaft 45 extends through the machine-head and is journaled therein and held in place by the nut 45ª, and the cutting-off lever is secured to said shaft. This feature is a much stronger and cheaper construction, besides obviating the necessity of carrying so many machine parts in stock.

The guide-bar 49 is (see Fig. 16) provided with the usual groove 50 for the wire to pass through after leaving the wire-guide 47 in the machine-head 3, and 51 are the usual fingers rigidly mounted on the apron-shaft 52 and carrying at their lower ends the apron 53, adapted to close said groove 50 when the wire is feeding and uncover the same to let the wire drop out through the medium of the arms 51ª (see also Fig. 11) of the rock-shaft acting against the fingers. 54, Fig. 11, is the usual stop-rod inserted in the wire-feeding groove of the guide-bar 49. This rod is secured in the usual manner to the movable rod 54ª below. 55 is the usual trip connected to rod 54ª, and 56 is the wire connecting said trip with the clutch-lever 57, so that when the end of the feeding-wire strikes the forward end of this stop-rod the clutch mechanism, which may be of any well-known construction, will be operated to rotate the driving-shaft 36, and through the medium of the cam 39 the cutting-off lever 44 is actuated to sever the wire.

The stop-rod 54 is made long enough to meet all the requirements as to different lengths of wire to be cut. When short pieces of wire are cut, this stop-rod has to be moved forward in the groove of the guide-bar accordingly. Heretofore the forward end of this stop-rod has been supported by twisting a piece of wire about the guide-bar, which is often shifted and displaced by the vibratory jar of the machine, and consequently the end of the stop-rod drops out of the feeding-line of the wire, causing more or less bad work. To avoid this, I have provided an adjustable stop-rod support, (see also Figs. 15 and 16,) comprising the block 58, carrying the set-screw 59.

60 is a U-shaped spring-clamp embracing three sides of the guide-bar 49, with its free ends entering the grooves 58ª of the block 58. It will be observed that the upper portions of these grooves are enlarged to receive correspondingly-enlarged portions 60ª of the free ends or legs of said clamp, so the two parts—viz., 58 and 60—will hold together under the clamping pressure of the set-screw 59 when the said support is secured to the guide-bar. It is necessary that the support should be so constructed that it can readily be attached and detached from the guide-bar. In the present construction the connecting and disconnecting is done by simply slipping the block 58 on or off the clamp 60 in a direction longitudinal with said guide-bar. It is immaterial as to how this stop-rod support is constructed so long as it can be adjustably secured in any position and can readily be attached to or detached from the guide-bar.

Heretofore wire straightening and cutting-off machines have been supported on a cabinet in place of the legs, as shown at Fig. 11, and the extension-pipe 61 was made an inseparable part of such cabinet. This construction made the machine unnecessarily heavy, and consequently expensive to construct and ship. In my present machine I have lightened the construction by the use of legs and have made the extension-pipe readily detachable therefrom, so that the machine can be packed in a comparatively small compass for shipment. In securing the extension-pipe to the legs I employ the U-shape bolts 62, which anchors the pipe firmly to the cross-pieces 63 of said legs. 64 is the end wire-receiving fork-bracket partially embracing the extension-pipe and is bolted to the short standard 65. 66 is an intermediate wire-receiving fork-bracket, several of which would be required in a long machine, which is supported to the extension-pipe by the U-shape bolt 67, similar to the U-shape bolts for attaching said pipe to the machine-legs previously mentioned. Formerly these intermediate fork-brackets were secured to the extension-pipe by a cap bolted to the semicircular foot 66ª, but under the vibrating strain, due to the rapid oscillating motion of the wire-cutting-off lever 44, especially when cutting short lengths of wire, these intermediate fork-brackets would invariably work loose, even when pinned to the extension-pipe. This tendency to work loose is entirely obviated by the use of the U-shape bolts. The small bearing that these bolts have in cross-section on the extension-pipe so increases the frictional contact of these fork-brackets with the pipe that accidental movement of the same is entirely prevented, and this is likewise true with respect to the U-shape bolts 62 for anchoring said extension-pipe to the legs previously described, wherein said bolts have a holding power sufficient to withstand any strain liable to be put on the said pipe.

To enhance the grip of the feet 64ª and 66ª of the fork-brackets, the surface is partially cut away, (see Figs. 13 and 14,) leaving the short bearing-contacts 64ᵇ and 66ᵇ.

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

1. The combination, in a wire straightening and cutting-off machine, comprising shafts carrying gears and wire-feeding rolls, boxes in which said shafts are journaled, said boxes located between said gears and feeding-rolls, both of said boxes pivotally supported at or near one end to a stationary part of the machine, the opposite end of said boxes adjustably supported, for the purpose set forth.

2. The combination, in a machine of the character described, comprising wire-feed rolls and shafts for same, boxes for said shafts, said boxes pivotally supported at or near one end to a stationary part of the machine, a supporting-standard for the opposite end of said boxes, means located beneath the lower box for vertically adjusting said boxes, for the purpose set forth.

3. In combination, with wire-feed-roll shafts carrying feed-rolls secured thereto, boxes for said shafts pivotally supported at or near one end to a stationary part of the machine, the other end adjustably mounted in a standard, a cam located below the under box, an adjusting-screw to operate said cam in one direction, and a spring to move said cam in the opposite direction, for the purpose set forth.

4. The combination, in a machine of the character described, of the head 4, rock-shaft 45 journaled therein, and cutting-off lever 44 rigidly mounted on said shaft, for the purpose set forth.

5. The combination, in a wire-straightener adapted for use in a machine of the character described having a rotary wire-straightener head carrying a flanged driving-pulley and a supporting-frame for said head, of receptacles adapted to hold absorbent material projecting from said frame, said receptacles provided with openings to receive the flanges of said pulley and thereby prevent the oil reaching the body portion of said pulley, for the purpose set forth.

6. The combination, in a machine of the character described, with an extension-pipe adapted to support wire-receiving brackets, of legs for supporting the rear part of said machine, U-shaped bolts embracing said pipe for detachably securing the pipe to said legs, for the purpose set forth.

7. The combination, in a machine of the character described, with an extension-pipe and wire-receiving brackets mounted thereon, of U-shaped bolts adapted to embrace said pipe and connect with the base of said brackets and firmly connect the same to the pipe, for the purpose set forth.

8. In a machine of the character described, having a guide-bar to receive the wire and a stop-rod to determine its length, of a stop-rod support comprising a thin metal clamp adapted to partially embrace said guide-bar, a block carrying a set-screw adapted to be readily engaged and disengaged from said clamp, for the purpose set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 22d day of November, A. D. 1902.

FRANKLIN B. SHUSTER.

Witnesses:
H. A. LAMB,
S. J. CHAFFEE.