

No. 827,975.

PATENTED AUG. 7, 1906.

J. M. HENDERSON.
WIRE DRAWING MACHINE.
APPLICATION FILED AUG. 11, 1905.

3 SHEETS—SHEET 1.

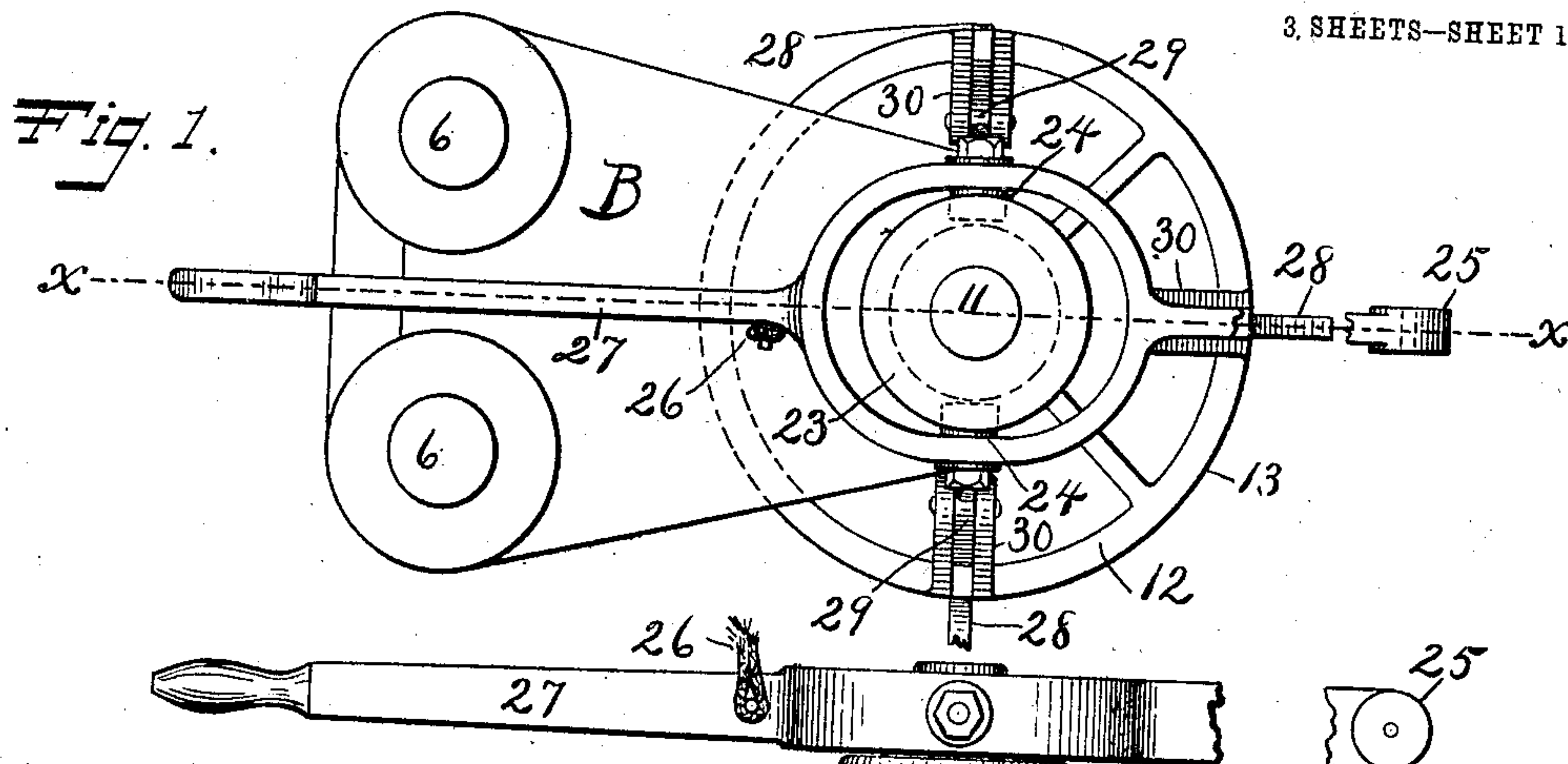
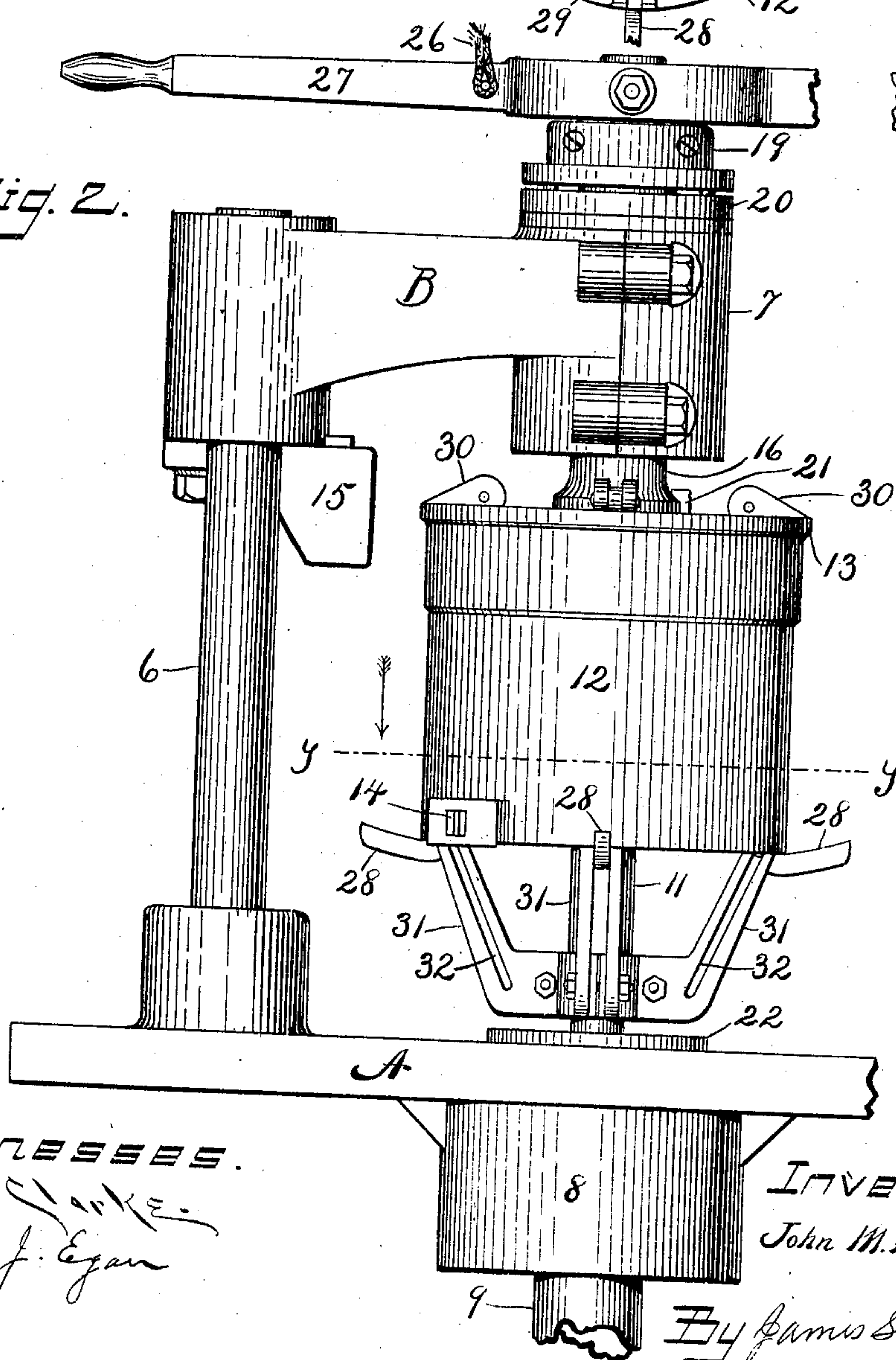


Fig. 2.



Witnesses.

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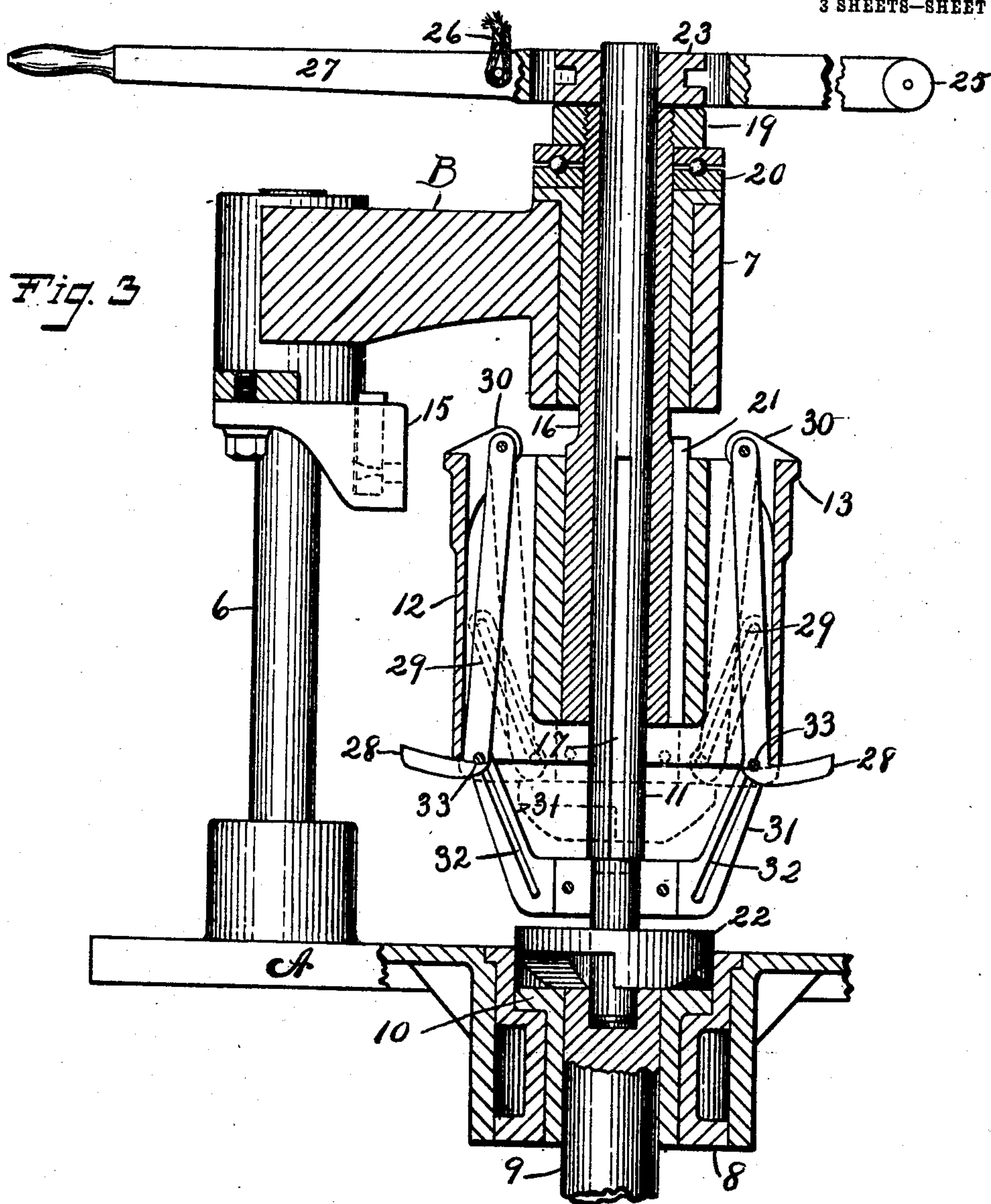
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3 SHEETS—SHEET 3.

Fig. 4.

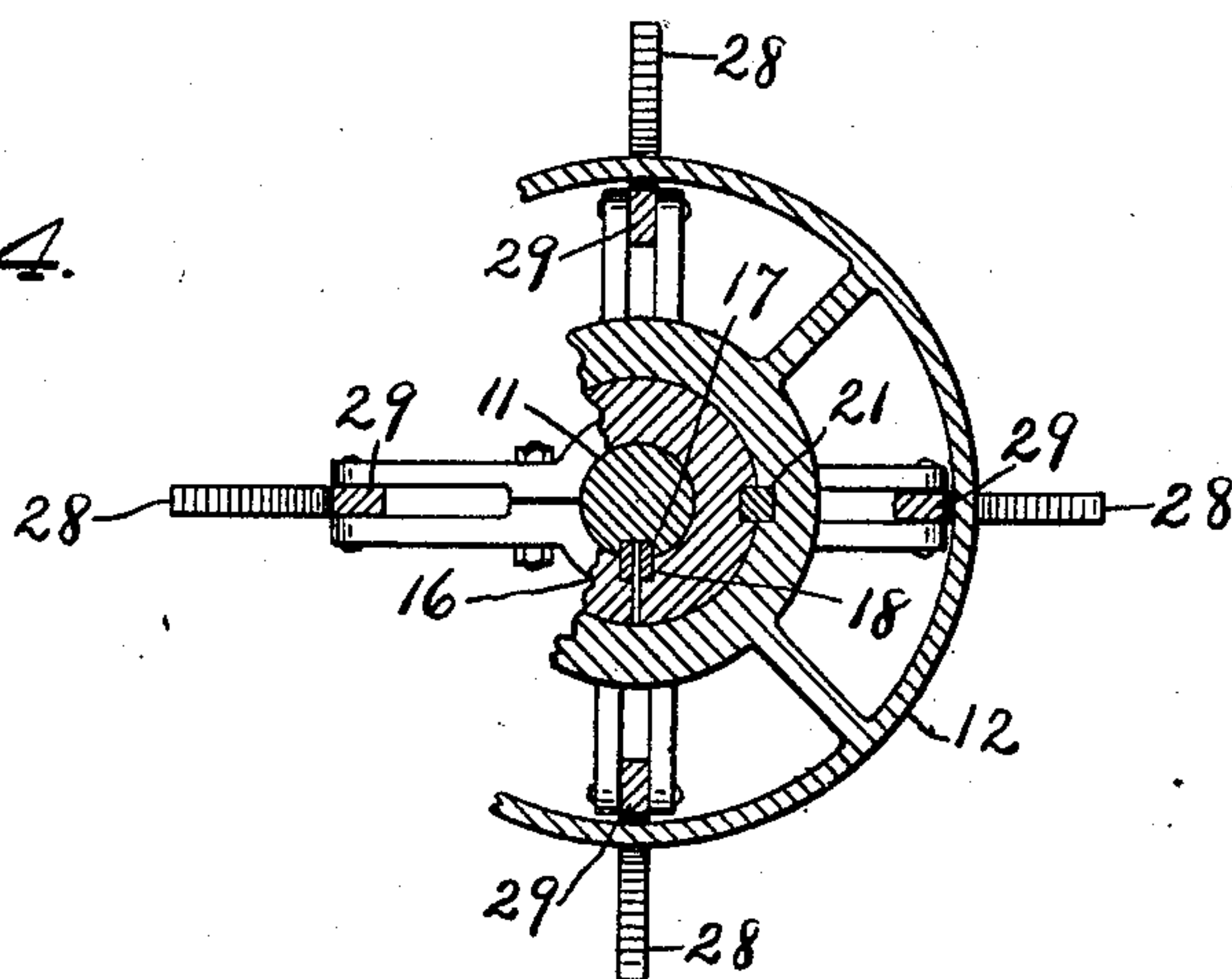
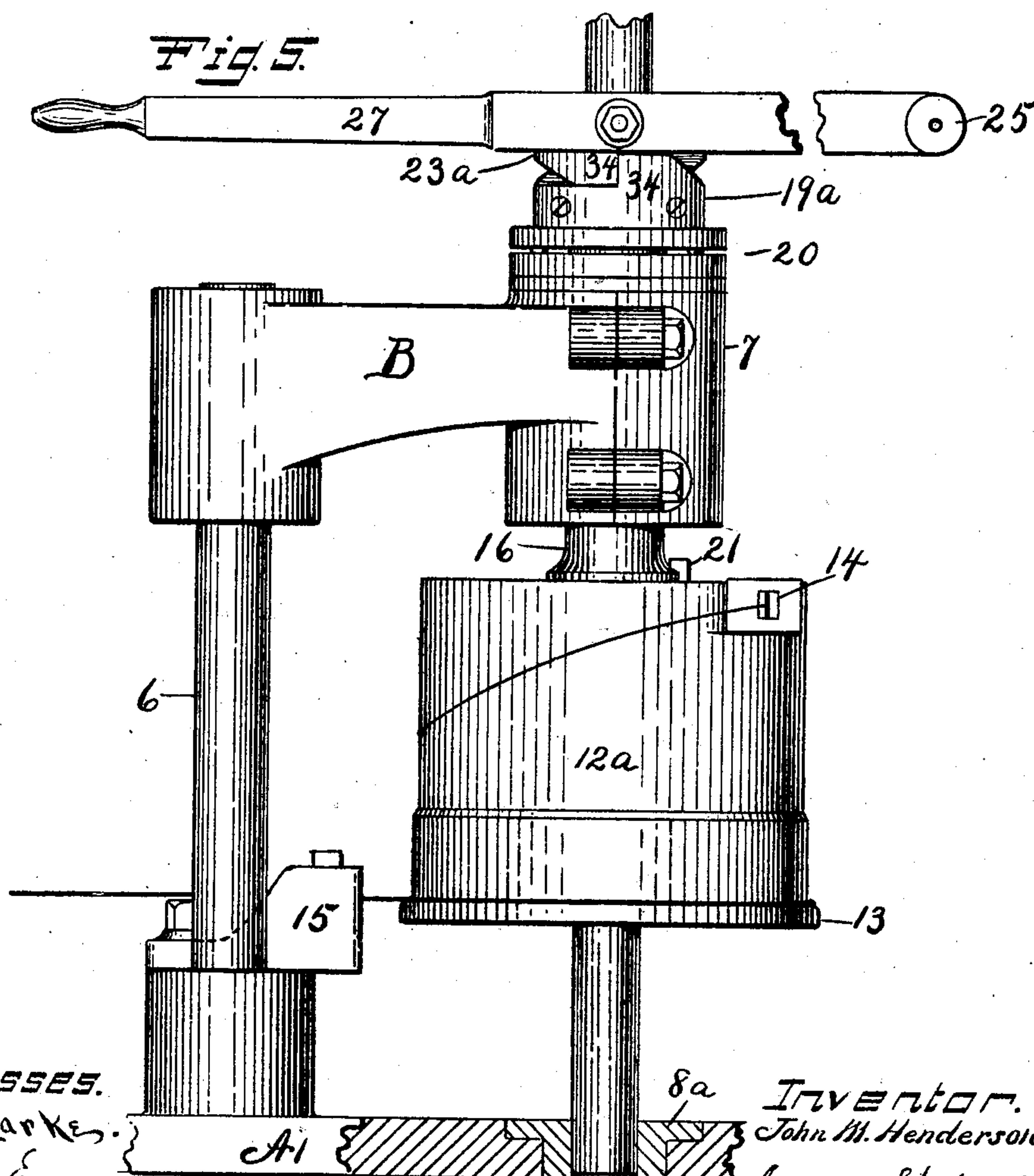


Fig. 5.



Witnesses.

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8a

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UNITED STATES PATENT OFFICE.

JOHN M. HENDERSON, OF WATERBURY, CONNECTICUT.

WIRE-DRAWING MACHINE.

No. 827,975.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed August 11, 1905. Serial No. 273,843.

To all whom it may concern:

Be it known that I, JOHN M. HENDERSON, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Wire-Drawing Machines, of which the following is a specification.

My invention relates to improvements in wire-drawing machines; and the main object of my improvement is to firmly support the wire-drawing drum from both ends and at the same time provide for the ready removal of the wire.

Another object is to provide a withdrawing support for the wire at the lower end of the drum.

In the accompanying drawings, Figure 1 is a plan view of the main portions of my machine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section of the same, partly in elevation, on the line *xx* of Fig. 1. Fig. 4 is a broken sectional plan of the drum and connected parts, the plane of section being indicated by the line *yy* of Fig. 2. Fig. 5 is a side elevation, partly in section, of a modified form of my machine.

A designates a bed, work-table, or bench of any ordinary construction, upon which is mounted two standards or posts 6, at the upper end of which posts is the subframe B, provided with a suitable box or bearing 7. The table A is also provided with a shaft-bearing 8. The parts thus far described, taken as a whole, constitute the frame of the machine, for which frame any other frame having upper and lower shaft bearings or supports may be substituted as an equivalent.

The upper end of a driving-shaft 9 (represented as broken off) is provided with an ordinary clutch member 10, rigidly secured to said shaft, so as to rotate therewith, and this end of the shaft, with the clutch member thereon, is supported axially in the bearing 8 of the bed or table, the upper end of the said bearing being counterbored to receive the disk portion of the said clutch member. The upper end of the shaft 9 is bored centrally, as shown in Fig. 3, to form a socket to receive the lower end of the sliding shaft 11 to center the said shaft and firmly support it in the shaft 9 through the bearing 8. The said shaft 11 is for driving the wire-drawing drum

12. This drum is, in the main, of an ordinary construction, and any ordinary drum to which my improvements are applicable may be substituted therefor.

For use with my withdrawing wire-support at the base of the drum I place the ordinary wire-casting flange 13 at the upper end and the vise 14 at the lower end of the drum. As usual, a portion of the drum adjacent to the flange 13 is of full diameter to give a holding friction to the coils of wire being drawn, while the rest of the drum is of a reduced diameter to release the holding friction and let the wire fall down. Any suitable die and die-holder 15, through which to draw the wire in any ordinary manner, may be supplied and mounted on any proper support—as, for example, on the subframe B.

While the drum 12 is driven or rotated by the sliding shaft 11 and is indirectly mounted thereon, it is keyed or otherwise rigidly fastened to the lower end of a sleeve 16—as, for example, by means of the key 21—within which sleeve the shaft 11 is fitted to slide and to which the said sliding shaft is connected in such manner as to necessitate the rotation of the sleeve and drum with the said shaft. As shown, this is accomplished by means of a longitudinal slot or groove 17 in the shaft 11 and a feather or spline 18, that is pinned or otherwise fastened to the sleeve. The upper end of the shaft 11 and sleeve 16 are supported by and rotate within the bearing 7 in the subframe B. The sleeve 16 is held against moving vertically down through the bearing 7 by means of a collar 19, pinned or otherwise fastened to the sleeve and acting in opposition to the upper end of the bearing 7, preferably with a ball-bearing washer 20, interposed between the said collar and bearing.

The shaft 11 has rigidly secured to it near its lower end a clutch member 22, that with the companion clutch member 10 before described forms a clutch for connecting and disconnecting the driving-shaft 9 and driven shaft 11. At the upper end of the shaft 11 a grooved collar 23 is rigidly secured, and in connection therewith is a lever 27, having suitable projections for engaging the grooved collar—as, for example, the shoes 24. This lever is represented as broken off. It may have its end 25 pivoted to or fulcrumed on any suitable fixed support (not shown) and may also have a rope or cord 26 attached

thereto and extended to any suitable counterbalancing-weight to counterbalance to a greater or less extent the weight of the sliding shaft and such parts as are lifted there-
 5 with. The counterweight may be heavy enough to lift the shaft 11 and connected parts.

The removable or withdrawing support for the wire at the base of the drum consists of
 10 any desired number of fingers 28, that are formed integral with the swinging arms 29, which are pivoted to or between suitable lugs or ears 30 at the upper part of the drum, the body of the said arms extending downwardly
 15 on the inside of the drum, as best shown in Fig. 3. Mounted on the shaft 11, so as to move therewith, is a spider-like frame having the same number of double arms 31 as there are swinging arms 29, (four as shown,) the
 20 lower ends of which arms lie in the spaces between each pair of double arms, as shown in Fig. 4. These double arms are connected with the swinging arms by a pin-and-slot connection, the said double arms being provided
 25 with oblique slots 32 and connected with the lower ends of the swinging arms by means of pins 33, that are fastened in the swinging arms, with their ends resting in the oblique slots 32, whereby an upward movement of
 30 the double arms with the shaft 11 operates through the said pins and oblique slots to withdraw the fingers 28 to release the work, the said swinging arms and fingers moving from the position shown by full lines in Fig. 3
 35 to that indicated by the broken lines therein. Returning the shaft 11 to its former or lowered position will automatically return the fingers to their projected position.

The wire to be drawn has its end passed
 40 through the die, so that said end may be held in the vise 14 in the ordinary manner. The operator may then depress the handle end of the lever 27, and thereby lower the shaft 11, so as to enter its lower end in the socket in
 45 the shaft 9 and at the same time bring the clutch members 10 and 22 together to put the shaft 11 in motion. The shaft 9 may be driven by any suitable means and may run continuously during working hours. The
 50 working position of the die-holder or die is such as to direct the wire to the casting-flange 13, so as to cast the coils downwardly as they are wound around the drum in the ordinary manner. If the counterweight for
 55 lifting the shaft 11 through the lever more than overbalances the weight of the shaft and connected parts, the operator should hold the lever down until the drum begins to pull the wire through the die, and thereby cause a
 60 frictional strain on the drum sufficient to prevent the shaft 11 from rising. The removable wire-supports are intended particularly for small or fine wire. As the wire becomes slack after leaving the larger portion of the

drum, it will fall down on the fingers 28, 65 where it may pile up in overlapping coils until the stock runs out of the die. As the stock runs out of the die, the friction on the shaft 11 is released, so that the counterweight, if heavy enough, will raise the said shaft 11, 70 thereby disengaging the clutch, so as to stop the rotation of the drum and also withdraw the supporting-fingers 28, so that the wire falls on the table or bed. If the weight is not heavy enough to raise the shaft, the operator 75 may raise it by means of the lifting-lever. The raising of the shaft 11 forms a clear space or opening between the lower end of the drum and the table and between the two bearings that support the drum from both 80 ends, so that the wire may be removed laterally through the open space thus made just above the top of the table on which the wire falls from the drum.

While the withdrawing support for the 85 wire is designed for use with a drum that has the frictional drawing portion at the top, the sliding devices or sliding connections for opening a space between the drum and the table is designed for all the various drums that 90 may be required for various kinds and sizes of wire or rods. In Fig. 5 the drum 12^a has its casting-flange 13 at the bottom and the vise 14 at the top and the supporting-fingers are omitted. The die and die-holder 15 are 95 changed in position to correspond with the change in the drum. The bed or table A' has a simple shaft-bearing 8^a without any counterbore for a clutch. There is no clutch member at the lower end of the shaft 11^a, and 100 this shaft extends upwardly above the lifting-collar 23^a for the reception of any power driving device, as a gear or the like, so that the said shaft is rotated by power applied at the top. The confronting faces of the lift- 105 ing-collar 23^a and the sleeve-collar 19^a are provided with clutch-teeth 34 to convert the said collars into companion clutch members that form an ordinary clutch. The longitudinal slot in the shaft and the feather in the 110 sleeve to make them always rotate together are omitted. The remaining parts are the same as hereinbefore described in connection with Figs. 1 to 4. With the lifting-lever 27 depressed the clutch mechanism connects 115 the shaft 11^a with the sleeve-collar 19^a, the sleeve, and the drum, so that the rotation of the said shaft imparts a rotary movement to the drum, and the wire is wound upon the drum in the ordinary manner. When the 120 wire runs out of the die, the coils will expand, so the wire falls on the table A'. As the lever 27 is lifted the shaft 11^a is raised with it to take the power off the drum and to remove the lower end of the said shaft from the bearing 8^a, thereby forming an open space be- 125 tween the shaft-bearings and between the top of the table and lower end of the drum,

so that the bunch of coiled wire may be removed laterally through the said open space. Depressing the lifting-lever 27 puts the machine in condition for repeating the operation.

The constructions herein shown and described represent the best mode in which I have contemplated the practice of my invention; but I do not wish to be confined to these precise details, since it is clear that without departing from the spirit of my invention many changes might be made therein. While only one form of the withdrawing wire-support has been shown, it should be noted that the said support is extended outwardly from the base of the drum and that by means of the operating devices it is withdrawn so as to let the wire fall. When used in connection with the longitudinally-sliding shaft devices for opening a wire-removing space at the top of the table, the wire-support is automatically withdrawn by the act of opening the said removing-space.

In both forms of longitudinally-sliding devices for opening the wire-removing space the shaft or shafts that support the drum are supported laterally by two bearings that give support to the drum from both ends, and the open space is not only between these two lateral supports, but is between the lower end of the drum and the top of the table. For convenience of description I have referred to the shafts 9 and 11 as "separate" shafts; but when they are coupled together by sliding connections they are practically one shaft and may be properly designated as such.

Having shown two different constructions for accomplishing the separation of the shaft and its connections, I would have it understood that I do not wish to confine myself to the details of construction further than the said details are specifically pointed out in the claims.

I claim as my invention—

1. In a wire-drawing machine, the combination of a suitable frame having a table with a rotatable wire-drawing drum having means for gripping the wire, a shaft for rotating the said drum, lateral supports for the said shaft and drum on the said frame for supporting both ends of the said drum, and means for disconnecting the said shaft and drum from one of their supports in the frame to open a space between the said lateral supports and above the said table through which space the wire drawn on the said drum may be removed laterally.

2. In a wire-drawing machine, the combination of a frame having a table with a rotatable wire-drawing drum, a longitudinally-sliding rotatable shaft for rotating the said drum, supporting-bearings on the said frame for supporting the said shaft and drum at both ends of the said drum, and means for

sliding the said shaft for opening a space between the said supporting-bearings, through which space the drawn wire may be removed laterally.

3. In a wire-drawing machine, the combination of a frame having a table for the wire to fall upon, with a wire-drawing drum vertically mounted to rotate on the said frame and supported thereby from each end, a shaft passing through the said drum, the said drum and shaft having a relatively longitudinal movement, and means for effecting the said longitudinal movement and thereby opening a space for removing the wire laterally from between the lower end of the drum and the table.

4. In a wire-drawing machine, the combination of a frame with a sleeve mounted to rotate thereon, a wire-drawing drum mounted on the said sleeve to rotate therewith, a rotatory shaft passing through the said sleeve for rotating therewith, lateral supports for the said shaft and drum on the said frame for supporting both ends of the said drum, means for rotating the said shaft, sleeve and drum together, and means for disconnecting the said shaft from one of its supports in the frame to form an open space for the removal of the wire.

5. In a wire-drawing machine, the combination of a frame with a sleeve mounted to rotate thereon, a wire-drawing drum mounted to rotate with said sleeve and supported thereby, a sliding shaft passing longitudinally through said sleeve, means for connecting the said shaft with a lateral support in the frame at the end of the drum opposite that which is connected with the frame by the said sleeve, means for rotating the shaft, sleeve and drum together, and means for disconnecting the said shaft from one of its supports in the frame to form an open space for the removal of the wire.

6. In a machine for drawing wire, the combination of a frame having a table, with a driving-shaft supported in a bearing below the said table, a sleeve supported to rotate in the upper part of the said frame, a wire-drawing drum mounted on the said sleeve to rotate therewith, a driven shaft extended into the said sleeve, mechanism for necessitating the rotation of the said sleeve with the said shaft, and means for operatively connecting and disconnecting the said driving and driven shafts, and to form an opening for removing the work from the work-table when the said shafts are disconnected.

7. In a machine for drawing wire, the combination of a frame having a work-table with a driving-shaft supported in a bearing below the said table, a sleeve supported to rotate in the upper part of the said frame, a wire-drawing drum mounted on the said sleeve to rotate therewith, a driven shaft passing through

the said sleeve and arranged to slide longitudinally therethrough, means for necessitating the rotation of the said sliding shaft and sleeve, and clutch mechanism at the confronting ends of the said driving and driven shafts for making them move as one shaft and for separating them to open a work-removing space adjacent to the work-table upon which the wire falls from the drum.

8. In a machine for drawing wire, the combination of a wire-drawing drum with a series of radially-extended and longitudinally-moving wire-supporting fingers for projecting longitudinally in a radial direction beyond the periphery of the drum at its lower end for withdrawing therefrom, and means for operating the said series of fingers to project and withdraw them radially in the direction of their length, for supporting and releasing the wire.

9. In a machine for drawing wire, the combination of a wire-drawing drum, with a series of swinging arms pivoted by their upper ends to the upper part of the said drum and having fingers at the lower ends of the said arms for projecting beyond the periphery of the drum and for withdrawing therefrom, and means for operating the said series of arms to project and withdraw the said fingers.

10. In a machine for drawing wire, the combination of a wire-drawing drum with a series of swinging arms pivoted by their upper ends to the said drum and having fingers at the lower ends for projecting into their supporting position and withdrawing therefrom, a sliding shaft arranged to move longitudinally of the said drum, and a frame mounted on the said shaft and having operating-arms connected with the said swinging arms by a pin-and-slot connection.

11. In a machine for drawing wire, the

combination of a frame having a work-table with a rotatable vertical wire-drawing drum mounted to rotate on the said frame and supported thereby from each end, a shaft arranged to slide longitudinally to the said drum for opening a work-removing space adjacent to the said table, wire-supporting devices at the lower end of the said drum and operating devices connected with the said shaft for projecting and withdrawing the said wire-supporting devices by the longitudinal movement of the said shaft for opening the work-removing space.

12. In a machine for drawing wire, the combination of a wire-drawing drum with a series of swinging arms extending vertically along the inner side of the drum and pivoted by their upper ends to said drum, the said arms having horizontally-extended fingers projecting radially from their lower ends, and means for operating the said arms to move the said fingers in the longitudinal direction for withdrawing and projecting the said fingers.

13. In a wire-drawing machine, the combination of a drum arranged horizontally to rotate on a vertical axis, with withdrawing-wire supports mounted on and carried by the said drum, and mechanism for operating the supports so mounted, the said supports being arranged to move in and out in substantially the horizontal plane of the lower edge of the said drum and with the lower end of the said drum in a position relatively to the upper face of the said wire-supports to strip the wire therefrom upon the inward movement of the said wire-supports.

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Witnesses:

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