

No. 754,209.

PATENTED MAR. 8, 1904.

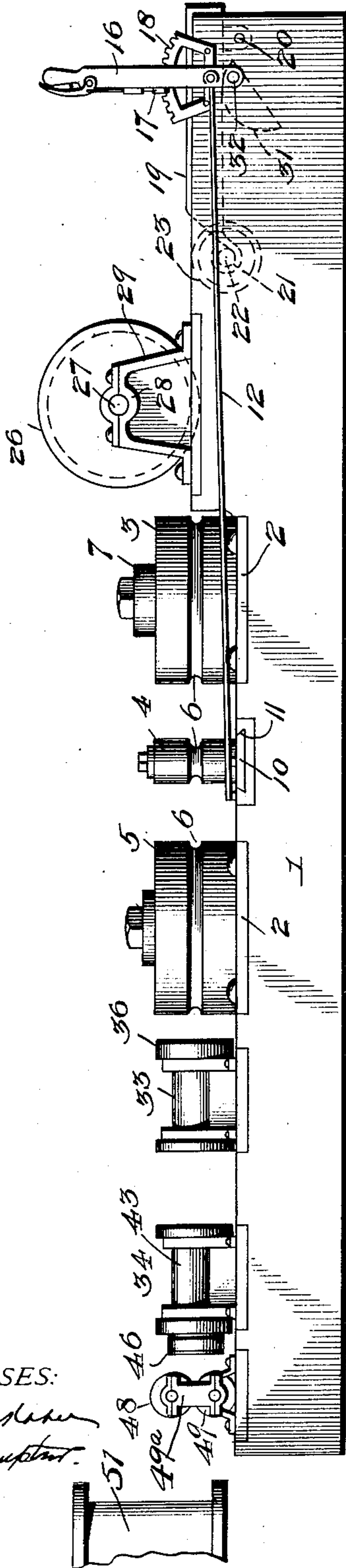
J. S. FERGUSON.
WIRE ROD CLEANING MACHINE.

APPLICATION FILED OCT. 9, 1903.

NO MODEL.

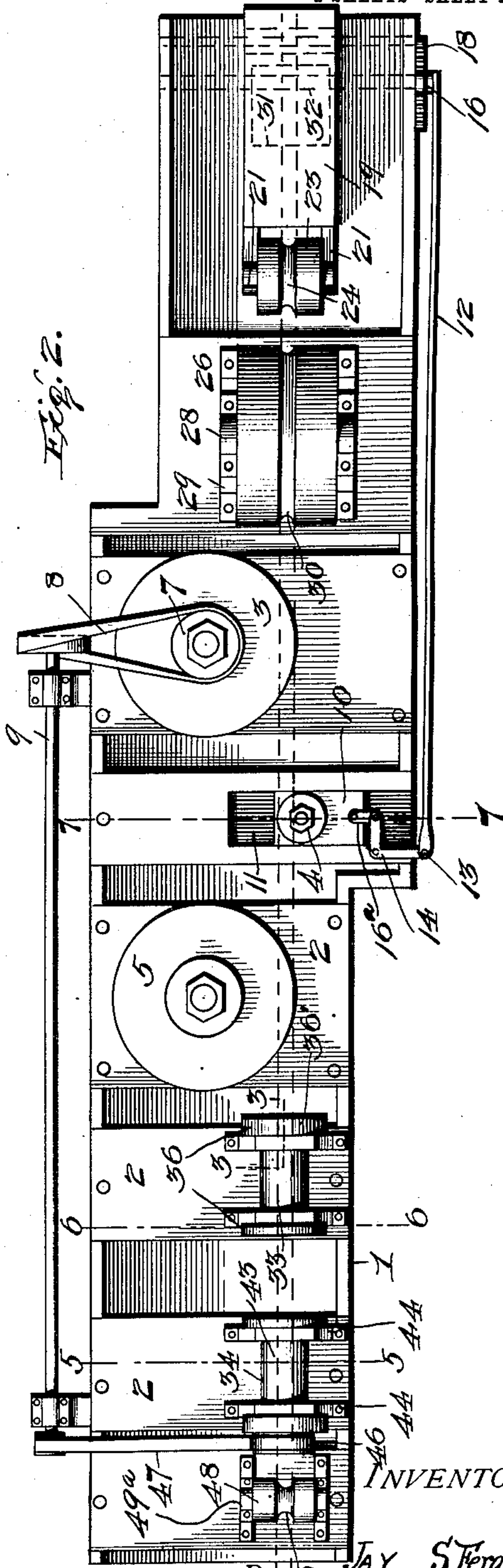
2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:
J. L. Ketchum
S. J. Walcott

Fig. 2.



INVENTOR

BY JAY S. Ferguson
K. B. Corman
Attorney

No. 754,209.

PATENTED MAR. 8, 1904.

J. S. FERGUSON.
WIRE ROD CLEANING MACHINE.

APPLICATION FILED OCT. 9, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 3.

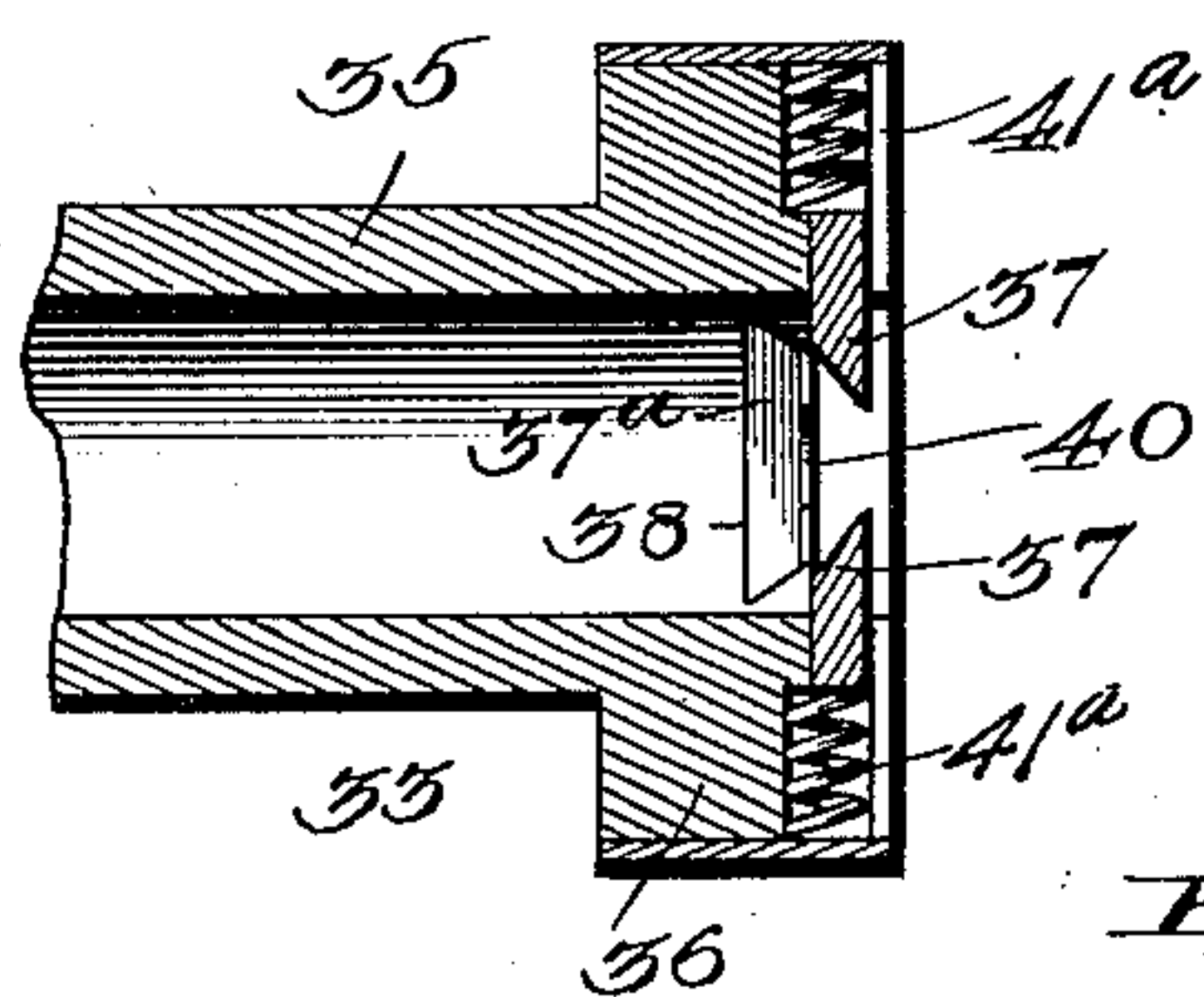


Fig. 4.

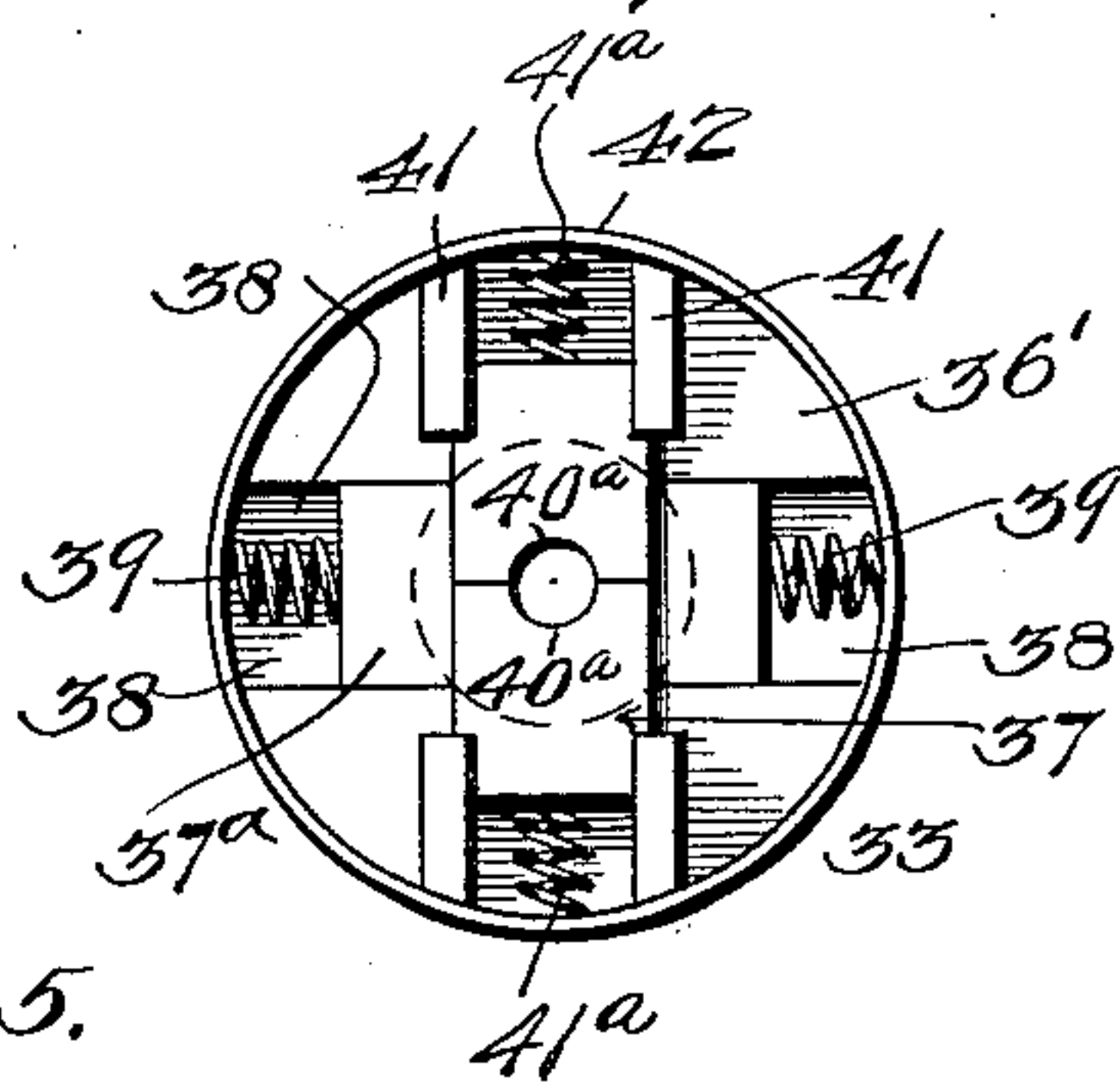


Fig. 5.

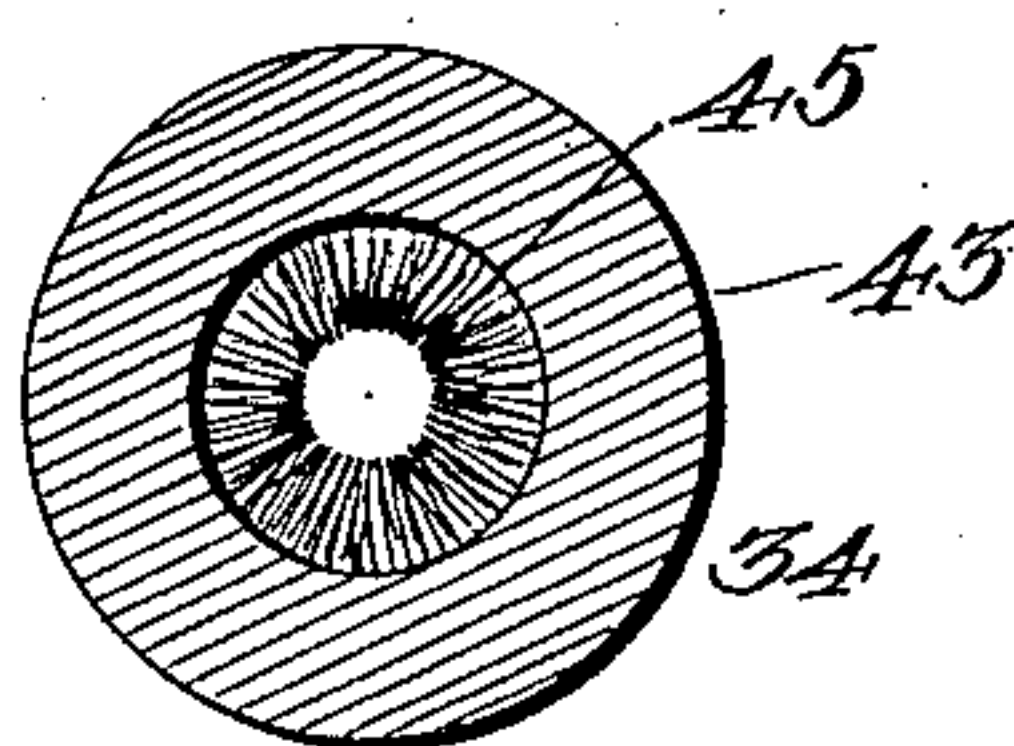


Fig. 6.

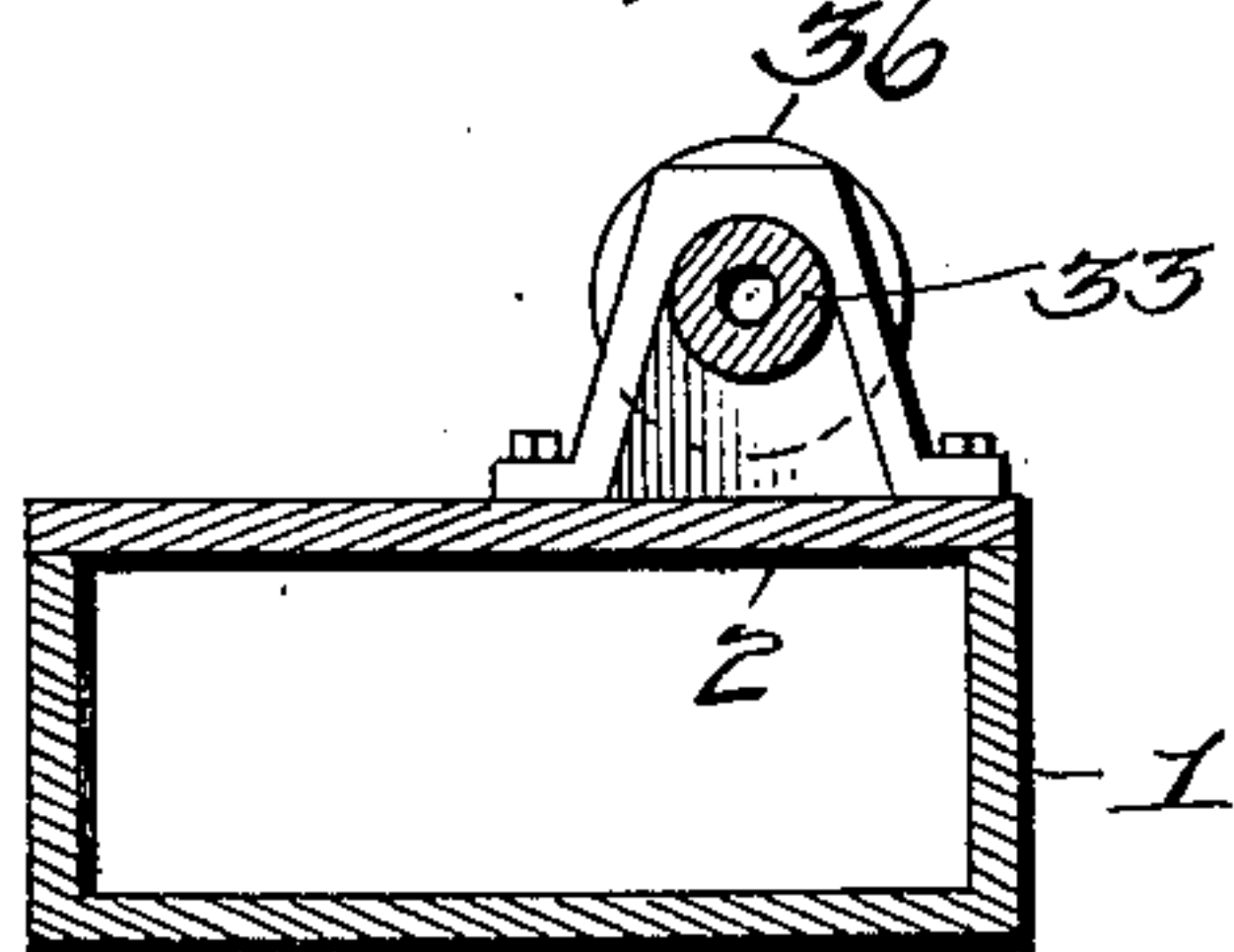


Fig. 7.

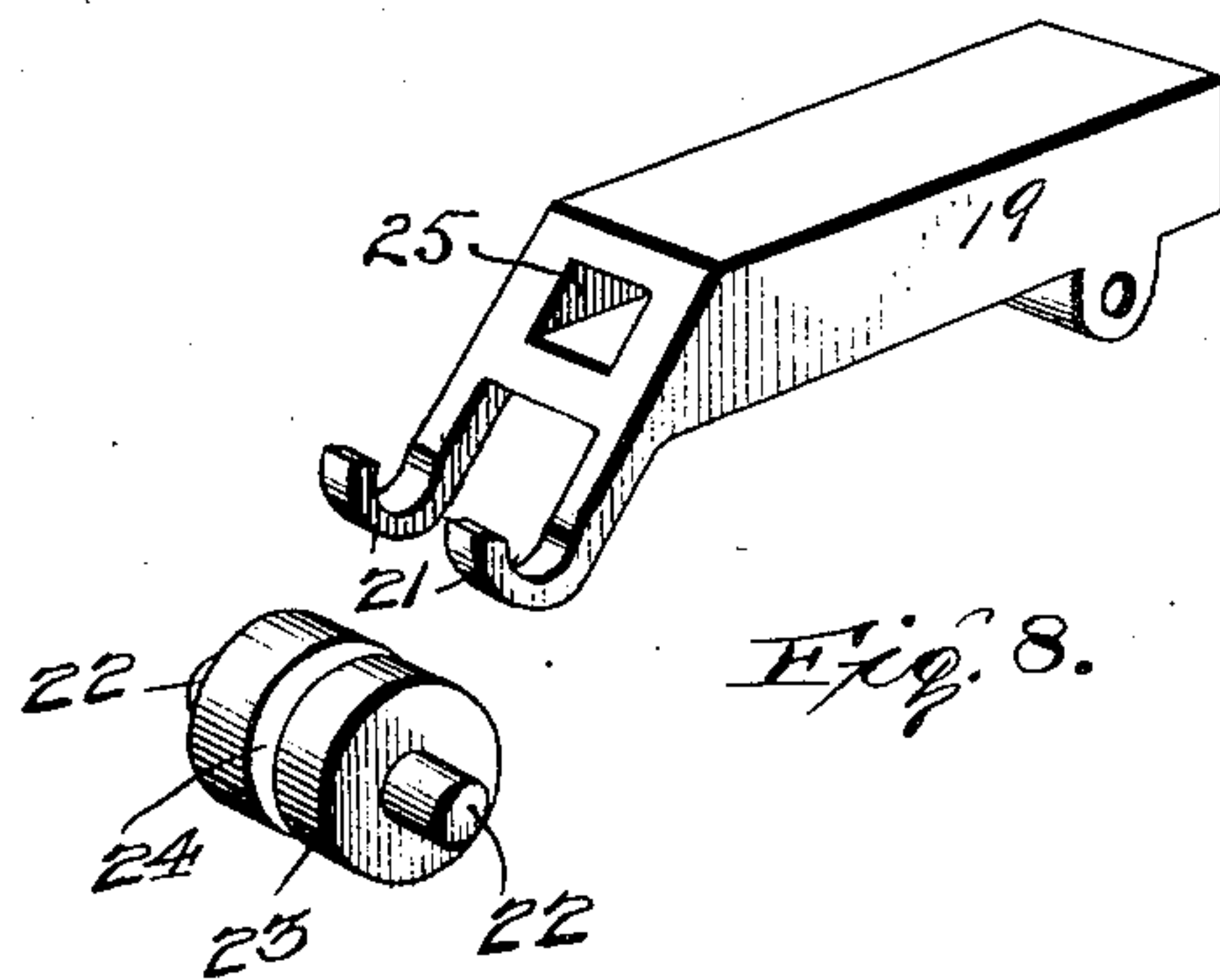
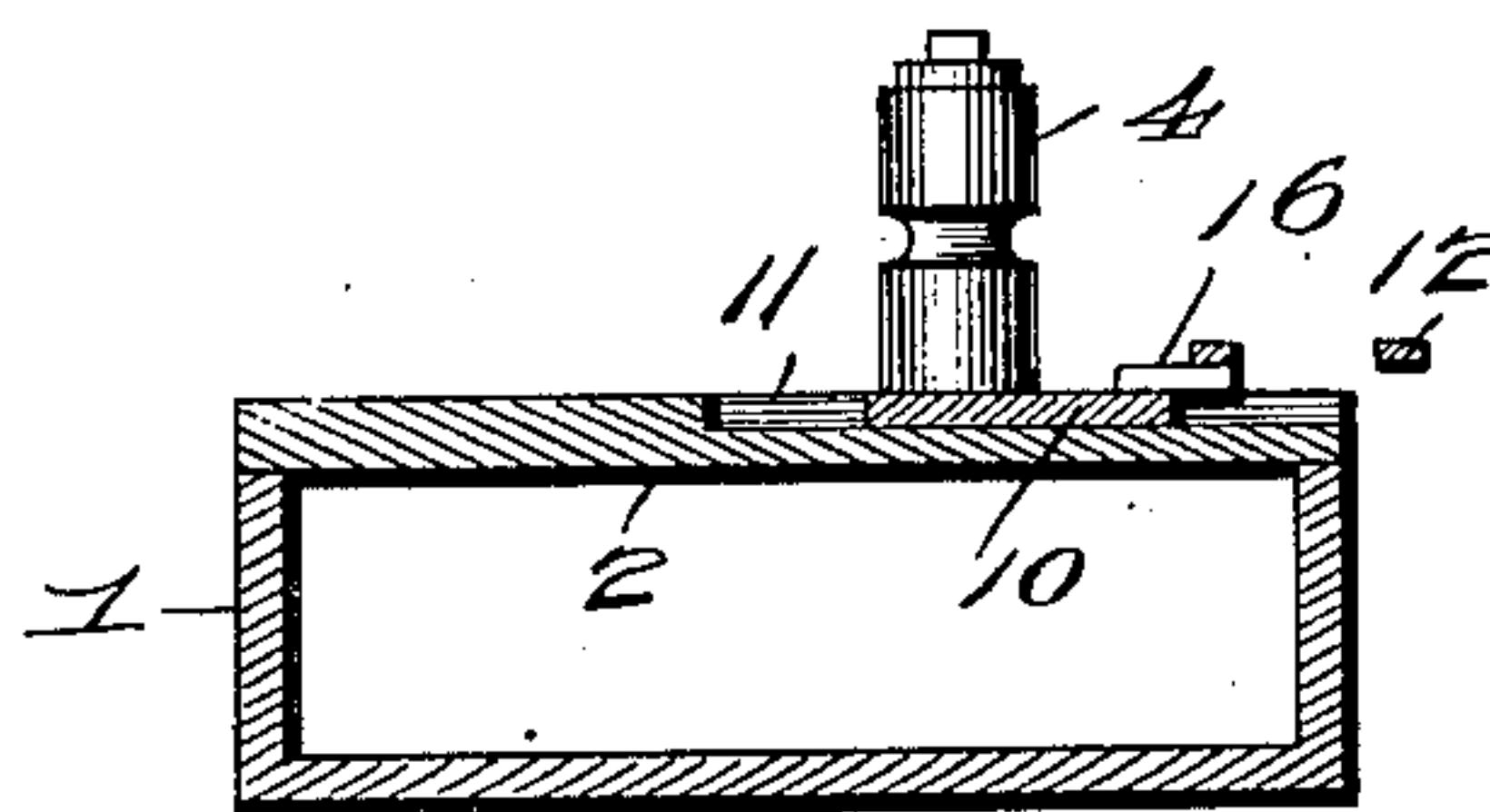


Fig. 8.

WITNESSES:

J. L. Mockman
J. H. Houghton

INVENTOR

Jay S. Ferguson

BY

H. C. Carman
Attorney

UNITED STATES PATENT OFFICE.

JAY S. FERGUSON, OF SOUTH SHARON, PENNSYLVANIA.

WIRE-ROD-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 754,209, dated March 8, 1904.

Application filed October 9, 1903. Serial No. 176,384. (No model.)

To all whom it may concern:

Be it known that I, JAY S. FERGUSON, a citizen of the United States, residing at South Sharon, in the county of Mercer and State of Pennsylvania, have invented new and useful Improvements in Wire-Rod-Cleaning Machines, of which the following is a specification.

This invention relates to the art of cleaning metal rods prior to drawing the same into wire, and has special reference to an improved machine designed to accomplish this work entirely by mechanical instrumentalities.

It is well known that wire-rods are generally covered with scales or crust, which must be entirely removed before drawing into wire, and the method generally practiced for taking off the scales and cleaning the rods prior to the drawing operation is to pickle or soak the same in acids, which method, however, is open to many objections. It is therefore the purpose of the present invention to entirely obviate the handling of wire-rods in this manner and to provide simple, practical, and effective means for thoroughly loosening up and removing the scales, besides placing the rod in the best possible condition for the wire-drawing operation.

With these and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention involved in the novel means for simultaneously varying the stress or tension of both the vertical and horizontal sets of straining-rolls and the means for removing the scales and cleaning the rod are necessarily susceptible to structural modification without departing from the scope of the invention, and a preferable construction of the same is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a wire-rod-cleaning machine constructed in accordance with the present invention. Fig. 2 is a top plan view thereof. Fig. 3 is an enlarged detail sectional view on the line 3 3 of Fig. 2, showing the mounting of the scraping-blades

of one of the cleaning devices which is in the form of a rotary scraper. Fig. 4 is an end view of the scraper shown in Fig. 3, exposing more plainly the relative positions of the separate pairs of scraping-blades. Fig. 5 is a detail cross-sectional view on the line 5 5 of Fig. 2, exposing the preferred construction of the cleaning device, which is in the form of a rotary brush. Fig. 6 is a transverse sectional view on the line 6 6 of Fig. 2, showing the cross-sectional form of the machine-bed. Fig. 7 is a detail vertical sectional view on the line 7 7 of Fig. 2, exposing the slidable mounting of the adjustable vertical straining-roll. Fig. 8 is a detail perspective of the vertically-swinging adjustable feeding-guide for introducing the wire-rod to the machine.

Like reference-numerals designate corresponding parts throughout the several figures of the drawings.

The working parts of the machine may be supported in any suitable manner in connection with an appropriate foundation or base; but in the drawings is shown a practical construction wherein the various instrumentalities may be maintained in proper working relation. As shown, this construction includes an elongated base 1 of the proper length to support all the parts, and of a channeled form, the same being of a U shape in cross-section, as illustrated in Fig. 6 of the drawings.

In the form of channeled base shown it is necessary to provide means for sustaining the different parts of the machine, and this may be accomplished by suitably securing upon the upper edges of the side walls of the base a series of transversely-arranged supporting-platforms 2, which platforms are designed to constitute individual supports for the different working parts of the machine, as plainly shown in Figs. 1 and 2 of the drawings. This structural detail can, however, be varied without affecting the invention.

The principle involved in this machine is that of exerting a lateral stress or tension upon the rod to provide for breaking and loosening up the scale thereon and subsequently removing the latter through the medium of suitable cleaning devices. In this connection the machine is also intended to provide means for ex-

erting this stress or tension upon what may be termed the "upper" and "lower" faces and also upon the opposite sides of the rod, whereby the entire periphery thereof will be strained, stretched, or pressed, so as to break or loosen up any scale thereon. This action is accomplished by the employment of the separate sets of vertically and horizontally arranged straining-rolls. Any desired number of these rolls in each set may be used; but a practical number is shown in the drawings.

The vertical set of straining-rolls are designated, respectively, by the references 3, 4, and 5, and these rolls are arranged in staggered relation alternately at opposite sides of the line of travel of the wire-rod. Also each of said rolls is journaled upon a vertical axis mounted upon an individual supporting-platform 2. The several vertical rolls 3, 4, and 5 are preferably provided with the horizontal peripheral guiding-grooves 6 for the rod, and the first roll of the series (designated by the numeral 3) is also additionally provided with a pulley member 7, which drives the belt 8, passing over a pulley on the transmitting-shaft 9 for the purpose hereinafter explained. The intermediate vertical roll 4 of the vertical set is preferably designed to be adjustably mounted and to have a movement toward and from the vertical planes of the vertical rolls 3 and 5. While this mounting and adjustment may be accomplished in various ways, a simple arrangement consists in mounting the axis or journal for the roll 4 upon the slidable roll-carrier 10. This roll-carrier is illustrated as being in the form of a dovetailed slide movable in a correspondingly-shaped slideway 11, provided in the upper face of the transverse supporting-platform 2 for the adjustable vertical roll 4. The adjustment of the roll-carrier 10 in a direction toward and from the plane of the rolls 3 and 5 is conveniently effected through the medium of an adjusting-rod 12, having a pivotal connection at one end, as at 13, with the bell-crank lever 14, and likewise connected at its other end, 15, with a regulating-lever 16. The bell-crank lever 14 is pivotally mounted upon the base-support for the roll 4 and is operatively connected, as at 16^a, with the slide-carrier 10, while the regulating-lever 16 is pivotally mounted upon the front end of the machine-base and carries a latch 17, cooperating with a fixed locking-segment 18, suitably secured to the machine-base.

The adjusting device described is also associated with a tubular adjustable feeding-guide 19. This feeding-guide essentially consists of an elongated guiding tube or trough arranged between the side walls of the base 1 at the feeding end thereof, and at its outer end the said tubular guide is pivotally mounted within or on the base through the medium of a suitable pivotal support 20, leaving its inner end free to swing in a vertical plane. At its free swinging end the guide is provided with a pair

of oppositely - arranged bearing - collars 21, which receive the journal ends 22 of the horizontal straining or tension roll 23, preferably provided midway between its ends with an annular rod-guide groove 24, the transverse center of said roll lying in the plane of the guiding bore or opening 25, extended through the body of the guide or tube 19. The said straining or tension roll 23 constitutes the lower roll member of the horizontal set of straining-rolls which comprises the said roll 23, and the fixed upper horizontal straining or tension roll 26, whose journal extremities 27 are mounted in suitable bearings 28, carried by the standards 29, arising from one of the individual platforms 2 and arranged, respectively, at opposite sides of the roll 26, as plainly shown in Fig. 2 of the drawings. The said upper horizontal straining-roll 26 is also provided with a central annular rod-guide groove 30 and is set somewhat in advance of the lower roll 23, whereby the latter is free to move up and down with the free end of the feeding guide or tube 19. This up and down adjustment of the feeding-guide with the initial straining or tension roll 23, carried thereby, is effected by an adjusting device 31, preferably in the form of a cam, operating beneath and against the guide 19 and carried upon the pivot-shaft 32 of the swinging regulating-lever 16.

Beyond the vertical set of straining-rolls 3, 4, and 5 there is arranged a pair of spaced axially - aligned cleaning devices 33 and 34, which subject the rod to a successive treatment, insuring the complete removing of the loosened scale and a thorough cleaning of the rod to place it in the best condition for the wire-drawing operation. These cleaning devices are both preferably of the rotary type, and they are arranged one in advance of the other in order to secure the successive treatment referred to. In the preferable construction the cleaning device 33, contiguous to the last roll of the vertical set, is in the form of a revolving scraper, having a scraping action upon the rod, while the last cleaning device 34 at the delivery end of the machine is in the form of a rotary brush, which effects a final brushing or cleaning. In this connection it is to be noted that while the invention contemplates means for positively driving the cleaning-brush 34 the cleaner or scraper 33 is not positively driven, but is intended to be idly, though rotatably, mounted in the bearings therefor. By reason of this idle rotatable mounting of the scraper 33 the same will readily accommodate itself to twisting or turning of the rod, so that it will always maintain an effective relation thereto.

Referring particularly to the first cleaning device 33, the same essentially consists of a tubular rotatable body 35, arranged longitudinally of the machine-base and journaled in transversely-disposed bearing-standards 36,

mounted in spaced parallel relation upon one of the individual supporting - platforms 2. The said body 35 may be conveniently provided with the terminal flange-heads 36 for maintaining the same in proper working position, and one of said heads, next to the last roll 5 of the vertical set, is designed to carry a plurality of radially-yielding scraper-blades 37 37^a. The blades are preferably arranged in separate pairs one behind the other in parallel vertical planes to extend the scraping-surface, while at the same time permitting of the employment of two distinct pairs of blades. The innermost scraper-blades (designated by the reference 37^a) are diametrically opposite and are of dovetail form to slide in the radial dovetailed guide-grooves 38, formed in the face of the inner head 36 of the body 35. In connection with each of the blades 37^a of the inner pair there is arranged at the outer end of such blade an adjusting-spring 39 for normally pressing the same in a direction toward the axis of the rotatable body, and at its inner end each blade is provided with a notched scraping edge 40, which engages against and about the rod. The outer scraper-blades (designated by the reference-number 37) are arranged upon the outer face of the inner head 36 and are held in position through the medium of the dovetailed guiding and holding strips 41, attached to such face of the head. Like the blades of the inner pair, those of the outer pair also have arranged against them the adjusting - springs 41^a for normally thrusting the blades in an inward direction, and at the inner ends the said blades of the outer pair are also provided with a pair of notched edges 40^a, which, with the edges 40 of the inner blades, form complements of the scraping-orifice through which the rod is drawn. The cleaning device 34 also consists of a tubular rotatable body 43, journaled in the transversely-disposed spaced bearing-standards 44, mounted upon one of the individual platforms 2. The said tubular rotatable body 43 has suitably secured within the bore or passage-way thereof the bristles or tubular brush 45, against which the rod is drawn as it passes therethrough. At one end of the tubular body 43, carrying the brush-bristles 45, is provided with a pulley element 46, over which passes the driving-belt 47, driven from a pulley on the transmitting-shaft 9.

Adjacent to the delivery end of the rotary brush 34 there is arranged a pair of superposed horizontal guiding delivery-rolls 48 and 49. These rolls, arranged one above the other, have their extremities journaled in bearings carried by the upright bearing-standards 49^a, mounted at one end of the machine-base, and the said rolls 48 and 49 are provided with central matching annular guide-grooves 50, which receive the rod from the rotary brush 34 and serve to prevent it from binding in said brush, as it is drawn upon the take-up reel 51, located

beyond one end of the machine-base and driven by power in any suitable manner. In this connection it will of course be understood that the rod to be treated is taken from a suitably-mounted reel located contiguous to the feeding end of the machine.

The threading of the rod through the machine is plainly indicated in Fig. 2 of the drawings and consists in passing the same through the tubular feeding-guide 19 over the initial straining or tension roll 23, under the horizontal straining-roll 26, against and at one side of the successive vertical rolls 3, 4, and 5, and then longitudinally through the separate cleaning devices 33 and 34. A transverse straining or stretching pressure is applied to the rod through the adjustment of the adjustable rolls of the vertical and horizontal sets, and the same degree of pressure is applied through these rolls by reason of the common adjustment therefor. It will be obvious that by adjusting the regulating-lever 16 for moving the roll 23 under straining pressure upward against the rod the same action would cause an inward adjustment of the vertical roll 4 in a lateral direction against the rod, so that as it passes against the horizontal rolls and then subsequently against the vertical rolls the same is subjected to such stress or strain as to cause a breaking and loosening up of the scales, which when they come into contact with the inner and outer pairs of scraper-blades carried by the rotary scraper will be stripped off of the rod. Small clinging particles will be removed by the subsequent treatment of the rotary brush 34, which also serves to give a final cleaning to the rod. The tubular feeding guide or tube at the feeding end of the machine will necessarily have somewhat of a straightening effect upon the rod as it is received from the feeding-reel.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described machine will be readily apparent without further description, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a rod-cleaning machine, straining-rolls arranged at opposite sides of the line of movement for the rod, and a separate tubular adjustable feeding-guide arranged at the feeding end of the machine for the reception of the rod prior to its passage to the rolls, said guide having a longitudinal guiding-bore accommodating the rod therein, and being movable in a direction transverse to the line of movement for the rod.

2. In a rod-cleaning machine, straining-rolls arranged at opposite sides of the line of move-

ment for the rod, and a tubular adjustable feeding-guide accommodating the rod therein and carrying one of said rolls, said guide being adjustable in a direction transverse to the line of movement for the rod.

3. In a rod-cleaning machine, straining-rolls arranged at opposite sides of the line of movement for the rod, a vertically-swinging tubular feeding-guide carrying one of said rolls whose rod-engaging portion is in line with the bore through the guide, and an adjusting device for said guide to move the latter in a direction transverse to the line of movement for the rod.

4. In a rod-cleaning machine, vertical and horizontal sets of straining-rolls, each set having an adjustable roll, and means for synchronously setting both of the adjustable rolls, and also holding them fixed in their set positions.

5. In a rod-cleaning machine, vertical and horizontal sets of straining-rolls for the rod, each set having an adjustable roll, a vertically-swinging pivotally-supported tubular feeding-guide carrying bearings for the adjustable roll of the horizontal set, and a regulating device having an adjusting-cam for the feeding-guide, and an operative connection with the adjustable roll of the vertical set.

6. In a rod-cleaning machine, the base having a transversely-disposed slideway, a set of vertical straining-rolls supported upon the base and arranged in staggered relation, one of said rolls being adjustable and having a carrier slidably mounted in the slideway, a horizontal set of straining-rolls arranged at the feeding end of the base and disposed one in advance of the other, one of said rolls having a vertical adjustment, a swinging feeding-guide carrying said adjustable horizontal roll, a regulating-lever having locking means and carrying an adjusting-cam operating against the feeding-guide, and an adjusting-rod having an operating connection with the said roll-carrier for moving the same toward and from the line of movement of the rod, and also operatively connected with the regulating-lever.

7. In a rod-cleaning machine, the base, vertical and horizontal sets of straining-rolls arranged in succession, each set having an adjustable roll for varying the strain against the rod, means for setting the adjustable rolls in fixed positions, a cleaning device, and means for operating the cleaning device by communicating motion thereto from one of the straining-rolls.

8. In a rod-cleaning machine, a series of rod-straining rolls, and a pair of spaced axi-

ally-alined rotatable cleaning devices receiving the rod from the rolls, one of said devices having positive motion communicated thereto and the other being an idler.

9. In a rod-cleaning machine, the base, a series of rod-straining rolls arranged in staggered relation, and a pair of spaced axially-alined cleaning devices receiving the rod from the rolls, one of said cleaning devices having a scraping element, and the other having a brush member for supplementing and completing the action of the scraper.

10. In a rod-cleaning machine, the base, a series of rod-straining rolls, and a pair of spaced axially-alined cleaning devices rotatably mounted and receiving the rod from the rolls, one of said cleaning devices having a scraper and the other having a brush, the latter being arranged to supplement and complete the action of the scraper.

11. In a rod-cleaning machine, the base, a series of rod-straining rolls, a pair of spaced axially-alined cleaning devices receiving the rod from the rolls and respectively embodying differently-constructed cleaning elements, and a pair of horizontal guiding delivery-rolls arranged to receive the rod from the last cleaning device.

12. In a rod-cleaning machine, a series of rod-straining rolls, and a cleaning device receiving the rod from the rolls, and consisting of a tubular rotatable body provided with a head at one end, separate inner and outer overlapping pairs of scraper-blades carried by said head and slidably mounted in independent radially-disposed slideways, all of said scraper-blades having at their inner ends matching notched scraping ends, and individual adjusting-springs for the several blades to yieldingly press the same inward.

13. In a rod-cleaning machine, the combination of a series of straining-rolls, a rotary cleaning device receiving the rods from said rolls, and a driving connection from one of said rolls to said cleaning device for rotating the latter.

14. In a rod-cleaning machine, a series of rod-straining rolls and a rotary cleaning device receiving the rod from the rolls and consisting of a tubular rotatable body provided within its bore with an interior brush.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAY S. FERGUSON.

Witnesses:

WM. W. ZIMMERMAN,
MARY R. ATTIG.