

(No Model.)

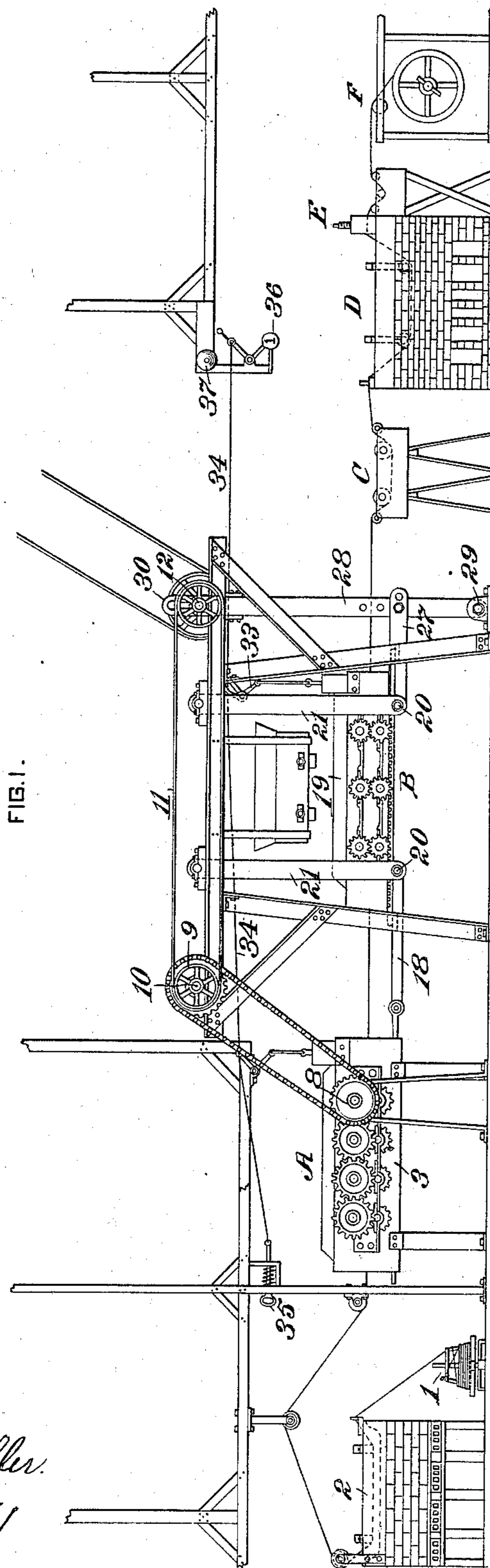
3 Sheets—Sheet 1.

J. NEEDHAM.

APPARATUS FOR SCOURING AND POLISHING WIRE.

No. 542,529.

Patented July 9, 1895.



WITNESSES:

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J. C. Gaither

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(No Model.)

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FIG. 2.

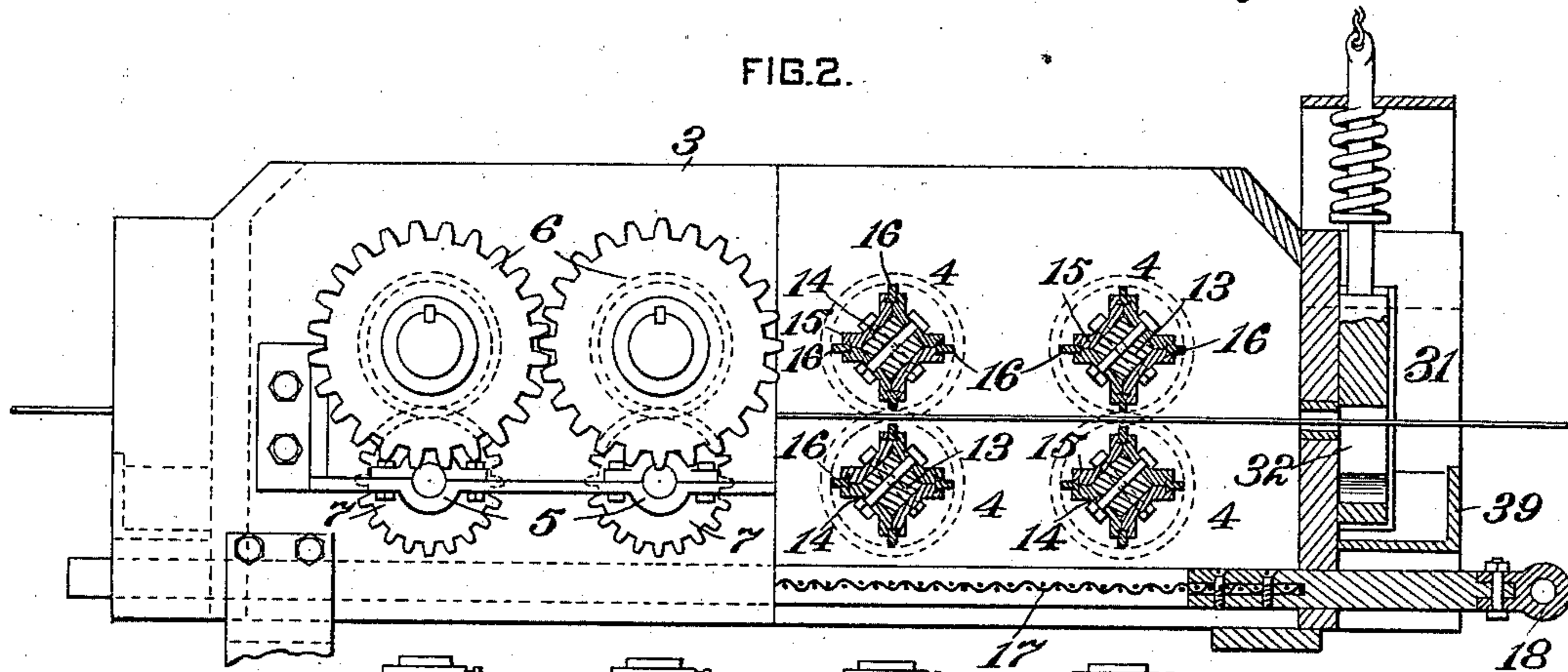


FIG. 3.

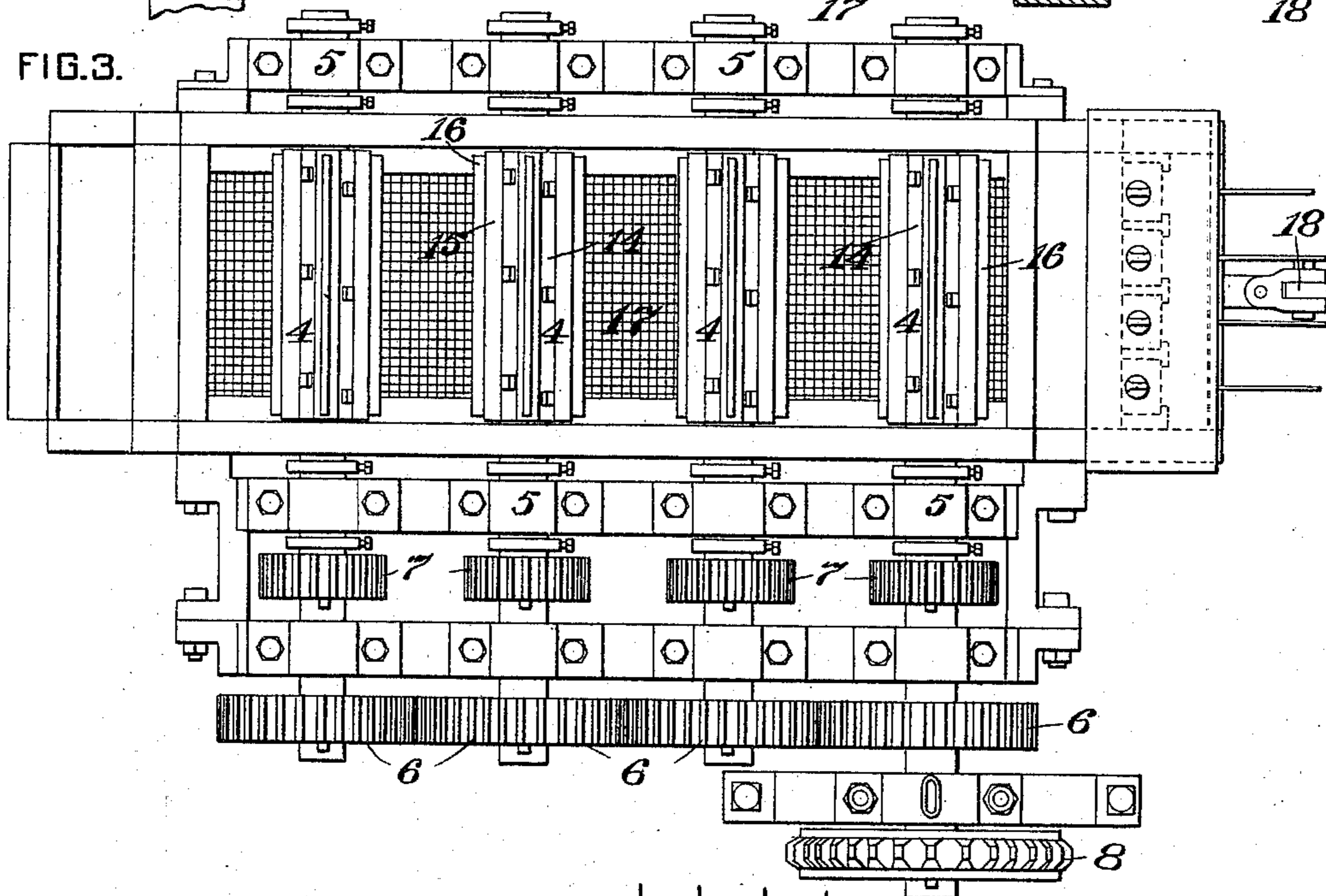
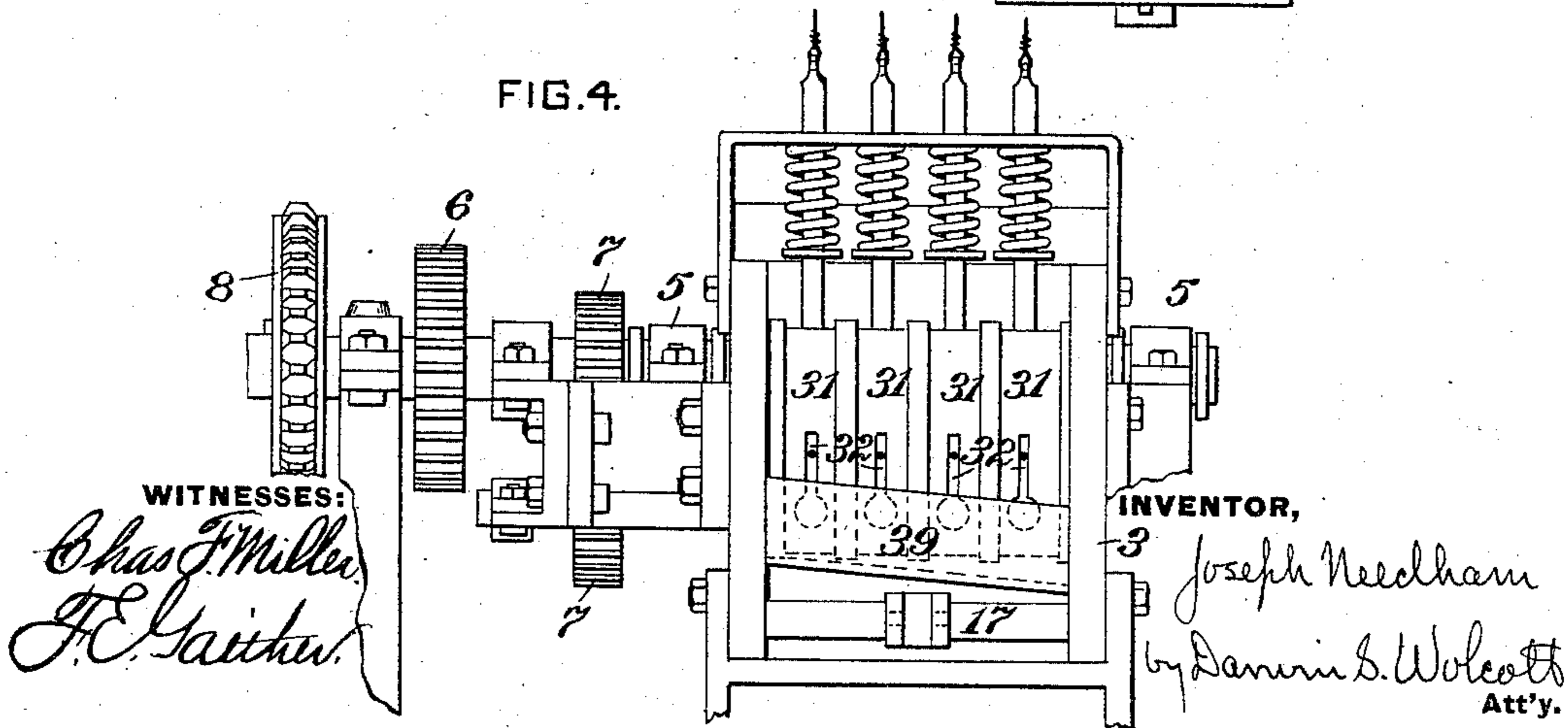


FIG. 4.



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FIG. 5.

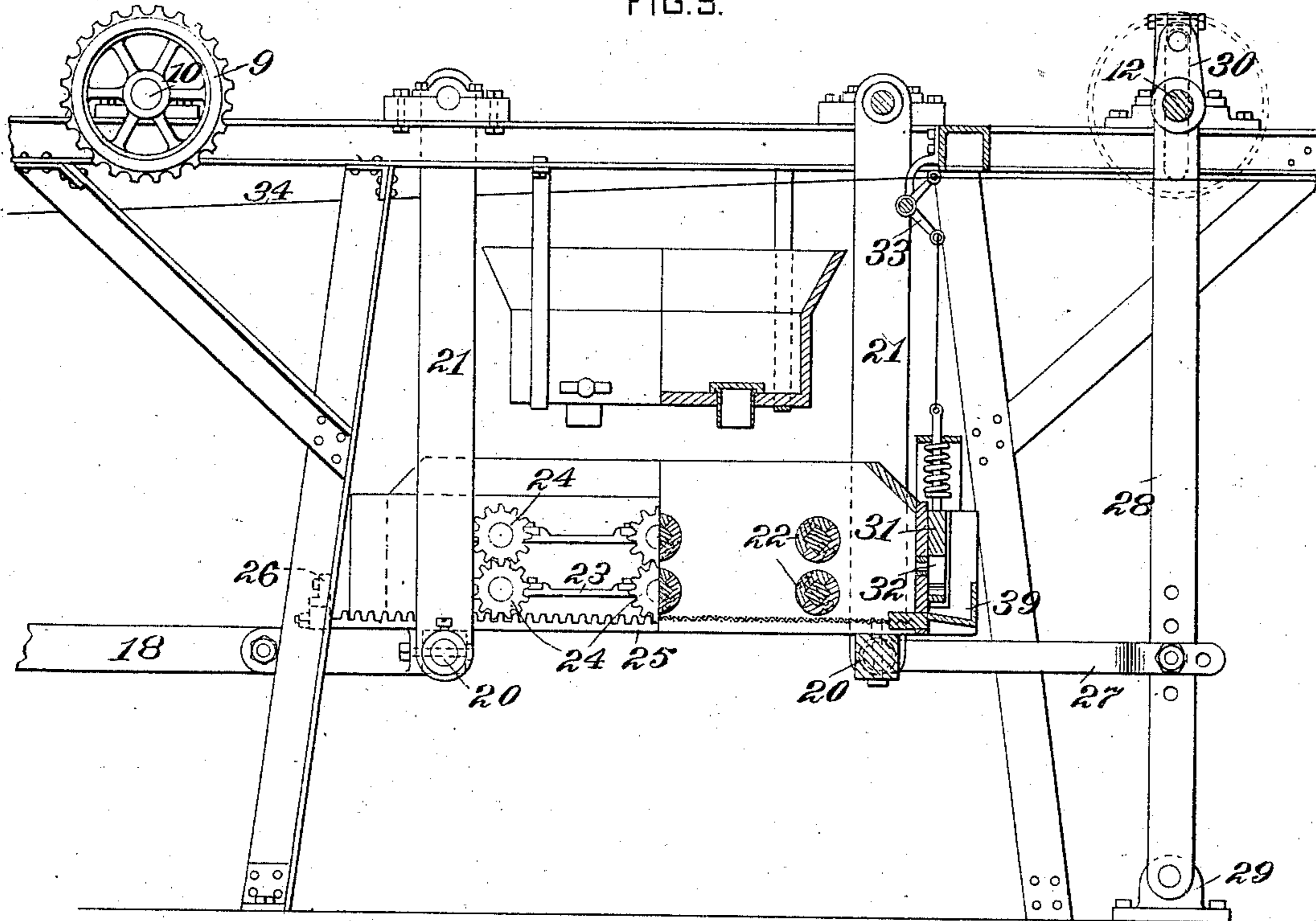
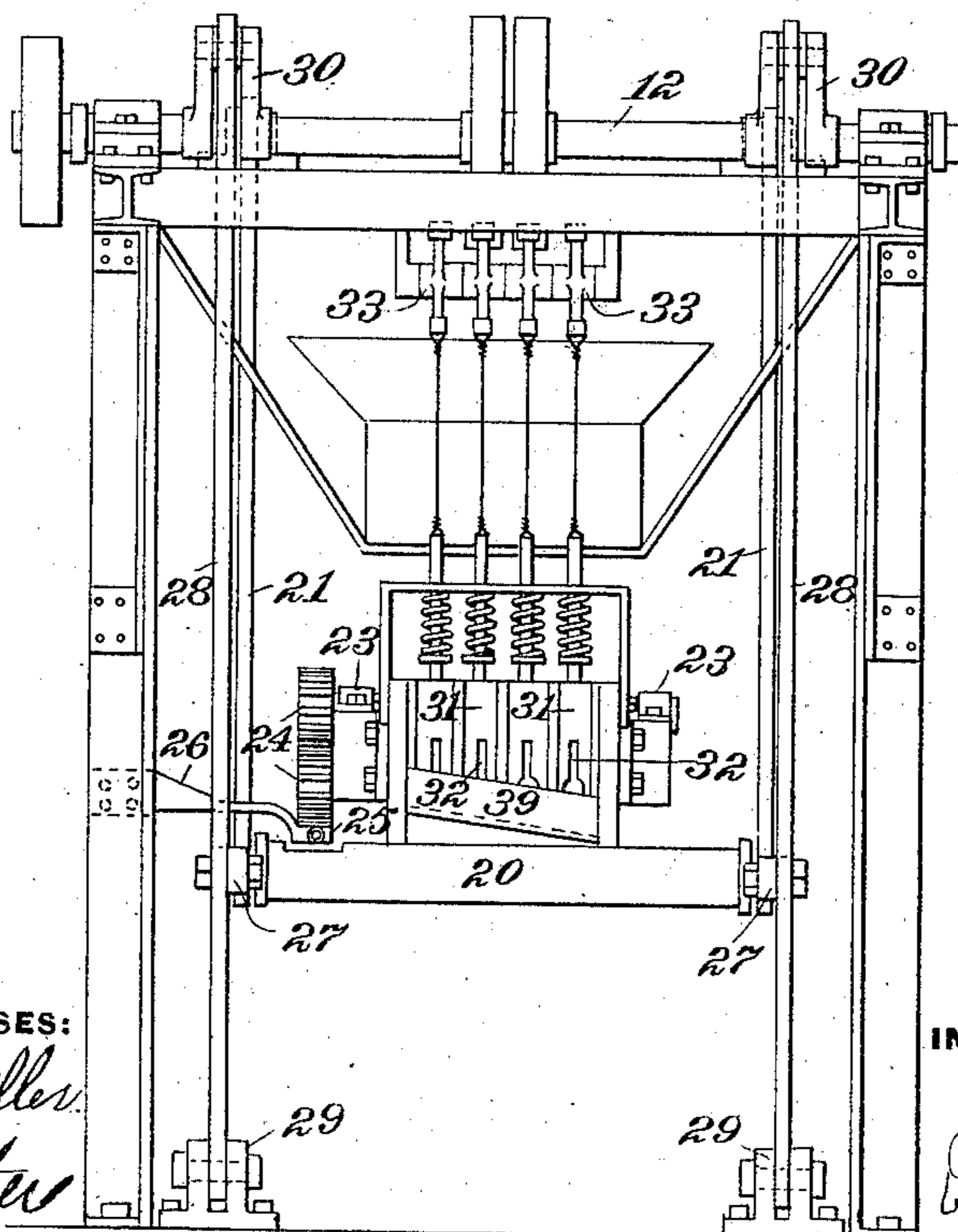


FIG. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH NEEDHAM, OF BRADDOCK, PENNSYLVANIA.

APPARATUS FOR SCOURING AND POLISHING WIRE.

SPECIFICATION forming part of Letters Patent No. 542,529, dated July 9, 1895.

Application filed October 25, 1894. Serial No. 526,918. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH NEEDHAM, a citizen of the United States, residing at Braddock, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Apparatus for Scouring and Polishing Wire, of which improvements the following is a specification.

The invention described herein relates to certain improvements in apparatus for scouring and polishing wire, &c., preparatory to coating the same with metal.

In the art as now practiced it is generally customary to effect the removal or loosening of scale or oxide from the wire by means of acid. As this oxide frequently penetrates the surface of the wire the latter must remain a considerable time in the bath to effect a thorough cleansing thereof. During this long immersion the pores and pits in the surface of the wire become filled with acid, which is sealed therein by the subsequently-applied metal coating. The inclosed acid acts upon the metal coating, causing it to turn dark in a short time.

The object of the present invention is to provide for the removal of the scale or oxide and the subsequent polishing of the surface of the wire by mechanical means, so that only a sufficient application of acid to effect the adherence of the metal coating is required.

To this end my invention consists in the construction and combination substantially as hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view in side elevation of my improved apparatus. Fig. 2 is a view, partly in elevation and partly in section, on an enlarged scale, of the scouring portion of the apparatus. Figs. 3 and 4 are a top plan and end elevation, respectively, of the same portion of the apparatus. Fig. 5 is a view similar to Fig. 2 of the polishing portion of the apparatus, and Fig. 6 is an end elevation of the same.

In the practice of my invention the coils of wire are placed upon a reel 1, from which it passes through a hot-lead bath 2 for the purpose of annealing the wire. From the lead bath the wire passes through the scouring apparatus A, the polishing apparatus B, the short acid-tank C, the coating bath D, and wiper E to the winding-drum F.

The scouring apparatus A consists of a box

3 having openings at its opposite ends for the passage of the wire therethrough. Three, four, or more pairs of rollers 4 are arranged transversely of the box and are journaled in suitable bearings 5 on the sides of the box or trough.

On one end of the shafts of each of the upper rollers is secured a gear-wheel 6, which intermeshes with a similar wheel on the shafts of adjacent rollers. The lower rollers are positively driven by intermeshing pinions 7 on the shafts of the upper and lower rollers. On the shaft of one of the rollers is mounted a sprocket-wheel 8, which is driven by a belt passing over a corresponding wheel 9 on a counter-shaft 10, the latter being driven through a belt 11 by the power-shaft 12, as shown in Fig. 1. Each of the rollers 4 consists of a shaft 13 and two or four removable plates 14, bolted on the shaft inside of the box, as shown in Figs. 2 and 3.

The plates are provided with radially-projecting ribs 15 having dovetailed grooves for the reception of the wings 16. The rollers of each pair rotate toward each other, so that wings 16 will press the scouring material—*i. e.*, crushed coke, flint, or gravel contained in the box—against the wire. The rollers are so constructed and relatively mounted in the box that the wings will not impinge upon the wire. In order to prevent the scouring material from being shifted by the rollers to one end of the box, adjacent pairs of rollers rotate in opposite directions, so that their action on the scouring material will be to press it against the wire without shifting it to any material extent longitudinally of the box.

In order to keep the scouring material clean and free from scale, the bottom of the box is formed by a sieve 17, which is so mounted as to be capable of being shifted back and forth by the polishing apparatus B, to which the sieve is connected by a link 18, as shown in Fig. 1.

The polishing apparatus B consists of a box or trough 19, which is attached to or rests upon bars 20, journaled at their ends in the lower ends of links 21, having their upper ends pivotally mounted on a suitable frame, as shown in Figs. 1, 5, and 6. A series of two, three, or more rollers 22 are arranged transversely of the box, their ends being journaled in suitable bearings 23 on the outer sides of the box, as shown in Figs. 5 and 6. On one

end of each pair of rollers are secured intermeshing pinions 24, so as to cause the rollers to rotate in unison. The pinions on the lower rollers of each pair intermesh with a rack-bar 25, which is fixed to brackets 26 on the posts or legs of the supporting-frame, as shown in Figs. 1, 5, and 6. One end of the box or trough is connected by links 27 to levers 28, pivoted at their lower ends in suitable shoes 29, while their upper ends are connected to cranks 30 in the power-shaft 12. The oscillation imparted to the levers produces a reciprocation of the box or trough, causing the polishing material contained therein to rub back and forth along the wire. The rollers 22 consist of a central shaft and two or more removable blocks having a circular perimeter bolted to the shaft, as shown in Fig. 5. The rollers of each pair are arranged relatively to each other, so as to have a firm bite or grip on the wire, and the rack-bar and pinions on the roller are so arranged that the movement of the box or trough against the movement of the wire will so rotate the rollers as to tend to impart a forward movement of the wire. As the peripheral movement of the rollers is equal or approximately so to the longitudinal movement of the box or trough it, follows that the movements of the two parts will counterbalance each other, thereby relieving the wire from all back pull. As the direction of the rollers is reversed on the return or forward movement of the box or trough, a like compensation is effected, relieving the wire from all forward pull.

In order to prevent the scouring and polishing material from being drawn from the boxes or troughs, it is necessary that the openings in the rear ends of the boxes or troughs should not be much larger than the wires operated on; but provision must also be made for kinks or splices in the wires. To this end the rear ends of the boxes or troughs are formed in part by a series of slides 31, the number thereof being dependent upon the number of wires operated on at the same time, provided with vertical slots 32 of a width a little greater than the diameter of wire. At their lower ends the slots are enlarged sufficiently to permit of the passage of splices or kinks, as shown in Figs. 4 and 6. These slides are connected to one arm of a like series of bell-crank levers 33, suitably pivoted above each of the troughs or boxes, the opposite arms of said levers being connected by wires 34 to suitable knobs 35, arranged in convenient proximity to the reel 1, as shown in Fig. 1. As the operator stationed at the reel makes a splice between the length of wire passing through the apparatus and a new length, he pulls one of the knobs corresponding to the location of the wire in the apparatus, thereby raising a slide at the rear end of each of the boxes and troughs, so as to bring the enlarged portions of the slots 32 in line with the wire having the splice. The wires 34 are also connected to indicators 36

and a bell 37 arranged in proximity to the coating bath D, thereby notifying the attendant at that point which wire has been spliced, so that he may adjust the wiper 38 and other parts connected with the coating bath for the passage of the splice.

Inclined troughs 39 are arranged across the ends of the troughs or boxes below the openings through which the wires pass, so as to deposit any of the material which may pass through the openings into suitable receptacles.

During its passage through the scouring and polishing boxes the scale or oxide is so thoroughly removed and the surface so cleaned and polished that only a slight application of a weak acid is necessary in order to insure the adherence of the metal coating.

I claim herein as my invention—

1. In an apparatus for cleaning wire, the combination of a box or trough having openings in its ends for the passage of wire, and two or more pairs of rollers provided with wings for pressing the scouring material against the wire, while passing between the rollers, the rollers of each pair rotating in opposite directions substantially as set forth.

2. In an apparatus for cleaning wire, the combination of a box or trough containing the scouring material provided with one or more openings in its front end and one or more slides at its rear end, provided with a slot having an enlargement at one end, substantially as set forth.

3. In an apparatus for cleaning wire, the combination of a box or trough containing scouring material, one or more pairs of rollers provided with wings for pressing the scouring material against the wire, the rollers of each pair rotating in opposite directions and a reciprocating sieve for the separation of scale and other foreign substances from the scouring material, substantially as set forth.

4. In an apparatus for cleaning wire, the combination of a reciprocating box or trough containing polishing material and one or more pairs of rolls arranged to bite upon the wire, said rollers having a peripheral movement equal to the longitudinal movement of the box or trough, but in the opposite direction, substantially as set forth.

5. In an apparatus for cleaning wire, a stationary box or trough containing scouring material in combination with a sieve movably mounted therein, a reciprocating box or trough containing polishing material and provided with a separating sieve, and a connection from the reciprocating box to the movable sieve, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOSEPH NEEDHAM.

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