No. 713,369. Patented Nov. 11, 1902.

W. J. WRIGHT.

WIRE WEAVING MACHINE.

(Application filed Jan. 18, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

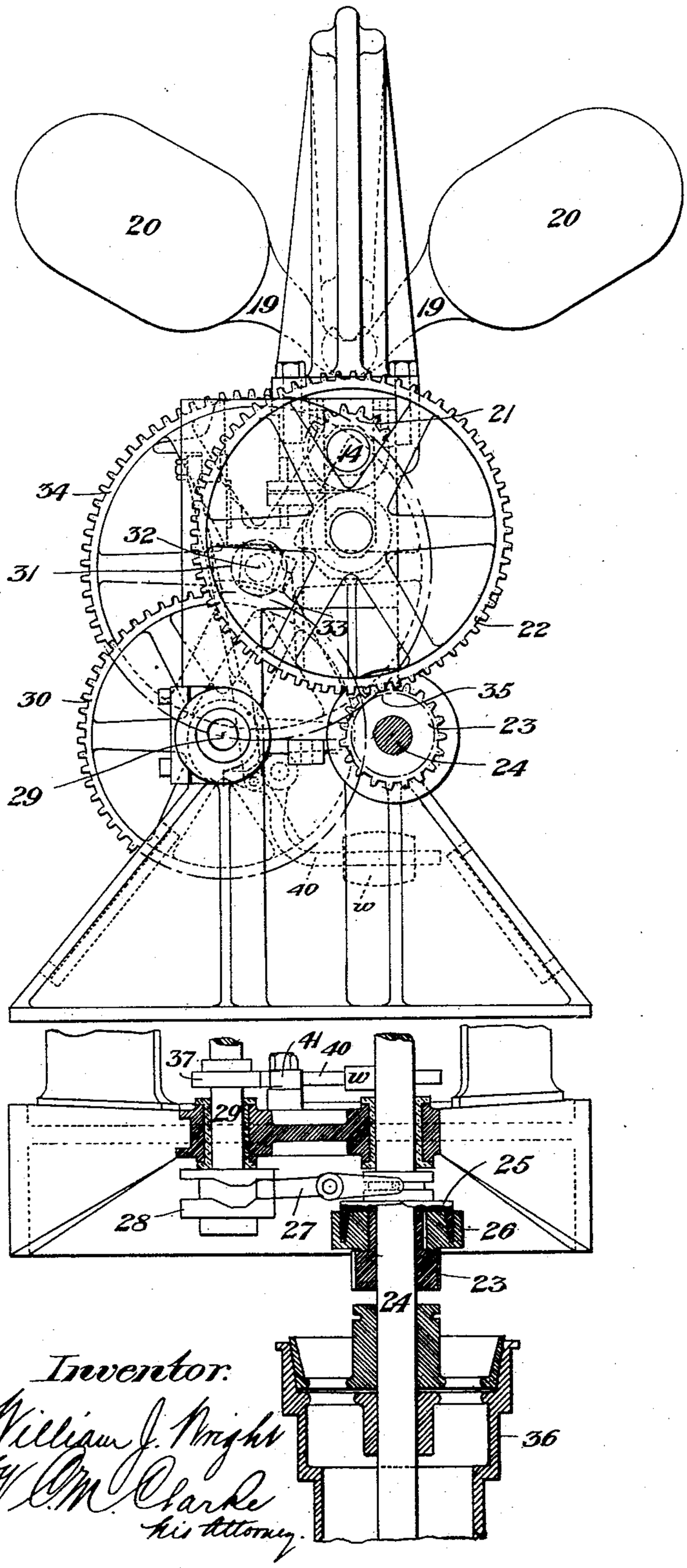

Fig. 2.

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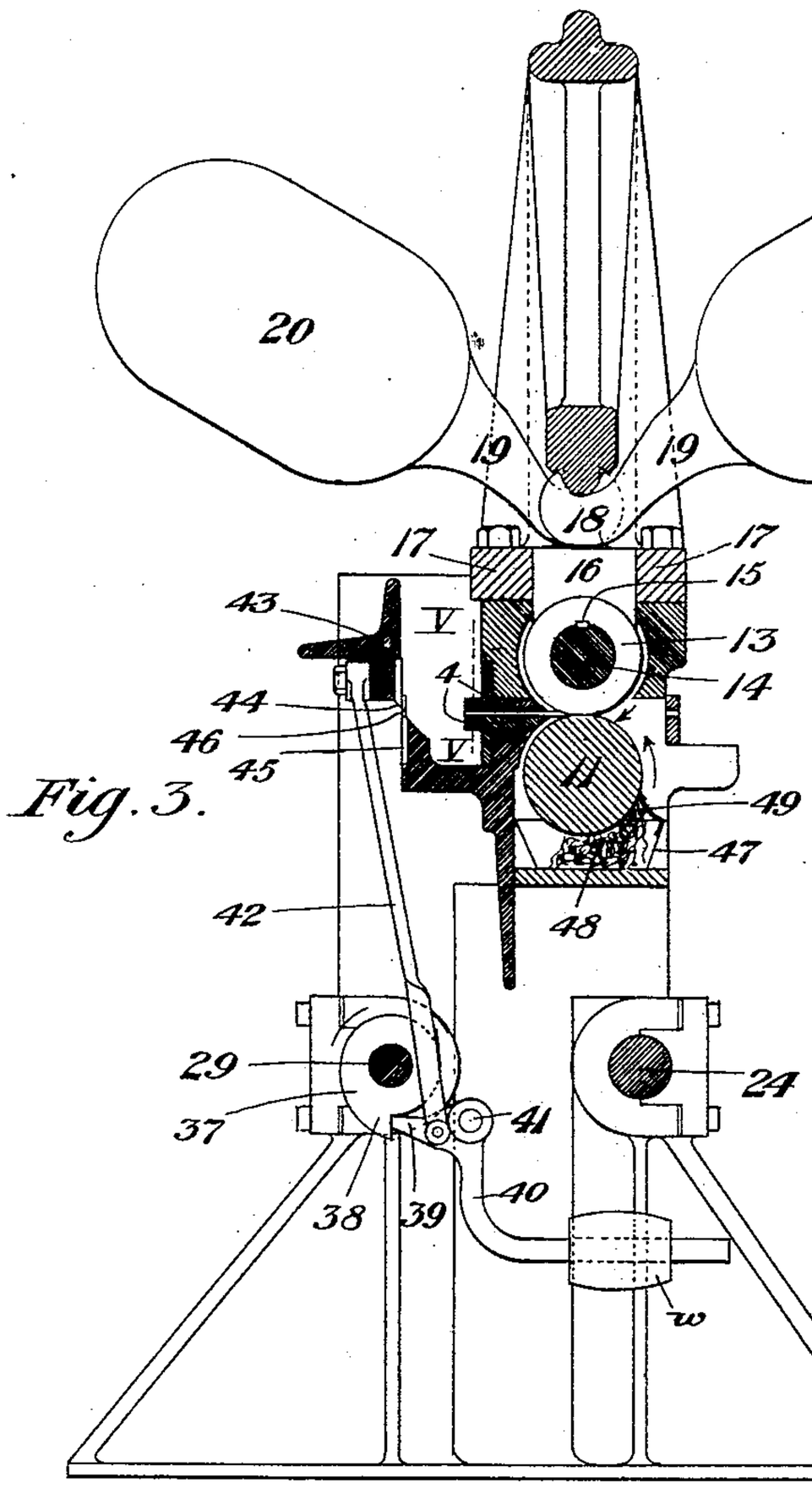

Fig. 3.

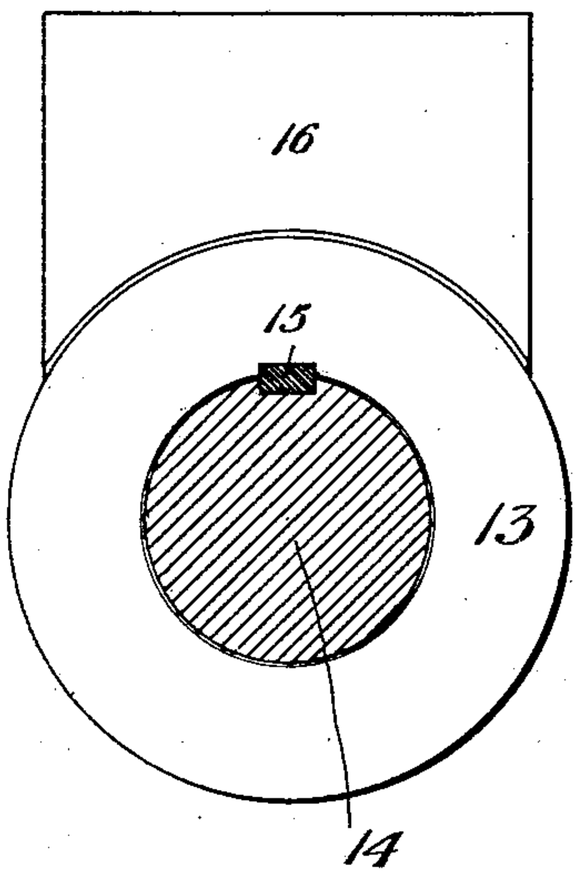

Fig. 8.

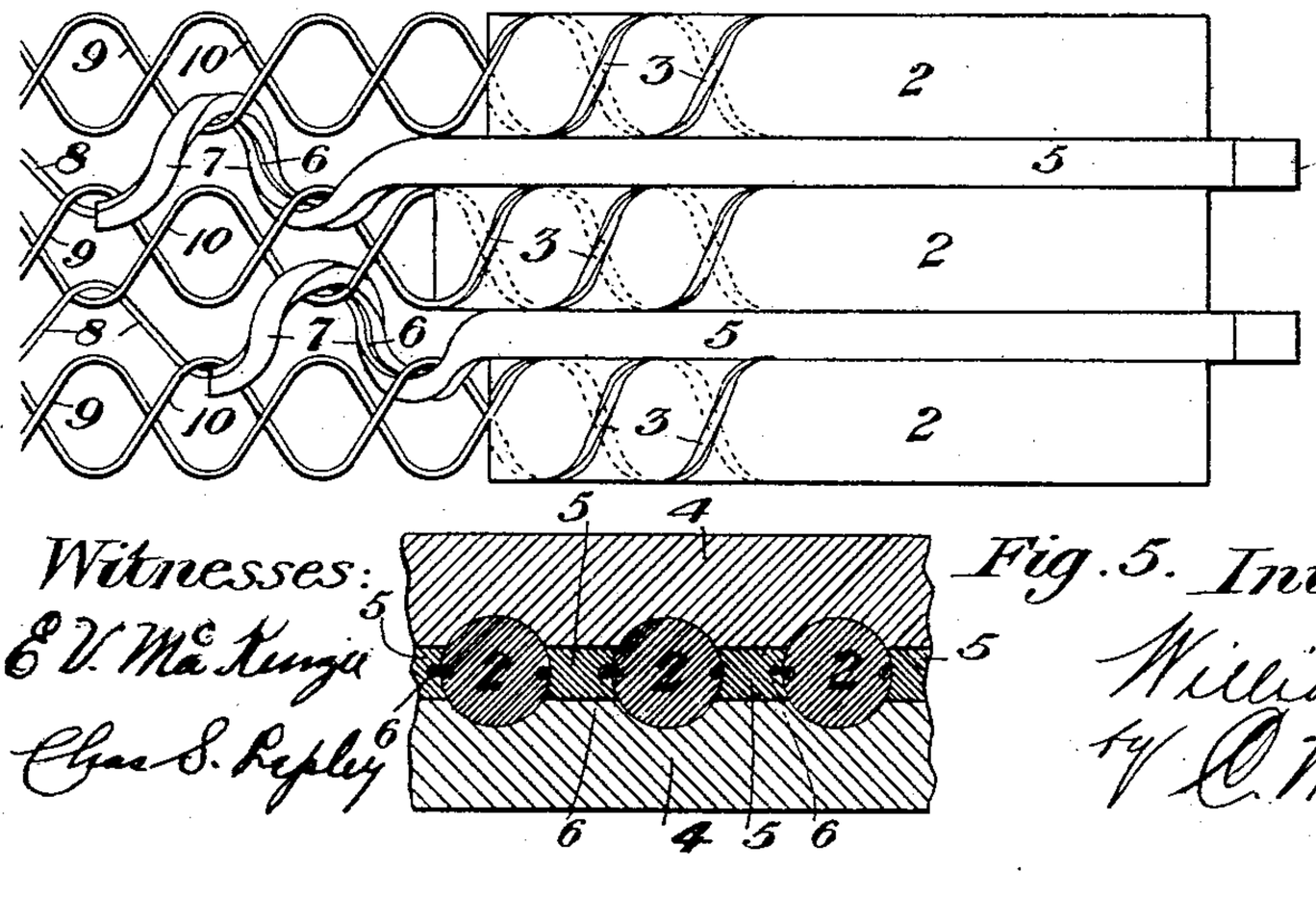

Fig. 4.

Fig. 5.

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(Application filed Jan. 18, 1902.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

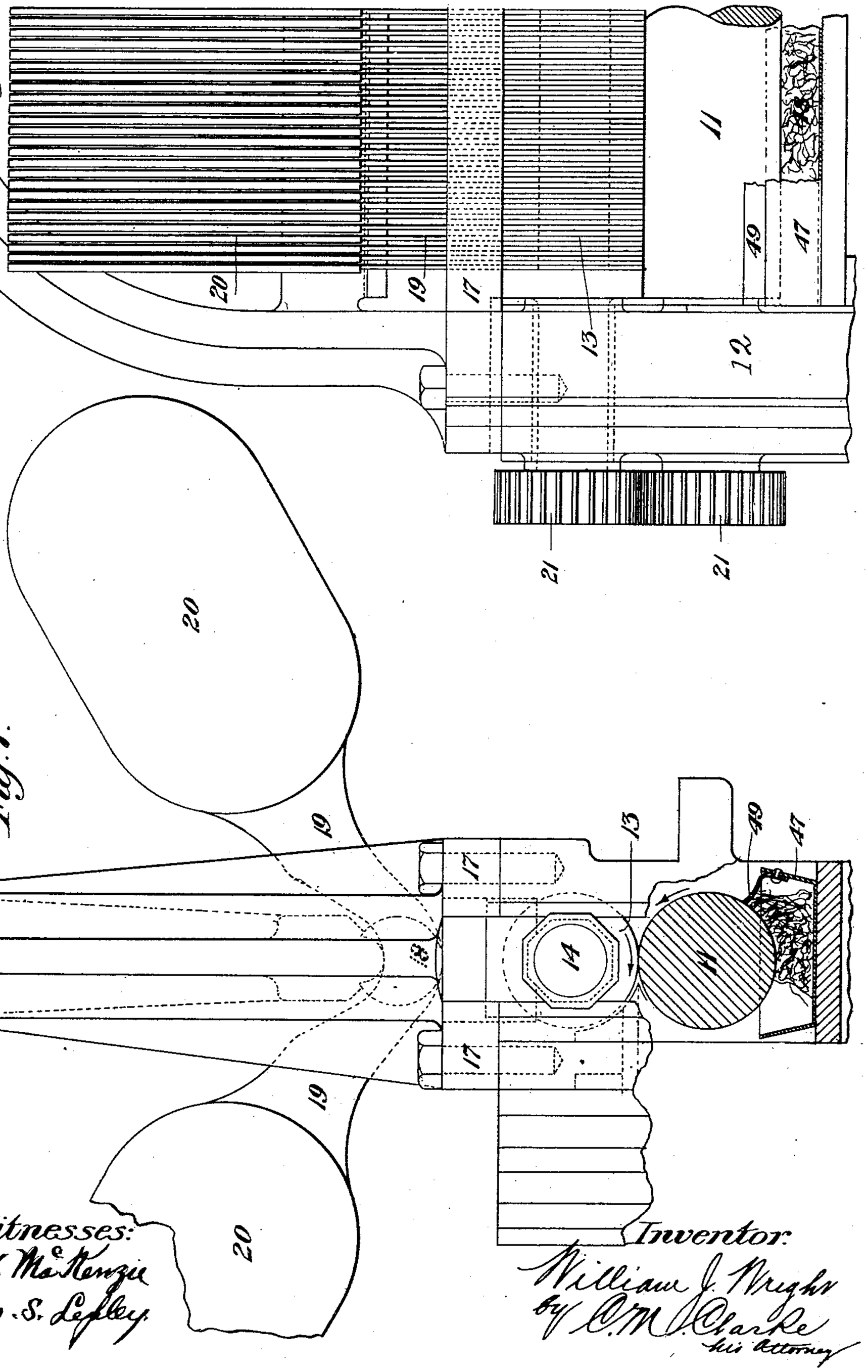

Fig. 7.

Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM J. WRIGHT, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO JOHN S. SCULLY, OF PITTSBURG, PENNSYLVANIA.

WIRE-WEAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 713,369, dated November 11, 1902.

Application filed January 18, 1902. Serial No. 90,290. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. WRIGHT, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Wire-Weaving Machines, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of my improved sectional-roll wire-weaving machine. Fig. 2 is a sectional plan view illustrating the main shaft, the cam-shaft, and the clutch-operating mechanism. Fig. 3 is a vertical cross-sectional view of the machine at its middle portion. Fig. 4 is a detail plan view illustrating the relative arrangement of the spindles, coils, and guides. Fig. 5 is a cross-sectional view on the line V V of Fig. 3, illustrating the arrangement of the spindles and the intervening coiling-guides. Fig. 6 is an enlarged detail view of the upper portion of the machine, showing the feeding-rolls mounted in their housings, the pressure-plates, and the manner of locating them. Fig. 7 is a similar view at right angles to Fig. 6. Fig. 8 is a cross-sectional view, on an enlarged scale, illustrating the manner of mounting the disks upon their operating-shaft.

My invention consists of an improved machine for weaving wire into fabric or netting composed of interfitting spiral coils, whereby the full width of the netting desired may be made at one time of any desired number of wires simultaneously and continuously and in one operation.

In the practice of my invention I employ a plurality of spindles 2, having the usual spiral grooves 3 3, which spindles are mounted in suitable housings or frame 4 at such a distance apart as will admit of the location between the spindles of separate coiling-guides 5, which for approximately the full length of the spindle are straight. These guides have on one side a groove 6 of sufficient size to admit of the wires, but partly closed, so as to not allow the wires to escape outwardly, and at or beyond the delivery end of the spindles each of these guides is formed into a spiral 7 of the same pitch and relative position as the spiral groove 3 of the spindles, the groove 6 of the guides being maintained on the inner side, as shown.

By reason of the close arrangement of the pairs of spirals formed on the spindles 2 to the next adjacent pair similarly formed it will be seen that the spiral guide 7 may be located as to the alternate opposite spiral loops of such pairs without interference with the forward progress of the coils, whereby when the independent spiral coils 8 are finally delivered from the ends of the guide 7 they will travel forward in the same relation to the coils 9 10 from spindles 2 and will interengage with such coils, as by reason of the close proximity of each independent pair 9 10 sufficient clearance is allowed for free engagement and interaction, and it will be seen that such assemblage and interaction of the coils will be continued throughout the operation.

The forward feed of the wire is accomplished by means of a solid lower feed-roll 11, mounted in suitable housings 12, and an upper set of narrow disks 13, loosely mounted upon a shaft 14, so as to provide for lateral play and in driving engagement therewith by means of a key 15, as clearly shown in Fig. 8. The width of these disks corresponds to the distance between the wires, the purpose being to provide a single disk for each wire, the disks being either smooth or grooved, whereby each individual wire is independently engaged by its particular disk and held in contact with the lower feed-roll 11. For the purpose of supplying pressure upon the disks 13 corresponding pressure-plates 16 are suitably mounted in sliding position between longitudinal bars 17 of the housings, each of such plates resting upon each of the disks, and upon each of these plates 16 rests and bears downwardly the heel 18 of a lever 19, the outer end 20 of which constitutes a counterweight, whereby considerable leverage and downward pressure is exerted upon the plate, and consequently upon the disk, thus holding it in contact with the lower roll 11. It will be observed that each alternate lever 19 and its counterweight extends outwardly on

the opposite side of the housings, thus providing clearance for the widened counterweight projection 20. It will be understood that a series of such disks, plates, and counterweighted levers extend from one end of the machine to the other, as indicated in Fig. 6, for the full length of the lower roll, thus providing a continuous series of independently-actuated pressure-disks mounted upon a common shaft, by which all of the disks are rotated at the same rate of speed. The shaft of the lower roll and of the upper series of disks are geared together by toothed gearing 21, so as to operate in the manner described, motion being transmitted to the lower roll 11 through a toothed wheel 22 in engagement with a similar wheel 23, mounted upon the main shaft 24 and adapted to be intermittently thrown into gear with such shaft by means of interfitting clutch members 25 26. The clutch member 25 is automatically operated by lever 27 in engagement with it and operated by cam 28 on shaft 29. The shaft 29 is rotated at slow speed through pinion 30 on its outer end in mesh with the driving-pinion 31, mounted upon the outer end of a spindle 32, which is adjustably set in a segmental slot 33, so as to be set toward or from the main shaft 24, so as to permit of the insertion of gears of different size to vary the relative speed of the main shaft and feed-rolls and shaft 29, by which the shearing mechanism is operated, whereby the machine may be set to cut off different lengths, as desired. Power is imparted to the driving-pinion 31 through toothed wheel 34, mounted upon spindle 32 and preferably secured to pinion 31, the pinion 34 being in mesh with the driving-pinion 35 on the opposite end of the main shaft 24. Such main shaft is driven by belt or other connections through pulleys 36 or other suitable means from any desired source of power. Upon shaft 29, carrying cam 28, are mounted cams 37 on the inside of the end bearings of the shaft, which cams for three-quarters of their periphery are of uniform diameter, the other portion being formed into the cam projection 38, which projection in the rotation of the cam depresses the end 39 of lever 40, pivoted at 41 to the frame and provided with a pivotally-connected pitman 42, attached to and for the purpose of operating the knife-beam 43, mounted in vertical slideways at each end of the machine. The lever 40 is provided with a counterweight *w*, by which the depressing action of the cam is reversed and the shear-beam raised.

The construction of the cam and lever and connections therefrom to the knife is the same at each end of the machine to insure uniform action. The shear-beam is provided with a knife 44, which slides upon the outer face of a stationary shear 45 through openings 46, of which the woven netting passes outwardly from the weaving-spindles.

The clutch 25 is held in engagement with the clutch member 26, so as to transmit rotatory movement to the rolls to feed the wires during three-fourths of the revolution of the shaft 29 by reason of the relative arrangement of the cams 28 and 37. The clutch is thrown out of gear during the downward travel of the knife, so that the feeding-rolls, both solid and sectional, remain stationary for one-fourth of the revolution of the shaft 29 until the shearing action is completed, the shearing-knife being raised simultaneously with the renewed clutch engagement produced by cam 28. As thus constructed the individual wires are fed inwardly between the upper disk and the lower roll to the spindles, and the operation is continuous and automatic, the rolls feeding forward the desired length of netting, which is sheared off at suitable intervals, as I have described, without further attention from the operator than from time to time to renew the wires to the spools (not shown) as they become emptied.

For the purpose of lubricating the working parts a pan or vessel 47 is located below the lower roll 11 upon suitable supports containing oil and waste 48, into which the lower roll extends and by which it is lubricated, a wiper 49 preventing excess oil from covering the roll. The oil will be carried up to and will lubricate the disks and their shaft, as well as the pressure-plates and the bearing ends of the levers, thus insuring free action, while at the same time lubricating the wires before they are introduced to the spindles and coiling-guides.

By reason of the sectional construction of the upper feeding-roll it will be seen that each wire is engaged by its separate disk, so that the feed mechanism is rendered operative and certain independent of any variations that may exist in the gage of the wire or in the diameter of one or both of the feed-rolls. This is a desirable and valuable feature of my invention, inasmuch as it overcomes the necessity of accuracy in either the wire or feed rolls, which is an element of great uncertainty wherever a series of wires, as in the present case, are fed forward simultaneously by rolls upon a common shaft.

If desired, the disks may be made of sufficient width to engage two or more wires within practical limits, and the width of the disks and their number will be regulated by the work in view. It will also be understood that the composite roller may be used upon any suitable substitute for the lower roll as a table, although the best results are secured when used as I have shown and described.

It will be understood that the invention as illustrated may be varied from in detail, so as to be adapted to the other constructions wherein it is desired to feed wire, and while I have illustrated it as being applied to the particular means for weaving spiral-coil netting, as illustrated in this and other applications, I do not desire to be understood as limiting my invention thereto, but to include all

such changes, variations, and adaptations as may be made by the skilled mechanic within the scope of the following claims.

What I claim is—

1. Apparatus for feeding closely-adjacent strands of wire consisting of closely-assembled roller-disks, means for rotating the disks, a bearing-surface against which the disks bear, and means for applying pressure to hold the disks against the bearing-surface.

2. In apparatus for feeding closely-adjacent strands of wire, the combination of a solid roll and a driving-shaft provided with closely-assembled roller-disks in driving engagement with the shaft, with means for exerting pressure on the disks, to hold them in gripping contact with the solid roll.

3. In apparatus for feeding closely-adjacent strands of wire, the combination of a solid roll and a driving-shaft provided with closely-assembled roller-disks in driving engagement with the shaft, with means for exerting pressure on each disk independent of the others to hold it in gripping contact with the solid roll.

4. In apparatus for feeding wire, the combination of a solid roll, and a series of independent disks, side by side, and approximating a continuous sectional roll, loosely mounted upon a driving-shaft and in driving engagement therewith, pressure-plates adapted to bear separately on each disk, and means for supplying pressure to each plate.

5. In apparatus for feeding wire, the combination of a solid roll and a series of independent disks loosely mounted upon a driving-shaft and in driving engagement therewith, pressure-plates for the disks, and counterweighted levers adapted to exert downward pressure upon the plates.

6. In apparatus for feeding wire, the combination of a main frame or housings, a solid roll, a series of disks mounted upon a common driving-shaft and in driving engagement therewith, means for rotating the roll and disks, pressure-plates mounted in the frame and adapted to bear upon the disks, and alternate oppositely-extended counterweighted levers mounted in the housing and adapted to exert pressure upon the plates.

7. In a machine for weaving wire, the combination with a plurality of grooved spindles with intervening coiling-guides, of a solid and a sectional feed-roll in gripping contact, with means for driving the feed-rolls.

8. In a machine for weaving wire, the combination with a plurality of grooved spindles, with intervening coiling-guides, of a solid and a sectional feed-roll in gripping contact, an intermittently-actuated shear-knife, and means for driving the feed-rolls and operating the shear.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM J. WRIGHT.

Witnesses:

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C. M. CLARKE.