No. 693,509. Patented Feb. 18, 1902.

E. P. FREDERICK.

WIRE ROPE MACHINE.

(Application filed Apr. 11, 1901.)

(No Model.) 2 Sheets—Sheet 1.

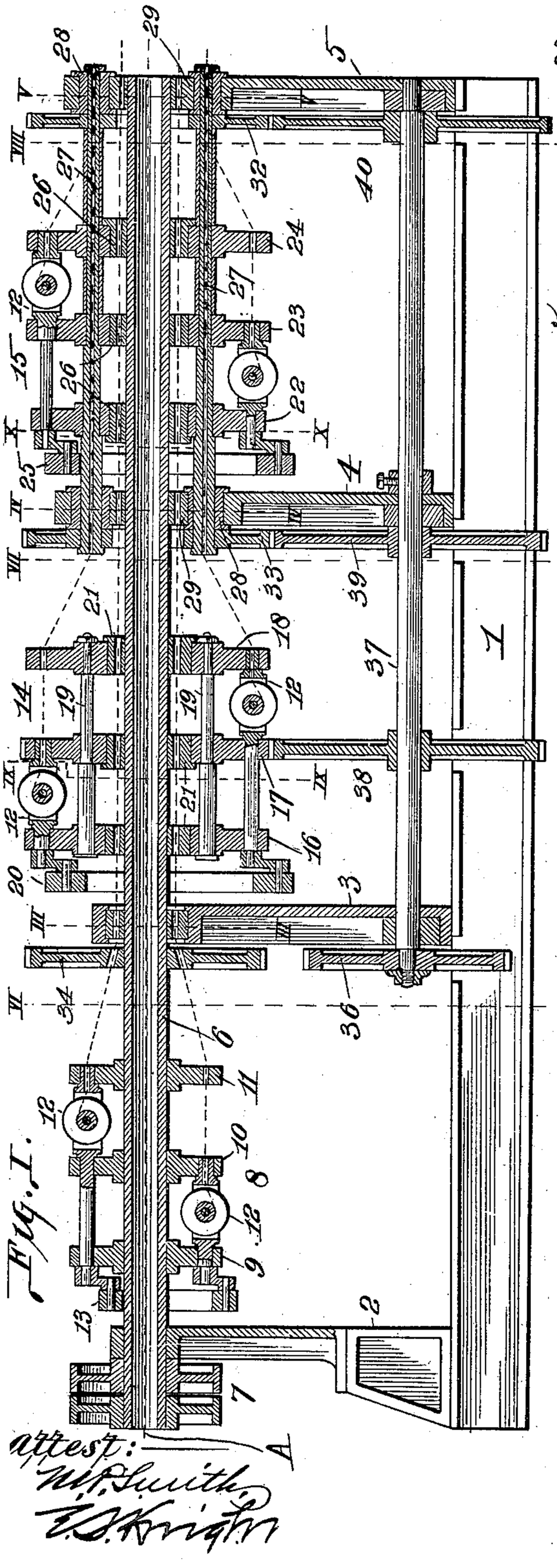

Fig. I.

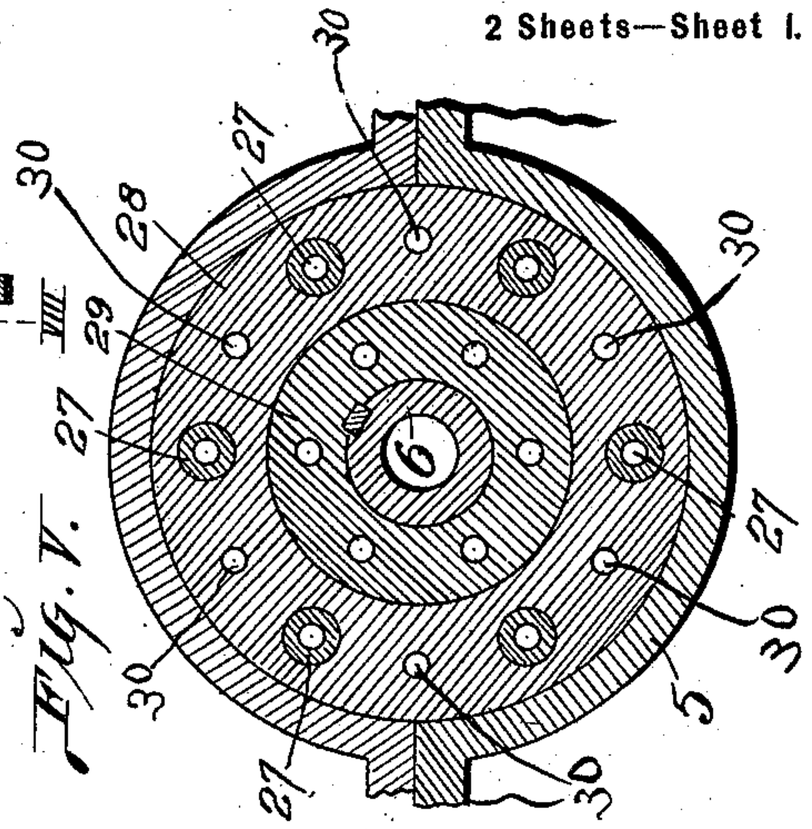

Fig. IV.

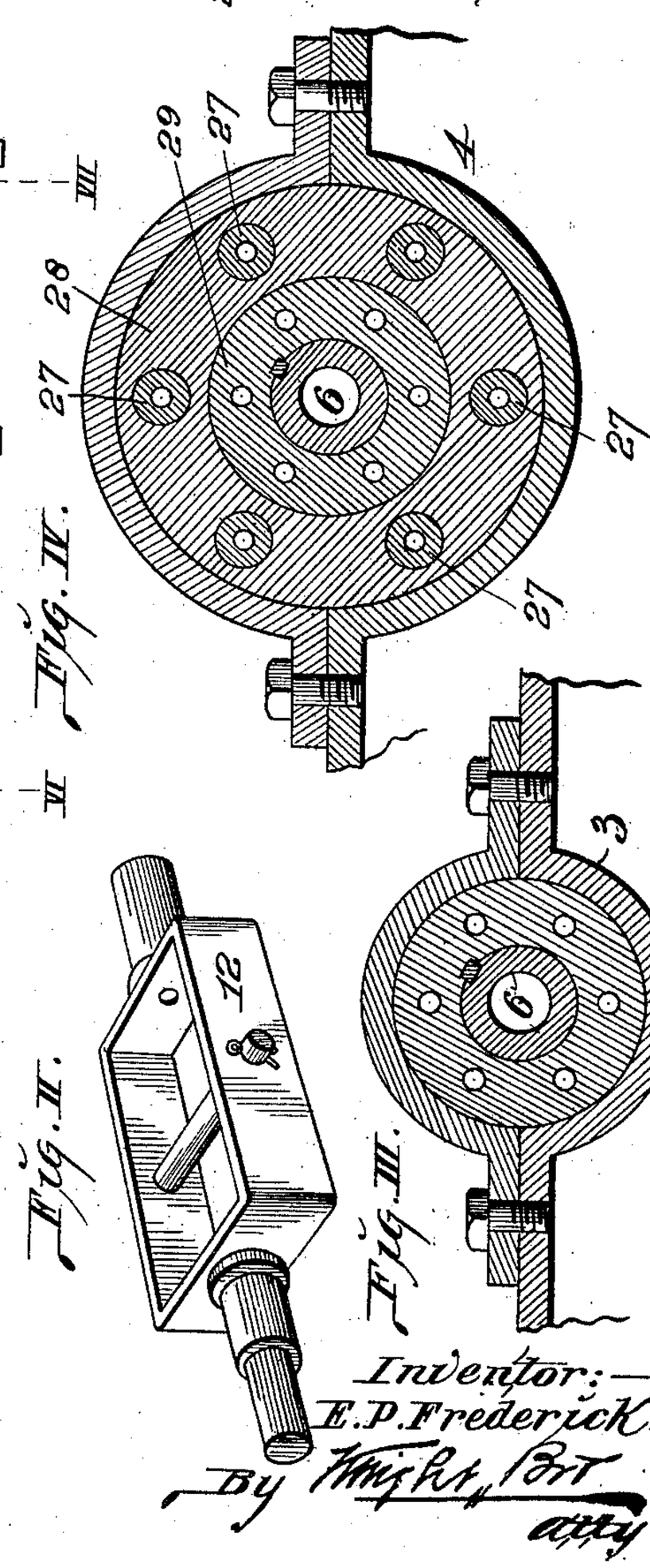

Fig. V.

Fig. II.

Fig. III.

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Fig. VII.

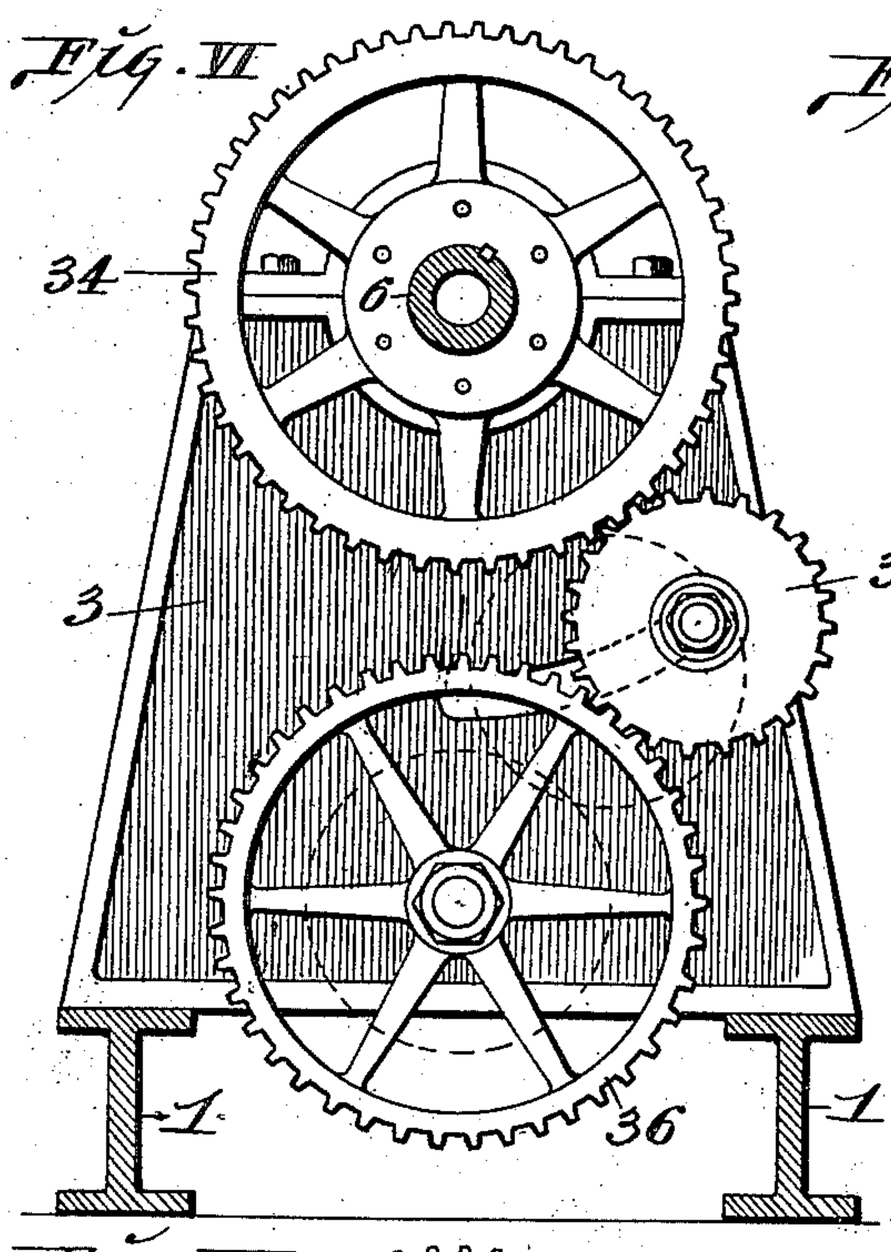


Fig. VIII.

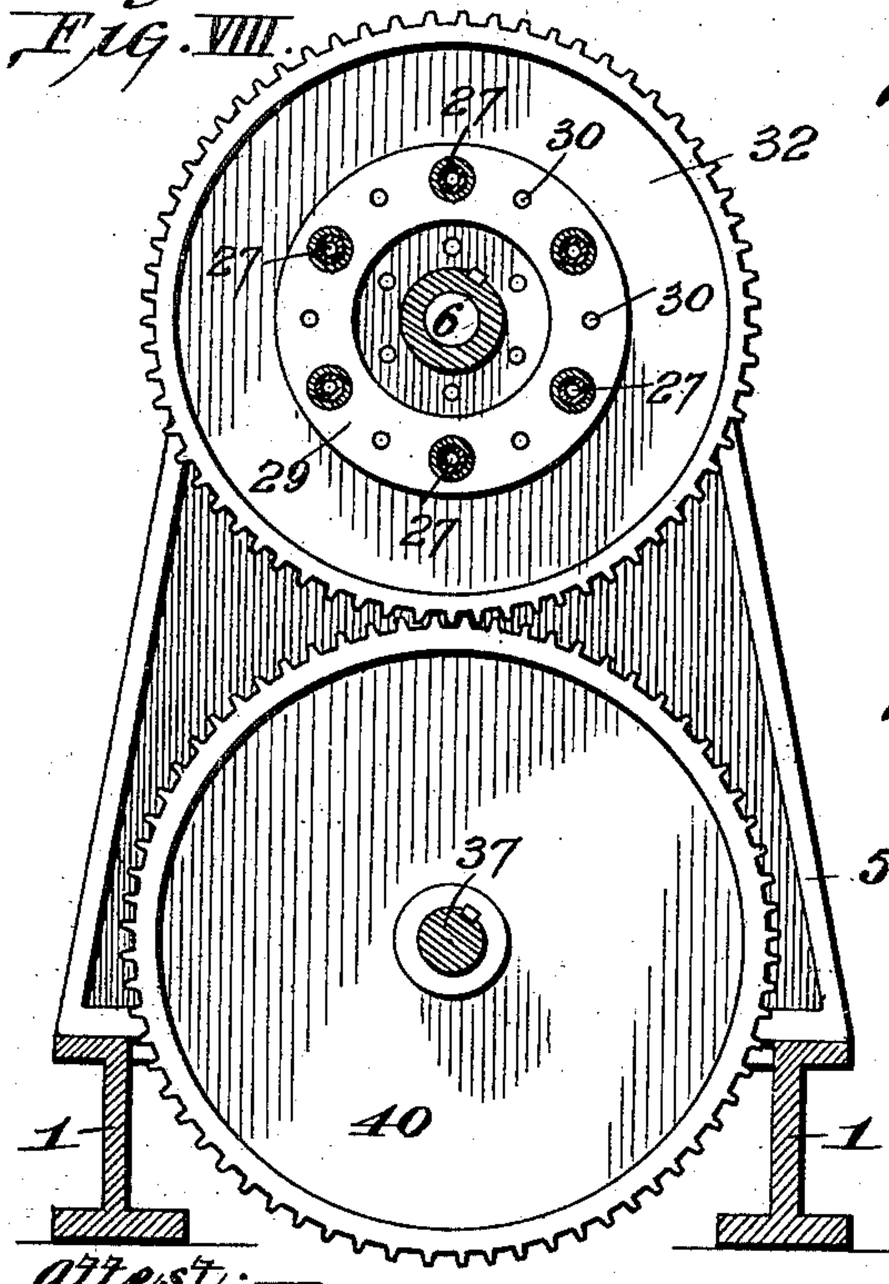


Fig. VII.

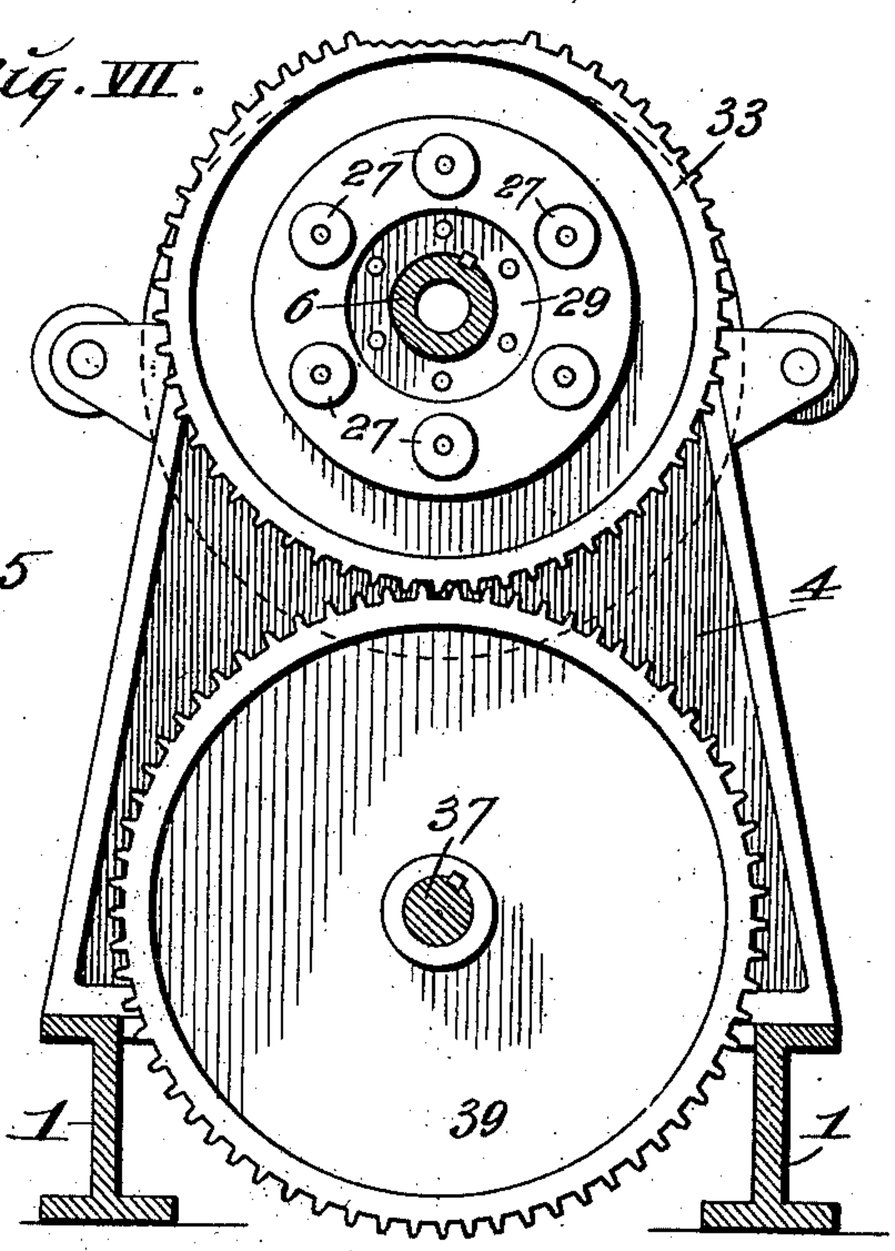


Fig. IX.

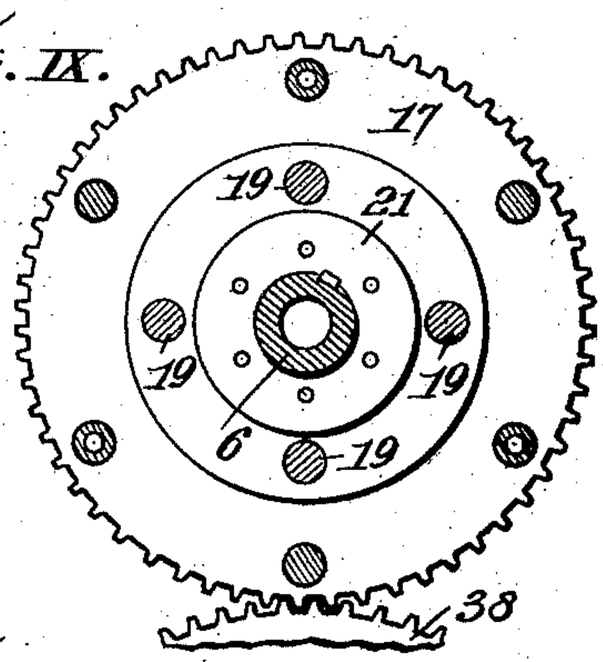
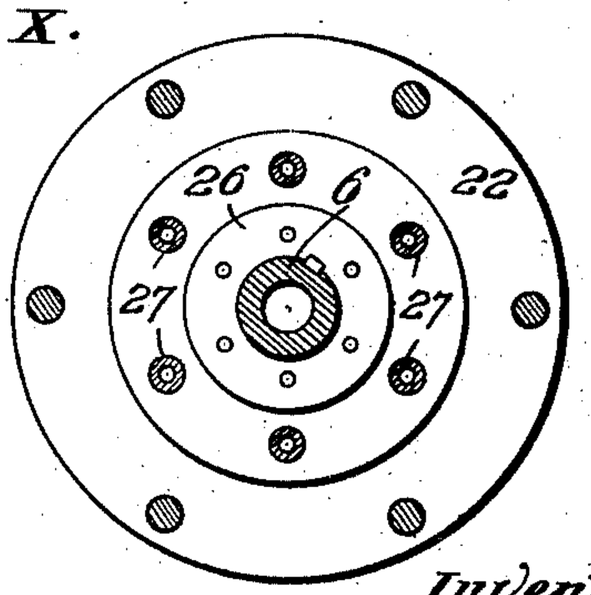


Fig. X.



Witnesses:—
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Inventor:—
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UNITED STATES PATENT OFFICE.

EDWARD P. FREDERICK, OF ST. LOUIS, MISSOURI.

WIRE-ROPE MACHINE.

SPECIFICATION forming part of Letters Patent No. 693,509, dated February 18, 1902.

Application filed April 11, 1901. Serial No. 55,319. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. FREDERICK, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Wire-Rope Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the manufacture of wire ropes composed of a number of strands twisted together in layers it is desirable at times to have the wires of some of the layers arranged with more or less angle than the wires of the other layers—that is to say, it is desirable for certain uses to which wire rope is put to have the wires of the inner layers of the rope arranged with a more acute twist than the wires of the outer layers.

The object of my invention is to make a wire-rope machine which will be simple in construction and operation and in which the "lay" of the inner wires of the rope can be formed at a greater angle or a more acute angle than the lay of the outer wires of the rope.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a vertical longitudinal section of my machine. Fig. II is an enlarged perspective view of one of the spool-frames. Fig. III is an enlarged detail vertical section taken on line III III, Fig. I. Fig. IV is an enlarged detail vertical section taken on line IV IV, Fig. I. Fig. V is an enlarged detail vertical section taken on line V V, Fig. I. Fig. VI is a vertical section taken on line VI VI, Fig. I. Fig. VII is a vertical section taken on line VII VII, Fig. I. Fig. VIII is a vertical section taken on line VIII VIII, Fig. I. Fig. IX is a vertical section taken on line IX IX, Fig. I; and Fig. X is a vertical section taken on line X X, Fig. I.

Referring to the drawings, 1 represents a bed-plate, from which rise four standards 2, 3, 4, and 5. In the upper end of the standards there is journaled a hollow shaft or spindle 6, having at one end the usual tight and loose pulleys 7, by which it is driven. Secured to the shaft 6 between the standards 2 and 3 is a flier 8, consisting of disks 9, 10, and 11, which support the wire-carrying spool-frames 12, the frame of one of the spools being shown in Fig. II. There are three spools located between the disks 9 and 10 and three between the disks 10 and 11, so that the flier carries six spools in all. The journals of all of the spool-frames extend beyond the disk 9, where they are provided with cranks connected together by a ring 13, so that the spools cannot turn independently of each other, this feature being old and well known. The forward ends of the journals of the frame 12 are perforated for the passage of the wires, as seen in Fig. I, and the disk 11 is peforated for the passage of the wires carried by the spools that are located between the disks 9 and 10, as also seen in Fig. I.

Mounted on the shaft 6 between the standards 3 and 4 is a flier 14, and mounted on the shaft between the standards 4 and 5 is a flier 15. The flier 14 is composed of three disks 16, 17, and 18, secured together by tie-bolts 19. Between the disks 16 and 17 are arranged three wire-carrying spool-frames, (corresponding to the spool-carrying frames 12,) and between the disks 17 and 18 are three wire-carrying spool-frames of like nature, the journals of all of the frames extending beyond the disk 16, where they are provided with cranks connected by a ring 20, corresponding to the ring 13. The disks 16, 17, and 18 are journaled on bushings 21, that are keyed to the shaft 6 and which are perforated for the passage of the wires from the flier 8. The flier 15 is composed of three disks 22, 23, and 24, between which are arranged wire-carrying spool-frames, as in the case of the fliers 8 and 14, and the journals of the spool-carrying frames are extended beyond the disk 22, where they are provided with cranks connected by a ring 25, corresponding to the rings 20 and 13. The disks 22, 23, and 24 are journaled on bushings 26, rigidly secured to the shaft 6 and which are perforated for the passage of the wires from the flier 8.

27 designates hollow bolts that pass through the disks 22, 23, and 24 and which likewise pass through rings 28, journaled, respectively, in the standards 4 and 5, and between which and the shaft 6 there are located perforated bushings 29, through which the wires from the flier 8 pass. The wires from the

flier 14 pass through the hollow bolts 27, as shown by dotted lines in Fig. I, and the wires from the flier 15 pass through perforations 30 in the outer ring 28.

32 and 33 represent gear-wheels carried by the bolts 27, the wheel 32 being adjacent to the outer ring 28 and the wheel 33 being adjacent to the inner ring 28. The bolts 27 thus serve to tie the disks 22, 23, and 24, the rings 28, and the gear-wheels 32 and 33 together, so that they will revolve in unison on the bushings 26 and 29.

The periphery of the disk 17 is provided with cogs, whereby there is made of it a gear-wheel corresponding to the gear-wheels 32 and 33. Secured to the shaft 6 is a gear-wheel 34, meshing through an intermediate pinion 35 (see Fig. IV) with a gear-wheel 36, secured to a counter-shaft 37, that is journaled in the lower part of the standards 3, 4, and 5. The shaft 34 is provided with gear-wheels 38, 39, and 40, which respectively mesh with the wheels 17, 33, and 32. It will thus be seen that when the machine is in operation the flier 8 will be driven at the speed of the shaft 6, to which it is directly connected, whereas the fliers 14 and 15 will be driven at whatever speed to which they may be geared through the connection between the shaft 6 and the counter-shaft 37, this speed being regulated at will by changing the size of the cog-wheel 36, as indicated by dotted lines in Fig. VI, for which purpose the pinion 35 has a slot-and-bolt connection with the standard 3, so that the pinion can be adjusted to make a connection between the gear-wheel 34 and the gear-wheel 36 whatever the size of the latter may be. In this manner I am enabled to give more lay to the wires from the flier 8 than that given to the wires from the fliers 14 and 15, and the amount of the difference in the lay can be readily changed at will by substituting one gear-wheel 36 for another of a different size.

The machine is simple in construction, effective in operation, and is not liable to get out of order, while it can be run at a high speed, owing to the fliers being of small diameter and the shaft 6 being supported at close intervals throughout its length.

The central wire of the rope passes through the hollow shaft 6 and is indicated by the dotted line A in Fig. I.

I claim as my invention—

1. In a wire-rope machine, the combination of a bed-plate, standards rising from the bed-plate, a shaft journaled in the standards, a flier directly connected to the shaft between two of the standards, a second flier journaled on the shaft between two of the standards, a third flier journaled on the shaft between two of the standards, a gear connection between said counter-shaft and the fliers that are journaled on the first-mentioned shaft, and a gear connection between the first-mentioned shaft and the counter-shaft, substantially as set forth.

2. In a wire-rope machine, the combination of a hollow shaft, a flier rigidly secured to the shaft, perforated bushings through which the wires from said flier pass, standards in which said bushings are journaled, a second flier mounted on said shaft by interposed perforated bushings through which the wires from the first-mentioned flier pass, a third flier mounted on said shaft through interposed perforated bushings through which the wires from the first-mentioned flier pass, perforated bolts extending through the last-mentioned flier and through which the wires from the second-mentioned flier pass, a counter-shaft, a gear connection between the second and third mentioned fliers and said counter-shaft, and a gear connection between said counter-shaft and the first-mentioned shaft, substantially as set forth.

In testimony whereof I have hereunto set my hand this 4th day of April, 1901.

EDWARD P. FREDERICK.

In presence of—
JOS. A. WANGLER,
E. S. KNIGHT.