

No. 898,294.

G. P. A. WEISENBORN. PATENTED SEPT. 8, 1908.
FENCE WEAVING MACHINE.
APPLICATION FILED JULY 22, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

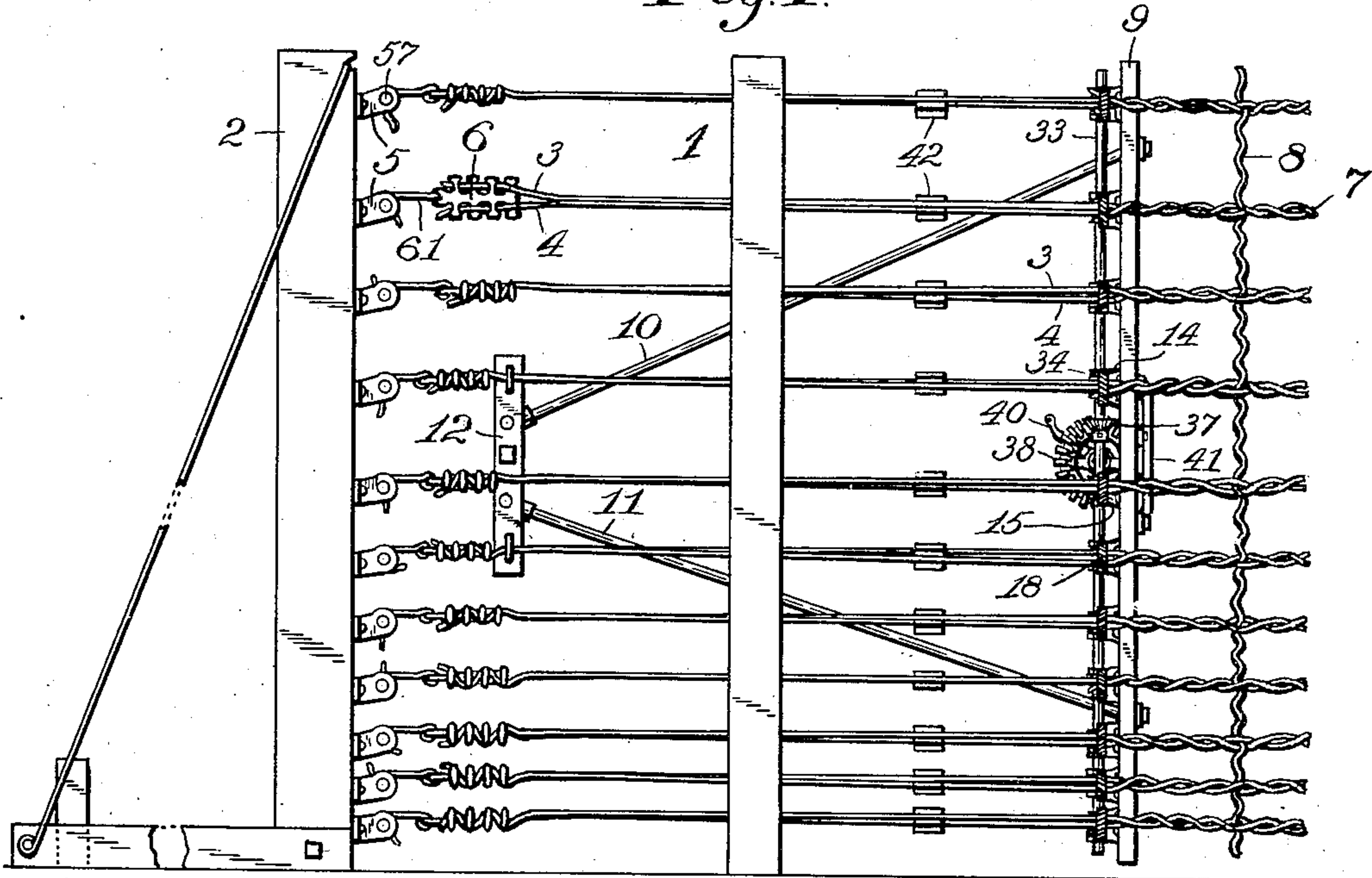
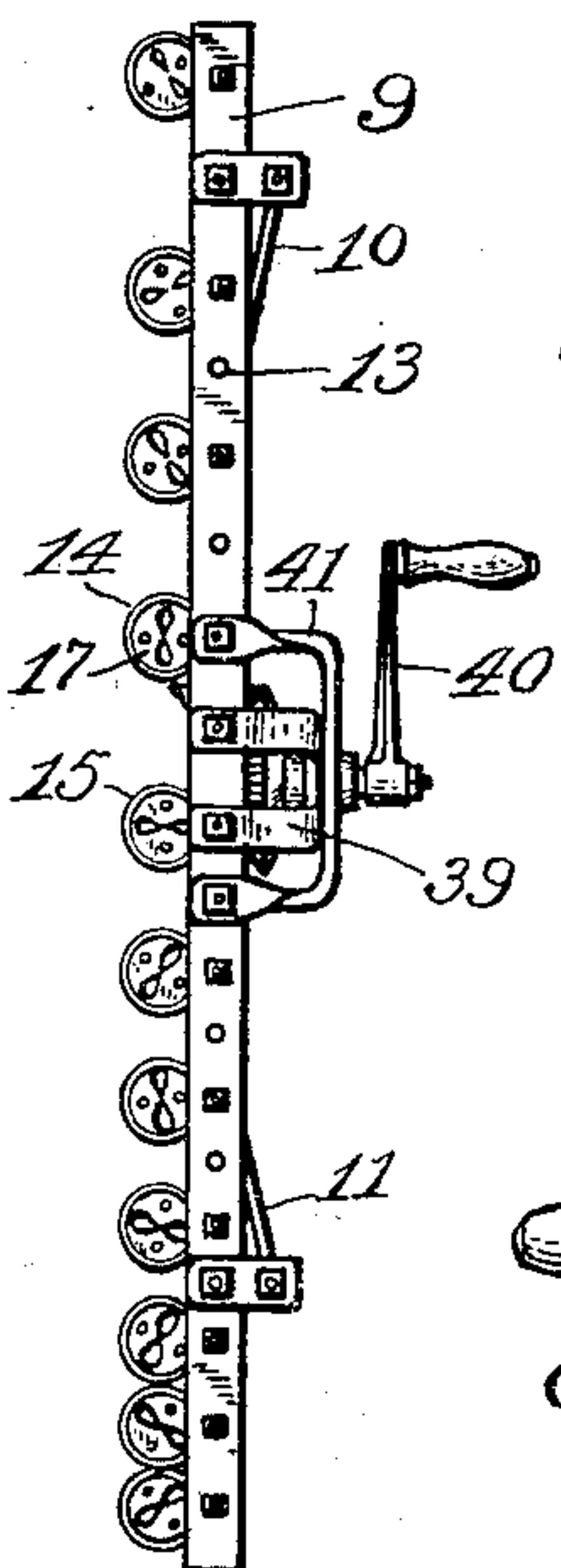


Fig. 2.



WITNESSES:

J. H. Gardner.
M. W. Beaty.

Fig. 3.

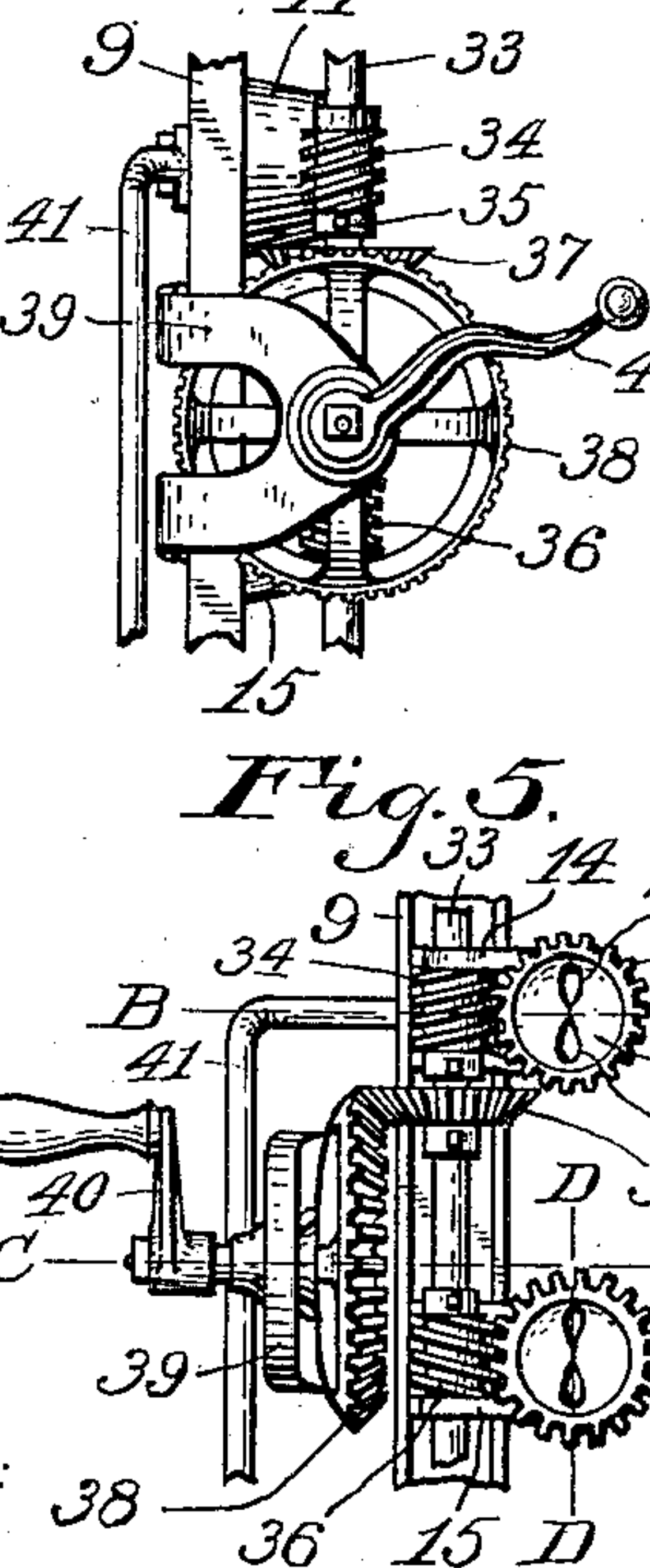


Fig. 5.

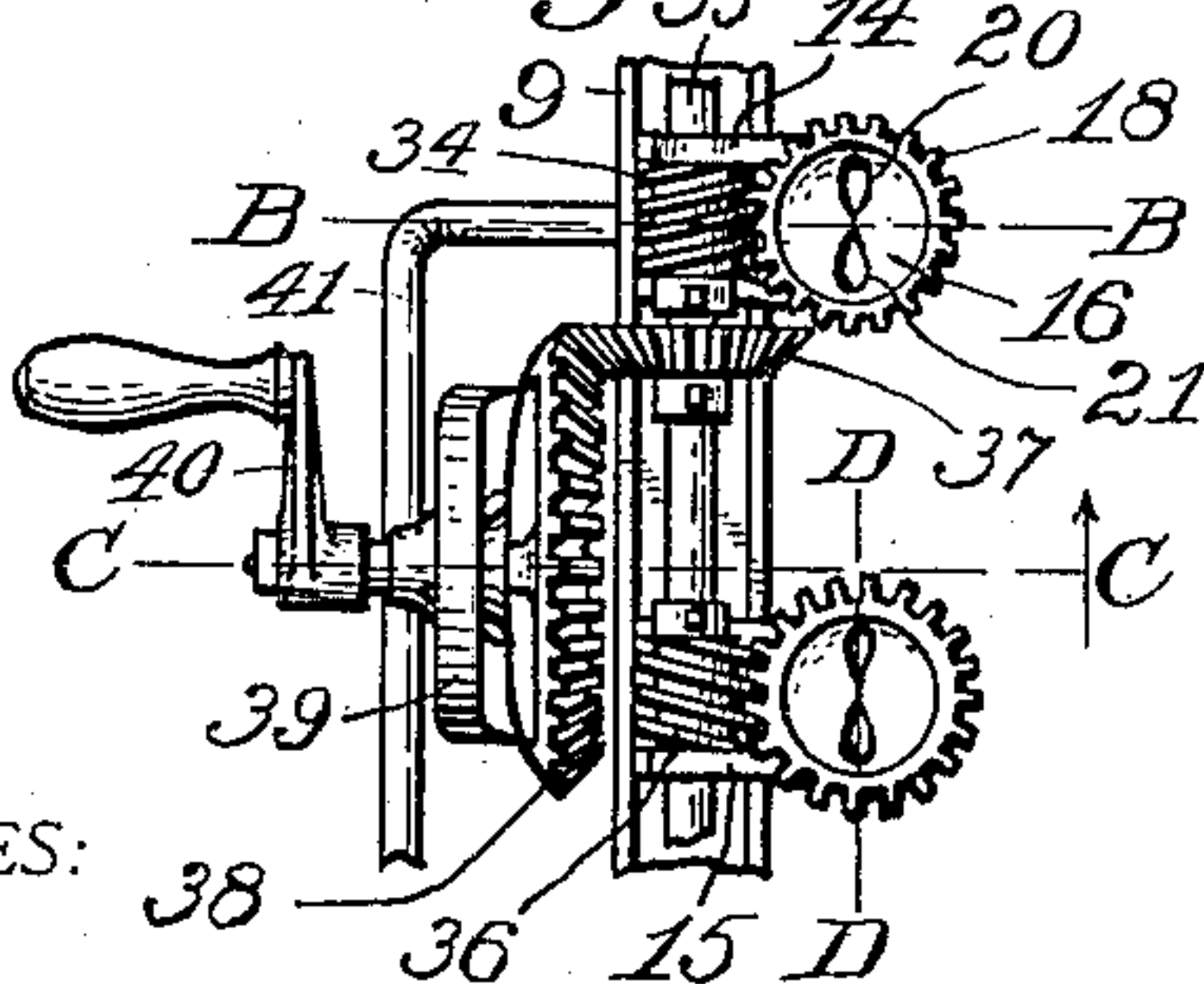


Fig. 4.

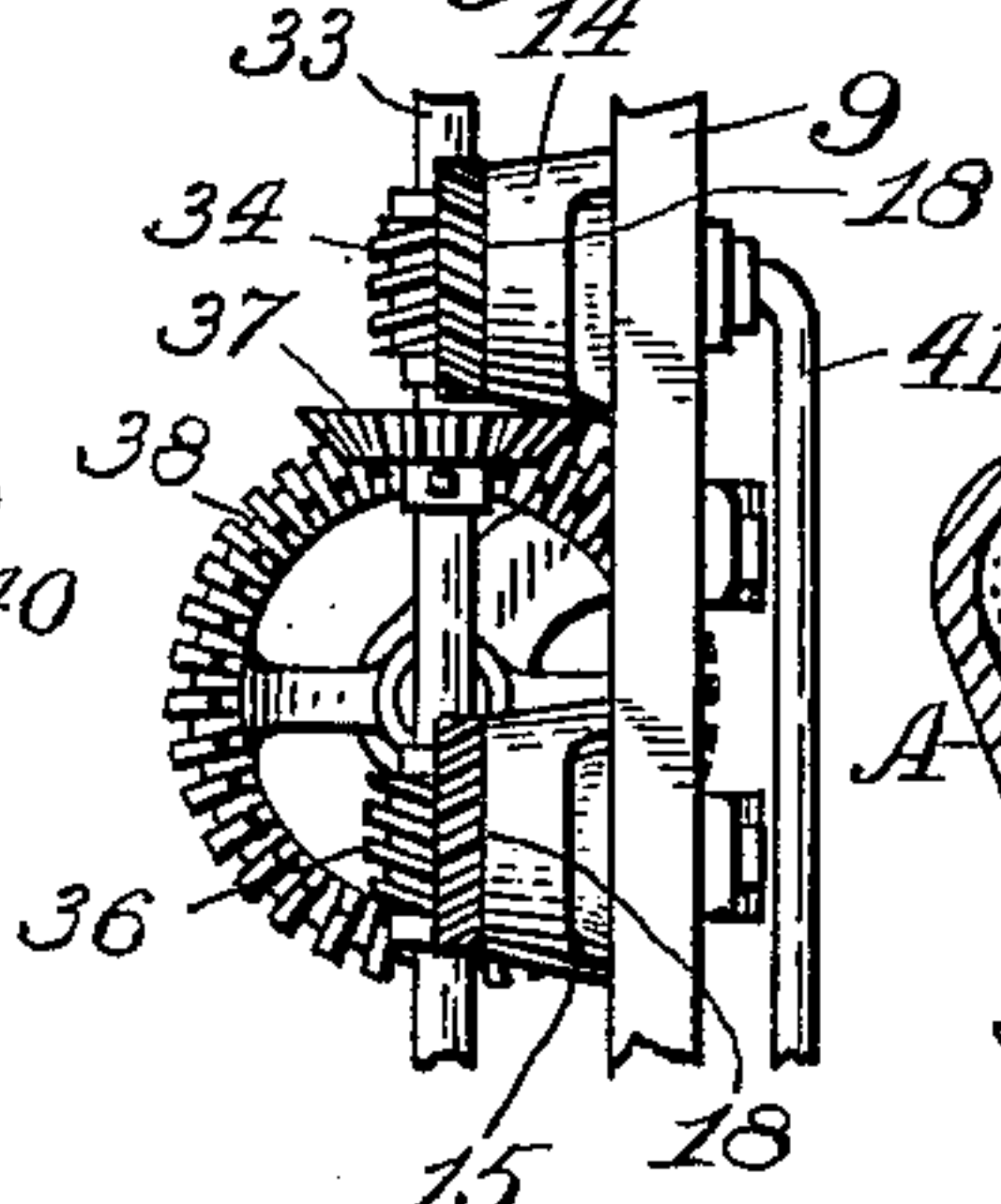


Fig. 7.

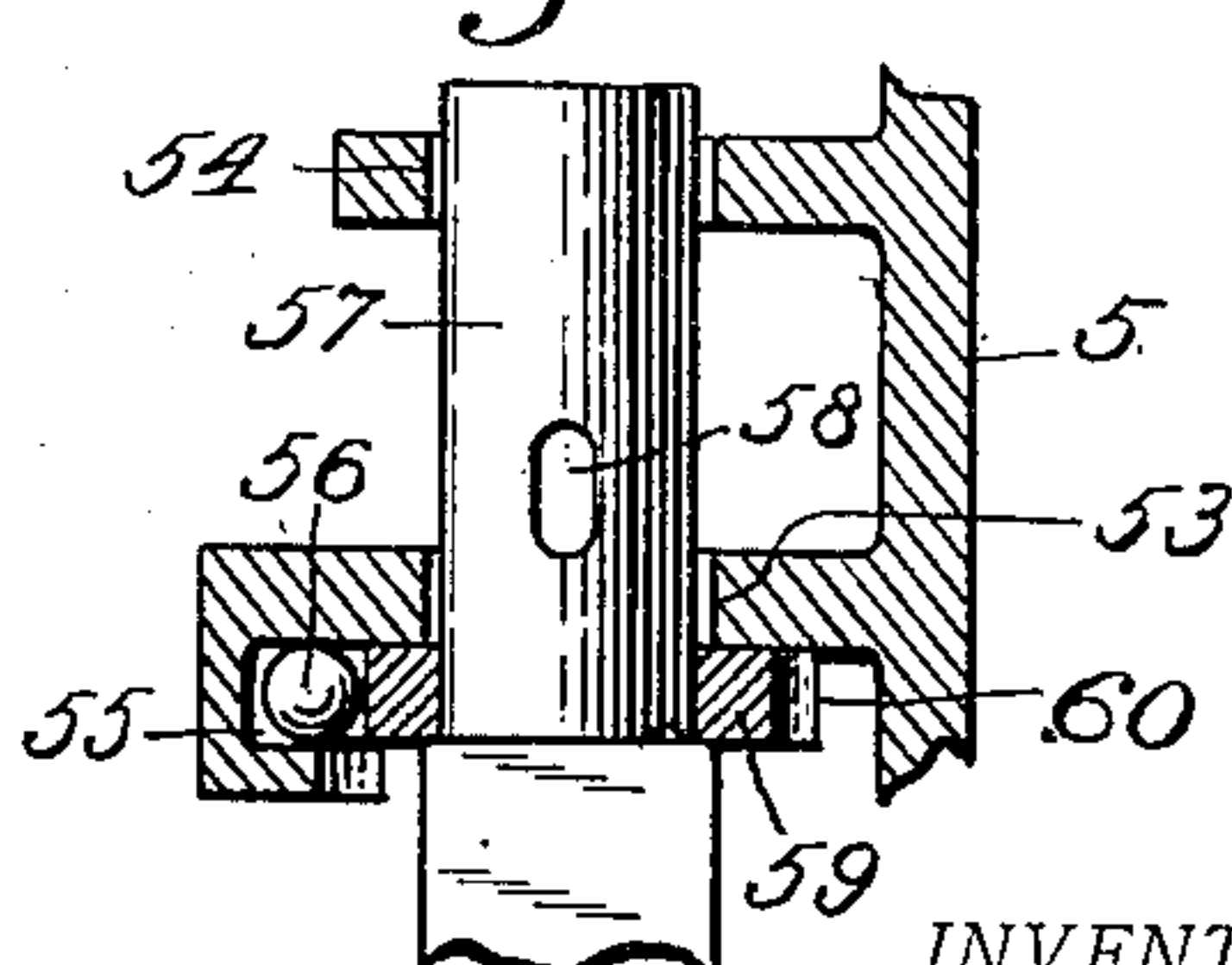
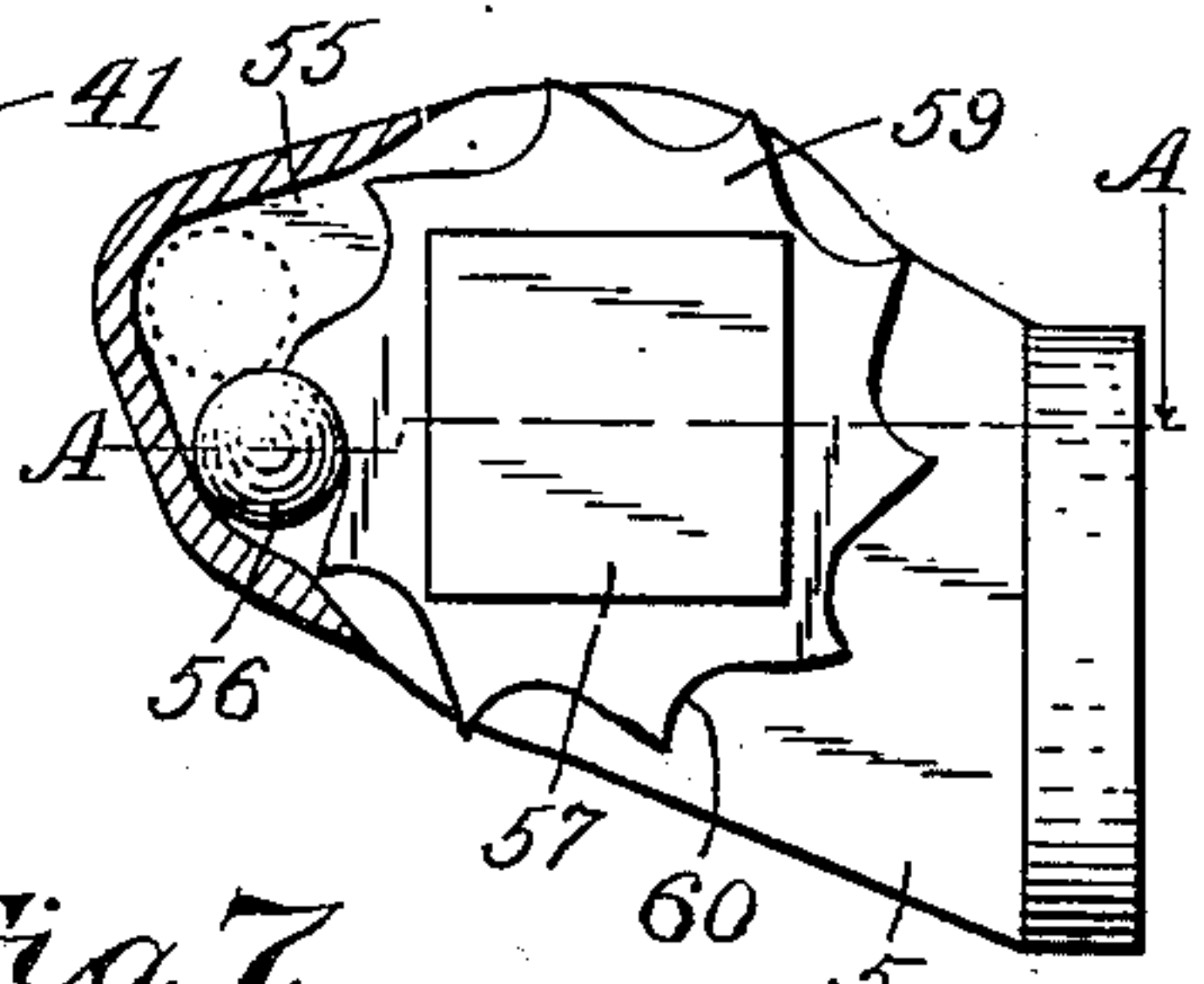


Fig. 6.



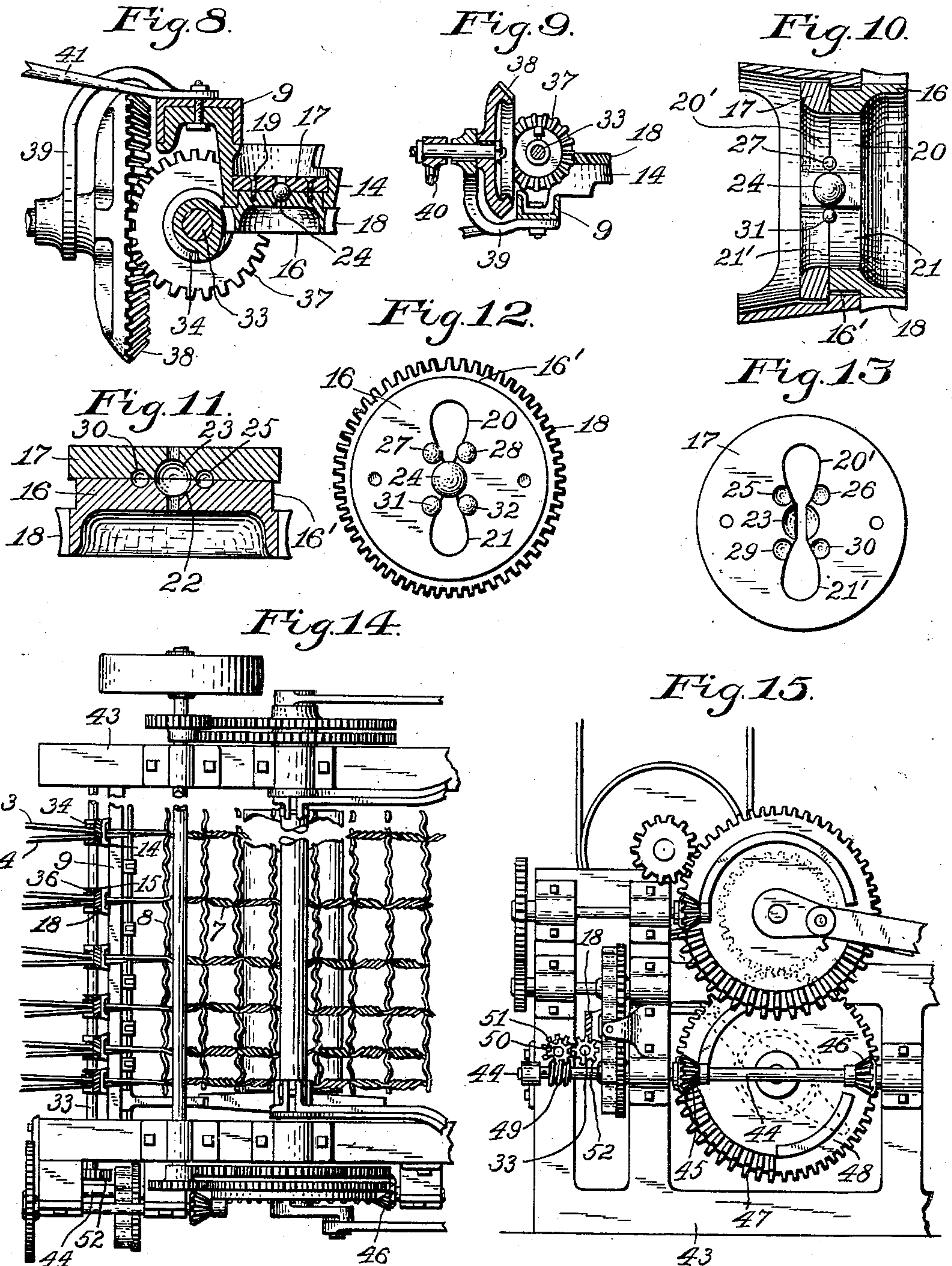
INVENTOR:

G. P. A. Weisenborn.
BY
E. J. Silvius,
ATTORNEY.

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2 SHEETS—SHEET 2.



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G. P. A. Weisenborn,
BY
E. J. Silvius,
ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE P. A. WEISENBORN, OF CLARENCE, MISSOURI.

FENCE-WEAVING MACHINE.

No. 898,294.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed July 22, 1907. Serial No. 384,947.

To all whom it may concern:

Be it known that I, GEORGE P. A. WEISENBORN, a citizen of the United States, residing at Clarence, in the county of Shelby and State of Missouri, have invented certain new and useful Improvements in Fence-Weaving Machines; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to machines for weaving wire fencing either on the ground where it is to be used or in factories, the invention having reference more particularly to improvements in the mechanism whereby the wires which form the line wire strands are twisted, and also referring to the mechanism for operating the twisters, and to the wire tighteners and adjusters, the object of the invention being to improve the above mentioned features of fence weaving machines, particularly to provide twisting mechanism which may be operated with the least expenditure of energy so as to be adaptable for hand operation, a further object also being to provide an improved machine of the above-mentioned character which may be constructed with few positively-operating parts having great durability and which may be cheaply repaired, and be economical in use.

With the above-mentioned and minor objects in view the invention comprises certain novel features of construction in fence weaving machines, in a novel form of twisting-head, and in the parts and combinations and arrangements of parts as hereinafter particularly described and referred to in the appended claims.

Referring to the drawings, Figure 1 is a fragmentary side elevation of a wire fence in process of construction with the improved weaving machine in connection therewith; Fig. 2, an elevation of the machine showing the following side thereof; Fig. 3, a fragmentary elevation of the machine showing the middle portion thereof at the side at which it is operated; Fig. 4, a fragmentary elevation showing the side opposite to that illustrated in the preceding figure; Fig. 5, a fragmentary elevation showing the advance side of the middle portion of the machine; Fig. 6, a side elevation of one of the wire tighteners, of which a portion is broken

away; Fig. 7, a fragmentary sectional view of the tightener on the line A—A in Fig. 6; Fig. 8, a horizontal sectional view on the line B—B in Fig. 5; Fig. 9, a horizontal sectional view on the line C—C in Fig. 5, looking upward; Fig. 10, an enlarged sectional view on the line D—D in Fig. 5; Fig. 11, a sectional view of the twisting head with parts thereof omitted; Fig. 12, a plan view of the inner side of the main portion of a twister head; Fig. 13, a plan view of the inner side of the follower plate comprising a part of the twisting head; Fig. 14, a fragmentary top plan of a power machine showing the improvements adapted to be used in connection therewith; and, Fig. 15, a fragmentary side elevation of the power machine and improvements connected therewith.

Similar reference characters in the different figures of the drawings designate corresponding elements or features of construction.

In the drawings 1 designates a fence post; 2, a standard comprising a part of the weaving apparatus for supporting the wires while being twisted at the places where the fence is to be erected; 3 and 4 designate the strands to be twisted to form the line wires of the fencing; 5, the wire tighteners; 6, the tension adjusters; 7, the complete line wires composed of two twisted strands each; and 8, the stay rods or pickets.

The machine proper comprises a main frame member 9 which is preferably composed of channel iron of suitable length to be used in upright position when building fencing on the ground, or horizontally when connected with a power machine. For portable use the main frame comprises also two rods 10 and 11 which are attached to the member 9 and extend convergently and are attached at their ends to a guide bar 12 which is suitably connected slidingly with two pairs of the wire strands, for guiding the machine uprightly, and preventing the member 9 from turning rotatively. The member 9 has a suitable number of bolt holes 13 to receive securing bolts whereby a suitable number of housings as 14 and 15 are removably secured thereto, the housings supporting the twisting heads and also operating mechanism thereof. The housings are all substantially alike except that they are preferably constructed in right hand and left hand pairs so as to better accommodate the operating mechanism of the twisting heads, and as will be understood

the housings may be shifted to different positions on the member 9 so that the spaces between fence wires may be made greater or less as may be desired, and obviously a greater or less number of housings may be mounted on the member 9 so as to twist as many line wires as may be required. Each housing comprises an annular main portion in which a twisting head is mounted rotatively.

Each twisting head comprises a main member 16 having a journal bearing 16' that rotates in the annular portion of a housing, the twisting head having a follower 17 which serves to retain the twisting head on its bearing, the twisting head being provided with peripheral slanting gear teeth 18 adapted to be engaged by a worm gear for driving the twisting head, the two parts of the twisting head being secured together detachably by screws 19. The main part 16 of each twisting head has two guide openings 20 and 21 preferably communicating one with another, and the follower plate 17 has similar registering guide openings 20' and 21' through which the wire strands extend as usual while being twisted. The main part has a central hemispherical socket bearing 22, and the follower plate has a corresponding bearing 23 in which is a hard steel ball 24 fitting closely therein between the two members of the twisting head but capable of rotative movement. At opposite sides of the openings are smaller socket bearings 25 and 26 in which are balls 27 and 28 and other sockets 29 and 30 in which are balls 31 and 32, so that the balls at the sides of the guide openings extend slightly beyond the walls of the openings, and therefore the wires which extend through the openings while being twisted together must bear against the ball 24 and the smaller balls at the sides of the guide openings. These balls are very hard so that they will not wear away rapidly, and there being only small portions thereof in contact with the wires, will not produce as much friction as there would be where the wires as heretofore bear on larger surfaces of ordinarily soft metal. Also in operation the balls shift more or less rotatively and present new surfaces to the wires. When finally becoming worn too much for use they may readily be removed and replaced by new ones at small cost, therefore obviating the necessity as heretofore, of discarding the twisting head member in which the guide openings are formed.

A shaft 33 is mounted rotatively in all of the housings, as 14 and 15 and has a suitable number of worms as 34 secured by a set screw 35 and a worm 36 likewise secured to the shaft in contact with portions of the housing whereby the shaft is guided against longitudinal movements, the worms being substantially alike except that the threads are pitched oppositely so as to be right and

left hand in order that while one worm turns a twisting head in one direction the adjacent worm will drive its twisting head in the opposite direction. A bevel gear wheel 37 is secured to the middle portion of the shaft 33 and is engaged by a bevel gear wheel 38, which is rotatively mounted in a housing 39 that is secured to the frame member 9, the wheel 38 being provided with a driving crank 40 by which the shaft 33 may be rotated in either direction. The member 9 is provided with a handle 41 to be used in handling and operating the machine. A suitable number of spreaders 42 are used as usual on the wire strands in advance of the machine when building fencing on the ground.

The main frame member 9 supporting the twisters and operating mechanism thereof may be suitably connected with various power machines for weaving the fencing in factories to be rolled for shipment. Portions of a well known type of machine are illustrated in which 43 is the main frame, and 44 a shaft mounted rotatively thereon for operating the twisting heads, this shaft being driven alternately in opposite directions by means of bevel gear wheels 45 and 46 secured to the shaft and engaged alternately by a quadrant of gear teeth 47 on a drive wheel 48, as will be clearly understood. The shaft 44 is provided with a worm gear 49 engaging a gear wheel 50 suitably supported which in turn drives a gear wheel 51 that engages a gear wheel 52 which is secured to the rotative shaft 33 having worms 34 and 36 thereon whereby the twisting heads hereinbefore described are operated. Of course different driving and reversing gearing than that mentioned may be employed and the power machine otherwise may be variously constructed, the operations of such machines being well understood in general.

Each wire tightener 5 which may be suitably attached to the standard 2 has two journal bearings 53 and 54, and also a pocket 55 in which is a steel ball 56 adapted to be shifted or to move therein, the ball normally falling by gravity to the lower portion of the pocket, the outer wall of which is inclined, so that the ball will gravitate towards the axis of the bearings in which is mounted a rotative spindle 57 having a hole 58 therein, there being a wheel 59 secured to the spindle and having semicircular notches 60 in its periphery to be engaged by the ball 56 to prevent retraction of the spindle, the arrangement being such that when the spindle is turned in one direction the ball will be pushed upward in the pocket and outwardly clear of the wheel by portions thereof between the notches, and after being thus pushed upward the ball will fall so that when the wheel turns in a reverse direction slightly it will be stopped and held by the ball engaging one of the notches 60 while the ball rests against the

opposing wall of the pocket in which it is housed. A suitable number of wires 61 are connected to the adjusters 6 and also to the spindles of the wire tighteners, so that after
 5 the wire strands 3 and 4 are connected to an adjuster 6 and tightened by turning the spindle 57, if either strand be found to be too tight relatively to the companion strand it may be slackened at its connection with the
 10 adjuster 6, and then both strands may be tightened evenly by further manipulation of the tightener, and obviously the different pairs of strands may be tightened uniformly by manipulating the tighteners.

15 In practical use the improved machine may be arranged in the usual manner as indicated hereinbefore, and the crank 40 is to be operated first in one direction and then in the reverse direction for twisting the differ-
 20 ent line wires in opposite directions and reversed between each two stay rods or pickets as is customary, all of the connections between the crank 40 and the twisting heads being direct and positive, and in view of the
 25 worm gearing the operations will be smooth and powerful, requiring the minimum amount of manual force and eliminating the lost motion and consequent loss of energy. Also as
 30 will be seen the machine is devoid of drive chains which in other machines become clogged with soil in handling the machines in fields and cause trouble in keeping them clean.

Having thus described the invention, what
 35 is claimed as new is:—

1. A fence-weaving machine including a twisting-head comprising a main member and a follower secured detachably together with guide-openings therein, a dividing bearing ball mounted between the main member and the follower and between the guide-
 40 openings, and two pairs of bearing balls mounted at opposite sides of the dividing bearing ball between the main member and the follower, each pair of balls being at opposite sides of an opening.

2. A fence-weaving machine including a main frame member composed of channel iron having two flanges, the member having a
 50 plurality of holes therein between the flanges, a plurality of housings mounted on the frame member and seated thereon between the flanges thereof, each housing having an annular main portion, bolts extending through
 55 the holes and securing the housings to the member against the flanges thereof, twisting heads comprising each a main member having a journal-bearing mounted rotatively in the annular portion of a housing, the twisting-
 60 head having a follower plate that is detachably secured to the main member thereof and retains the main member on its bearing, said main member of the twisting-head having gear teeth thereon and having also guide-
 65 openings therein, said follower plate also hav-

ing guide-openings therein registering with the guide-openings of the main member of the twisting-head, a shaft mounted in the housings, and worms secured adjustably on the shaft and engaging the gear teeth of the
 70 twisting-heads.

3. A fence-weaving machine including a main frame member having two opposite flanges, a plurality of right-hand and left-hand housings arranged in reverse order
 75 alternately and secured adjustably to the frame member and seated against said flanges, each housing being secured by a single bolt and having an annular main portion, twisting-heads comprising each a main mem-
 80 ber having a journal-bearing mounted rotatively in the annular portion of the housing, and a follower plate secured detachably to the main member and retaining the same on its bearing, said main member having gear
 85 teeth thereon and having also guide-openings therein, said follower plate also having guide-openings therein registering with the guide-openings of the main member of the twisting-head, a shaft mounted rotatively in the
 90 housings, and worms secured adjustably on the shaft and engaging the gear teeth of the twisting-heads, alternate worms being reversed and engaging opposite sides of the different adjacent housings and preventing
 95 longitudinal movements of the shaft.

4. In a fence-weaving machine, the combination of a main frame member, a plurality of housings mounted on the frame member and having each an annular portion, twisting
 100 heads comprising each a main part that has a journal-bearing which is mounted in the annular portion of a housing, and a follower plate secured removably to the main part, said main part having gear teeth thereon and
 105 having also two guide-openings therein and a hemispherical socket-bearing between the two guide-openings, said follower plate having two guide openings and also a hemispherical socket-bearing between the two guide-
 110 openings, a ball in said hemispherical socket-bearings; a shaft mounted in the housings, and worms secured to the shaft and engaging the gear teeth of the twisting-heads.

5. In a fence-weaving machine, a twisting-
 115 head comprising two parts secured detachably together, each part having two guide-openings therein and a socket-bearing at each side of each guide-opening, and also a relatively larger central socket-bearing be-
 120 tween the two guide-openings, a dividing ball bearing in said central socket-bearings, and four balls in the socket-bearings that are at the sides of said guide-openings.

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

GEORGE P. A. WEISENBORN.

Witnesses:

WM. H. PAYNE,
 E. T. SILVIUS.