

(No Model.)

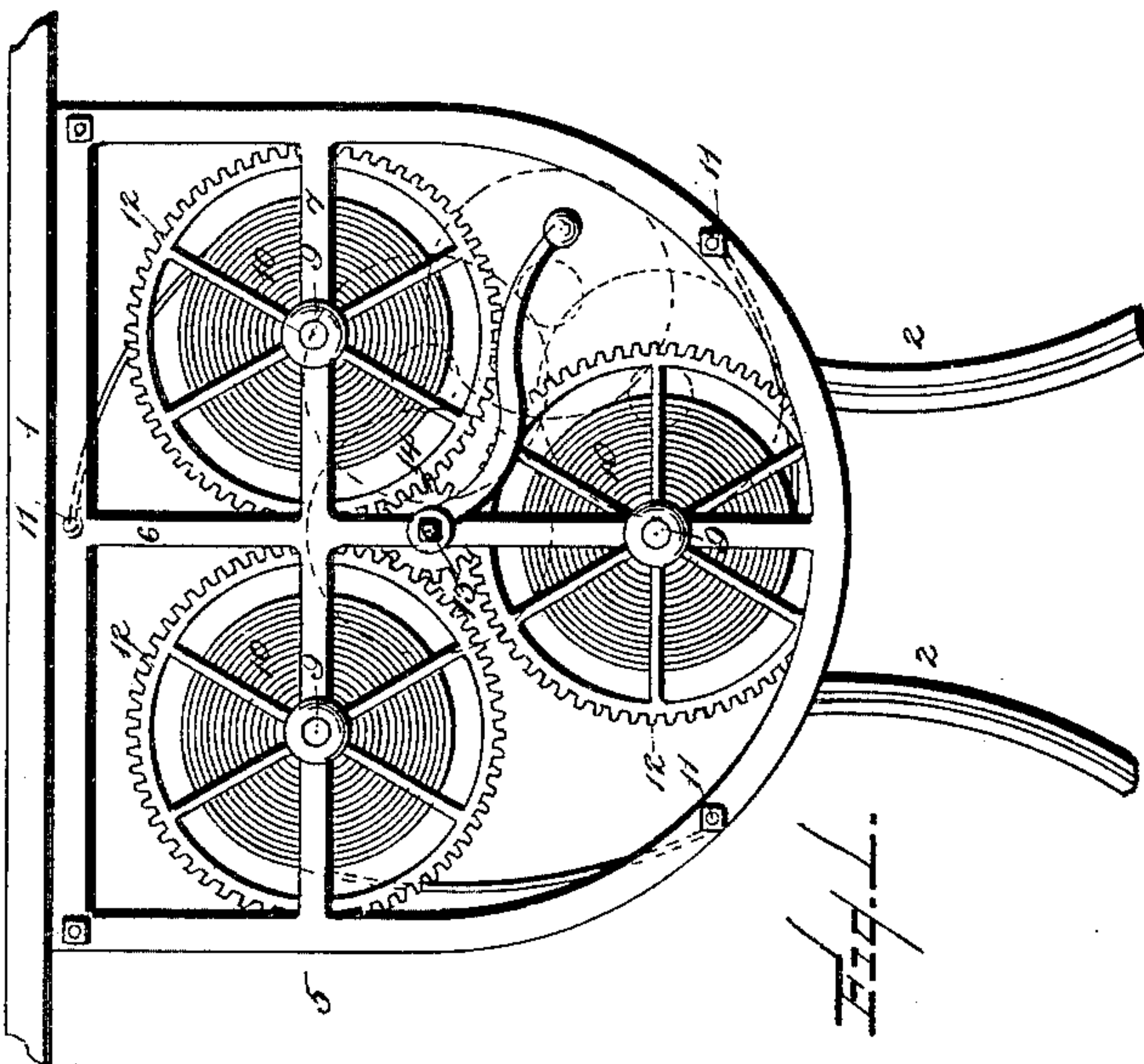
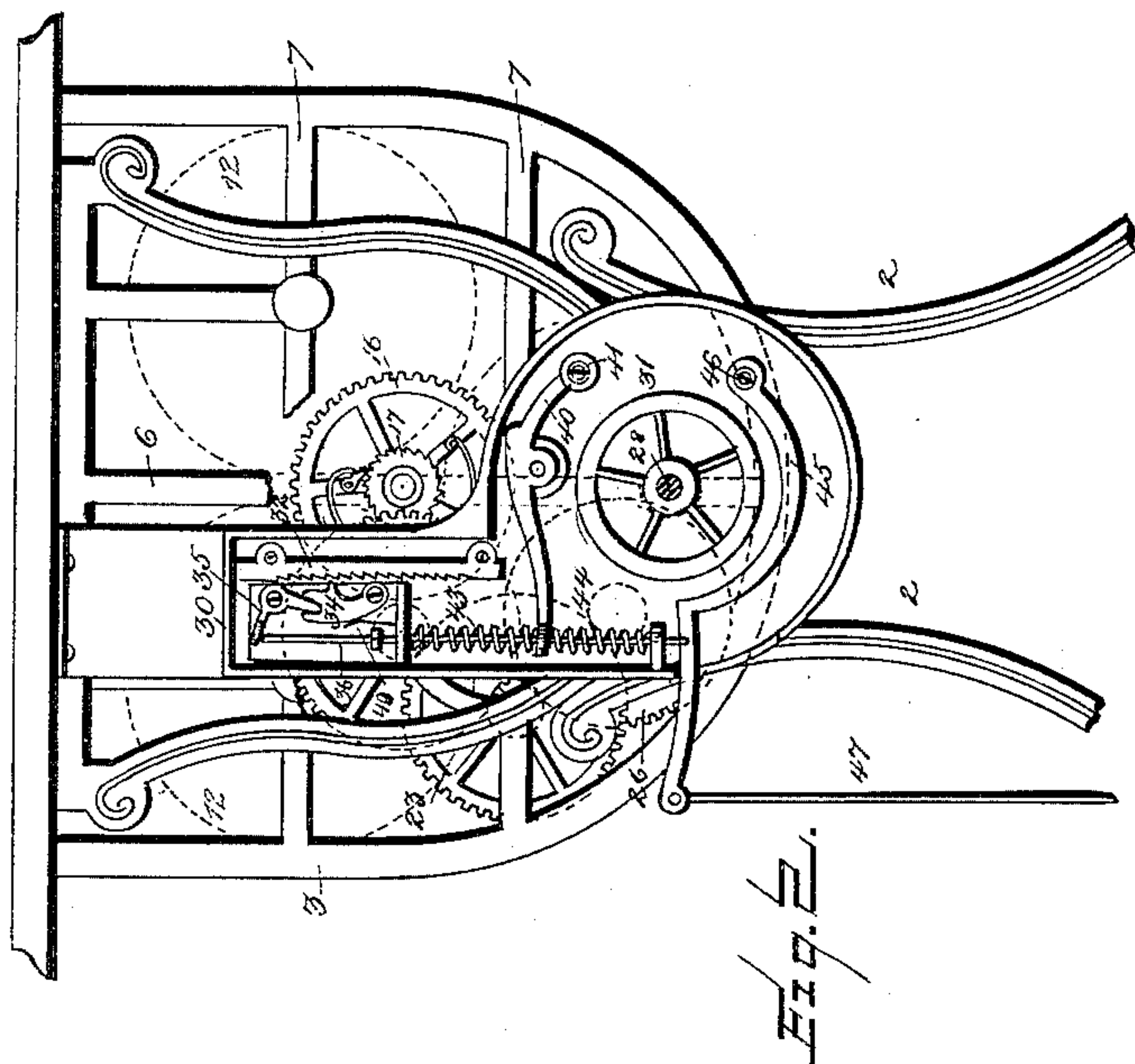
2 Sheets—Sheet 1.

A. G. FERREE.

SPRING MOTOR.

No. 394,066.

Patented Dec. 4, 1888.



Witnesses:

L. C. Mills,
W. D. Tuval.

Inventor:

Albert G. Ferree.
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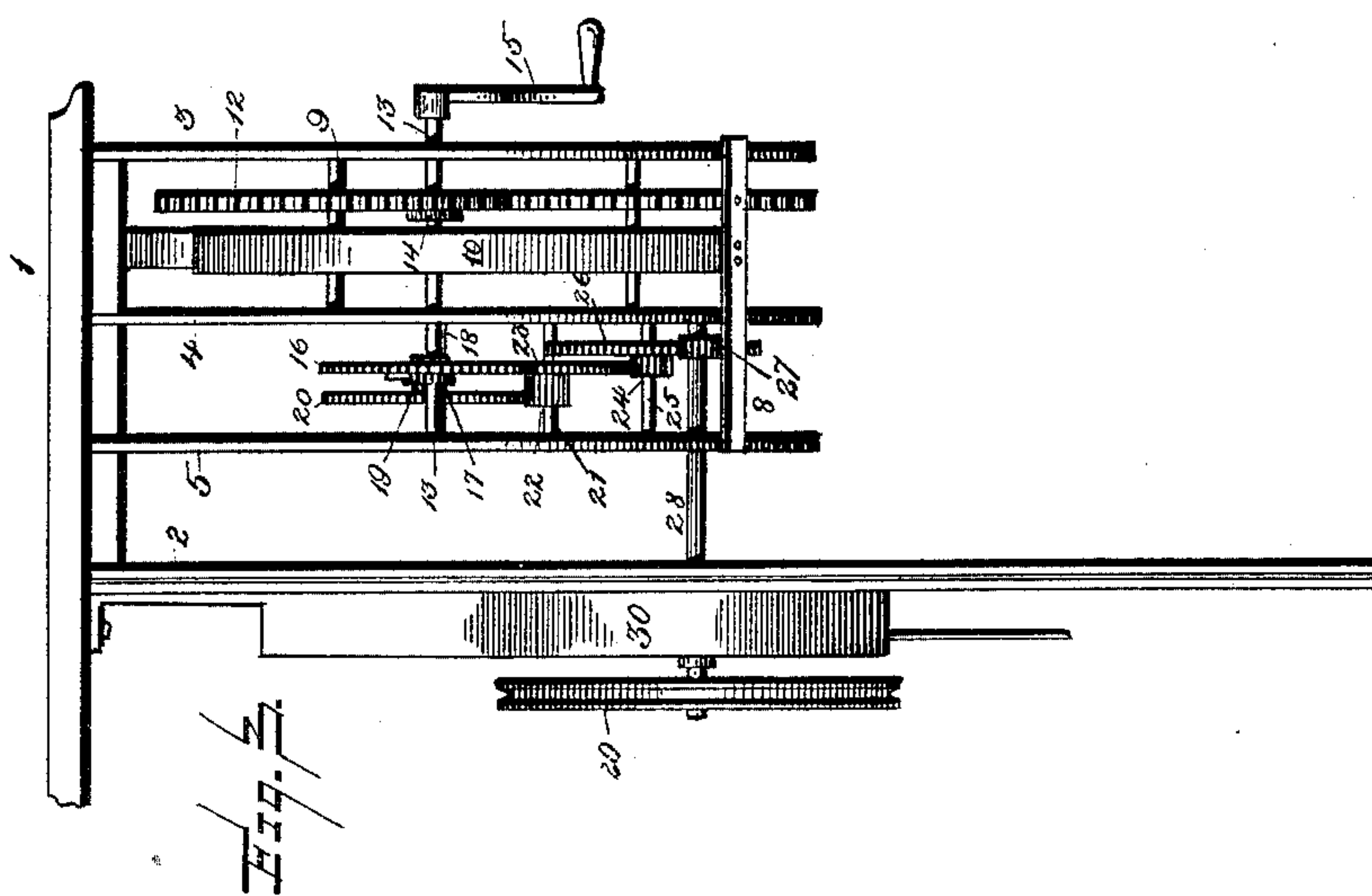
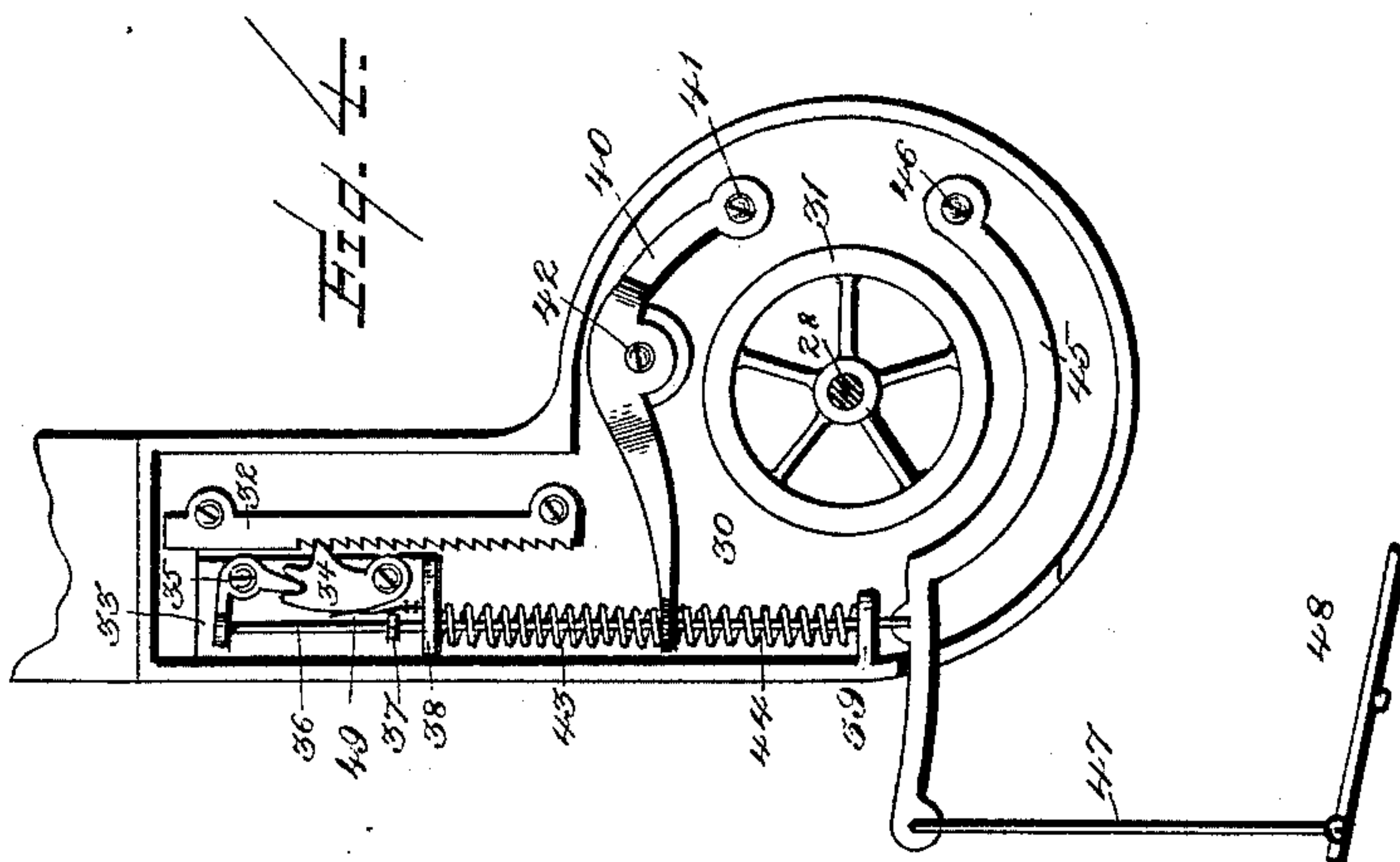
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2 Sheets—Sheet 2.

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Witnesses:

L. C. Hills.
W. A. Duval.

Inventor:

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UNITED STATES PATENT OFFICE.

ALBERT G. FERREE, OF BLOOMINGTON, ILLINOIS.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 394,066, dated December 4, 1888.

Application filed April 16, 1888. Serial No. 270,740. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. FERREE, a citizen of the United States, residing at Bloomington, in the county of McLean, State of Illinois, have invented certain new and useful Improvements in Spring-Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to motors for running sewing-machines, organs, small lathes, and other light machinery, and is of the class known as "spring-motors."

The objects and advantages of the invention, together with its novel features, will hereinafter appear, and be particularly pointed out in the claims.

I have herein illustrated my motor as adapted for and applied to a sewing-machine, but in this regard I do not limit my invention; but, as before stated, and as will hereinafter be seen, the same is equally applicable for other light machinery.

Referring to the drawings, Figure 1 is a side elevation of a portion of a sewing-machine table or stand having a motor constructed in accordance with my invention mounted thereon. Fig. 2 is an opposite view. Fig. 3 is a rear elevation of a portion of the machine, the motor being shown in end elevation; and Fig. 4 is an enlarged detail of the motor-governing mechanism.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 represents the table of a sewing-machine, and 2 the standards thereof, all of which are of the usual construction.

For the purpose of providing suitable supports for the numerous shafts employed in my construction, I form the frame-work of the motor in three sections or frames, 3, 4, and 5, which are laterally and vertically intersected by bars 6, 7, which sections are connected and held in suitable relative position by means of tie-bars 8.

Journalled transversely in the two parallel bars 7 of the sections 3 and 4, and equidistant from the vertical bars 6 of said sections, are two oppositely-located shafts, 9, upon which are wound coiled springs 10, one end of each of the springs being made fast to the

shaft upon which it is wound and the opposite end being secured, as at 11, to the frame. A similar shaft, 9, having a similar spring, 10, is also provided, the same being located in the two opposite vertical bars 6. I have herein shown these three shafts and the same number of springs as the motive power; but I would state that a greater or less number of shafts and springs may be provided, if desired.

Upon each of the shafts 9 are mounted at their front ends gear-wheels 12, and journaled at a point equidistant from each of these wheels and in the vertical bars 6 is a power-shaft, 13, carrying a small gear, 14, with which the three wheels 12 mesh. A crank, 15, for winding the springs upon their shafts, is also mounted upon the shaft 13 at its front end, and at its rear end is mounted a gear-wheel, 16, having a ratchet-wheel, 17, provided with a pawl upon its face. At one side of the shaft 13 is journaled a cross-shaft, 18, upon which is mounted a spur-wheel, 19, and a gear-wheel, 20, the gear 16 of the shaft 13 meshing with said spur 19. A similar shaft, 21, having a spur, 22, meshing with the gear 20, is journaled below the shaft 18, and upon the same is mounted a gear-wheel, 23, which meshes with a spur-wheel, 24, mounted on a third shaft, 25, which carries a gear-wheel, 26, which in turn meshes with a spur-wheel, 27, mounted upon a shaft, 28, which projects outwardly from the frame-work and carries the fly-wheel 29. In the present instance the fly-wheel 29 is the usual fly-wheel of the sewing-machine.

In Figs. 2 and 4 I have shown one manner of starting and stopping the motor. In this instance a casing, 30, is mounted between the fly-wheel 29 and the standard 2, and through the same passes the shaft 28, which is provided with a pulley, 31. A rack-bar, 32, is secured rigidly in the casing and above the wheel or pulley 31, and mounted for reciprocation between said bar and the side wall of the casing is a head, 33.

Pivoted in the head 33 is a bifurcated toothed sector or pawl, 34, the tooth of which is designed to be thrown into and out of contact with the teeth of the rack-bar, and normally held in contact therewith by a spring,

49, and above the pawl is mounted a bell-crank lever, 35, one terminal of which works between the bifurcations of said pawl, and the opposite end of which is loosely connected
 5 to a vertical rod, 36, provided with a stop, 37, and journaled in guides 38 39, the former formed on the lower end of the sliding head 33 and the latter upon the casing 30. A lever, 40, is pivoted, as at 41, in the casing above
 10 the wheel or pulley 31, and has its opposite end connected to the vertical rod 36 and carries intermediate its ends a roller, 42, designed to bear upon the brake-wheel or pulley 31. A coiled spring, 43, is mounted upon the rod
 15 36, and between the lower end of the sliding head 33 and the terminal of the lever 40, and a similar spring, 44, is mounted upon said rod between the bracket or guide 39 of the case and the terminal of said lever.

20 At the opposite side of the brake-wheel 31, as at 46, is pivoted a curved lever, 45, to which the lower end of the rod 36 is connected. The lever is extended beyond the point of connection with the rod 36, and is connected to
 25 the treadle-rod 47, the lower end of which is connected with the treadle 48 of the machine.

The operation of my invention is as follows: By winding upon the crank 15 the shaft 13 is turned or rotated, which winds the shafts
 30 9 and their springs 10 tightly thereon. The motor is now ready to be started and the power stored by the springs to be transmitted through the train of gearing described. By pressing upon the treadle 48 at its front end
 35 the rod 36 is pushed upward and the bell-crank lever 35 operated so as to withdraw the tooth of the pawl 34 from mesh with the rack-bar 32, when the spring 43 will act to force the sliding head 33 upward, and the
 40 spring 44 will act to remove the roller 42 from contact with the brake-wheel 31. When the pressure is removed from the treadle, the rod 36 will draw upon the lever 35, causing it to operate the pawl 34 and throw it into mesh
 45 with the rack-bar 32, and thus the pressure is removed from the brake-wheel 31 and the motor set in motion. The motion is in this instance conveyed through the shaft 28 to the fly-wheel 29 of the machine, and thence
 50 by the usual band and pulley or pitman to the machinery. To stop the machine, the rear end of the treadle is lowered and the reverse operation secured—namely, the pulley 42 brought to bear upon the brake-wheel and its motion retarded entirely or partly, accord-
 55 ing to the pressure. The lever may be held in any adjusted position, it only being necessary to draw upon the rod 36 and the head 33, and when the required tension is secured
 60 release the rod, and the pawl 34 will be thrown into mesh with the rack-bar 32, and thus the lever 40 is locked in position.

Having described my invention and its operation, what I claim is—

65 1. In a motor of the class described, the combination, with a series of shafts, each car-

rying a coiled spring and a gear, of a crank-shaft carrying a spur-wheel meshing with the gears and carrying a gear-wheel provided with a pawl-and-ratchet mechanism on its
 70 face, and a series of shafts each carrying a large wheel and a spur, the large gear of each shaft meshing with the spur of the next succeeding shaft, substantially as specified.

2. The combination, in a motor having a
 75 series of spring-shafts carrying gears meshing with the spur of an intermediate crank-shaft and a train of speed-increasing gears, of a stopping and starting mechanism having a brake-wheel mounted on one of the
 80 speed-increasing gear-shafts, substantially as specified.

3. The combination, in a motor provided with a power-conveying shaft, of a stopping and starting mechanism arranged at one side
 85 of the motor and having a brake-wheel mounted on said shaft, a brake-lever pivoted at one side of the wheel and connected to a governing-rod and to said lever and terminating in a sliding head connected to a pawl
 90 adapted to be thrown into and out of connection with a fixed rack-bar, substantially as specified.

4. The combination, in a motor having a shaft, of a governing mechanism having a
 95 brake-wheel mounted on the shaft, and a brake-lever pivoted at one side thereof and connected with a governing-rod mounted in a sliding head and connected to a bell-crank lever having its opposite end meshing with a bifurcated
 100 pawl adapted to be thrown into and out of mesh with a stationary rack-bar mounted at one side of the sliding head, substantially as specified.

5. The combination, with a sewing-machine
 105 table, of a spring-motor mounted at one side thereof and comprising a series of springs mounted upon shafts having gears meshing with a spur mounted on a crank-shaft, and having a large gear connected with a train of
 110 speed and power conveying gears mounted upon shafts, and a governing mechanism having a brake-wheel mounted upon the power-shaft of the train, a brake-lever mounted at one side thereof and connected to a vertical
 115 rod terminating in a sliding head and connected to the treadle of the machine, a rack-bar mounted at the side of the sliding head, and a pawl adapted to be thrown into and out of contact with the rack-bar by the rod, sub-
 120 stantially as specified.

6. The combination, with the frame-work having the shafts 9, carrying springs 10 and gears 12, the shaft 13, having spur 14, gear 16, and pawl and ratchet 17, of the shafts 18, 21,
 125 and 25 and 28, carrying large and small gears 20, 19, 23, 22, 26, 24, and 27, substantially as specified.

7. The combination, with a motor having a power-shaft, of the casing 30, the brake-wheel
 130 31, mounted thereon, the brake-lever 40, pivoted as at 41, and having the roller 42 and con-

5 nected with the rod 36, mounted in guides 38
39, terminating in the sliding head 33 and con-
nected at its top to the lever 35, operating the
pawl 34, meshing with the rack-bar 32, a stop,
37, and springs 43 44, mounted on the rod, and
the lever 45, pivoted as at 46, connected to the
rod 36 and having the depending rod 47, sub-
stantially as specified.

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

ALBERT G. FERREE.

Witnesses:

JOHN T. LILLARD,
E. E. DONNELLY.