

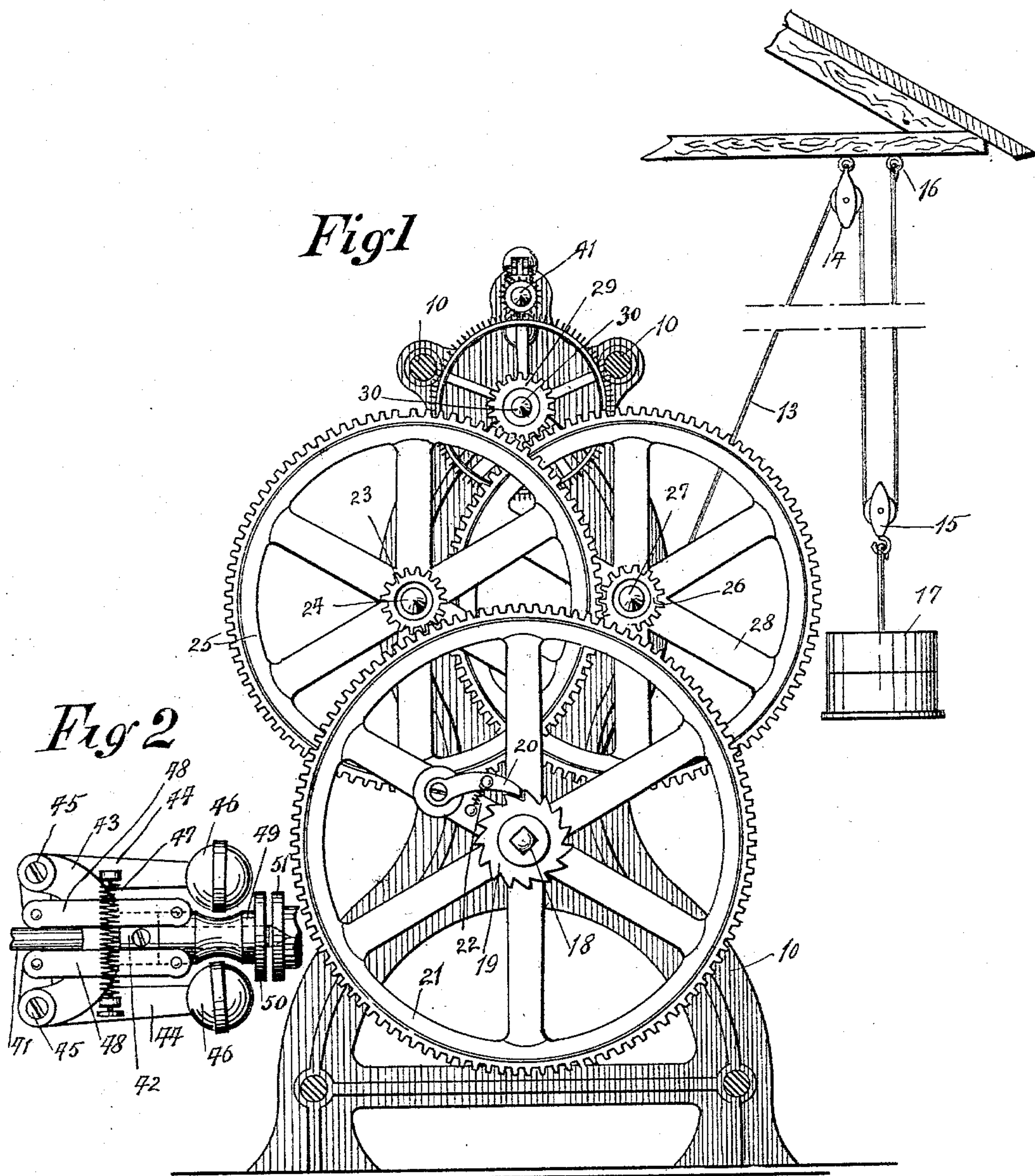
(No Model.)

2 Sheets—Sheet 1.

M. M. MONTGOMERY.  
MOTOR.

No. 561,722.

Patented June 9, 1896.



WITNESSES:

Gertram H. Saunders  
Edward L. Luman

INVENTOR

Mannie M. Montgomery.

BY

H. P. Hutchinson  
ATTORNEY.

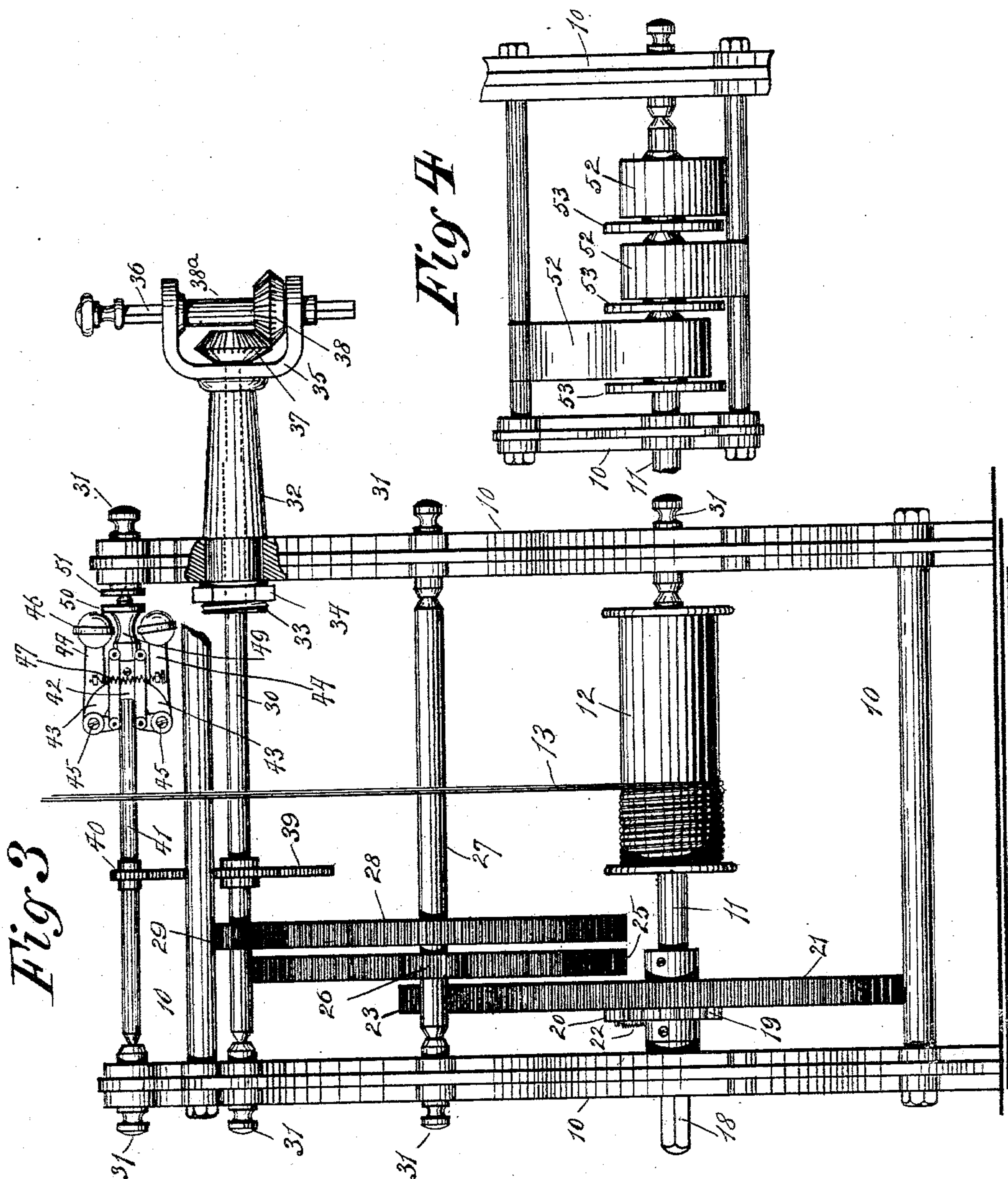
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# UNITED STATES PATENT OFFICE.

MAMIE M. MONTGOMERY, OF GOWENSVILLE, SOUTH CAROLINA.

## MOTOR.

SPECIFICATION forming part of Letters Patent No. 561,722, dated June 9, 1896.

Application filed June 10, 1895. Serial No. 552,222. (No model.)

*To all whom it may concern:*

Be it known that I, MAMIE M. MONTGOMERY, of Gowensville, in the county of Greenville and State of South Carolina, have invented certain new and useful Improvements in Motors, of which the following is a full, clear, and exact description.

My invention relates to improvements in motors, and is particularly adapted for use in driving churns or other light pieces of mechanism, being an improvement on the motor shown in Letters Patent of the United States, No. 528,129, dated October 23, 1894.

The object of my invention is to improve the working qualities of the motor shown in the patent referred to above, to produce a motor driven by weights or springs, which is adapted to drive light machinery, to provide a convenient means for applying the motor to either a vertical or horizontal shaft, and in general to produce a simple form of motor which is easily run and regulated.

To these ends my invention consists of certain features of construction and combination of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, in which similar figures of reference refer to corresponding parts throughout the several views.

Figure 1 is a sectional side elevation of my improved motor. Fig. 2 is an enlarged detailed plan view of the governor. Fig. 3 is a broken front elevation, partly in section, of the motor. Fig. 4 is a broken detailed view of an arrangement of springs which can be substituted for the weight to drive the motor.

The motor is provided with a suitable frame 10, which may be of any approved design, and on the frame is journaled a shaft 11, to which is secured a drum or pulley 12, and to this is attached a cable 13, which extends upward over a pulley 14, which is secured to the ceiling or other support, and the cable runs over the pulley 14, through a pulley-block 15, and is finally made fast to the ceiling or support, as shown at 16. The pulley-block 15 has a heavy weight 17 suspended from it and the weight draws on the cable 13 and so unwinds it from the drum 12, thus driving the drum-shaft 11, to which it is attached, and driving the machine.

To provide for winding up the cable 13, the shaft 11 has one end squared, as shown at 18, and a wrench may be conveniently applied to the squared end of the shaft. The shaft 11 has also attached to it a ratchet-wheel 19, which is engaged by a pawl 20 on the main gear-wheel 21, which is loose on the shaft 11, and the pawl is pressed into engagement with the said ratchet-wheel by a spring 22.

The gear-wheel 21 meshes with and drives a pinion 23 on a shaft 24, which is journaled on the frame 10, and the shaft 24 carries a gear-wheel 25, which drives a pinion 26 on another shaft 27, also journaled on the main frame 10. The shaft 27 carries a gear-wheel 28, which drives a pinion 29 on the driving-shaft 30, and it will be observed that the gearing above described provides for rapidly multiplying speed, and it will be understood that any necessary number of gears may be arranged between the main shaft 11 and the driving-shaft 30, the number and character of gears and shafts depending upon the amount of speed or power.

The driving-shaft 30 extends outward through a hollow arm 32, which is held in one side of the frame 10, this arm having its inner end projecting through the side of the frame and provided with a screw-thread 33, which receives a jam-nut 34, and by tightening the nut the arm is locked.

The arm 32 has at its outer end a fork or bracket 35, which supports a secured shaft 36, this extending through the hub 38<sup>a</sup> of a bevel gear-wheel 38, which hub is journaled on the fork 35 above referred to. The gear-wheel 38 and the shaft 36 are driven by a gear-wheel 37 on the outer end of the driving-shaft 30.

It will be seen that by loosening the nut 34 the arm 32 may be turned so as to bring the shaft 36 into either a vertical or horizontal position, or, in fact, into any desired incline from the vertical, and then by tightening the nut the parts may be held in the position desired and the shaft 36 coupled to any other shaft or wheel which it is to drive.

The driving-shaft 30 is provided with a gear-wheel 39, which meshes with a pinion 40 on the governor-shaft 41, which is journaled on the main frame 10, and it will be observed in this connection that the governor-shaft and the several other shafts referred to have cone-



shaped ends which are held in adjustable bearings 31, this being an ordinary expedient for securing an easy bearing.

The governor-shaft has attached to it a collar 42, (see Fig. 2,) which is provided with a bracket 43, carrying bell-crank arms 44, which at their elbows are pivoted to the bracket 43, as shown at 45, the pivots being on diametrically opposite sides of the shaft, and the outer ends of the bell-cranks are provided with weight-balls 46, which are held close to the shaft by springs 47. The inner ends of the bell-crank arms 44 are pivoted to the links 48, which connect them with the sliding sleeve 49 on the governor-shaft 41, and this sleeve carries a friction-plate 50, which is adapted to engage the stationary friction-plate 51, which is secured to the frame 10 opposite the governor.

It will be seen that when the governor-shaft is revolving at a normal rate the weights 46 will lie close to the shaft; but if the speed greatly increases the balls moved by centrifugal force will fly out and so tilt the bell-cranks 44, slide the links 48, and bring the friction-plate 50 in contact with friction-plate 51, and thus the speed of the motor is checked.

Instead of using the weight 17 referred to, the main shaft 11 may be provided with strong springs 52, (see Fig. 4,) which are secured to drums 53 on the shaft and to adjacent parts of the frame, and these springs when wound up exert the same effect on the shaft as the weight by unwinding and revolving the shaft.

It will be observed that the series of springs 52 radiate from the main or drum-shaft 11, and that each spring is attached at a different point, so that the pull of the springs coming from opposite directions has a tendency to equalize the strain and makes very much

less friction on the shaft than would result if the springs were all connected to a support on one side of the shaft. This is an important matter, because it is recognized that efficiency in motors of this class depends largely on the reduction of friction to the minimum.

When the machine is to be used, a wrench is applied to the squared end 18 of the shaft 11 and the shaft is turned so as to wind up the cable 13 and raise the weight 17, the ratchet-wheel 19 turning meanwhile beneath the pawl 20; but when the weight is lifted and the wrench removed the weight causes the cable 13 to unwind, so as to turn the shaft 11 in the reverse direction, and the shaft, by reason of the ratchet connection with the gear-wheel 21, turns the said gear-wheel and the train of gearing connected with it, thus imparting motion to the driving-shaft 30.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A motor, comprising a suitable frame, a main or drum shaft thereon, means for turning the drum-shaft, a driving-shaft, a train of gearing connecting the drum-shaft and driving-shaft, a hollow arm held to turn in the frame and projecting from one end thereof at one end of the driving-shaft which it supports, the said arm having a fork at its outer end and means as a nut and thread for fixing its position in the frame, and a shaft journaled transversely in the fork of the hollow arm and geared to the driving-shaft, substantially as described.

MAMIE M. MONTGOMERY.

Witnesses:

T. T. EARLE,  
R. K. EARLE.