

C. M. KILER.
MOTOR.

APPLICATION FILED MAR. 3, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 2.

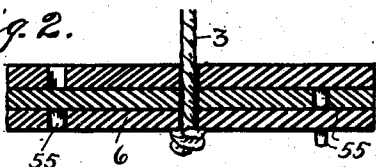
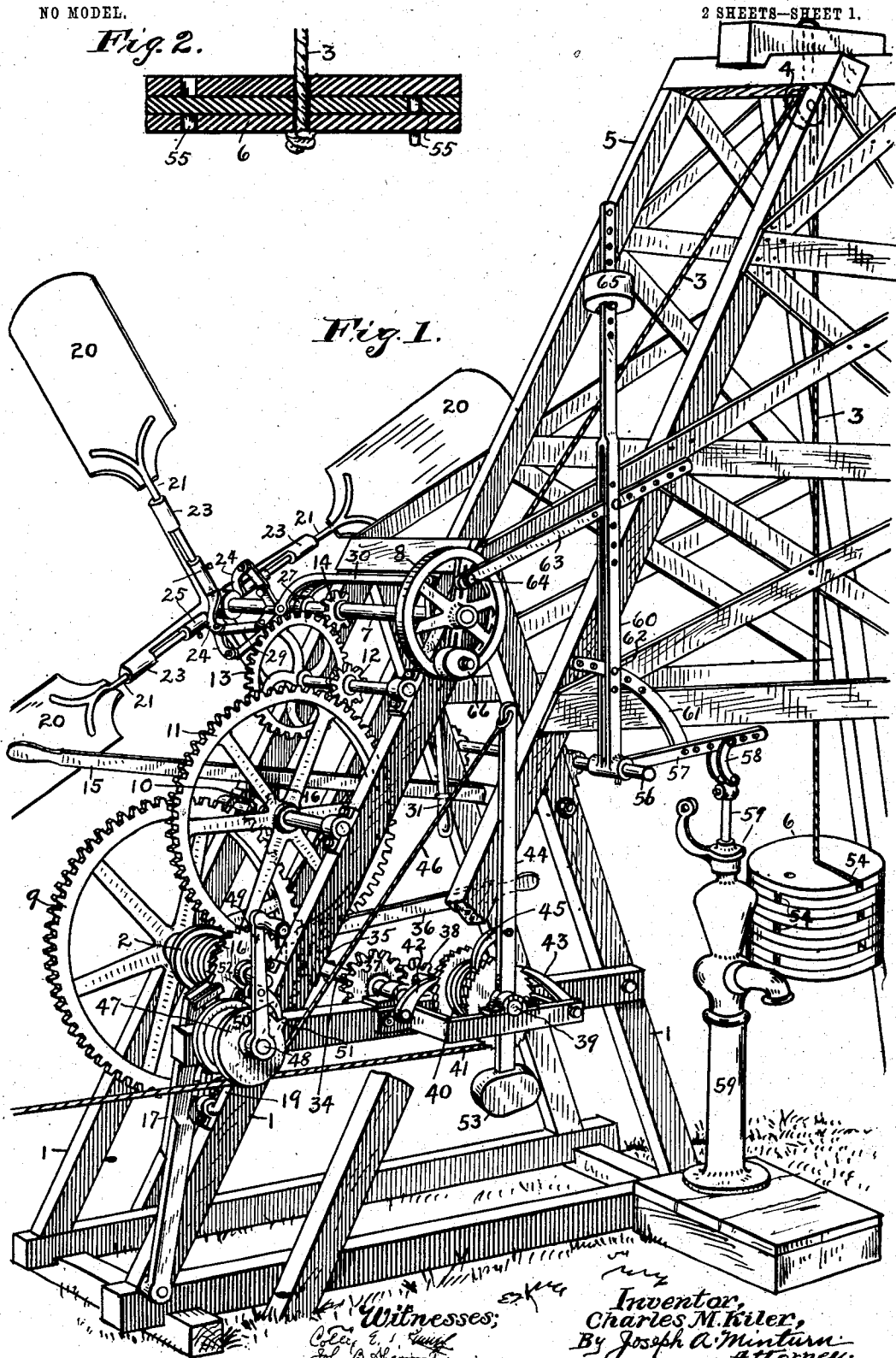


Fig. 1.



Witnesses:
C. E. J. Smith
John B. Sherman

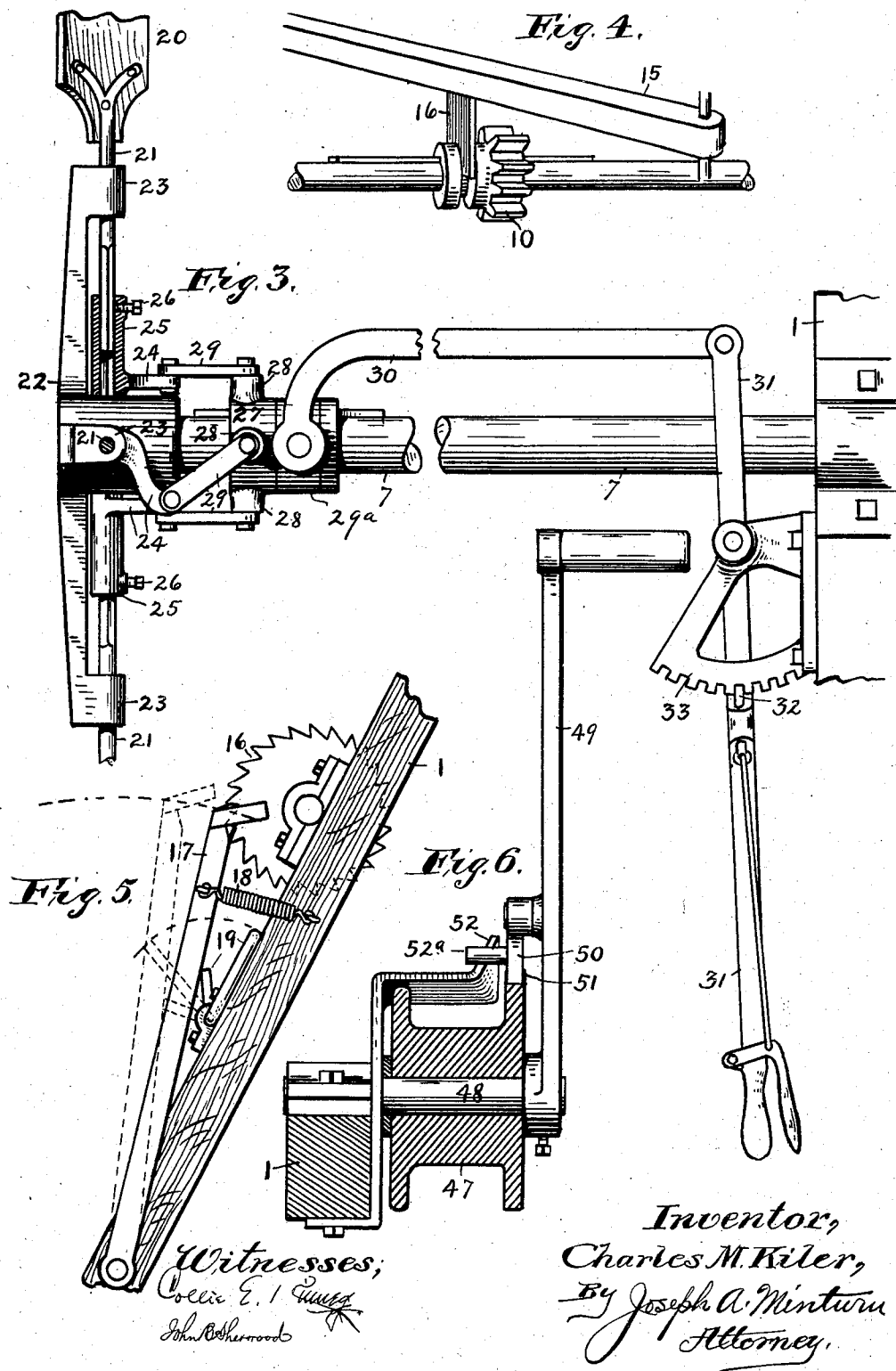
Inventor,
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

CHARLES M. KILER, OF INDIANAPOLIS, INDIANA.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 737,115, dated August 25, 1903.

Application filed March 3, 1903. Serial No. 146,028. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. KILER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Motors, of which the following is a specification.

This invention relates to improvements in motors operated by weight or spring, and preferably by weight, for pumping, grinding, and doing all kinds of light work on a farm or in a shop; and the object of the invention is to provide a governor mechanism that can be regulated without stopping the motor for speeding or slowing down the latter.

The object also is to provide a convenient and easy means for winding up the weight or spring and for utilizing horse-power for this purpose if found desirable to do so.

Another object is to provide a simple and durable machine of low cost to manufacture and easy to operate by an inexperienced person.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my invention connected up for pumping purposes; Fig. 2, a vertical section of the weights used in the device shown in Fig. 1; Fig. 3, a detail in side elevation and partial section of the mechanism for shifting the governor-fans; Fig. 4, a typical detail in perspective of the lever and sliding pinions used at several parts of my invention to disconnect certain of the parts; Fig. 5, a side elevation of the pawl mechanism for holding the drum on which the weighted cable is wound; and Fig. 6, a detail in transverse section of the auxiliary or crank drum, showing the details of mechanism by which the crank-pawl is disengaged from the drum-ratchet.

Like characters of reference indicate like parts throughout the several views of the drawings.

1 is the frame of the motor, which may be made out of wood, as shown, or from angle-iron.

2 is the main drum, mounted on a suitable shaft supported in boxes on the frame 1.

3 is a cable, which is fastened at one end to the drum and passing thence over pulley 4 at

the top of the tower 5 is made fast to the weights 6. By winding the cable upon the drum the weights are hoisted in the air, and the lowering of the weights by gravity furnishes the power for the motor, the purpose of the latter being to husband the power and make it available for practical purposes.

7 is a shaft from which the power is taken and which I shall hereinafter refer to as the "power-shaft." On it is mounted the wheel 8, which may serve as a belt-wheel when it is desired to transmit rotary motion, or it may be a crank-wheel, as in the drawings, when it is desired to transmit reciprocatory movement. The shaft on which drum 2 is mounted is connected with the shaft 7 by a train of cog-wheels 9, 10, 11, 12, 13, and 14, which increase speed at the expense of power. The wheel 10 (see Figs. 1 and 4) is splined to its shaft and is shifted longitudinally of the shaft into and out of engagement with wheel 9 by the lever 15. It has an extended hub with an annular groove in which is seated the plate 16 from lever 15. When it is desired to wind the cable upon the drum 2, the machinery from wheel 9 out is disconnected by throwing pinion 10 out of engagement with wheel 9 by the action of lever 15. One of the annular side guards of the drum has ratchet-notches 16, (see Fig. 5,) which are engaged by the pawl-lever 17 during the winding process to keep the weight from running down by any accidental release of the drum. This pawl-lever 17 is drawn into contact with the ratchets by spring 18 and is thrown out of engagement by the outward throw of bent lever 19, as shown in dotted lines in Fig. 5. The opposite end of power-shaft 7 from wheel 8 projects beyond the frame 1, and on this projecting end are the four governor-fans 20, which by the resistance of the air through which they are forced to travel regulate the speed of said power-shaft. The resistance will be greatest when the fans are turned broadside to the direction of their travel and least when turned edgewise to said travel. Between these extremes are many variations of resistance, and I provide the following-described means for adjusting the fans:

The fans have stems 21, which are round in cross-section next to the fan and squared at their inner portions.

22 is the spider to the arms of which the fan-stems are secured. These arms have inside lugs 23 with radial bores to receive the stems 21.

24 represents levers or cranks having lateral shanks 25 with longitudinal holes squared in cross-section to receive the squared ends of stems 21. Said stems have longitudinal adjustment in said shanks within certain limits while being compelled to rotate with the shanks. The given adjustment of the stems is held by set-screws 26.

27 is a hub splined to shaft 7, so as to rotate with said shaft, but adjustable longitudinally thereon. It has the lugs 28, which are connected by links 29 with the levers 24, as shown in Fig. 3, so that by the longitudinal movement on shaft 7 of said hub the levers 24 will be moved to rotate the fans. The hub 27 has a circumferential groove to receive the collar 29^a, having trunnions which pivotally engage the opposite forks of the bifurcated lever 30. The opposite end of lever 30 is pivotally secured to lever 31. The latter is pivoted to the frame of the motor and has a dog 32 to engage the rack 33 and hold any given adjustment of the fans. By means of the lever 31 the fans may be adjusted without stopping the motor. This is particularly desirable with motors operating a pump where the pump has to be primed on starting and requires to be operated at a higher speed at that time than later on while pumping water. By adjusting the fans longitudinally, as above provided, the leverage exerted by them is increased or diminished, thereby affording an additional regulation.

I will now describe the winding mechanism employed by me.

34 is a shaft supported by the motor-frame and having the small pinion 35, which is splined to its shaft-like pinion 10, and said pinion 35 is thrown in or out of engagement with wheel 9 by being moved longitudinally of shaft 34 by the lever 36. The construction and adaptation of lever 36 is the same as lever 15. (Shown in Fig. 4.) It has a shifting plate like 16, engaging a groove in the hub of pinion 35 in same manner as the pinion shown at 10 in said Fig. 4. This shaft also has the larger cog-wheel 37, which engages the pinion 38 of adjacent parallel shaft 39.

Mounted either on shaft 34 or shaft 39, and here shown as on shaft 39, is the drum 40, to which the cable 41 is fastened and several turns of said cable wound upon the drum. By hitching a horse to the other end of the cable and drawing it out in the direction shown in Fig. 1 the drum will be rotated in a direction to operate the mechanism which will wind the cable 3 on the drum 2. The two rims of the drum will be provided with ratchet-teeth, which are in reverse order for the two rims, and these will be engaged by the oppositely-acting pawls 42 and 43, which will be brought into use one at a time, de-

pending on the direction which it is desired to move the drum. The pawl not desired to be operative at a given time will be thrown back out of engagement with its ratchet-wheel.

Mounted on the shaft 39 is lever 44, having pawl 45 to engage the teeth of the adjacent rim of the drum in the manner shown in Fig. 1, and the upper end of the lever is connected by the cable 46 with a third drum 47, supported at the side of the motor-frame 1. The drum 47 is loosely mounted on the shaft 48, and the shaft 48 is rotated by means of the crank 49. The crank-lever has the pawl 50, which contacts with the single tooth 51 on the adjacent rim of the drum 47, so as to lock the crank and drum together and cause the cable 46 to be wound upon the drum 47 when the crank is turned in the proper direction and draw the lever over toward drum 47, thereby through the connecting-train of gears causing the drum 2 to be driven in direction to wind cable 3 on it. When the end of lever 44 has reached the limit of its movement, the pawl 45 is raised by the incline 52, acting on pin 52^a from pawl 45, out of engagement with the tooth 51, thereby releasing the loosely-mounted drum. Thereupon the lever 44 is returned to its first position by the weight 53 or by means of a spring (not shown) substituted for the weight and connecting the end of the lever with the motor-frame. In operating with the lever 44 the pawl 42 will be first thrown out of engagement with the drum. By the use of lever 44 I get the advantage of the long leverage in raising the weight 6 and by means of the associated mechanism am enabled to operate the lever by a continuous turning of the crank 49.

The weights 6 are here shown as a plurality of separate plates or disks having a radial slot 54 to allow them to be slipped laterally upon the cable and having holes and dowel-pins 55 of one entering the holes of the disk under it to prevent displacement. In assembling the disks the radial slots will be turned ninety degrees from the direction of the one adjacent to it to better hold the positions of the disks on the cable. The disks will be of cast-iron; but other forms of weights and other material may be used without departing from the spirit of this invention.

Mounted at the rear of motor-frame 1 is the horizontal shaft 56, on which is loosely mounted the arm 57, which is connected by link 58 with the rod of pump 59. Also mounted loosely on shaft 56 is the approximately vertical lever 60, which is held a predetermined angular distance from arm 57 by the bar 61. The bar 61 has a series of perforations to receive bolt 62, which connects it with the lever 60. The lever 60 is connected by pitman 63 with the wrist-pin 64 on the side of wheel 8. The lever 60 extends a considerable distance above its connection with pitman 63 and is provided with the weight 65, which by its gravity assists the motor in operating the pump, for

when the pump is lifting water lever 60 and its weight are on the downstroke of the oscillatory movement of said lever around shaft 56. The return stroke when the piston of the

5 pump is descending requires much less power from the motor, and the excess is utilized in raising the weight 65. The lever 60 and the pitman have a series of perforations for the connecting-bolt to allow of adjustment. The
10 wrist-pin 64 is adjustable radially on wheel 8, and a radially-adjustable counterweight 66 is provided on the opposite side of wheel 8.

Having thus fully described my invention, what I claim as new, and wish to secure by
15 Letters Patent, is—

1. In a motor, a train of gears, shafts for said gears, a drum on the same shaft as the gear at one end of the series, a pulley, a weight, a cable fastened at one end to the drum and
20 passing thence over the pulley and attached to the weight at its other end, a second drum having a cable wound upon it and means connecting the second drum with the first whereby when the cable is drawn off of the second
25 drum the weighted cable will be wound upon the first drum, a shaft at the other end of the train of gears, radial feathering-fans mounted at one end thereof, means for feathering the fans without stopping the motor, and
30 means at the other end of said last shaft for driving the mechanism to be operated by the motor.

2. In a motor, a train of gears, shafts on which the gears are mounted, a drum on the
35 same shaft as the gear at one end of the series, a pulley, a weight, a cable fastened at one end to the drum and passing thence over the pulley and attached to the weight at the other end, said drum having a ratchet-rim,
40 a pawl-lever engaging said ratchet, a spring to force the lever into said engagement, a hinged bent lever adapted to be turned to force the pawl-lever out of engagement, a power-shaft at the other end of the train of
45 gears from the drum, feathering-fans mounted on one end of the power-shaft, means for feathering the fans without stopping the motor, a crank-wheel on the shaft at its end opposite the fans, levers adjustable in angular
50 relation to each other forming a walking-beam, and a pitman connecting the crank-wheel with the walking-beam.

3. In a motor, a train of gears, shafts on which the gears are mounted, a drum on the
55 same shaft as the gear at one end of the series, a pulley, a weight, a cable fastened at one end to the drum and passing thence over the pulley and attached to the weight, means for winding the cable upon the drum, a power-shaft at the other end of the train of gears
60 from said drum, a crank-wheel on said shaft, a bifurcated lever pivoted at its lower bifurcated end apart from said shaft and having a weight at or near its upper end, a pitman taking
65 between the bifurcated ends of the lever and secured adjustably thereto and connecting said lever to the wrist-pin of the crank-

wheel, an arm extending laterally from said lever and turning on the same pivot as the lever and a brace-bar pivotally secured to the arm
70 and taking through the bifurcated lever and adjustably connected with the lever so as to move with it and vary the angular relation of the arm and lever.

4. The combination, with a motor having a
75 crank-wheel, of a lever pivoted at its lower end and having an adjustable weight adjacent to its upper end, an arm projecting laterally from the lower end of the lever and adjustable in its angular relation with said le-
80 ver, said arm being attached to the piston-rod of a pump and said lever standing approximately in a vertical position at the beginning of the lifting stroke of the pump-rod, and a pitman adjustable in its length connect-
85 ing the weighted lever with the crank-wheel of the motor.

5. The combination with the power-shaft of a motor, of one or more fan-blades having supporting-stems, seated in levers at right angles to said stems levers to receive the stems,
90 a hub adjustable longitudinally of the power-shaft having radial lugs and link-bars connecting the lugs with the stem-levers, means, without stopping the motor, for adjusting the
95 fan-blades, a crank-wheel opposite the fan on the power-shaft, a weighted lever, a pitman connecting the lever and crank-wheel, and an arm adapted to be connected with a pump-piston, said arm being pivoted and adjustable
100 in angular relation with the weighted lever.

6. The combination with the power-shaft of a motor, of a spider having long radial arms terminating with lateral perforated lugs, one or more fan-blades, stems for said blades hav-
105 ing squared ends, said stems being inserted through the perforations of the lugs, levers at right angles to said stems having elongated shanks with squared holes in which the squared stems are longitudinally adjustable,
110 a hub on the power-shaft adjustable longitudinally thereon having radial lugs and a circumferential groove, a collar in said groove, bars connecting the lugs with the ends of the said levers, a bifurcated lever parallel with the
115 power-shaft and a hand-lever mounted on a fixed pivot and pivotally secured to the bifurcated lever to longitudinally reciprocate the latter and prevent its rotation with the shaft.

7. In a motor, a power-shaft, a governor
120 comprising one or more fan-blades, stems for said blades, a spider mounted on the power-shaft having arms with lugs having radial perforations through which the said stems are
125 passed, levers at right angles to said stems having shanks which are perforated to receive the ends of said stems, a hub mounted on the power-shaft and splined thereto so as to have rotary movement with the shaft and longitudinal adjustment thereon, said hub having
130 radial lugs, link-bars connecting the ends of the lugs with the ends of the said levers, said hub having a circumferential groove, a collar seated in said groove, a bifurcated lever piv-

otally secured to the collar and a fixed pivoted lever to reciprocate the hub and prevent motion of rotation of the lever and collar with the shaft connected with the bifurcated lever
5 and means for holding a given adjustment of said second lever.

In witness whereof I have hereunto set my

hand and seal, at Indianapolis, Indiana, this 23d day of February, A. D. 1903.

CHARLES M. KILER. [L. S.]

Witnesses:

JOSEPH A. MINTURN,
COLLIE E. KINNEY.