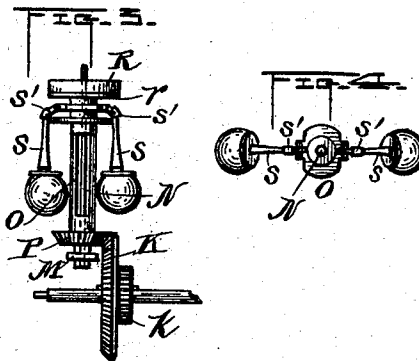
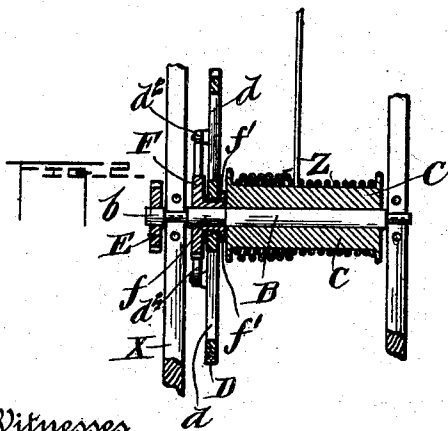
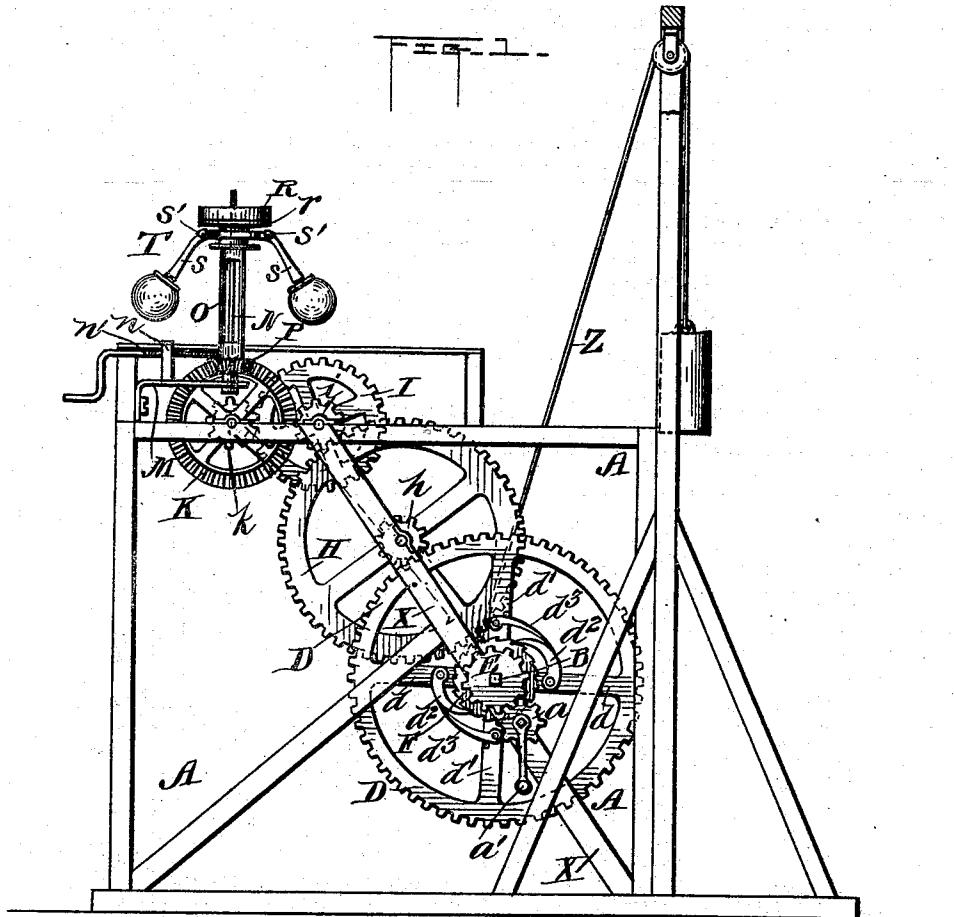


(No Model.)

J. GRASS & C. E. HARDIE.
MECHANICAL MOTOR.

No. 503,593.

Patented Aug. 22, 1893.



Witnesses &
Obedience.
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UNITED STATES PATENT OFFICE.

JOSIAH GRASS AND CHARLES EDWARD HARDIE, OF LASSEN COUNTY,
CALIFORNIA.

MECHANICAL MOTOR.

SPECIFICATION forming part of Letters Patent No. 503,593, dated August 22, 1893.

Application filed August 1, 1892. Serial No. 441,904. (No model.)

To all whom it may concern:

Be it known that we, JOSIAH GRASS and CHARLES EDWARD HARDIE, citizens of the United States, residing in the county of Lassen and State of California, have invented certain new and useful Improvements in Mechanical Motors; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in mechanical motors and has particular reference to that class that is operated by means of weights, and has for its object the provision of a motor in which regularity of speed is attained, and maintained so long as the device is in operation.

The advantages of this invention are apparent from the construction; being easily mounted, operated and controlled, its lightness and durability of construction, its portability and cheapness.

The invention consists in the construction and novel combination of parts hereinafter described and more particularly pointed out in the claims hereunto appended.

The invention is fully illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the device, complete, showing the motor in condition for operation. Fig. 2 is a vertical cross section taken through the spool, &c. Figs. 3 and 4 are details of different parts of the device.

Similar letters of reference indicate corresponding parts in all the views where they occur.

A is the frame work of the motor upon and in which the operating parts are secured and it may be made of wood or any other material that may be deemed suitable or desirable, depending upon the character of the work for which the motor is to be used, and of any suitable construction.

B is a shaft having its ends journaled in suitable bearings in the journal-bearing supporting rod or piece X, as shown, and is preferably rectangular in cross section for the pur-

pose of receiving and holding securely thereon the spool C upon which is wound the cord or rope Z when it is desired to put the motor in readiness for operation. One portion of this shaft B is made square and receives and holds thereon the ratchet wheel F which is supplied with a flanged collar *f'* upon which collar is loosely geared the wheel D, as shown and hereinafter described.

The shaft B may have rigidly secured to its end or made integral therewith the portion *b* which projects beyond the outer surface of the piece X, and receives and rigidly holds thereon the cog-wheel E which meshes with a smaller cog wheel *a* which is journaled to the outer surface of the piece X and to which is secured the handle or crank *a'* by means of which the rope is wound upon the spool, C, as is evident. The spool C, cog wheel E and the ratchet F are all rigidly secured to and turn with the shaft B as is apparent. The wheel D turns loosely upon the flanged collar *f'*, of the ratchet F, as stated, and has loosely secured upon its spokes *d* pawls *d'* for engagement with the ratchet wheel F, as shown, so that the wheel D may be brought into rigid connection, and move with the shaft B through the instrumentality of the ratchet F and the pawls *d'*, as is evident from the drawings. To the spokes *d'* of the wheel are rigidly secured the springs *d''*, which springs bear upon the pawls *d'* for the purpose of holding them in engagement with the ratchet F. It will thus be seen that the cog wheel D will not be rotated when the rope is wound upon the spool, as, when the crank *a'* is turned the pawls slip over the ratchet. When, however, the rope has been wound upon the spool and the weight released, the ratchet *i*, which is rigid with the shaft B, will engage the pawls secured upon the cog wheel D and cause it to revolve, and thereby causing the cog wheels and gears with which it is intermeshed to revolve, as is apparent.

The cog wheel H is journaled in suitable bearings in the piece X, and has secured rigidly on one side of its hub the small cog wheel *h* which meshes with the cogs on the periphery of the wheel D and is revolved thereby when the motor is in operation. The small cog wheel *h* is located on the hub of the wheel

H on the side adjacent to the piece X. Wheel H in turn meshes with and revolves small cog wheel *i* which is rigidly secured to and at one side of the hub of the cog wheel I. These wheels I, *i*, are journaled in suitable bearings in the main frame of the device. The cog wheel I meshes with the cog wheel *k*, and revolves it in the same manner but in an opposite direction to that in which it is itself revolved. Cog wheel *k* is rigidly secured to the hub of the bevel gear wheel K and revolves it for a purpose hereinafter set forth. The wheels H, *h*, I, *i*, and K, *k*, are secured together by means of rivets, or keyed together by key-rods, as shown, or they may be cast integral, if so desired.

As a means for producing regularity of speed we use a governor T consisting of a rod or bar N fixed in a bracket M secured to the main frame of the device. Upon this bar or rod N is placed the hollow shaft O which is adapted to loosely revolve thereon. At the lower end of said hollow shaft is rigidly secured a gear for engagement with the gear of the motor device. The gear P forms the bottom portion of this hollow shaft and rests and bears upon a boss or collar upon the bracket M to which the rod N is secured. The upper portion of this hollow shaft is flanged and has ears or lugs on its circumference diametrically opposite to each other, into or between which are secured the governor arms *s*, *s*, as shown. These governor arms are of the usual construction and are slightly curved near their ends for a purpose hereinafter described, and are secured in the ears or lugs in any suitable manner. Upon the curved portions of the governor arms near their points of attachment to the ears or lugs are riveted or otherwise secured auxiliary pieces *s'* for bearing against the under surface of a ring *r* secured to the under side of a plate or cap R. Upon the top of the rod N is fitted the cap or plate R, which is adjustably secured thereon, and is provided on its under surface with a ring *r* against which the auxiliary pieces upon the curved portions of the governor arms bear. Upon the bracket

M is secured a lug *n* through which passes a jam rod *n'* which is adapted when desired to impinge and bear upon the hollow shaft O just above the gear P and is used to create a constant friction upon the governor, thereby tending to regulate the speed thereof. When the speed of the governor becomes very great, the arms are thrown upward and the auxiliary pieces upon the curved portions thereof bear and press upon the under surface of the ring *r* and create additional friction thereby diminishing the speed of the governor and consequently that of the device, as is evident.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a mechanical motor of the character described the combination of a shaft B, spool C secured thereon, a flanged or collared ratchet F rigidly secured on said shaft, a cog or gear wheel D loosely mounted on the collar of said ratchet, pawls secured to said cog wheel D for engaging with the ratchet F, and suitable springs for holding the said pawls in engagement with the ratchet, gear rigidly secured to the outer end of said shaft and means for rotating said gear for winding the rope upon the spool, with a series of intermeshing gears and governor connected thereto, the whole suitably mounted for operation, as set forth.

2. The combination with a mechanical motor, as described, of a governor consisting of a bracket M, rod N secured therein, a hollow shaft O surrounding said rod N, a gear on the lower end of said hollow shaft, said hollow shaft having a flanged shaped top having ears or lugs thereon, curved governor arms *s*, auxiliary pieces *s'* secured on the curved portions of the said arms, and an adjustable plate or nut R on the upper end of the rod N, as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSIAH GRASS.

CHARLES EDWARD HARDIE.

Witnesses:

N. J. BARRY,
J. E. PARDU.