

(No Model.)

3 Sheets—Sheet 1.

A. LEWIS.

SPRING AND WEIGHT MOTOR.

No. 298,001.

Patented May 6, 1884.

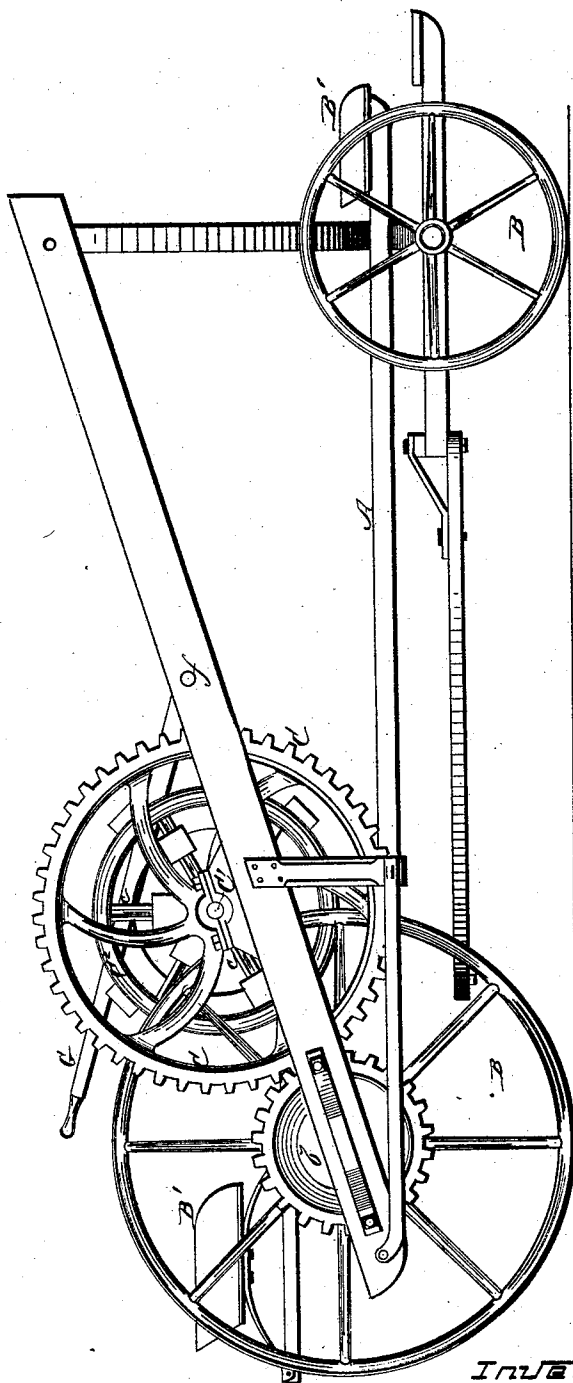


Fig. 1

WITNESSES

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INVENTOR

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(No Model.)

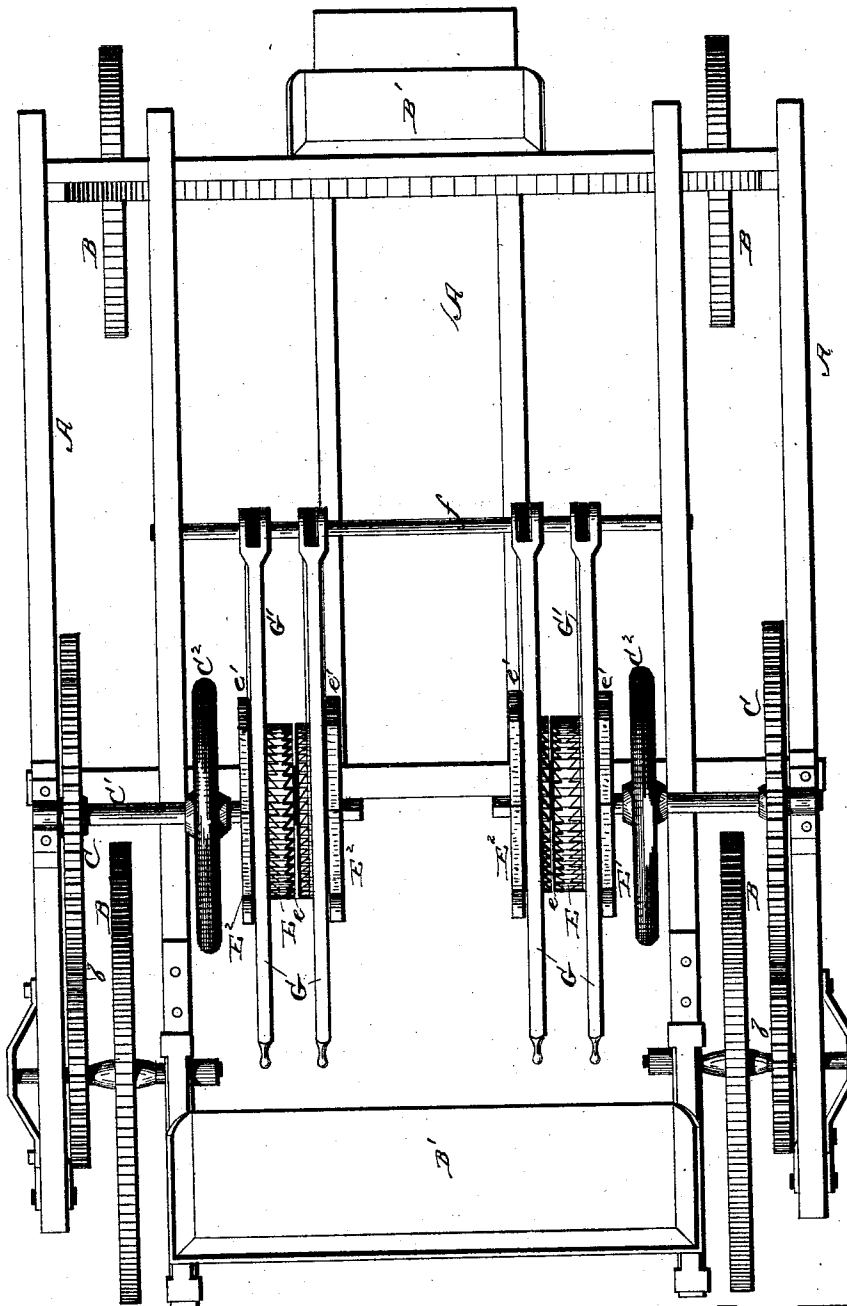
3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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FIG. 3.

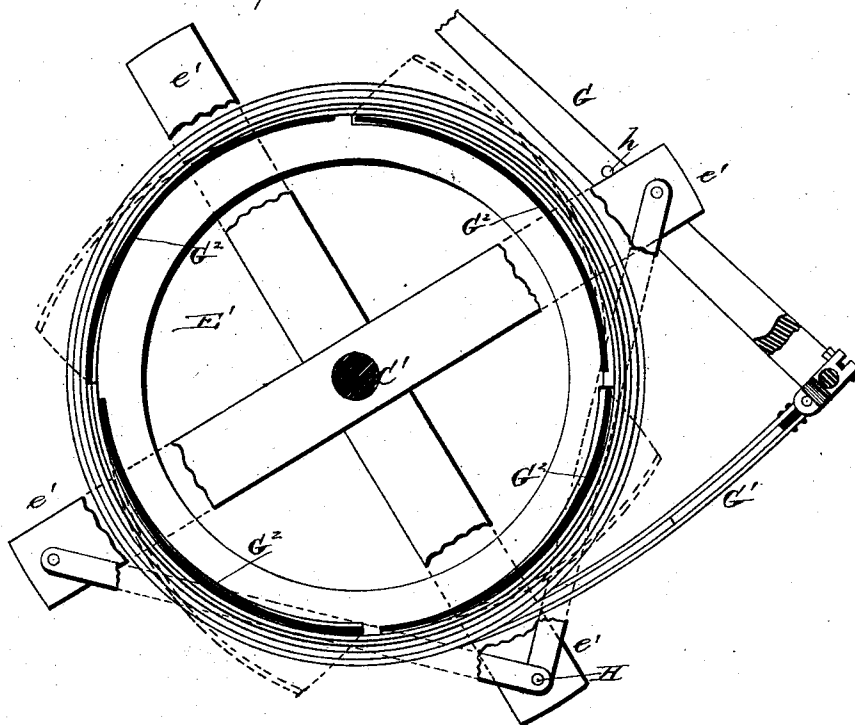


FIG. 4.

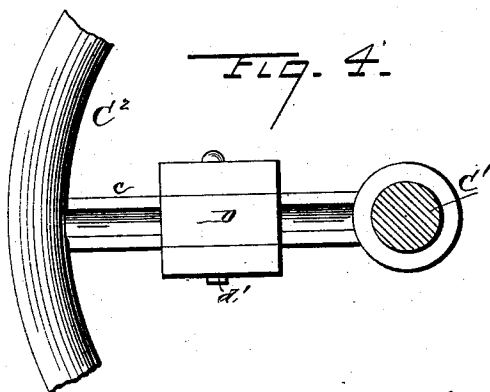
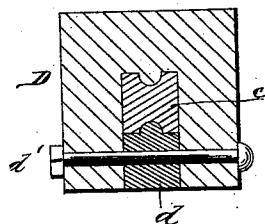


FIG. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW LEWIS, OF NAPERVILLE, ILLINOIS.

SPRING AND WEIGHT MOTOR.

SPECIFICATION forming part of Letters Patent No. 298,001, dated May 6, 1884.

Application filed March 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, ANDREW LEWIS, a citizen of the United States, residing at Naperville, in the county of Du Page and State of Illinois, have invented certain new and useful Improvements in Spring and Weight Motors, of which the following is a specification, to wit:

This invention relates to an improvement in combined spring and weight motors; and it consists in certain peculiarities of construction and arrangement of the same, substantially as will be hereinafter more fully set forth and claimed.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and arrangement, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of my invention as applied to a road-vehicle. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged detail side view of my improved spring-drums, and Figs. 4 and 5 are views of the weighted wheel which forms an auxiliary to the springs.

A represents a main frame of any suitable construction, mounted upon the wheels B B, and provided with seats B' B', for the accommodation of the operator and others. The rear wheels, B B, are each provided with a cogged pinion, *b*, which meshes with a gear, C, upon a shaft, C', journaled in boxes on the main frame, which shaft carries a fly-wheel, C², as seen in Fig. 1. This wheel has its spokes *c* provided with removable weights D, which are free to slide in or out on the spokes as the wheel revolves, and are formed with a removable section, *d*, secured in place by a bolt, *d'*, as in Fig. 5, in order that these weights may be detached from the wheel at any time.

Upon the inner ends of the two shafts C' C' are secured two drums or wheels, E, formed upon each side, with ratchet clutch-teeth *e e*, adapted to engage and operate in opposite directions, as in Fig. 2.

Upon each side of the clutch-disk E are placed on the shaft loosely the spring-drums E' E², also provided with teeth engaging the disk E in opposite directions, and one adapted to operate the machine in a forward and the other in a reverse direction. To each

drum are secured several strong flat springs, G', which are wound upon the drum, and have their opposite ends secured to a shaft, *f*, secured to the frame, the ends of the springs upon the reverse drums being of course wound and led in opposite directions, as will be evident at once. These springs are held in place by being wound in a groove or between guide-arms *e' e'* of each drum, and in these grooves, or between the arms *e'*, lies a shifting lever, G, having its end secured to the shaft *f*, and by means of which the spring-drums are shifted upon their shaft to engage or be disengaged from the disk E at the pleasure of the operator.

In ordinarily heavy work difficulty has always been experienced in spring-motors in getting springs of the ordinary form of sufficient strength for the work desired. In this case I overcome this difficulty as follows: Upon the periphery of the spring-drum, beneath the springs G', I place any number of short, strong springs, G², secured firmly to the drum at one end, and having the other end free, as seen in Fig. 3. It is evident that when the main springs G' are wound up the ends of the auxiliary springs G² are compressed and held down upon the drums, and they will always exert an outward pressure upon the springs G' in exact proportion to their strength and number. This arrangement enables me to use springs G' of much lighter construction, and at the same time obtain much more power than could be had from the long springs directly.

The operation of the device is readily understood. The drums, having been wound up by means of handles H, are held in this condition by means of small pins *h*, passed through holes in the shifting-levers, and engaging with the guide-arms of said drums. When it is desired to start, the operator removes the pin *h* and shifts the spring-drum into engagement with the ratchet-disk, and either one or both of the drums may be used at one time, according to the speed and power required at the time. As these springs are uncoiled, they may be rewound at any time by the operator without stopping the machine, and thus keep it moving an indefinite length of time. As the shaft C' and fly-wheel C² revolve, the loose weights on this wheel slide out to its periphery as they descend and in toward the hub as

they rise again, and thus aid materially in keeping the device in motion after being once started. When it is desired to stop the machine, it is only necessary to replace the pin *h*, which engages and stops the spring-drum, and the action of the ratchet-clutch at once throws it out of gear. Any desired kind of brake may be used with the device, and the motion is reversed at any time by means of the second set of drums and their shifting-levers, as will be at once understood.

I have shown but four of the auxiliary springs *G*² upon the drums *E*¹ *E*² in Fig. 3, but desire to use as many as may be required. Their ends may overlap each other without in any way interfering with their action, and they add materially to the strength of the main springs.

I have in this case shown the motor applied to a vehicle; but it is evident that it is equally applicable to section-cars for railroads, the operation of sewing and other light machines, and to any use requiring a moderate power.

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

1. In a spring-motor, a drum, upon which the actuating or main spring is wound, provided with a series of short springs interposed between the drum and main spring, substantially as and for the purpose set forth.

2. In a spring-motor, a main frame, a drum journaled thereon, and a main spring having one end secured to the frame and the other wound upon and secured to the drum, in combination with a series of short auxiliary springs upon the periphery of the drum, having one end secured thereto and the other free to press outward against the coils of the main spring, substantially as and for the purpose set forth.

3. In a spring-motor, a main spring made in two or more separate parts laid one upon the other, and wound upon a suitable driving-drum, substantially as and for the purpose set forth.

4. In a combined spring and weight motor, a main driving-shaft provided with a fixed clutch-disk and a loose spring-drum adapted to be engaged and disengaged therewith, in combination with a fly-wheel fixed on the main shaft, and having its spokes provided with weights free to slide in and out upon the same as the wheel revolves, substantially as and for the purpose set forth.

5. The wheel *C*², provided with the sliding weights *D*, formed with a removable portion, *d*, secured by bolt *d*¹, substantially as and for the purpose set forth.

6. In a spring-operated vehicle or car, the main frame *A*, wheels *B B*, gearing *b*¹ *C*, and driving-shafts *C*¹, provided with the clutch-disks *E*, in combination with the oppositely-operating spring-drums *E*¹ *E*², constructed as herein described, and the shifting-levers *G G*, substantially as and for the purpose set forth.

7. In a spring-motor, the main spring *G*¹, composed of two or more separate springs wound upon the drum *E*¹, and having one end secured thereto and the other to the main frame, in combination with the auxiliary springs *G*², interposed between the main spring and the drum on which it is wound, all constructed and arranged to operate substantially as and for the purpose set forth.

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

ANDREW LEWIS.

Witnesses:

CHAS. KRESSMAN,
W. C. McARTHUR.