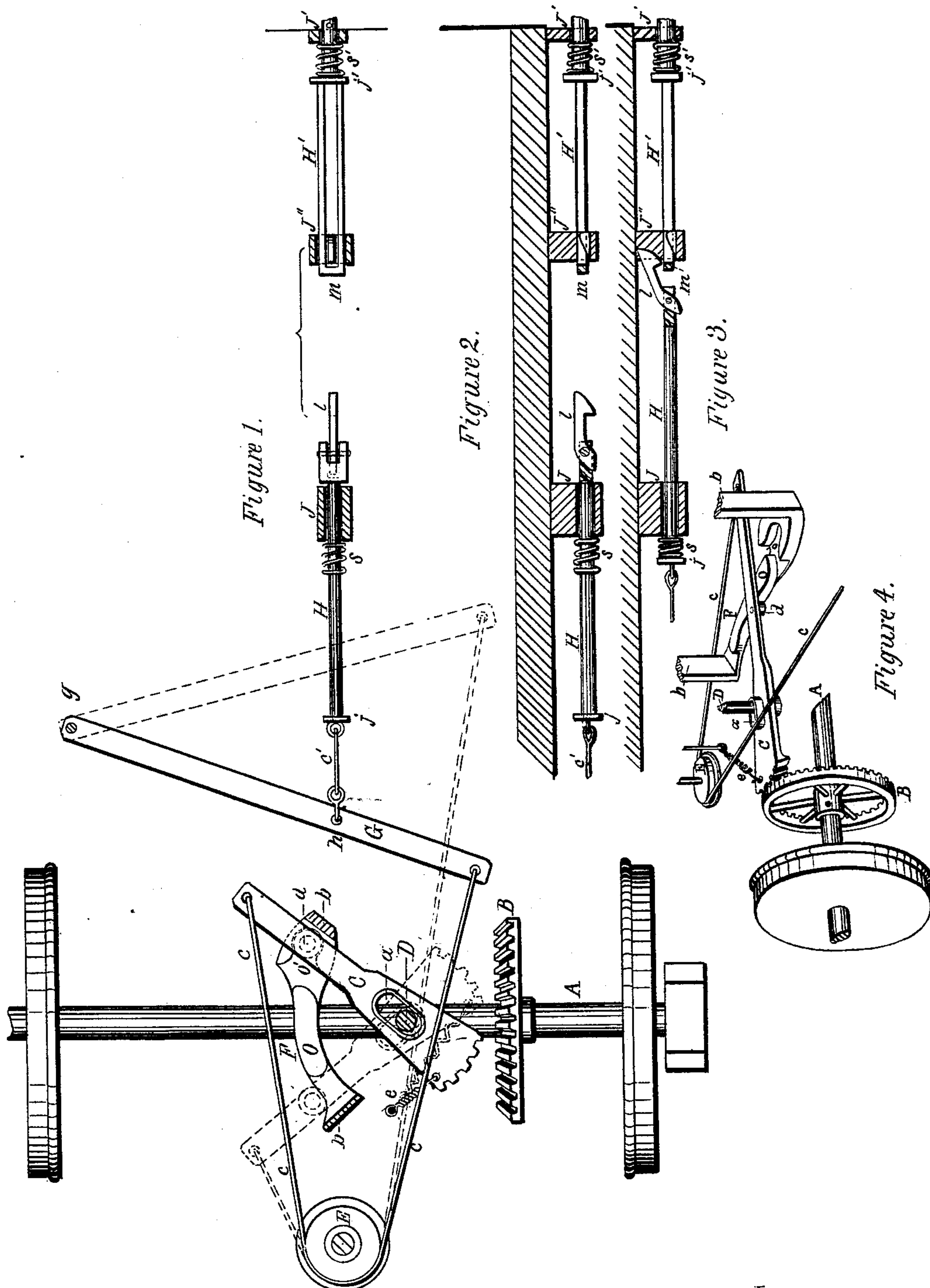


(No Model.)

J. F. GOODRIDGE & A. POPE.
Car Starter.

No. 234,026.

Patented Nov. 2, 1880.



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UNITED STATES PATENT OFFICE.

JAMES F. GOODRIDGE AND ALEXANDER POPE, OF BOSTON, MASS.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 234,026, dated November 2, 1880.

Application filed May 31, 1880. (No model.)

To all whom it may concern:

Be it known that we, JAMES F. GOODRIDGE and ALEXANDER POPE, both of Boston, in the State of Massachusetts, have invented an Improvement in Car-Starters, of which the following is a specification.

Our invention relates to a form of car-starter in which a segment-gear upon the end of a lever, the other end of which is connected with the draw-bar, is made to engage with a gear-wheel upon the car-axle; and it consists in pivoting such a lever beneath the car-floor by means of a slot in the lever and a pin inserted in the frame of the car, so that the lever may have both a horizontal swinging and a longitudinal sliding motion, and combining therewith a spring to draw back the lever when the latter is released from the pull of the draw-bar, and a sweep or guide to throw the gear-sector and gear-wheel into gear when the lever is pulled forward by the draw-bar, and to disengage and keep disengaged the gear-sector and gear-wheel when the lever is released and free from the pull of the draw-bar. By this arrangement there is a great reduction of the distance to be traveled by the draw-bar over any other contrivance with which we are acquainted. Moreover, the car-starting apparatus, when released from the draw-bar, is always in a fixed position, regardless of the grade of the road upon which the car travels, and, the gear-sector engaging with the gear-wheel near the top of the latter, there is less liability that the apparatus be thrown out of order by wind, ice, or snow.

We operate our car-starting apparatus by means of a draw-bar in two pieces, which we hereinafter describe in connection with our invention; but we do not claim that this draw-bar is of itself new. Any suitable draw-bar in two pieces would answer our purpose, or a draw-bar in a single piece might easily be arranged to work with our car-starting apparatus without departing from our invention.

In the drawings, Figure 1 is a plan representing our invention as seen from above, the car-floor being supposed to be removed. Figs. 2 and 3 are side elevations of the draw-bar at different stages in its use. Fig. 4 is a perspective view, representing the segment-gear

as engaged with the gear-wheel under the control of the guide-pin.

A is the car-axle, to which are rigidly attached the car-wheels. B is a bevel-gear wheel, also rigidly attached to the axle A. C is a lever, its shorter arm ending in a beveled segment-gear.

D is a pin inserted in the frame of the car and passing through a slot, *a*, in the lever. This pin is the fulcrum of the lever, and the lever has accordingly a horizontal swinging and a longitudinal sliding movement on the pin.

E is a pulley whose shaft projects downward from a floor-beam, and *c* is a cord passing around the pulley E, one end of it being secured to the long arm of the lever C, while the other is attached, either directly or indirectly, to the draw-bar.

F is a sweep or cam-guide, suspended from the car-frame by two rods, *b b*, and *d* is a guide-pin upon the lower face of the lever C.

A spring, *e*, connects the lever C with one of the floor-beams, and operates to keep the pin *d* in constant contact with the cam of the sweep F, as well as to draw back the lever C to its normal position when the car has been started, as hereinafter described.

As shown in the drawings, the cord *c* is indirectly secured to the draw-bar, one end of it being attached to the free end of a horizontally-swinging lever, G, pivoted to the car-frame at *g*. The draw-bar is connected with this lever G at a point, *h*, between the pivot *g* and the end to which the cord *c* is secured. The lever G, however, may be regarded merely as a substitute for a guide-pulley, around which the cord *c* might pass to be directly connected with the draw-bar.

The draw-bar is made in two parts, H H', supported by guides or bearings J J' J² in floor-beams or iron boxes underneath the car. The part H is connected with the lever G by a rod or cord, *c'*, and is provided with a shoulder, *j*, and a spring, *s*. The part H' has a shoulder, *j'*, and a spring, *s'*.

The part H is provided with a latch, *l*, and the part H' with a corresponding slotted catch, *m*. The latch *l* is pivoted to the front part of the draw-bar H, and has its rear upper surface

beveled to lock against a corresponding bevel upon the draw-bar H, as shown, so that the latch can never fall below the position shown in Fig. 2. The latch is so shaped and a lifting-bar, *n*, is so placed relatively to the catch *m* that the latch, on striking the lifting-bar, is disconnected from the catch.

The operation is as follows: In stopping the car, or when it is at rest, the horses will be held back so that the latch *l* engages with the catch *m*, and when the car is to be started the two parts of the draw-bar act as if they were one, so that a pull upon H' will bring forward the lever G. The motion of G is communicated to lever C by cord *c*, and as lever C begins to move its guide-pin *d* strikes a projection, *o*, of the cam-guide F, which is so shaped that a continued motion of the lever throws its segment-gear into gear with the bevel-wheel B, the slot *a* permitting the lever to slide on the fulcrum-pin D for this purpose, as seen in Fig. 4. The car is thus started with a very considerable gain of power. The pull upon the lever C is continued until the segment-gear passes out of gear with the wheel.

About this time the pull upon the draw-bar has brought it so far forward that the latch *l* strikes the lifting-bar *n* and releases the part of the draw-bar H' from the part H. The shoulder *j* then takes the weight of the load, the jar being somewhat lessened by the spring *s*'. When the separation is made between the two parts of the draw-bar the spring *e* draws back the lever C to its original position, the guide-pin *d* traveling upon the farther side of the projection *o* until it passes into a recess, *o*'.

We claim—

The gear-wheel B upon the car-axle, the slotted lever C, provided with a gear-sector upon its shorter arm and having a horizontal and sliding motion, the pin D, sweep F, and spring *e*, in combination with the draw-bar of a car and suitable connections, substantially as described, for the purpose specified.

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