

(No Model.)

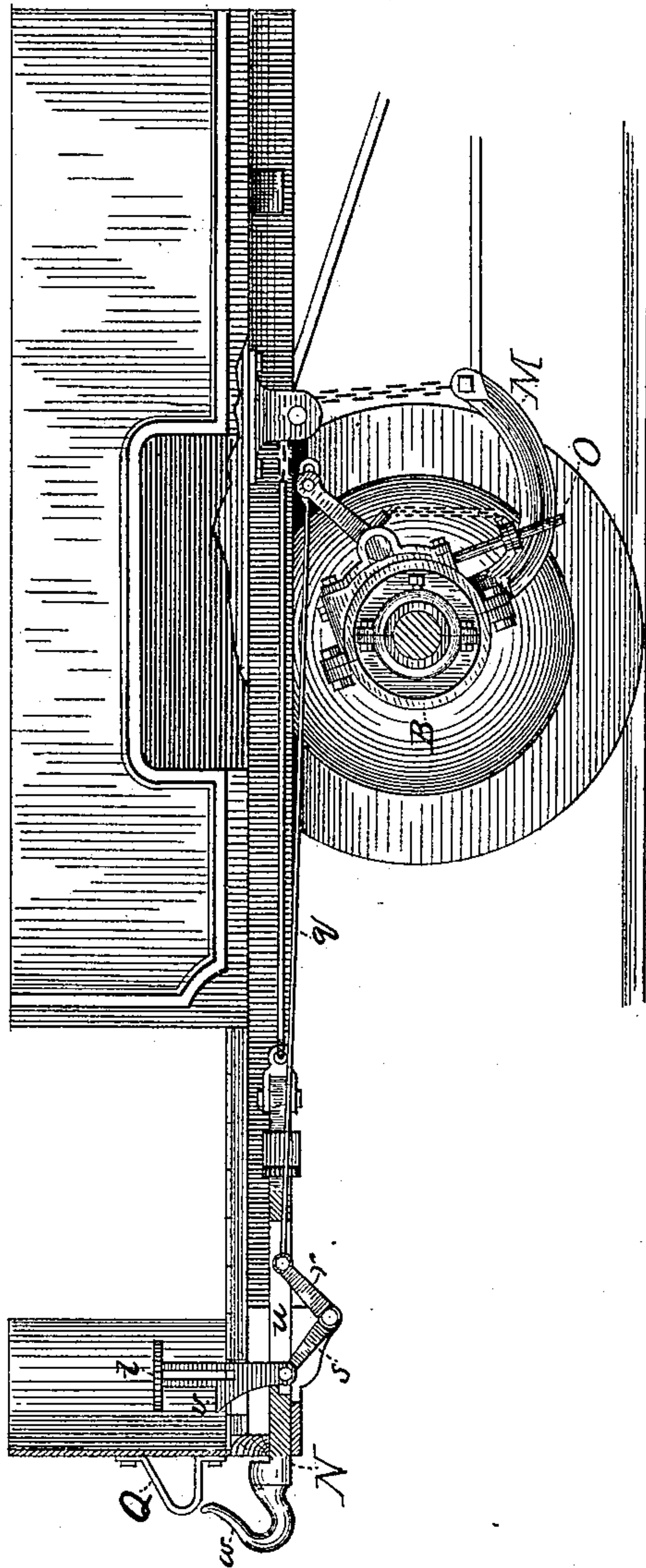
3 Sheets—Sheet 1.

L. W. HEWETT & S. J. LEONARD.

CAR STARTER.

No. 275,211.

Patented Apr. 3, 1883.



ATTEST:

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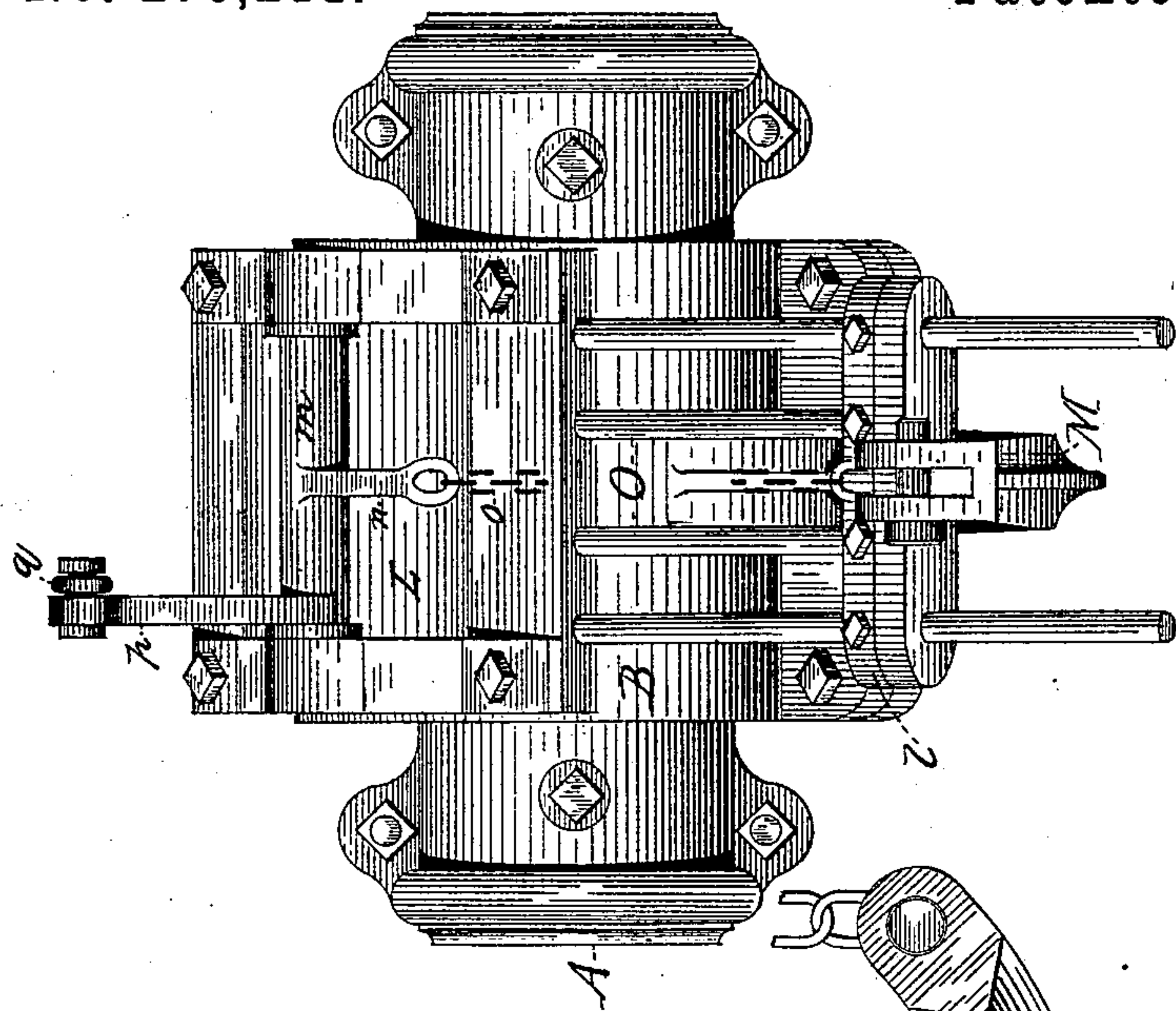


FIG. 3.

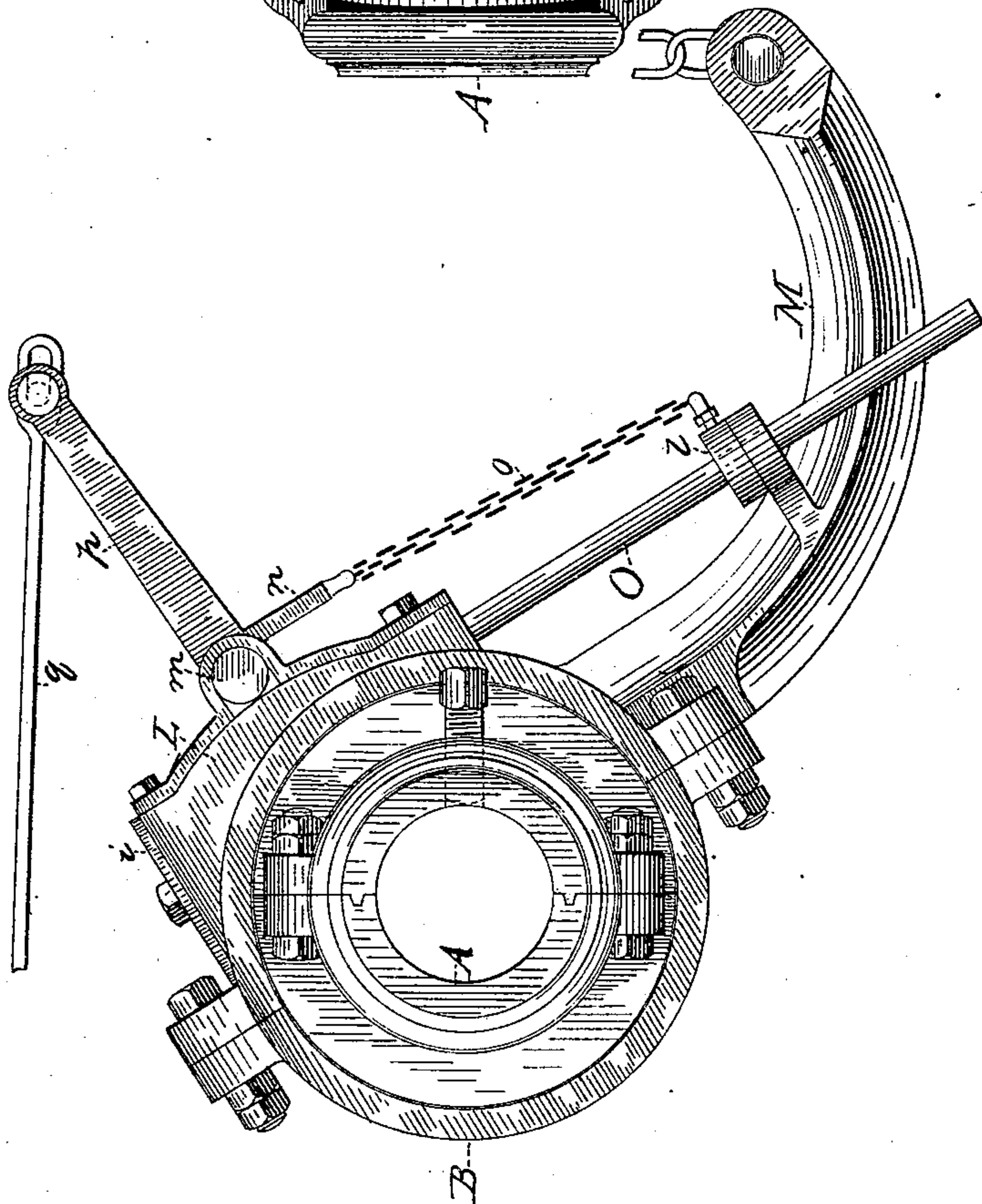


FIG. 2.

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Fig. 5.

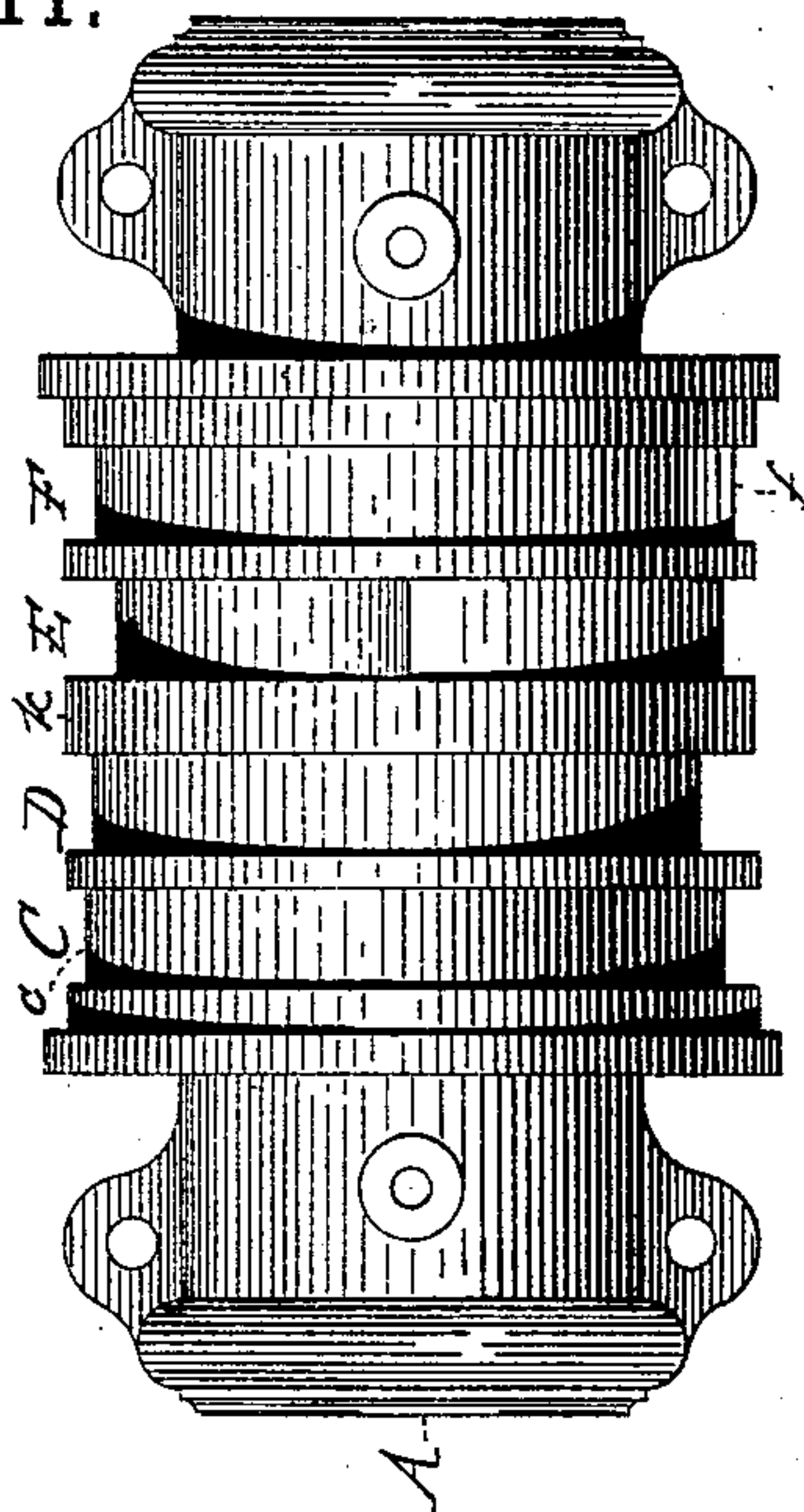


Fig. 4.

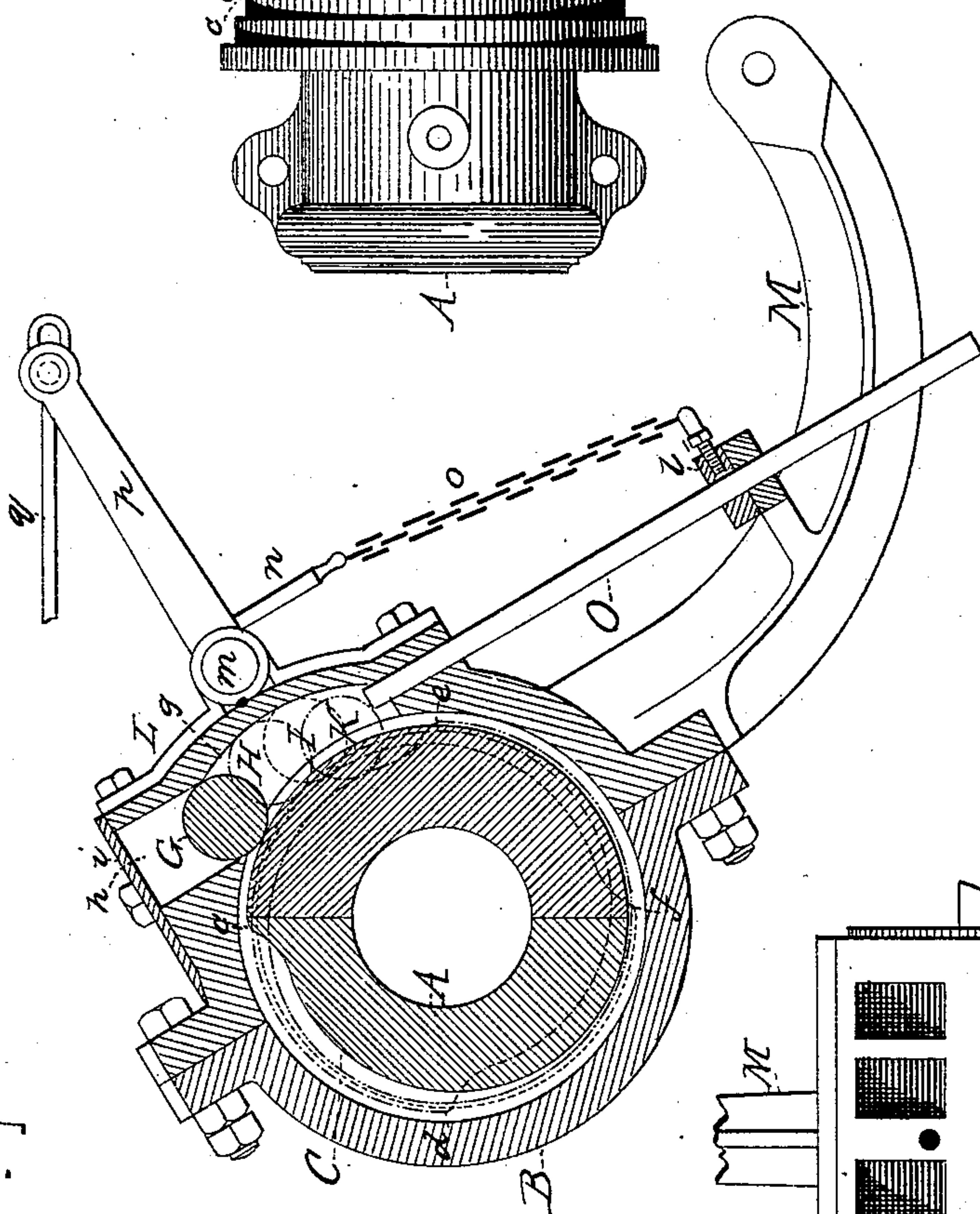
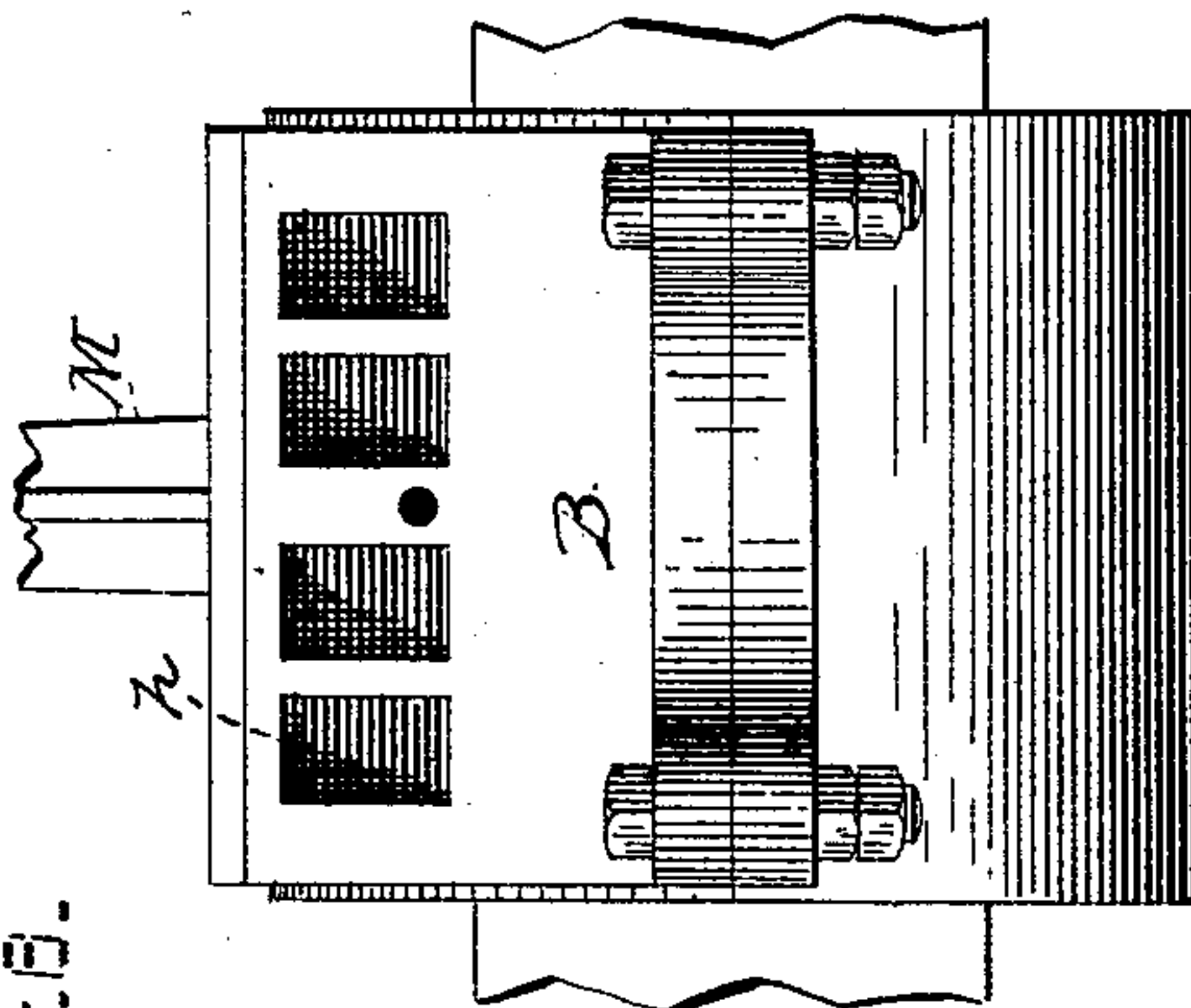


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEWIS W. HEWETT, OF NEW YORK, N. Y., AND SUMNER J. LEONARD, OF WILLIAMSPORT, PENNSYLVANIA, ASSIGNORS TO PHILIP B. SHAW, OF WILLIAMSPORT, PENNSYLVANIA.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 275,211, dated April 3, 1883.

Application filed May 2, 1882. (No model.)

To all whom it may concern:

Be it known that we, LEWIS W. HEWETT, of the city, county, and State of New York, and SUMNER J. LEONARD, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a certain new and useful Improvement in Car-Starters, of which the following is a specification.

Our invention relates to car-starters of that class which employ a sliding draw-bar and a clutching device connected therewith and working on the car-axle, such clutching device being adapted to grip the axle on its forward movement only; and the object we have in view is to produce a starter of this character which will be capable of long use and considerable wear without losing its efficiency or its certainty of action; which will have a much larger bearing-surface in the individual gripping devices than heretofore, and will be provided with a plurality of such devices, so as to distribute the strain and prevent all liability to slip; which will be provided with a mechanism for throwing the gripping devices out of action, not materially affected by the settling of the car upon its springs, and with means for compelling the driver to throw the gripping devices out of action at one end of a car before he can shift his horses to the other end of the car; and which will be constructed for the ready removal and replacing of the gripping devices without taking the oscillating collar apart or removing it from the sleeve that is secured to the axle.

Our invention consists in the novel devices and combinations of parts employed by us to accomplish the foregoing object, as fully hereinafter explained, and pointed out by the claims.

In the accompanying drawings, forming a part hereof, Figure 1 is an elevation and partial section of one end of a car carrying our starter and attachments; Fig. 2, a side elevation of the starter removed from the axle; Fig. 3, a rear elevation of the same; Fig. 4, a vertical section of the starter; Fig. 5, a separate elevation of the sleeve; and Fig. 6, a view from the front side of the collar, with the plate which retains the gripping-rollers in position removed.

Like letters denote corresponding parts in all six figures.

A is the sleeve, which is made in two parts, as heretofore, and is secured to the axle of the car. It has an enlarged central portion, with which the gripping devices engage. Upon this sleeve is placed loosely the collar B, also made in two parts, and inclosing the central enlarged portion of the sleeve, which turns within the collar when the car is in motion. Heretofore the central portion of the sleeve has been provided with a single groove in which worked a gripping-ball carried by a cam-lever pivoted in a slot in the collar, and another ball playing in a tapering groove in the collar, and serving to prevent any retrograde movement of the car; but these devices lost their efficiency after a little wear, and the bearing-surface of each ball being only about one-eighth of an inch, the strain was all at one point and increased largely the danger of breaking the collar. Instead of a concentric groove, we employ in our starter two or more cam-grooves, C D E F. Each of these grooves preferably approximates in shape a part of a true spiral, its radius decreasing regularly for every degree of revolution. The shoulders *c d e f*, where the points of greatest and least radius meet, are given a rounded or curved form. The cam-grooves, which are shown as four in number, are located with their points at the quarters of a circle, so that three of them will always be in position for effective operation. Rollers G H I K bear on the cam-faces of these grooves and play in a chamber, L, formed in one part of the collar B. The bearing-surface *g* of this chamber is eccentric with the axle, and the cam-grooves divide this chamber into a number of tapering parts, each part being smaller at the lower end of such chamber than at its upper end. The chamber L has a number of extended openings, *h*, closed by a removable plate, *i*. Through these openings the rollers are put into or removed from the chamber L, and into these openings the rollers are pushed in succession by the points of the cams. When the point of any one cam passes the inner end of the opening *h* in line with it the roller moves into the space made by the regularly-receding face of

the cam and travels toward the lower end of the chamber L, turning in the opposite direction to the sleeve until the point of the cam lifts the roller out of the chamber L and pushes it into one of the openings *h*.

In the operation of starting the car the collar B is turned, as will be well understood, upon the sleeve, and the rollers are jammed between the surface *g* of chamber L and the cam-grooves, locking the collar to the sleeve. The further movement of the collar turns the sleeve and the car-axle to which it is attached. The chamber L being less than a quarter of a circle in extent, three of the rollers are always in position to act, and at times all four are in position to grip the sleeve. The cam-surfaces and rollers wear evenly, and by such wear the point of effective gripping on the cam is somewhat changed; but the efficiency of the starter is not materially decreased. When the extent of effective gripping-surface is reduced materially by wear, new and larger rollers can be readily inserted, and the starter will be as efficient as when first put in operation. The rollers prevent any retrograde movement of the car by a gripping action, which is caused by the reverse movement of the sleeve within the collar, instead of by the forward movement of the collar on the sleeve, as is the case in starting. The rollers which are used have many advantages over the balls heretofore employed. They bear the whole width of their faces, while the balls bear at one point only. Consequently the rollers are much more certain in their action. The rollers can also be made absolutely true at small expense, and will wear evenly, while the balls cannot be constructed of true spherical shape, and, in addition, wear unevenly. The use of a number of gripping devices, it will be seen, distributes the strain and lessens the liability of the breaking of any of the parts.

M is a lever, which is cast with one part of the collar B, or is secured solidly to one or both parts of such collar. This lever is connected with a chain passing over a sheave secured to the bottom of the car, and attached to a rod running to the spring-retracted draw-bar N. The lever M can be made solid with the collar, for the reason that the two operations of the starter are performed by the rollers that lie between the collar and the cam-surfaces of the grooves. This lever may be pivoted to the collar, and may carry a roller bearing on the central concentric surface, *k*, and it may be limited in its movement, or adjustably fixed by means of set-screws. The office of the roller carried by it, however, will only be to take most of the strain off of the gripping-rollers when the car is in motion.

To throw the rollers out of action, rods O are used, (one for each roller,) which pass through the bottom of the chamber L. These rods are connected by a bar, *l*, by raising which the rollers will be forced into the openings *h*, and the sleeve will be free to turn backward in the collar. It is only necessary to raise the

rollers in this form of starter, (which weigh at the most but a few ounces,) while with that employing the gripping-lever the whole collar has to be raised on its rear side in order to allow the lever to drop back out of action.

To prevent the settling of the car on its springs from affecting the throwing-out device, the rock-shaft *m*, which operates the rods O, is carried directly by the collar. It has an arm, *n*, connected by a chain, *o*, with the bar *l* of the lifting-rods O, and another arm, *p*, connected by a slotted rod, *q*, with an arm, *r*, secured to a rock-shaft turning in a bracket from the casing in which the draw-bar slides. The other arm, *s*, of this last rock-shaft is connected with a step or other suitable device, *t*. This step plays through a slot, *u*, in the draw-bar N, and has a beveled shoulder, *v*, which, when the step is forced downwardly to throw the starter out of action, pushes the draw-bar forward and locks it in that position.

A bracket, Q, is secured to the dash-board of the car and projects over the point of the hook of the draw-bar when such draw-bar is retracted. This bracket Q prevents the driver from detaching his horses until the draw-bar is forced forward by the depression of the step *t*, which throws the starter out of action; hence in shifting the horses from one end of the car to the other the driver is obliged to set the starters properly. As soon as the horses commence to pull upon the draw-bar the starter at that end of the car is put in action.

What we claim is—

1. In car-starters, the combination, with a sleeve secured to the car-axle, of a collar movable upon the sleeve, and two or more gripping devices working on different portions of the sleeve laterally, substantially as set forth.

2. In car-starters, the sleeve secured to the car-axle, and having two or more spiral cam-grooves upon which the gripping devices act, substantially as set forth.

3. In car-starters, the combination, with the sleeve secured to the car-axle, and having two or more spiral cam-grooves, of the collar movable upon the sleeve, and gripping devices, substantially as set forth.

4. In car-starters, the combination, with the sleeve secured to the car-axle, and having two or more spiral cam-grooves, of the collar and the rollers, substantially as set forth.

5. In car-starters, the combination, with the sleeve secured to the car-axle, and having two or more spiral cam-grooves located side by side and arranged with their points in succession, of a collar movable upon such sleeve, and having a chamber carrying gripping devices working in such spiral cam-grooves, substantially as set forth.

6. In car-starters, the combination, with the sleeve secured to the car-axle and having two or more spiral cam-grooves located side by side and arranged with their points in succession, of a collar movable upon such sleeve, and having a chamber carrying rollers or equivalent gripping devices, and the extended chambers

into which said rollers are pushed by the points of the cams in passing, substantially as set forth.

5 7. In car-starters, the movable gripping-collar provided with a rigid lever for moving the same, substantially as set forth.

10 8. In car-starters, the combination, with the sleeve secured to the car-axle, of the collar, the intermediate gripping device, and the rigid lever, substantially as set forth.

9. In car-starters, the combination, with the movable gripping devices, of means for throwing them out of action without turning the collar, substantially as set forth.

15 10. In car-starters, the combination, with the sleeve, the collar, and the gripping devices, acting both to start the car and to prevent retrograde movement, of the lifting-rods throwing such gripping devices out of action with-
20 out turning the collar, substantially as set forth.

11. In car-starters, the combination, with the gripping-collar, of the rock-shaft for operating the throwing-out device, mounted directly upon such collar, substantially as and 25 for the purpose set forth.

12. In car-starters, the combination, with the throwing-out devices, of a device for preventing the detaching of the horses until the starter is thrown out of action, substantially 30 as set forth.

13. In car-starters, the combination, with the throwing-out devices, of the bracket covering the point of the draw-bar hook, substantially as and for the purpose set forth.

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Witnesses:

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CHAS. L. GIRARD.