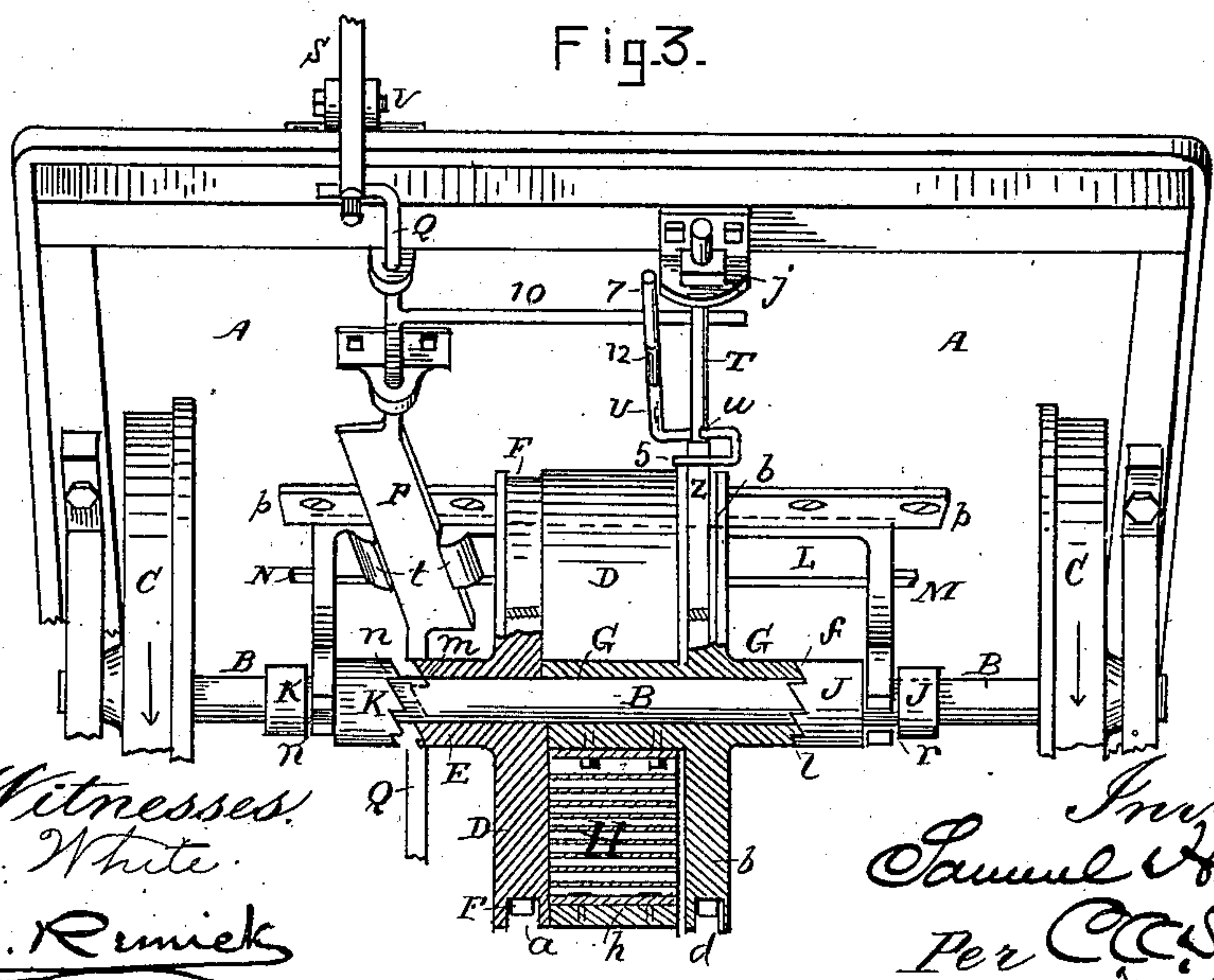
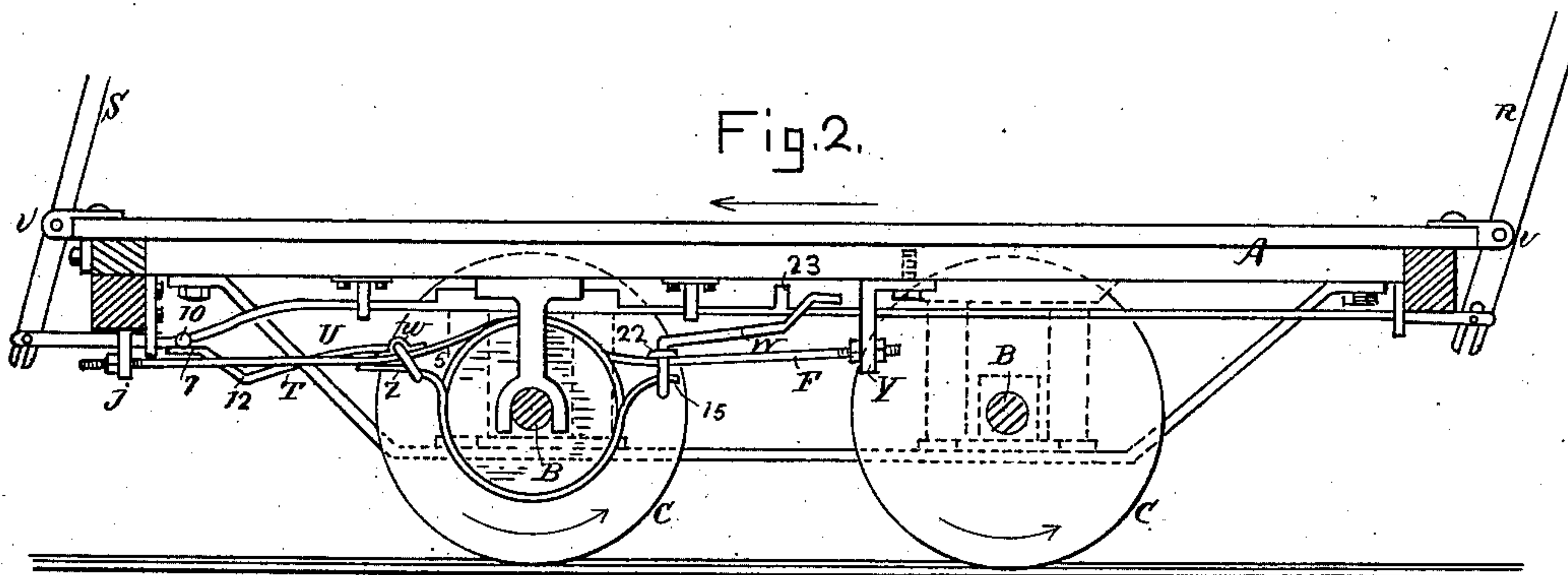
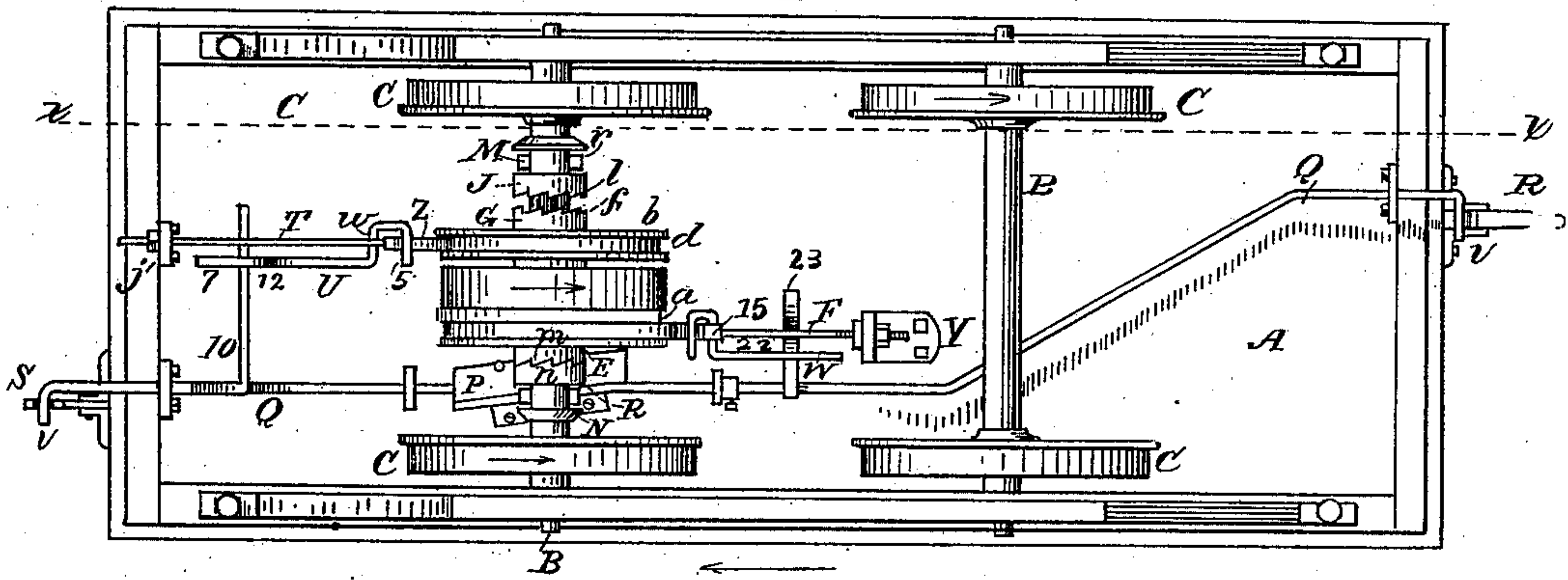


(No Model.)

S. HENRY.
CAR STARTER.

No. 299,539.

Fig. 1. Patented June 3, 1884.



Witnesses:
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UNITED STATES PATENT OFFICE.

SAMUEL HENRY, OF BRAINTREE, MASSACHUSETTS.

CAR-STARTER.

SPECIFICATION forming part of Letters Patent No. 299,539, dated June 3, 1884.

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

To all whom it may concern:

Be it known that I, SAMUEL HENRY, of Braintree, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Car-Starters, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a bottom plan view of a car provided with my improved starter; Fig. 2, a vertical longitudinal section of the same, taken on line *x* in Fig. 1; and Fig. 3, an end view in perspective.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of car-starters in which the power exerted in stopping the car is stored up and utilized in starting it, being automatic in its action, and designed more especially for horse-cars; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more effective device of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation:

In the drawings, A represents the bottom of the car, B the axles, and C the trucks, these being all of ordinary construction, except as hereinafter specified.

Disposed around one of the axles there is a hollow drum or case, D, provided around its periphery, near one side, with the annular groove *a*, and at one end with the horizontally-projecting hub E, having a series of serrations or ratchet-teeth, *m*. A sleeve, G, having an annular flange, *b*, provided around its periphery with a groove, *d*, is fitted to the same axle, its body extending into the case D, and its outer end being serrated or provided with a series of ratchet-teeth, *f*, which incline in a direction opposite those on the hub E, as best seen in Figs. 1 and 3.

Disposed within the case D, around the sleeve G, there is a stout flat coiled spring, H, one end of which is attached to said sleeve by the screws *i*, and the other to the case by the screws *h*. A collet, J, is fitted to slide on the axle, but prevented from turning thereon by means of a spline, (not shown,) said collet being provided at its inner end with a series of serrations or ratchet-teeth, *l*, adapted to engage the teeth *f* on the sleeve G. A corresponding collet, K, is fitted to slide on the opposite end of the axle, but prevented from turning thereon by a spline, (not shown,) said last-named collet being provided with a series of serrations or ratchet-teeth, *n*, adapted to engage the teeth *m* on the hub E. A bar, L, is fitted to slide horizontally in the ways *p* and transversely of the bottom A, said slide having at one end a downwardly-projecting bifurcated arm, M, the forks of which pass astride the collet J, and at the other end a corresponding arm, N, which bestrides the collet K, the collets being respectively provided with grooves *r*, for receiving the forked ends of the arms and preventing their escape therefrom. The bar L is provided at one end with a diagonally-arranged transverse groove, *t*, in which is fitted to slide the plate P. This plate is mounted on the rod Q, supported in proper ways beneath the bottom A, and is jointed at one end to the vertically-arranged brake-lever R, and at the opposite end to a like lever, S, the levers being respectively pivoted at *v* to the ends of the car.

Projecting downwardly from one end of the frame-work of the bottom A there is an arm or bracket, *j*, and secured in this there is a rod, T. This rod is flattened at its inner end, forming a strap or friction-band, which passes around the flange *b*, and is provided with the outwardly-projecting end *z*.

Pivoted at *w* on the upper side of the rod Q there is a bent lever, U, its inner end, 5, extending under the free end *z* of the rod T, and its outer end, 7, under a horizontally-projecting arm, 10, on the rod Q. The lever U is bent upward at 12, so that when the lever S is moved into the position shown in Fig. 2 the rod 10 will ride upwardly over its outer end, 7, thereby depressing it, and causing its inner end, 5, to be elevated, and the friction-

band or flattened inner end of the rod T, resting in the groove *d*, to grasp or hug the flange *b* of the sleeve G, and thereby brake said sleeve, or prevent it from turning on or with the axle B.

Projecting downwardly from the central portion of the bottom A there is a bracket or arm, Y, in which a horizontally-arranged rod, F, is secured. This rod is also flattened to form a friction-band, and passes around the case D, terminating in the free end 15, and resting in the groove *a* in the same manner that the rod T rests in the groove *d*. A bent lever, W, corresponding in form with the lever U, is pivoted at 22 on the rod F, and is actuated by a horizontally-projecting arm, 23, on the rod Q, to cause the flattened portion of the rod F, resting in the groove *a*, to hug or brake the case D and prevent it from turning on or with the axle B when the lever R is moved into a position opposite that shown in Fig. 2, in substantially the same manner as the rod T is actuated to brake the sleeve G.

The collets J K and their connecting parts are so constructed and arranged that when the levers R S are brought into a vertical position the collet J will be disengaged from the sleeve G and the collet K from the case D, thereby permitting the car to run freely in either direction without acting on the spring H or either of the brakes.

In the use of my improvement, when the car is moving in the direction of the arrow in Fig. 1, if now it is desired to stop the car, the driver on the forward end of the same pulls the brake-lever S inwardly, as best seen in Fig. 2, thereby causing the arm 10 on the rod Q to depress the outer end of the lever U and the rod T to brake or prevent the sleeve G from turning. At the same time the collet K is caused to engage the case D, and the collet J disengaged from the sleeve G, the spring H being wound up within said case and the car stopped, in a manner which will be readily obvious without a more explicit description.

It will be observed that when the upper end of the brake-lever S is pulled inwardly into the position shown in Fig. 2 the corresponding end of the lever R will be thrown outwardly into a reverse position; also, that when the brake-levers are pulled or moved to cause the collet K to engage the case D and the collet J to be disengaged from the sleeve G prior to winding up the spring, as described, the arm 23 on the rod Q will pass off from the lever W, thereby releasing the grasp of the friction band or rod F on the case D, and permitting said case to be turned freely when engaged by the collet K. After the spring has been wound up within its case and the car stopped, when it is desired to start up the car, the brake-lever S is pushed outwardly, as shown in Fig. 3, causing the collet K to be disengaged from the case D, the collet J to engage the sleeve G, the rod or band T to release its hold on said sleeve, and the rod

or band F to grasp and hold the case D, thereby permitting the spring to exert its power, through the collet J on the axle B, to assist in starting the car.

It will be obvious that when the car is run in the opposite direction, or toward the lever R, the operation of the mechanism will be substantially the same, but that the spring will be wound up by holding the case D stationary and turning the sleeve G, instead of holding the sleeve stationary and turning the case, as described. It will also be obvious that the power required to brake up or stop the car is stored up in the spring and utilized to start the car in either direction, as the case may be, when one of the brakes is released; also, that the toothed collets J K respectively act as clutches in connection with the sleeve G and case D, and that instead thereof clutches of any other suitable construction adapted to perform the same functions may be used, if desired. The construction of the mechanism for operating the clutches, and also for braking or holding the case and sleeve stationary and releasing the same, as required, may also be changed considerably without materially departing from the spirit of my invention. The levers U W are respectively provided with adjusting-screws, (not shown,) which act on the free ends of the rods T F, to regulate the pressure of the friction-bands. When the power necessary to stop the car has been applied and stored up in the spring H, or when said spring has been wound up by holding the sleeve G stationary and turning the case D, or vice versa, if, now, the brake-levers R S are moved into a vertical position, the collets J K will be disengaged, the arm 10 on the rod Q will actuate the lever U on the rod T, to tighten the friction-band on the flange *b* of the sleeve G, and the arm 23 on the rod Q will actuate the lever W on the rod F, to tighten the friction-band on the case D, thereby holding both the sleeve and case stationary, with the spring wound up and in readiness for use in starting the car in either direction desired, thus enabling the power used to brake up the car, for instance, in going downhill to be utilized at any time thereafter, either in starting the car when stopped, or to assist in drawing it uphill.

It is not absolutely essential that the case D should cover the spring, or that the sleeve G should extend within the spring, provided the case, spring, and sleeve are properly connected.

Having thus explained my improvement, what I claim is—

1. The improved car-starter herein described, the same consisting of the case D, spring H, sleeve G, clutches J K, bar L, rods T F, levers U W, arms 10 and 23, rod Q, slide P, levers R S, axle B, and wheels C, constructed, combined, and arranged to operate substantially as specified.

2. In a car-starter, the lever W, in combi-

nation with the rod F, rod Q, arm 23, and case D, substantially as and for the purpose set forth.

3. In a car-starter, the lever U, in combination with the rod T, rod Q, arm 10, and sleeve G, substantially as and for the purpose specified.

4. In a car-starter, the plate P, in combi-

nation with the rod Q, bar L, arms N, clutches J K, and levers R S, substantially as and for the purpose set forth.

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