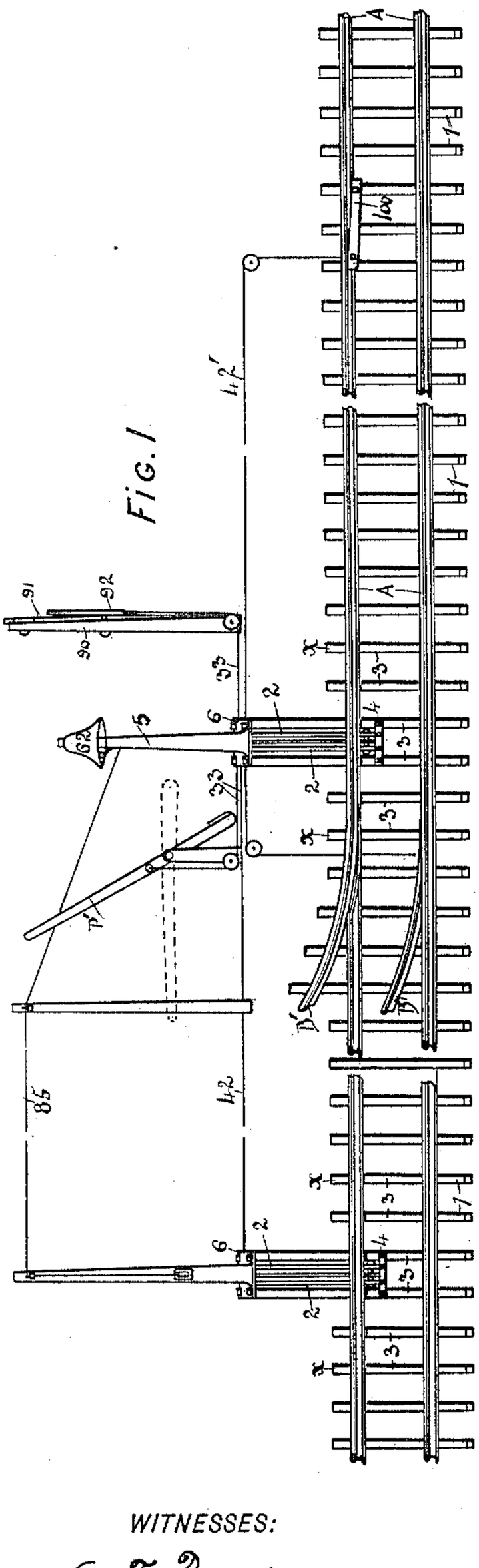
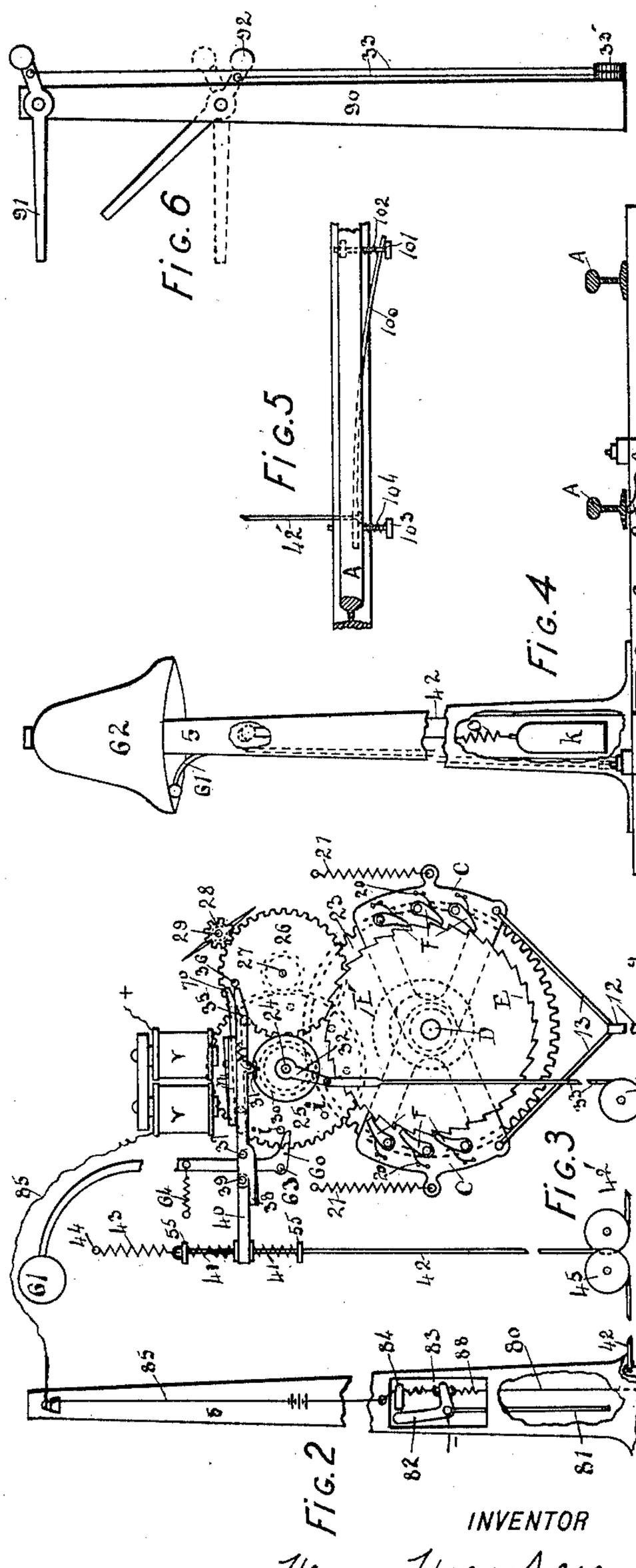
(No Model.)

H. HOESCHEN.

MOTOR.

No. 600,420. Patented Mar. 8, 1898.





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MOTOR.

SPECIFICATION forming part of Letters Patent No. 600,420, dated March 8, 1898.

Application filed December 11, 1895. Renewed January 29, 1898. Serial No. 668,495. (No model.)

To all whom it may concern:

Be it known that I, HENRY HOESCHEN, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain useful Improvements in Motors; and I do hereby declare that the following is 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, which form a part of this specification.

This invention has relation to a new and novel motor more particularly adapted to be operated in connection with moving bodies, such as railway-cars, and comprises a power mechanism adapted to perform certain work—such as throwing a switch, operating a signal, winding a clock, or, in fact, providing a motive power that can be used for almost any purpose—it being understood that the initial power is provided by means of a pumping movement which is due to the elasticity of a rod or bar over which a load is made to pass.

In the accompanying drawings, Figure 1 shows my invention as attached to operate a railway gate and signal, the device being actuated by means of the cars passing over the rails. Fig. 2 shows a broken detail of one of the posts as used in my device. Fig. 3 shows an enlarged broken detached detail of the operating mechanism as used in my device. Fig. 4 shows a broken detached detail of my device as arranged to operate a weight. Fig. 5 shows a top view of the rail, showing the releasing mechanism as employed in my device, while Fig. 6 shows a detached detail of an ordinary semaphore.

A represents two ordinary rails, which can be of any size or length, mounted upon the usual ties 1 1. In my invention, however, I provide at a suitable point what might be termed a "bridge-space," as shown in Fig. 1, for instance, between *x x*, where the rails A A are above the ties 3 3, but are not permitted to rest on these ties in their normal condition, there being a small space left between these ties 3 and the rails A, which space may be approximately a quarter of an inch. At a point immediately between the space, in which I maintain the rails in a suspended condition, as it were, I provide projecting ties, which ties give support to a hollow post 5, as is shown in Figs. 1 and 4. These projecting ties in turn give support to two shorter bars 2 2, held by means of an end bar 4 and an end plate 6, which bars 2, referring to Fig. 4, are provided with transverse rods 8 and 9, the first rod giving support to the lever 10 and the second giving support to the bell-crank 11. The lever 10 has an upwardly-extending arm *a*, which is made to rest below the center of the suspended rail, as is shown in Fig. 4.

Securing the lever 10 and bell-crank 11 is an ordinary bar *e*. Extending upwardly from this bell-crank 11 is a rod 12, referring now to Fig. 3, which rod is provided above with two extending bars 13, which bar is secured to two approximately triangular-shaped plates C, which plates C are mounted upon an axle D. This axle D can be given any suitable support, and where the device is used and operated within a hollow pillar, as is shown in Fig. 4, may extend through the same from side to side, it being immaterial as long as this axle or shaft is properly fixed.

Working upon the shaft D by means of any ordinary friction-clutch is a ratchet-wheel E, which wheel by means of the friction-clutch is adapted to revolve the shaft D, and in doing so winds an ordinary spiral spring E′. The spring in Fig. 3 is shown in dotted lines, it being positioned behind the ratchet-wheel E.

Each of the plates C is provided with preferably three pawls F, which pawls are positioned so that even though the plate C moved but one-third the length of one of the ratchet-teeth they will still grasp and actuate the ratchet E.

The pawls F F are so arranged that one system actuates the ratchet in descending, the other being made to actuate the ratchet in working upward, the pawls being spring-actuated, as is usual in devices of this sort, the springs 20 being provided for that purpose.

The plates C are held in an upward position by means of the tension-springs 21, which in operation tend to normally force the nosing *a* of the lever 10 snug against the rail A.

The shaft D is further provided with an ordinary gear-wheel 23, which meshes with a small gear-wheel, which is hidden in the drawings, mounted upon the shaft 24. Further

secured to this shaft 24 is a gear 25, meshing with the gear which is hidden in the drawings, but shown in dotted lines and mounted upon the shaft 27, which shaft also supports the gear-wheel 26, meshing with an ordinary regulating-wheel 28 upon the shaft 29. The shaft 24 further gives support to an incised disk 30, the incisions 31 being adapted to receive the nosing *w* of the bar 35, pivoted upon the pin 37. This bar 35 is further provided with the plate *n*, adapted to be actuated by the electromagnets *v*. Secured to the wheel 26 is a pin 36, which is adapted to work against the bars 35 and 70 to stop the train of gearing whenever the nosing of the bar 35 or 70 works into one of the incisions 31, as shown in the drawings.

Mounted at a suitable point within the post 5 (the one shown in Fig. 2 not being provided with a pawl) is a bar 50, mounted upon a pin 51, and from the lower end of which extends a cable 52, which cable 52 can be carried to the lever 10, as will be understood in referring to Fig. 4. Extending from the upper end of the bar 50 is a strand or cable 42, passing over a suitable pulley 45, which strand is provided with two collars 55. This strand 42 passes through the rear pivoted portion 40 of the lever 35, which portion is secured by means of the pin 39. Working between the collars 55 and the portion 40 are the springs 41, the spring 43 being used to compensate the changes in length of the strand 42.

Positioned upon the shaft 24 is a crank-arm 32, to which arm is secured a cable or strand 33. This strand is the one that is supposed to do the work and which is led to the clock, semaphore, bell-clapper, gate-arm, or whatever device is operated, as this crank can be made to revolve once or a given number of times. By means of the crank 32 it is of course understood that a rotary or a sliding movement could be readily obtained by means of any suitable ordinary converting motion. In the drawings, for instance, should a train of cars be made to pass over the rails A A the suspended rail A would of course be forced down a quarter of an inch or so (the distance which it is above the tie) while the load is above it. This movement would actuate the levers 10 and 11 to operate the pawls upon one side of the ratchet, and as soon as the load was removed from the rail the rail would assume its normal position, which upper movement would be followed by the lever 10, held under tension below and against the rail A by means of the spring 21, which movement would also actuate the pawls upon the opposite sides of the ratchet.

At a suitable point I provide a duplicate of the lever 10, which is secured (referring now to Fig. 2) by means of a cable 52 to the plate 50, which is actuated to operate the cord 42, which downward movement of the cord would throw the bar 35 upward, permitting the pin 36 to escape, so that the train of gearing would be started to operate the crank 32 and the cable 33 to do the desired work, which might be to set a semaphore or operate a gate or both jointly, the limit of work done being of course controlled by the strength of the spiral spring E′. As the train successively bounded over this suspended rail A it would continuously tip upon that side; but this continued movement would not disturb the bar 35, as the movement would be compensated by the springs 41 and the pivoted arm 40.

In the use of my invention I find that a bell-alarm is what would be of the greatest service, especially to give an alarm at cross-roads and points not provided with gates. This bell-alarm I provide by means of the wheel 25, which is provided with one or more pins *i*, adapted to engage the projecting shoe 60 of the bell-clapper 61, arranged to operate the bell 62. The bell-clapper is mounted upon a pin 63 and is normally held in one position by means of the spring 64, as is shown in Fig. 3.

As has been described, a railway equipped with my improvement would be provided with one of these dipping rails and a suitable distance from and upon both sides of the gate an alarm signal or semaphore be operated. At the first dipping of the rail the winding mechanism would be released by means of the strands 42 52, permitting the escape of the disks 30, while simultaneously the motor or driving mechanism would be wound up. The disks 30, which would be provided with one or more incisions, would revolve until they were checked by some means. This checking of the motor would be accomplished by the arm 70, referring to Fig. 3, which arm is mounted adjacent and is precisely like and operates exactly as does the lever 35, only working into a disk similar to the one 30 and incised preferably at a point opposite to the incision shown in the forward disk in Fig. 3. As the motor-arm 70 fell into this second disk it would be locked some time before the train would arrive at the point where the second dipping of the rail is accomplished, which second dipping would release this second lever 70 to give a second action to the motor, which second action would be the one that would return or bring the alarm or signal into its original and first position.

In my invention I have shown and described a motor as winding a spring-actuated train-gearing. It is of course understood that an effect equal to that could be accomplished in winding up a weight, as is shown in Fig. 4, for instance, where the weight *k* is wound up in place of the spring and this weight exerting an influence to unwind the clock-gearing. In using a weight, as there is considerable pounding, as it were, of the two plates C C in winding up this weight, I provide the same with an ordinary strand *o*, at the lower end of which I position a spring, which compensates the shock imparted to the working mechanism.

Where the alarm or other device to be op-

erated and the point actuated is a very great distance from the point of contact or the point at which the rail is dipped, I provide a modification in which my train of gearing, where, in place of being actuated by means of the mechanical arrangement embracing the strands 42 and pulleys 45, I accomplish the same result electrically. It is understood that the movement imparted to the releasing-strand 42 can be varied; but where the distance would be too great this movement might be lost in the slackness of the wire, and consequently the device would remain inoperative. I accomplish a result, however, by means of a strand 80, which I secure to the pivoted bar 50, which strand in turn is suitably positioned within a suitable post and is provided with a bell-crank 82, having a depending bar 81, which acts to keep the bell-crank 82 in proper position and at the same time acts as a regulator, as will be described. Two or more movements could be given to a semaphore—for instance, by duplicating the arms 35 and 70 or duplicating the incisions 31. The strand 80 is provided with a suitable spring 88, having a loop 83, between which loops the lower arm of the bell-crank 82 is held. Immediately above and positioned adjoining the bell-crank 82 is an ordinary electric terminal 84, in connection with the battery leading to the electric magnets *v*, positioned above the two bars 35 and 70, the magnets being provided with an earth connection, as is also the bell-crank 82, so as to bring the battery and electric magnets in circuit. Normally this circuit remains in an open position; but the slightest contact between the lever 82 and terminal 84 will magnetize the electric magnets *v v*. To raise these bars to permit the working of the motor, there would be a continuous movement of the rail as the cars successively passed over the suspended portion, which movement would be imparted to the bar 82, but be partly compensated by means of the spring 88 and the slowness of the pendulum movement of the bar 81. It can of course be imagined that an exceedingly heavy load or weight could be raised by this mechanism, as the system of levers is actuated by the immense weight of the passenger or freight coach or car, and while but very little movement is imparted to the winding-up mechanism each car twice actuates this winding mechanism, and it is found that the device is wound up ever so much more than is required to unwind it, and hence the main shaft D has to be provided with a friction-clutch to act as every weight was wound up to its highest position, it occasionally occurs that a train would pass over, and while releasing it once would wind up ten times in excess of the movement lost in actuating the desired signal.

Now, having thus described my said invention, what I claim as new, and desire to secure by United States Patent, is—

1. The combination with a supporting-shaft of a spring adapted to normally rotate said shaft in one direction, a ratchet upon said shaft, a pawl adapted to rotate said shaft in a direction opposite to said spring, a partially-suspended bar and connection between said partially-suspended bar and pawl, a train of gearing in connection with said main supporting-shaft, a controlling mechanism working in conjunction with said train of gearing, said controlling mechanism being arranged to stop or start said train of gearing, a second partly-suspended bar, connection from said second suspended bar to said controlling mechanism, said partially-suspended bars being dipped or bent by a load passing over the same, the first dipping of the bar being adapted to release said power-motor, the second dipping of the bar being adapted to wind said mechanism, all substantially as and for the purpose set forth.

2. The combination with a main supporting-shaft, of a clutch-ratchet secured to said shaft, a spring secured to said shaft, a gear upon said shaft secured to said spring, a train of gearing connected to said gearing, releasing and return levers working in connection with said train of gearing, a pawl working against said ratchet, a spring-bar adapted to be deflected at three points by means of a passing load, a pivoted lever below said first dipping-point, a strand connecting said pawl and lever to said releasing-lever, a lever pivoted below said second dipping-point, a strand leading to said pawl in connection with said ratchet, a pivoted lever below said point in connection with said return-lever, said instrumentalities being adapted to operate substantially as and for the purpose set forth.

3. The combination with a main supporting-shaft, of a power-spring secured to said shaft, said power-spring in unwinding being adapted to rotate said shaft in one direction, a clutch-ratchet secured to said shaft adapted to rotate said shaft to wind said spring, duplex pawls adapted to actuate said ratchet, one pawl working in descending and the remaining pawl working in ascending, a partly-suspended spring-rail adapted to be dipped out of alinement by means of the passing load, a pivoted lever below said rail adapted to be actuated by the dipping of said rail, said pivoted lever being secured by means of a strand to said duplex pawls, a train of gearing secured to said main shaft and incised locking-disks, a lever working upon said disks to lock said train of gearing in one position, said locking-lever being connected by means of a strand to said pivoted lever, a second locking-disk forming part of said train of gearing, a second locking-arm working in conjunction with said second locking-disk, a second partly-suspended spring-dipping bar, a bar connecting said second dipping bar to said second locking-arm, and a power of transmission of said train of gearing, all of said effects being combined and adapted to operate substantially as and for the purpose set forth.

4. The combination with a main shaft, said

shaft being adapted to wind a power mechanism, a ratchet upon said shaft, a pawl working said ratchet, a train of gearing in conjunction with said shaft, a bar of transmission extending from said train of gearing, a releasing and locking mechanism adapted to control said train of gearing, a bar, a strand connecting said bar to said pawl, said pawl being actuated by deflection of said bar, all of said effects being arranged and adapted to operate substantially as and for the purpose set forth.

5. The combination with a main shaft, of a power mechanism secured to said shaft, a ratchet secured to said shaft, a pawl adapted to wind said ratchet, a train of gearing in connection with said main shaft, a regulating-wheel within said train of gearing, locking and releasing levers adapted to work in conjunction with said regulating-wheel, a power of transmission extending from said train of gearing, a bar adapted to deflect by means of a moving load, a strand connecting said deflecting-bar to said pawl to wind said ratchet, a strand connecting said releasing-lever to said deflecting-bar, a second deflecting-bar, an electromagnet within the circuit adapted to actuate said locking-lever, said electromagnet being within a broken circuit, the deflecting of said second bar being adapted to close said open circuit to actuate said locking-lever, all of said instrumentalities being arranged substantially as and for the purpose set forth.

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

HENRY HOESCHEN.

Witnesses:
H. H. HARDER,
G. W. MATTINGER.