(No Model.) 2 Sheets—Sheet 1.

B. C. ROWELL.

SPEED CONTROLLING APPARATUS FOR RAILWAYS.

No. 584,962. Patented June 22, 1897.

Fig. 1.

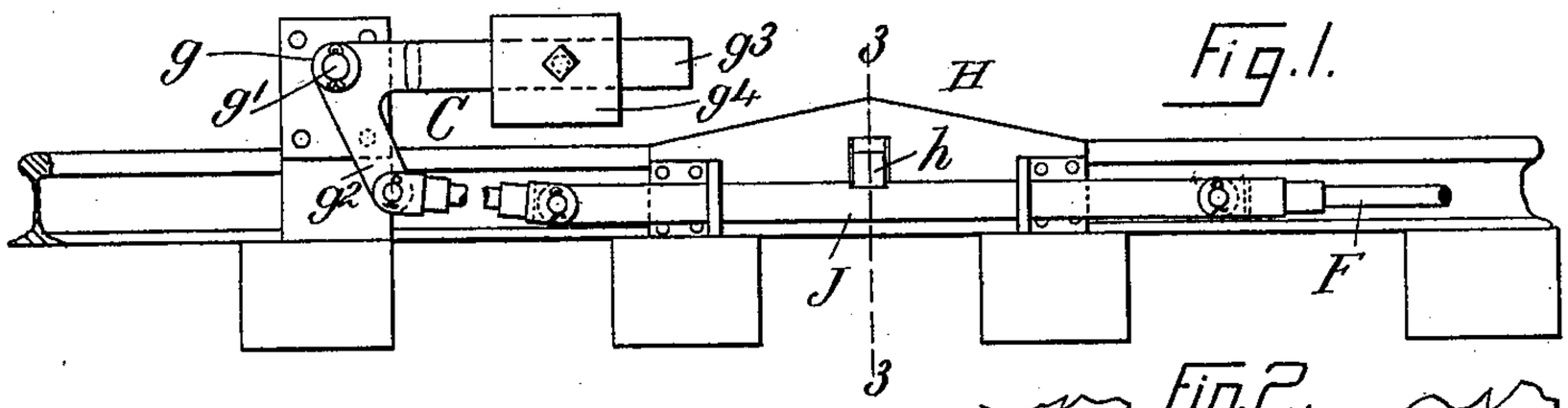

Fig. 2.

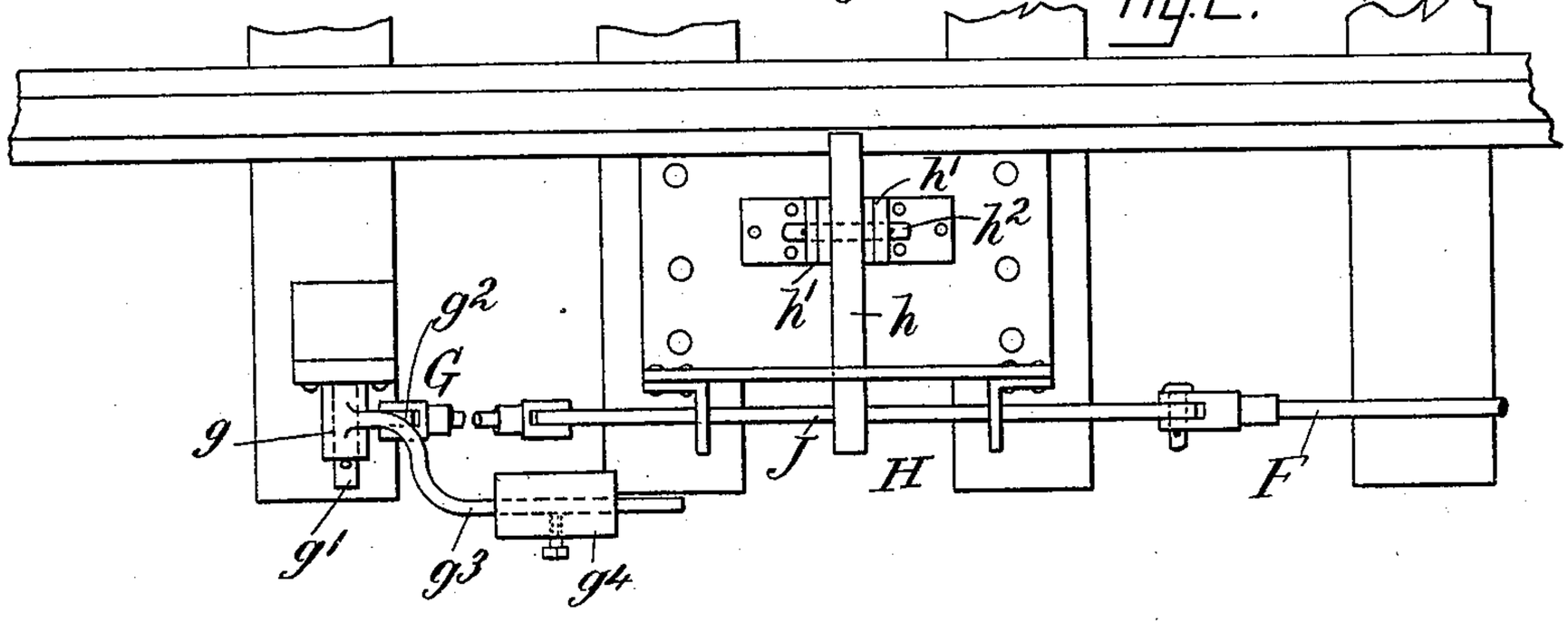

Fig. 3.

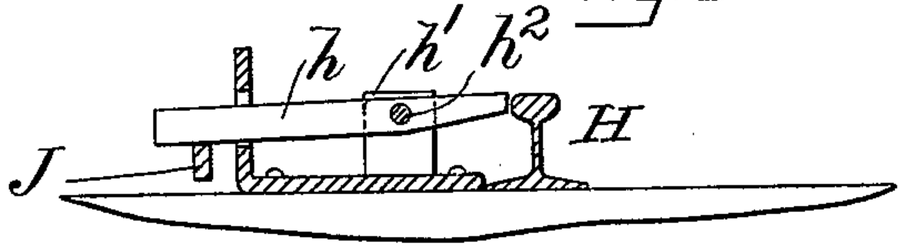

Fig. 4.

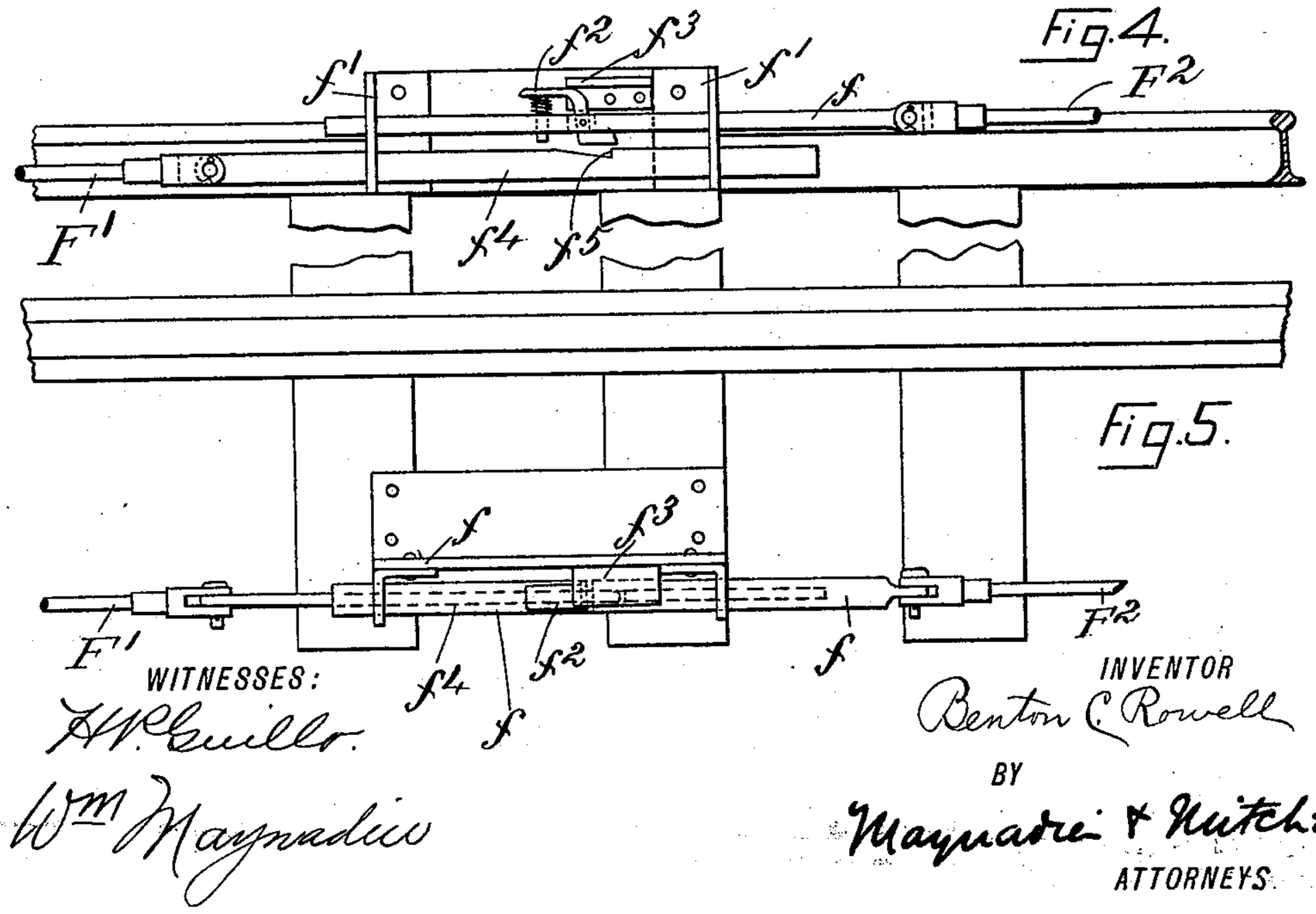

Fig. 5.

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(No Model.) 2 Sheets—Sheet 2.

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SPEED CONTROLLING APPARATUS FOR RAILWAYS.

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Fig. 8.

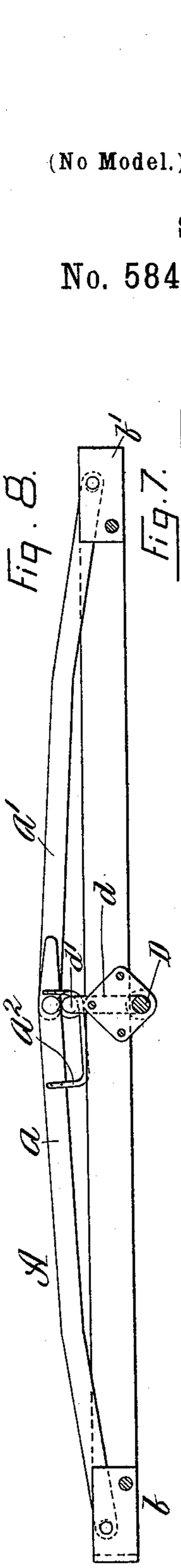


Fig. 7.

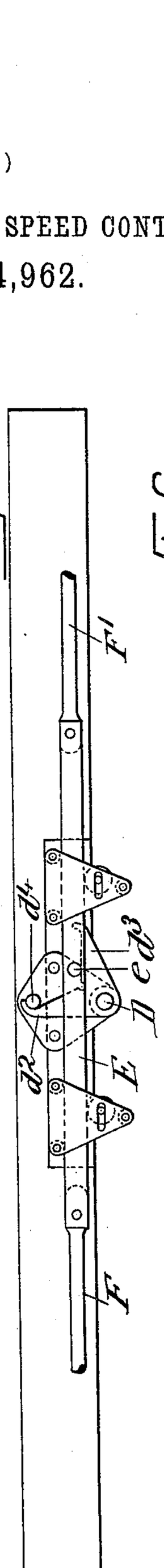


Fig. 6.

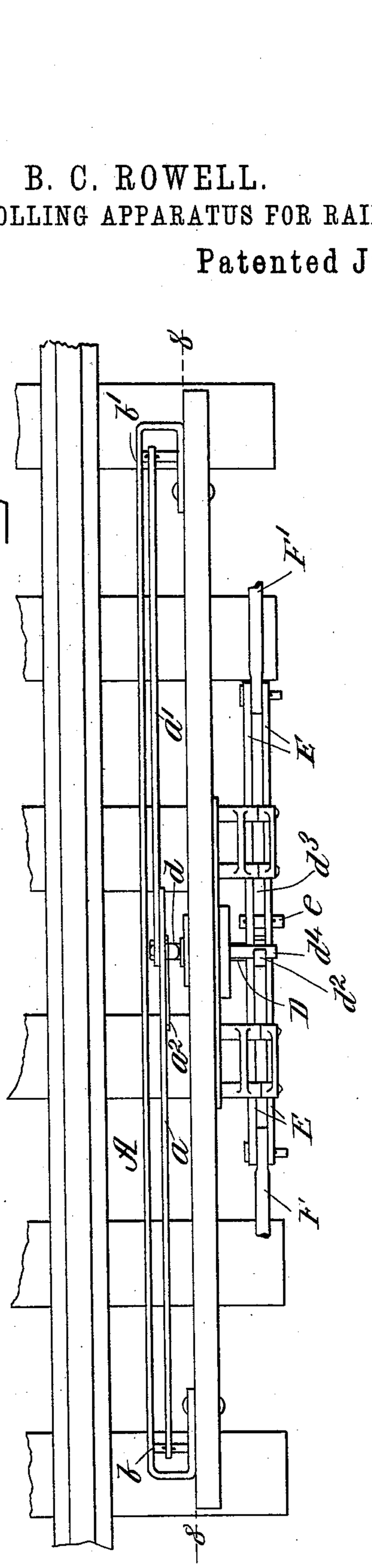
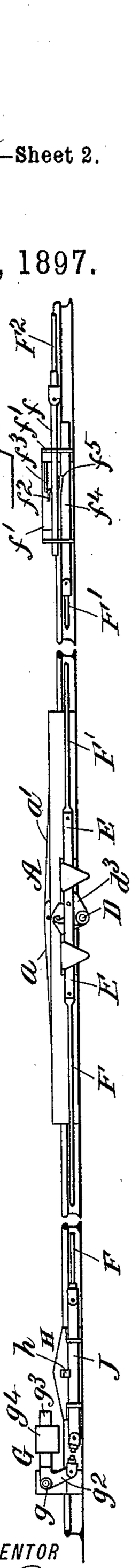


Fig. 9.



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UNITED STATES PATENT OFFICE.

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SPEED-CONTROLLING APPARATUS FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 584,962, dated June 22, 1897.

Application filed July 6, 1896. Serial No. 598,158. (No model.)

To all whom it may concern:

Be it known that I, BENTON C. ROWELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Speed-Controlling Apparatus for Railways, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the trip and power mechanism. Fig. 2 is a plan of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is an elevation of the setting mechanism. Fig. 5 is a plan of Fig. 4. Fig. 6 is a plan of the safety-stop. Fig. 7 is an elevation of Fig. 6. Fig. 8 is a section on line 8 8 of Fig. 6. Fig. 9 shows, upon a reduced scale, the apparatus as a whole.

The object of my invention is to provide a mechanism which shall insure that the train shall not pass over a given section of track at a greater than a predetermined average speed, so that, for example, the approach to a station or to a bridge shall never be made at a rate of speed greater than that deemed desirable, and if the engineer disregards his instructions and does not slow down the train will be automatically stopped. To accomplish this, I employ as part of my mechanism safety-stop A, such as is fully described in Letters Patent of the United States No. 217,144, dated July 1, 1879, and No. 444,962, dated January 20, 1891. This safety-stop is formed by two arms a a', each of which is hinged at one end to a part of the frame of the mechanism (marked b b') by a bolt in a slot in the end of each arm, the slot allowing a certain amount of play necessitated by the adjustment of the arms. The other end of each arm is connected by a pin to the other arm. A rock-shaft D is arranged beneath the connected ends of arms a a', the rock-shaft having an arm d at its inner end and a wrist-pin d' on that arm. This wrist-pin projects under the connected ends of the arms a a' and is also within a slot formed by a strap a^2, fast to arm a. Fast to rock-shaft D are two arms d^2 d^3, with which a pin e, fast to link E, is alternately in contact. The link E connects the ends of rods F F'. It will now be obvious that endwise movement of the rods F F' will rock the shaft D and raise or lower the safety-stop to or out of operative position, as the case may be. A stop-pin d^4, fixed to the frame of the apparatus, limits the movement of the rock-shaft D by the bringing up of the arms d^2 d^3 against the stop-pin. (See Fig. 7.) This safety-stop apparatus is placed in position at the exit end of the section of track which the speed-controlling apparatus as a whole controls. At the entrance to this section is placed a power mechanism C and an automatic trip H.

The power mechanism, which may be of any convenient form, is shown in the drawings as a hub g on stud g' and having two arms, one of which, g^2, is connected to link J, and thus to rod F, and the other arm of which, g^3, carries a weight g^4, which may be adjusted upon the arm g^3 to vary the power exerted by the weight.

The trip mechanism is illustrated in Figs. 1, 2, and 3 and consists of the lever h, mounted upon a suitable standard h' and moving upon a fulcrum-pin h^2. The short end of this lever h is suitably arranged with respect to the track to be depressed by a passing wheel throwing up the long end of the lever, which projects through the frame of the apparatus and engages a notch in link J. (See Figs. 1, 2, and 3.)

Figs. 4 and 5 show resetting mechanism.

Rod F^2 is connected to a second rod f, which reciprocates in a frame f' and carries a spring-catch f^2, which in one position is operated by the shoulder f^3. Directly beneath rod f and also reciprocating in frame f' is a rod f^4, having a notch f^5, adapted to be engaged by the catch f^2. The rod f^4 is connected at one end to rod F'.

The operation is as follows: Suppose the apparatus to be set as shown in Fig. 9, the arms of safety-stop A being raised to stop the train and rods F F' being moved to the right until spring-catch f^3 is released, as in Fig. 4, and rod F, held by lever h, engaging the notch in link J, as in Figs. 1, 2, and 3, for the weight g^4 of the power mechanism G is raised as rod F is drawn to the right and the lever h of the trip mechanism engages with the notch in link J. Upon the other side of the safety-stop A the resetting mechanism is in the position shown in Figs. 4 and 5. Suppose, now, that a train enters the section at the left of Fig. 9. Upon passing trip

mechanism II the trip-lever will be thrown out of engagement with the notch in link J, and weight g^4 will then be left free to draw rods F F' f^4 to the left, lowering safety-stop A out of its stopping position. (See Fig. 7.) The time required to effect this change may be regulated by varying the weight g^4 or its position upon lever g^3. To reset the mechanism, the rod F' is moved to the left until the spring-catch f^2 engages notch f^5. Rod F^2 is then drawn to the right, pulling with it rods f^4 F', link E, rod F, and link J and throwing rock-shaft D to reset safety-stop A by the action of pin *e* against arm d^3 until motion to the right is arrested by the reëngagement of lever *h* with J—that is, drawing the rods and links to the right raises the weight g^4, and as the notch in the upper edge of link J comes under the end of lever *h* lever *h* drops into it and locks the apparatus in this set position until the lever is tripped by the wheels of a train. As the lever *h* locks the mechanism in its set position the catch f^2 comes under shoulder f^3 and is disengaged from the notch f^5.

The operation of my invention depends, it will be clear, upon the relation subsisting between the distance between the trip H and the safety-stop A and the time occupied by the weight g^4 in drawing the safety-stop to its inoperative position. Suppose the distance between the trip H and the safety-stop A to be fifteen feet and the adjustment of the weight such that one second is occupied in drawing the safety-stop from its operative to its inoperative position. It will be obvious that if the train is proceeding at a rate of speed not exceeding fifteen feet per second, or ten miles per hour, the safety-stop will be lowered to the inoperative position during the time occupied by the train in traversing the fifteen feet, while, upon the other hand, if the train is proceeding at a rate of speed much in excess of ten miles per hour it will traverse the fifteen feet before the safety-stop has been lowered to its inoperative position and the train will be brought to a standstill by the action of the safety-stop.

What I claim as my invention is—

1. The speed-controlling apparatus above described consisting of a lever at the entrance of the section over which the speed is to be controlled and operated by the train; a detent controlled by that lever; a connecting-rod controlled by that detent; a counterweight to move the connecting-rod in one direction when released by the detent; means to move the rod endwise against the force of the counterweight; and a safety-stop at the exit of the section and set at "danger" when the connecting-rod is held by the detent all organized and combined to stop the train automatically if its speed be too great and to let it pass if its speed be not too great.

2. In combination arms *a a'*; rock-shaft D; its arm *d*; its arms d^2 and d^3; stop d^4; and pin *e* between the arms d^2 d^3 fixed upon a longitudinally-moving rod to rock and lock the shaft when the rod is reciprocated, substantially as described.

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