(No Model.) 2 Sheets—Sheet 1.

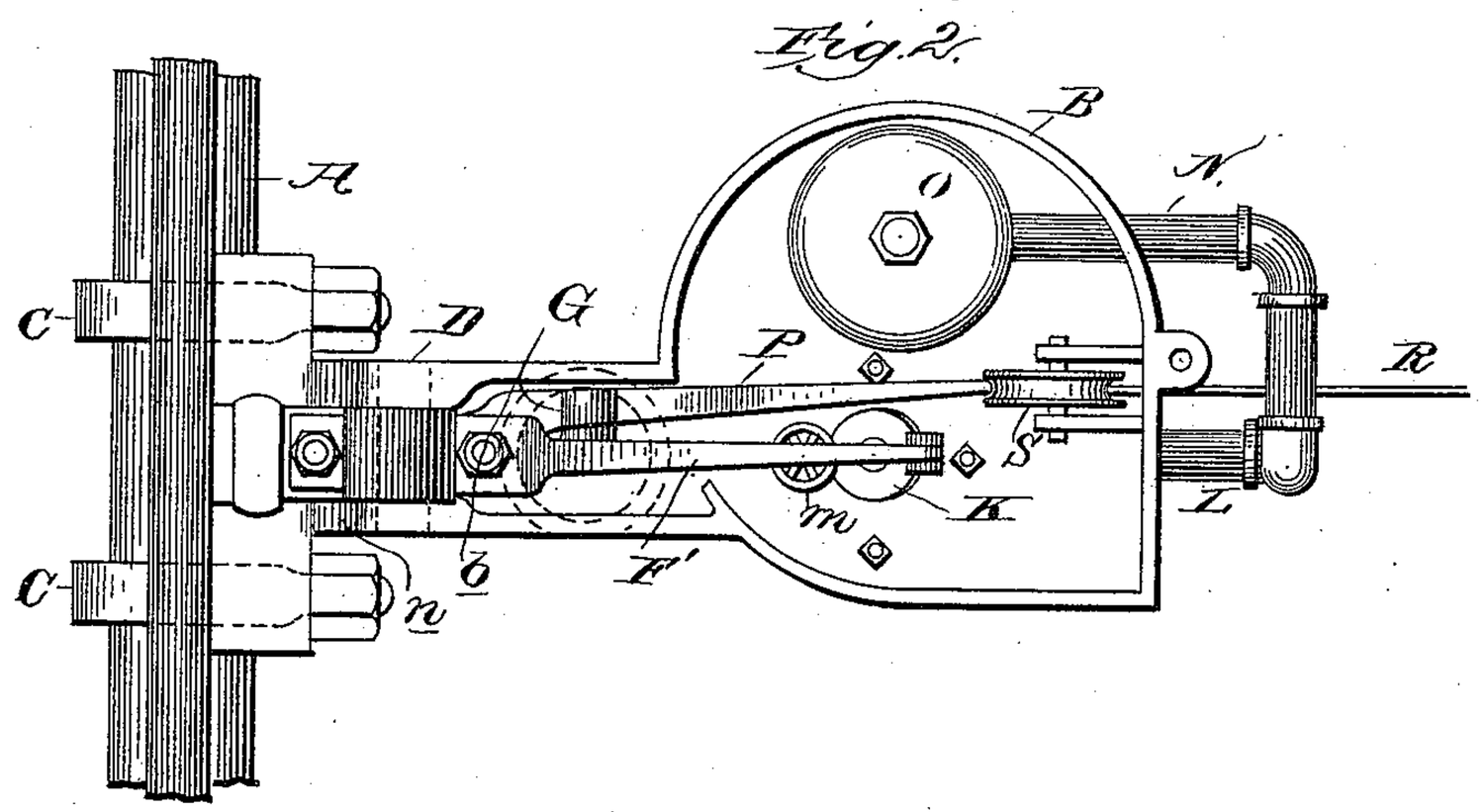
E. FONTAINE.

RAILWAY TIME SIGNAL.

No. 438,841. Patented Oct. 21, 1890.

Fig. 1.

Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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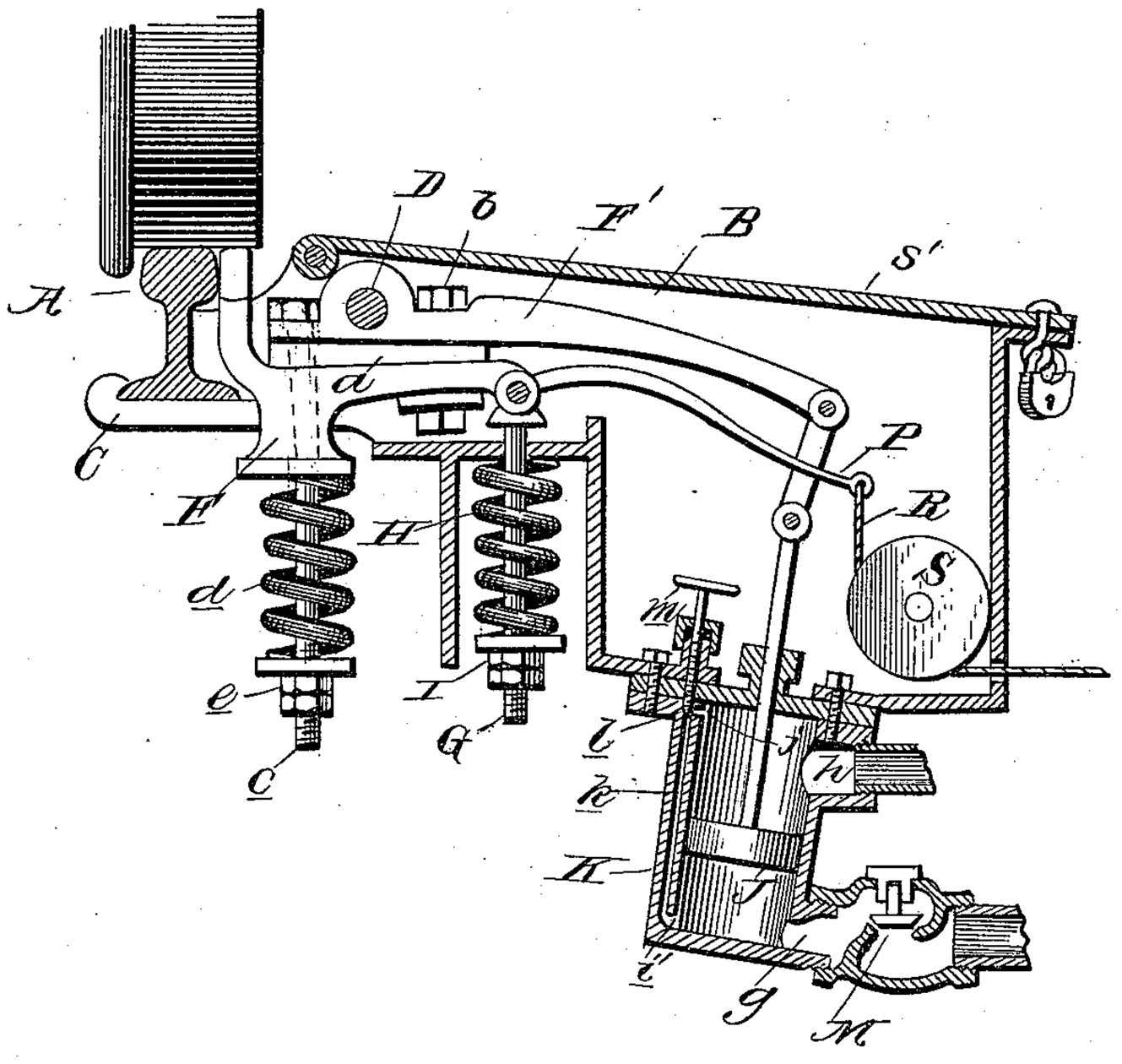
Fig. 3.



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UNITED STATES PATENT OFFICE.

EUGENE FONTAINE, OF AUBURNDALE, OHIO.

RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 438,841, dated October 21, 1890.

Application filed December 10, 1889. Serial No. 333,292. (No model.)

To all whom it may concern:

Be it known that I, EUGENE FONTAINE, a citizen of the United States, residing at Auburndale, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Actuating Devices for Railway-Signals, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to devices for actuating signals, either visual or audible, through the wheel of a passing train.

In attempting to transmit the blow of a locomotive-wheel to a signal two serious difficulties are encountered. If the part struck by the wheel is suffered to rise freely after being depressed by each wheel, (so that it is struck by all or nearly all the wheels of one side of the train,) the excessive jar destroys the device in a short time. On the other hand, if the device is connected with mechanism to prevent its rising quickly after being depressed (such as a dash-pot or other equivalent device) the inertia of the moving parts and their resistance to rapid motion is so great that while the machine will operate regularly and easily in the case of a slowly-moving train the shock from a train running at high speed (say sixty miles an hour) is so instantaneous that the device is soon destroyed. Even the inertia of the moving parts of a very light signal apparatus—such as is shown in my two former patents—is sufficient to destroy the actuating mechanism in a short time under the impulse of fast-running trains if a rigid connection is made. I have succeeded by the device illustrated in the accompanying drawings in obviating both these difficulties and in providing a signal which will be struck by very few wheels of any train, and is very durable and reliable.

Figure 1 is a central vertical section of my device, and Fig. 2 is a plan view thereof. Fig. 3 is a similar section as Fig. 1, with the parts in the relative positions when actuated by the wheel of a fast-moving train.

A represents one of the rails of a track.

B is a housing supported in any suitable manner in proximity to the rail, and may be firmly secured thereto by means of clamping-bolts C, engaging the foot of the rail, or in any other suitable manner.

F′ represents a lever fulcrumed on a pin D, which is carried in the housing B, and the long arm of said lever is connected by a link with the piston-rod of a piston J in the dash-pot K.

F represents a lever whose short arm *f* is in close proximity to the rail A and extends normally slightly above said rail, while its long arm P is a spring for a portion of its length and is connected with a chain or cord or cable R, which leads around the pulley S and is connected with the signal mechanism of any desired kind. The lever F is connected wtth the lever F′ by a bolt *c*, which passes through the short arm of lever F′ and loosely through the short arm of lever F, and is encircled by a coiled spring *d*, one end of which bears on the under side of lever F, while the the other end bears on a collar held by the jam-nuts *e* on bolt *c*, so that the levers F and F′ are at this point held together only by the elastic force of the spring *d*.

a represents a cushion, of rubber or resilient material, interposed between the levers F and F′.

b represents a bolt, which passes loosely through the levers F and F′ on the long-arm side of the fulcrum of said levers for the purpose of holding said levers together, yet permitting the lever F under certain circumstances to play slightly on bolt *b*. A circulating-pipe L connects a port *g* at or near the bottom of the cylinder with the port *h* at or near the top of the cylinder, and this circulating-pipe is provided with a check-valve M. A supply-pipe N connects the circulating-pipe with a reservoir O, placed in any convenient position within the housing. Two minor ports *i* and *j* are formed at or near the bottom and top of the cylinder respectively, and these are connected by a circulating passage or pipe *k*, which is controlled by an adjustable valve *l*, the handle *m* of which is in accessible location for being conveniently adjusted. A cover S′ is hinged at *n* to the housing and secured by a lock *o*.

The cylinder and circulating-passage connected therewith are filled with glycerine, oil,

or other suitable fluid not liable to freeze, a suitable supply of it being maintained in the reservoir O, from which it freely communicates into and through the circulating pipes and passages into the cylinder. The valve *l*, controlling the circulation between the ports *i* and *j*, is then slightly opened more or less, as will be found necessary for the proper operation of the parts.

The operation of my invention is as follows: If the short arm *f* of lever F be depressed comparatively slowly, so that the inertia of the moving parts becomes unimportant, and so that the liquid in the dash-pot will transfer from the upper to the lower side of piston J during the time in which the short arm of lever F is descending, the two levers F and F′ swing on the fulcrum D as if they were a single lever, and the long arm P of the lever F operates the signal mechanism, the resilient character of said arm preventing undue shock. After the long arm of lever F′ has been raised the check-valve M closes and holds the piston J of the dash-pot K in an elevated position, thus holding down the short arm *f* of lever F and permitting said short arm *f* to rise only as fast as the liquid below the piston J will run through the passage *k*, and this of course can be governed by the valve *l*, which can be adjusted by the valve-stem *m* to any desired degree of opening. The spring H now draws the long arm of lever F downward, thus causing the piston J to gradually descend and carrying downward the long arm of the levers F and F′; but if the short arm of lever F be struck by the wheel of a train running at a high rate of speed and depressed very suddenly the operation of the device is modified as follows: The spring *d* yields to the force of the blow, as shown in Fig. 3, thus converting this spring and its sustaining-bolt *c* into a fulcrum for the lever F; but as this is a yielding fulcrum the long arm P of lever F is not moved upward in proportion to the relative lengths of the two arms of said lever, and the shock of moving the signal is thus lightened. At the same time the bolt *c* draws downward on the short arm of lever F′, and the long arm of lever F presses upward on the cushion *a*, thus raising the long arm of lever F′ and the piston J of the dash-pot K, but to a less extent and more slowly than would be the case if the levers F and F′ were rigidly connected together or were one lever. As the wheel passes beyond the short arm *f* of lever F, the reaction of spring *d* forces said short arm *f* upward until it comes in contact with the cushion *a*, when its upward course is checked because the dash-pot K is now holding the long arm of lever F′ in a raised position. If this permits the short arm *f* of lever F to rise above rail A, the next wheel again depresses said short arm, (but with much less violence, owing to its lowered position,) and the foregoing operation is repeated until the long arms of both levers F and F′ are raised to their highest working elevation by a series of comparatively easy impulses, instead of by a sudden and violent shock, and both levers are then returned to their normal positions by the above-described action of spring H and dash-pot K.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An actuating device for a railway-signal, consisting of a lever having one end in position to be struck by a passing train, and elastically connected with its fulcrum, substantially as and for the purposes set forth.

2. An actuating device for a railway-signal, consisting of a lever having one end in position to be moved by a passing train, and having a shifting fulcrum, substantially as and for the purposes set forth.

3. An actuating device for a railway-signal, consisting of a lever having one end normally in position to be struck by a passing train, a main fulcrum on which said lever vibrates, and a yielding fulcrum indirectly connected with the main fulcrum, substantially as and for the purposes set forth.

4. In a device for actuating a railway-signal, a pivoted lever having one end connected with a dash-pot or its equivalent and a lever having one end normally in position to be struck by a passing train, and secured to said pivoted lever by an elastic connection, substantially as and for the purposes set forth.

5. The combination of a pivoted lever F′, a dash-pot K, and a lever F having one end in position to be moved by a passing train, and secured to lever F′ by a spring-connection *c d*, and an interposed cushion *a*, substantially as and for the purposes set forth.

6. In a device for actuating a railway-signal, a lever having an elastic connection with its fulcrum and with the signal mechanism, substantially as and for the purposes set forth.

7. In a device for actuating a railway-signal, a double lever, one part of which is pivoted on a fulcrum and connected with a dash-pot or its equivalent, the other part being elastically connected therewith and extending into position to be struck by a passing train, and a connection from either of said levers to the signal mechanism, substantially as and for the purposes set forth.

In testimony whereof I affix my signature, in presence of two witnesses, this 19th day of November, 1889.

EUGENE FONTAINE.

Witnesses:
M. B. O'DOGHERTY,
JAMES WHITTEMORE.