(No Model.) 2 Sheets—Sheet 1.

J. CHANDLER.

MEANS FOR STOPPING RAILWAY TRAINS.

No. 273,465. Patented Mar. 6, 1883.

Fig. 2.

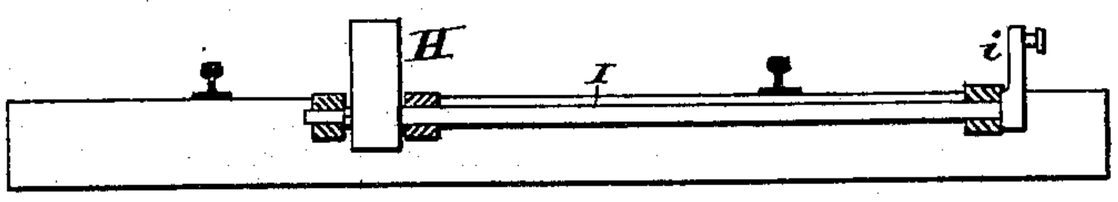
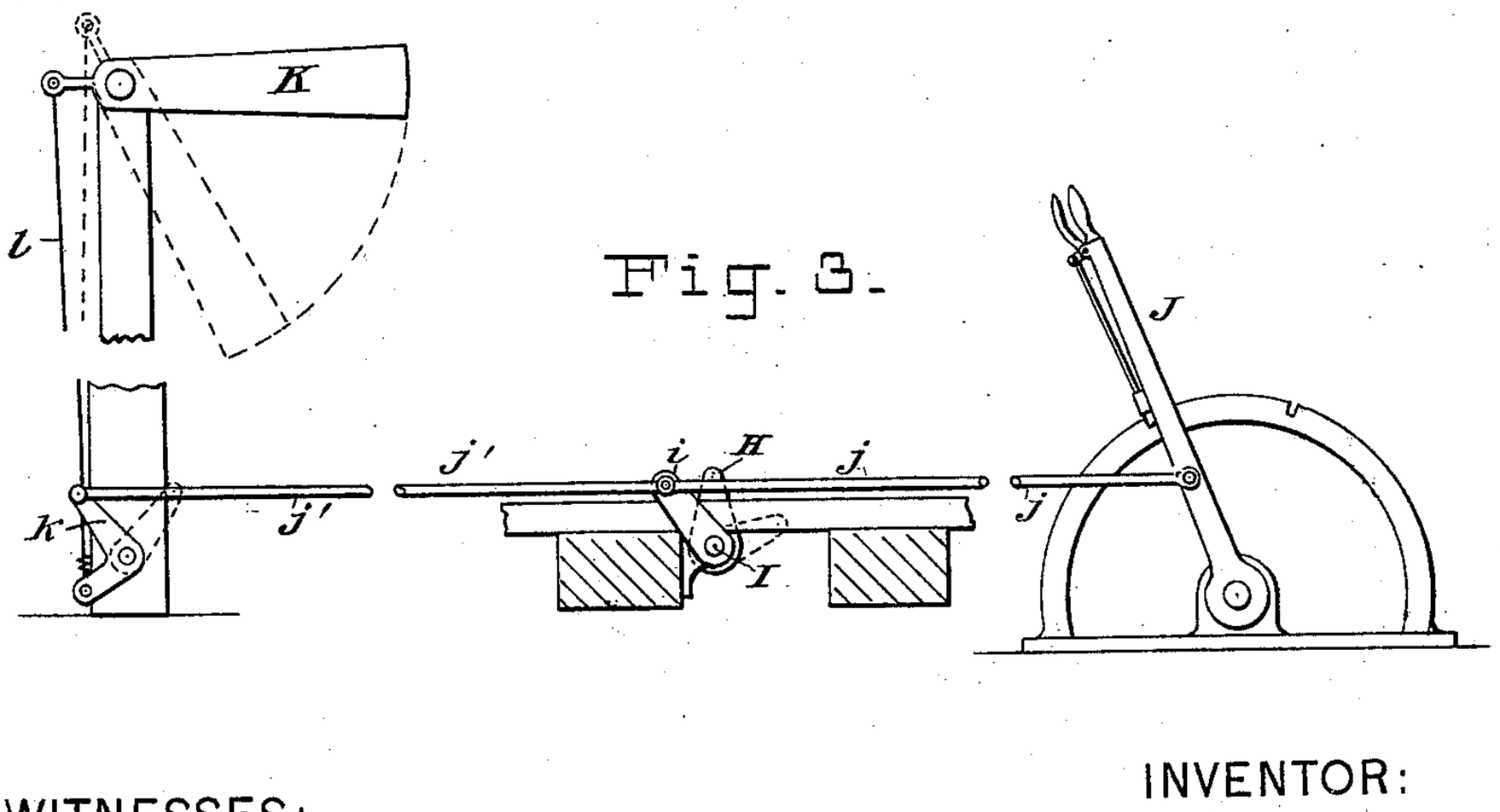


Fig. 1.

Fig. 3.



WITNESSES:

E. B. Bolton

Geo. H. Fraser.

INVENTOR:

John Chandler

By his Attorneys,

Burke, Fraser & Bennett

(No Model.) 2 Sheets—Sheet 2.

J. CHANDLER.

MEANS FOR STOPPING RAILWAY TRAINS.

No. 273,465. Patented Mar. 6, 1883.

Fig. 4.

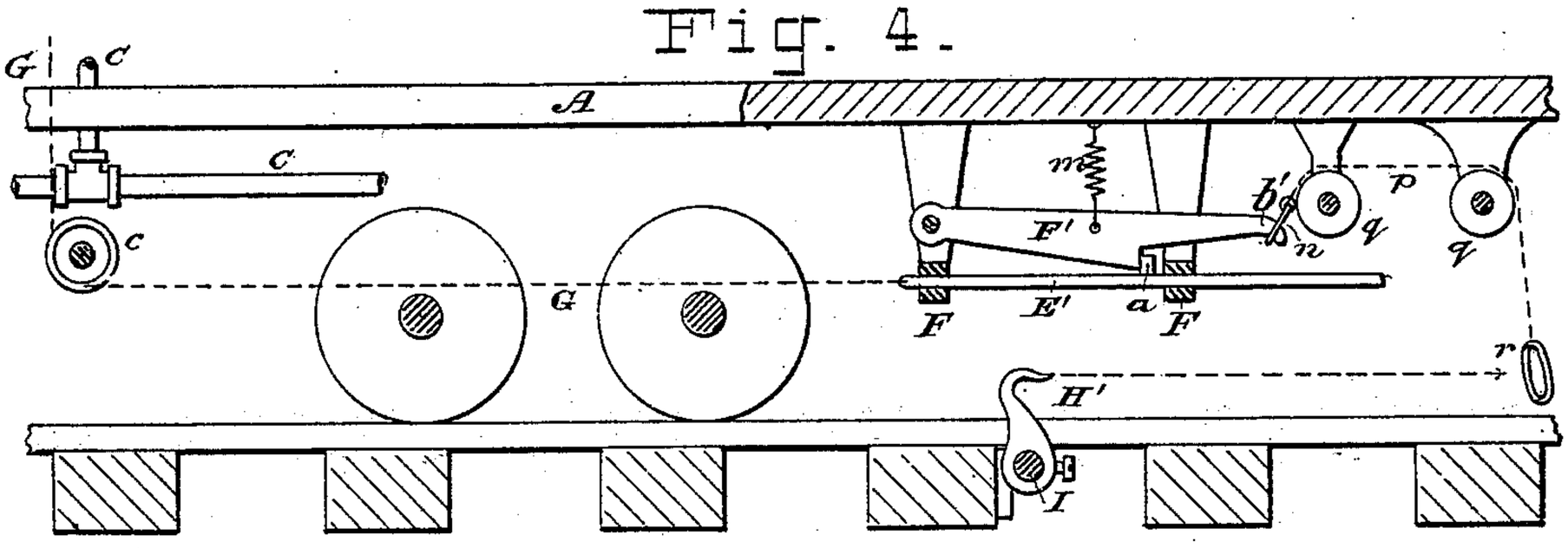


Fig. 5.

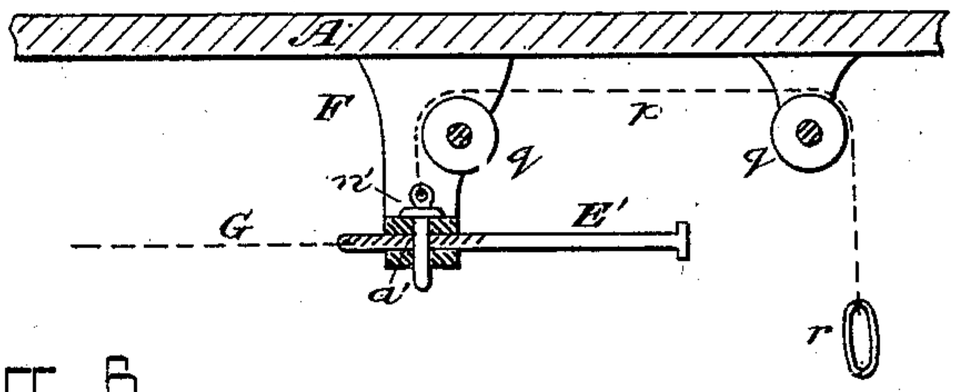
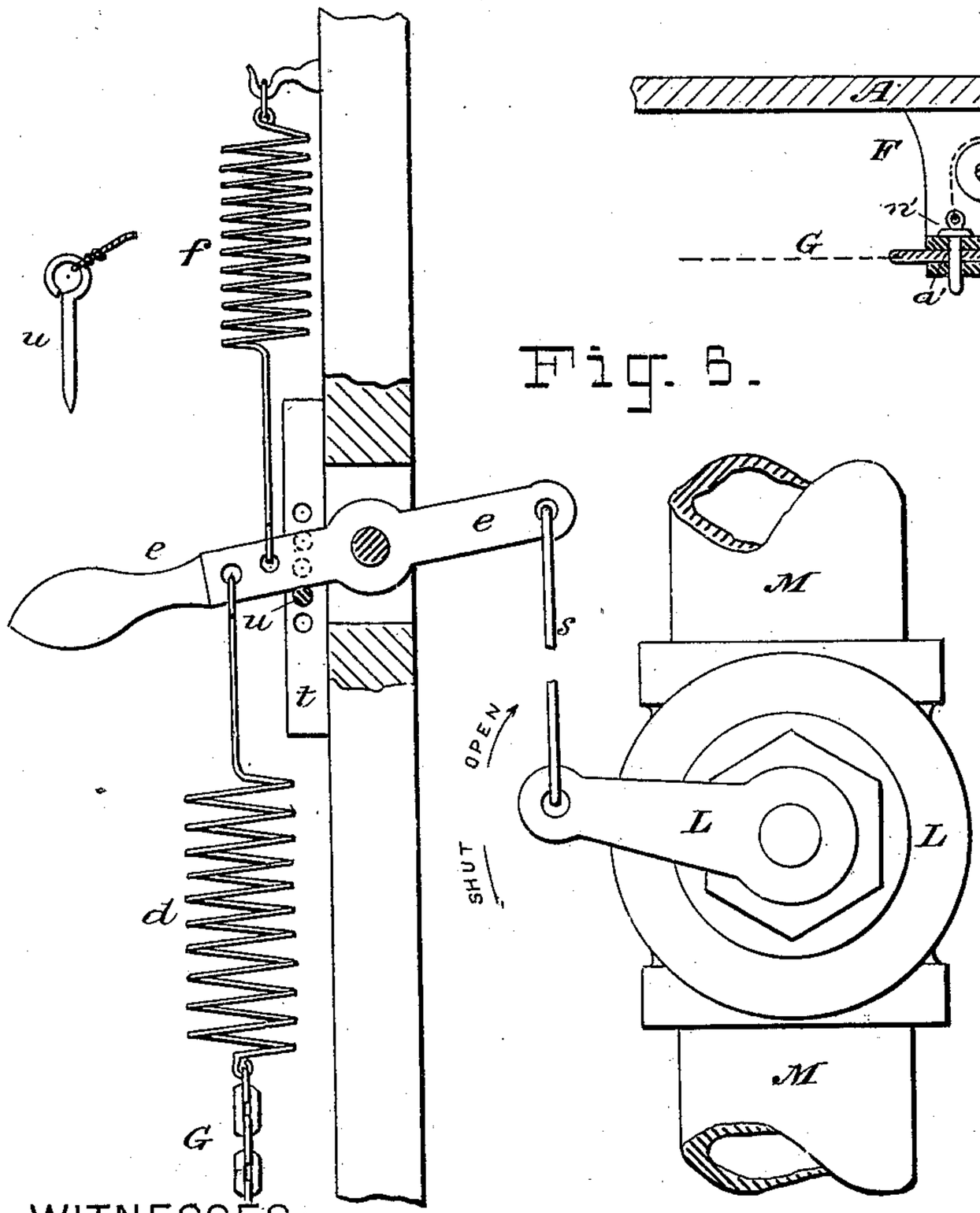


Fig. 6.



WITNESSES:

E. B. Bolton

Geo. H. Fraser.

INVENTOR:

John Chandler,

By his Attorneys,

Burke, Fraser & Connolly

UNITED STATES PATENT OFFICE.

JOHN CHANDLER, OF BROOKLYN, NEW YORK.

MEANS FOR STOPPING RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 273,465, dated March 6, 1883.

Application filed August 25, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHANDLER, a resident of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Means for Stopping Railway-Trains, of which the following is a specification.

My invention is principally designed to be used, in connection with the block system of signals on railways, to enforce obedience by the engineer to the indications of the semaphore. The arrangement is such that when a semaphore stands at "safety" an approaching train may freely pass, but when it stands at "danger" the train, if it is not stopped by the engineer, will be automatically stopped in spite of any action that the engineer may take. Thus the signalman has it in his power to stop any train passing his block—a feature of my invention that will be especially useful in case of a runaway locomotive, or of a train that has got beyond the engineer's control.

In the accompanying drawings, Figure 1 is a vertical section of one end of a railway-car and of the portion of track beneath it, showing one method of carrying my invention into practice. Fig. 2 is a transverse section of the track, cut on the line 2 2 in Fig. 1. Fig. 3 is a side elevation of the track and semaphore apparatus. Fig. 4 is a view answering to Fig. 1, but omitting some parts and showing others in modification. Fig. 5 is a fragment of Fig. 4, showing a further modification of certain parts; and Fig. 6 is a side elevation, partly in vertical section, of the throttle-valve mechanism on the locomotive.

I will first describe Figs. 1, 2, and 3. The car A is provided with the usual air, steam, or vacuum brakes, of which B is the cylinder, C is the train-pipe, and D is the conductor's valve. These I have shown as of the construction employed in the Westinghouse system of air-pressure brakes, omitting all details which do not immediately pertain to my invention, as the details of this system are well known. In this system the brakes are applied automatically by means of springs, being normally held off by the pressure in the pipes and cylinders, but applying themselves whenever this pressure is sufficiently reduced. The conductor's valve D is an escape-valve to enable the conductor or brakeman to reduce the pressure and apply the brakes in case of emergency. It will be understood that my invention may be applied to any other system of automatic brakes, whether working by fluid-pressure or otherwise, by suitably modifying its construction or connections, as will be readily understood.

Beneath the car I mount a trip-lock or trigger, which in Fig. 1 consists of a bar, E, carried in fixed guides F F, having a shoulder, *a*, which, when the lever is set, takes against one of the guides, and having also a downwardly-inclined tail, *b*. To the front end of this lever is connected a chain or rope, G, which extends forward, passes over a sheave, *c*, and extends up through the front platform, where it is connected, through a spring, *d*, with the lever *e* of the conductor's valve D. Another spring, *f*, is arranged above the lever *e*, and is connected thereto through a rod, so as to pull upon the lever in opposition to the spring *d*. The latter, however, is the stronger of the two, so that when the trip-lever E is set it pulls downward on the lever *e* and holds the valve D closed. If the conductor requires to open the valve D, he has only to pull up on the lever *e* with a force sufficient to overcome the superior tension of the spring *d*.

On the track, at or near the block signaling-point, is a cam or dog, H, which may be elevated or depressed at will by the signalman, or automatically by electric or other means. When all is safe it is depressed, but in case of danger or obstruction ahead it is elevated, and when elevated it stands in the way of the inclined arm *b* of the lever E, so that, when the next train passes, the lever E on the car A will strike it, and be thereby thrown up until the shoulder *a* clears the guide F, whereupon the spring *d* will draw the lever forward into the position shown in dotted lines, when its pin *g* catches against the guide F and stops its further movement. The tension on the spring *d* being thus relieved, the spring *f* is permitted to act, and it pulls up the lever *e* and opens the valve D, thereby permitting the brake-pressure to escape, applying the brakes and stopping the train. When the obstruction on the block ahead is removed a trainman will go beneath the car and pull the lever E back to

the position shown in full lines, thereby closing the valve D and enabling the engineer to pump up the pressure and release the brakes.

The spring *d* may be arranged at any point along the chain G, between the trip-lever E and the valve-lever *e*, and the chain G should be provided with a turn-buckle, *h*, to take up slack.

The cam or projection H may be arranged to be raised or lowered bodily; but I prefer to fix it on a shaft, I, extending across the track beneath the rails, as shown in Fig. 2, and having on its end, at the side of the track, a crank-arm, *i*, which may be engaged by a rod, *j*, which extends along the track and terminates in the signal-house, where it is connected to the signaling-lever J, as shown in Fig. 3. The semaphore K, Fig. 3, should also be worked from the same lever through a supplementary rod, *j'*, which extends from the crank *i* to the semaphore-pole, where it communicates motion to the semaphore through a bell-crank, *k*, and wire *l*, or by other suitable means. The arrangement shown is in case the cam H is located between the signal-house and the semaphore; but any operative connection may be employed, the essential being that when the semaphore stands at "danger" the cam H shall be turned up, and when the semaphore is at "safety" the cam is turned down.

Fig. 4 is identical with the lower part of Fig. 1, except that certain parts are of modified construction. The chain G is connected to a slide-rod, E', sliding longitudinally of the car in guides FF, and having a projecting-pin, forming a shoulder, *a*. When set as shown, this shoulder catches against a shoulder on a trip-lever, F', which has a spring, *m*, pulling up on it with sufficient force to lift its weight, but not to lift it against the pressure of the shoulder *a*. The tail *b'* of the lever F' is slightly hook-shaped, and around it a ring, *n*, is loosely slipped. From this ring a chain, *p*, passes back over two sheaves, *q q*, and its end hangs down and bears a large ring, *r*, which hangs near the track. On the track, in place of the cam H, is a hook, H', which may be turned up or down, and which, when up, stands directly in the path of the ring *r*, so that when the train is passing it will catch into that ring, thereby pulling the chain *p*, jerking up the lever F' until the ring *n* slips off, and the entire chain *p*, with its two rings, will be pulled from the car and left on the track attached to the hook H'. The lever F', in being jerked up, releases the shoulder *a*, which permits the slide E' to slip forward, slacks the chain G, and applies the brakes. Before starting the train the chain *p* is replaced and the trip again set.

Fig. 5 is a fragment of Fig. 4, the lever F' being dispensed with and the slide E' having a hole, *a'*, which, when the slide is pulled back to place in setting, coincides with holes above and below in the frame F, and through these holes a pin, *n'*, is dropped. The end of the chain *p* is fixed to this pin, so that when the chain is pulled out by the hook H' the pin *n'* is first withdrawn, thereby releasing the slide E' and applying the brakes.

It will be readily understood that the stopping of a train by my apparatus will be, in practice, of very rare occurrence, and that it will, in fact, take place only when all the other safeguards have failed or been disregarded. It will be sufficient to provide the locomotive or one car on the train with my automatic devices for applying the brakes, although it is best that every car should be so provided.

In Fig. 6 is shown the means I have devised for automatically shutting off the steam from the engines on the locomotive. The trip-lock apparatus beneath the locomotive or tender is the same as shown in Figs. 1, 4, or 5, it not being deemed necessary to duplicate it in this figure. G is the upper end of the chain leading from the trip-lock, as already described. *d* is the stronger spring, and *f* the weaker spring, already described, and *e* is the lever they engage, except that in this case it is the lever by which the engineer controls the throttle-valve. This valve is shown at L, its arm L' being connected by a link, *s*, with the lever *e*.

M is the steam-pipe leading from the boiler to the engine steam-chests. The engineer may operate this valve by the lever *e* at will, the pressure of the spring *d* only being slightly superior to that of the spring *f*, so that but little strength is required to close the valve by lifting the lever. On each side of the lever *e* is a cleat, *t*, pierced with holes, and through any of these holes, beneath the lever, a pin, *u*, may be thrust at will, thereby holding the lever up and the valve partly closed. Thus when running the engineer may control the admission of steam to the engines. In case the trip-lock is sprung, however, the spring *d* is slackened, and the spring *f* pulls up the lever *e*, thus shutting the throttle and facilitating the stopping of the train. The extreme upward movement of the lever *e* may also open a relief-valve on the locomotive, the counterpart of the valve D in Fig. 1, thereby serving also to apply the brakes thereto. Instead of operating the throttle-valve by the trip-lock, as shown, the valve L may be a separate cut-off valve, so that the engineer may work his throttle independently and in the ordinary manner. The spring *f*, instead of being weaker than the spring *d*, may act at an inferior leverage, as shown in Fig. 6.

It will be observed that in general the construction shown in Fig. 6 is the same as that shown in Fig. 1, the only difference being that in Fig. 1 the throwing up of the lever opens a relief valve, while in Fig. 6 it closes the throttle-valve, both operations tending to bring the train to a stop.

I make no claim to applying the brakes or

shutting off the steam by mechanism on the train encountering an adjustable obstruction on the track, as that, broadly, is not new; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination, with a railway locomotive or car, of a trip-lock apparatus, substantially as set forth, which constantly tends to operate mechanism for stopping or retarding the locomotive or car, but which is normally restrained from so doing by being set or caught against some fixed part, with a cam or equivalent device on the roadway capable of being moved into or out of engagement with said trip-lock, and which, when moved into engagement therewith on the passage of the train, acts to spring the trip-lock, or free it from said fixed part, substantially as set forth.

2. The combination, with a railway car or locomotive and its automatic brake, of a lever for applying said brake, a spring tending to operate said lever, another spring acting upon said lever in opposition to the first and with greater force, a chain or cord connected with said latter spring, and a trip-lock connected to the other extremity of said chain, combined and arranged to operate substantially as set forth.

3. The combination, with a car or locomotive, of a valve controlling the stopping thereof, a spring tending to move said valve, and a chain or cord connected to said valve and extending to the trip-lever, the said lever having an inclined plane or surface, which, upon striking a fixed part, causes the lever to move laterally and free itself, substantially as set forth.

4. The combination of valve-lever *e*, springs *f* and *d*, chain or cord G, lever E, having shoulder *a* and incline *b*, and guides F F, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN CHANDLER.

Witnesses:

ARTHUR C. FRASER,

GEORGE H. FRASER.