

(No Model.)

E. D. GRAFF.  
RAILWAY APPLIANCE.

No. 441,484.

Patented Nov. 25, 1890.

Fig. 1.

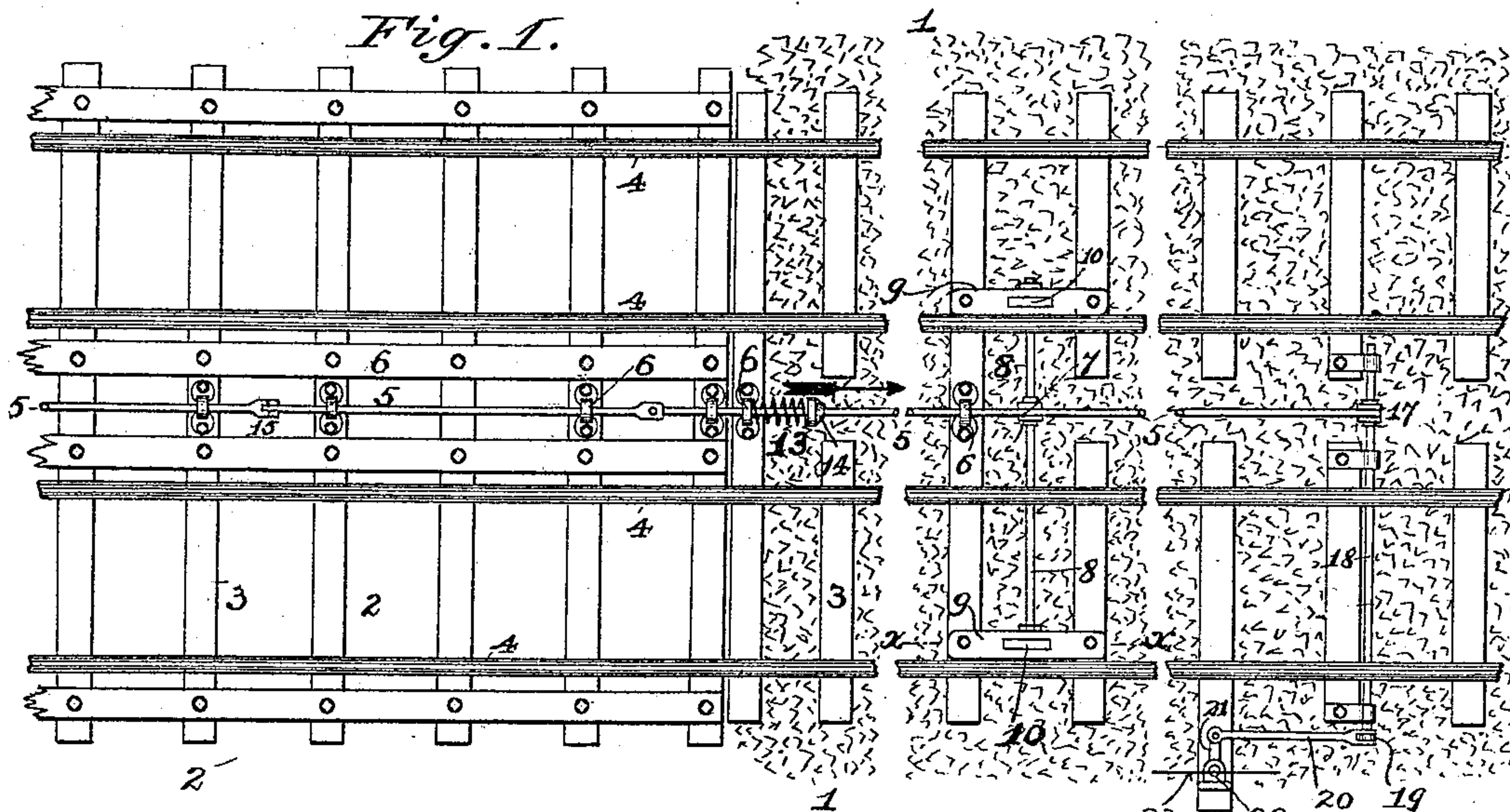


Fig. 2.

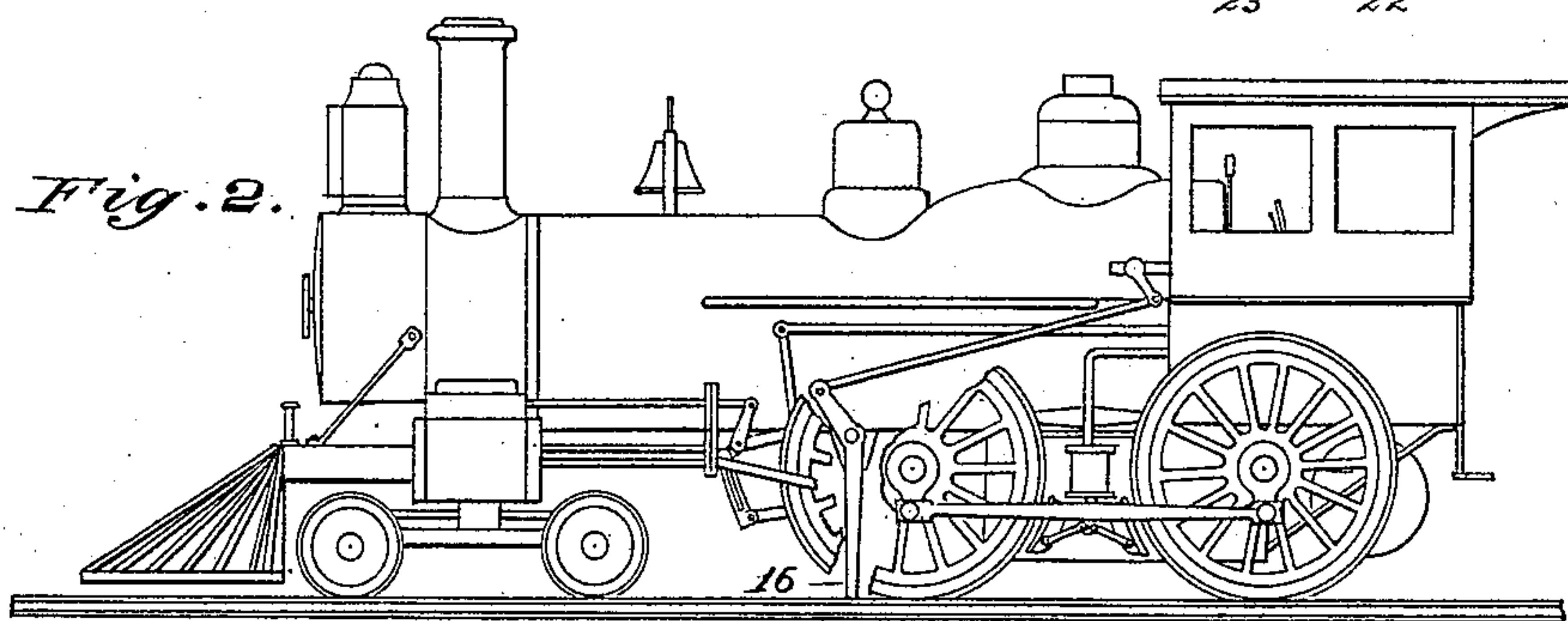


Fig. 3.

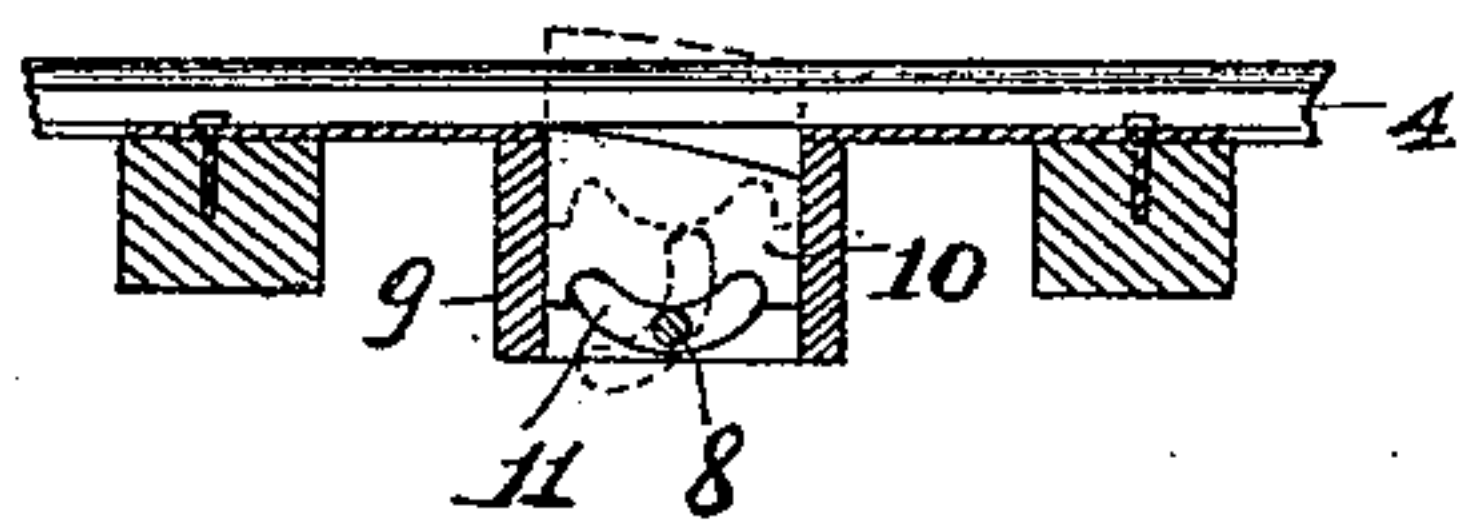


Fig. 4.



Fig. 5.

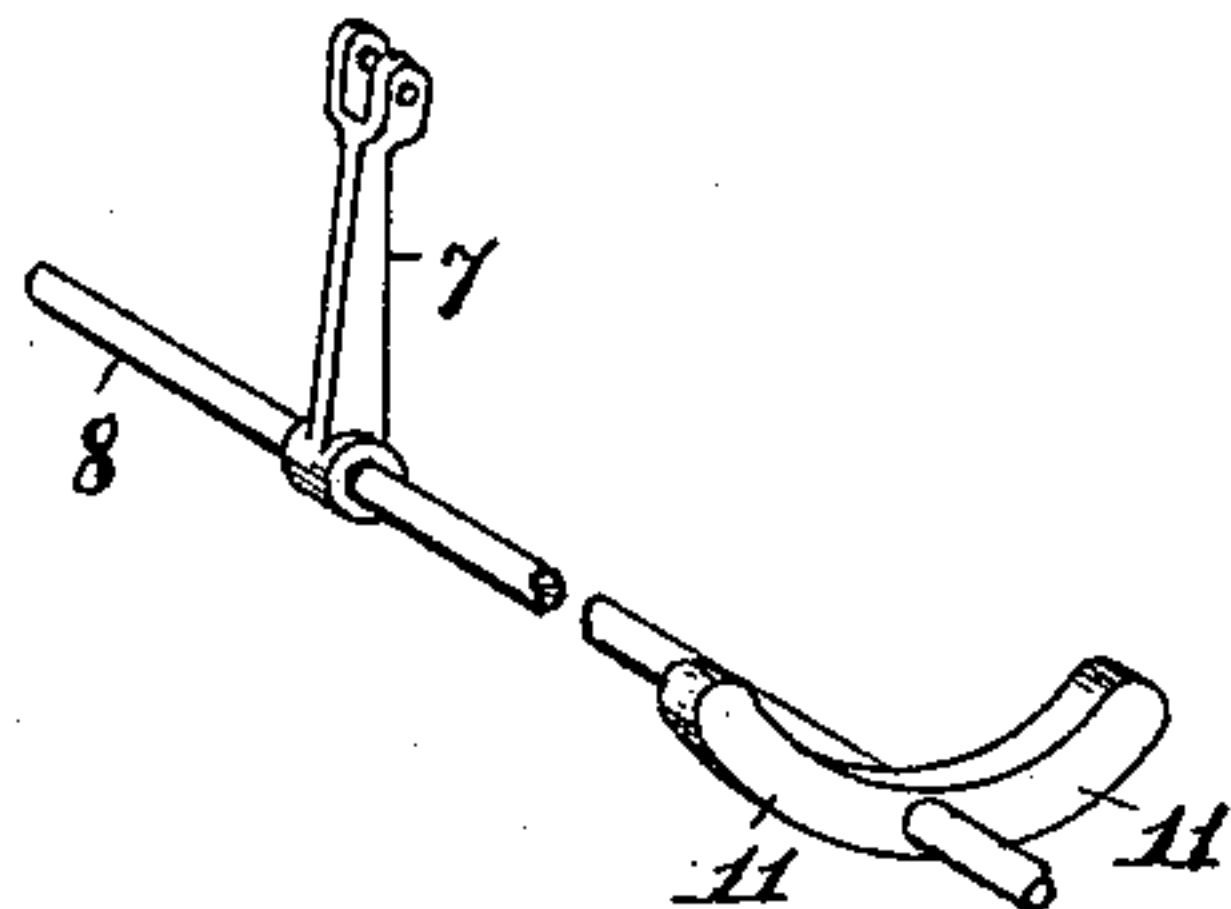
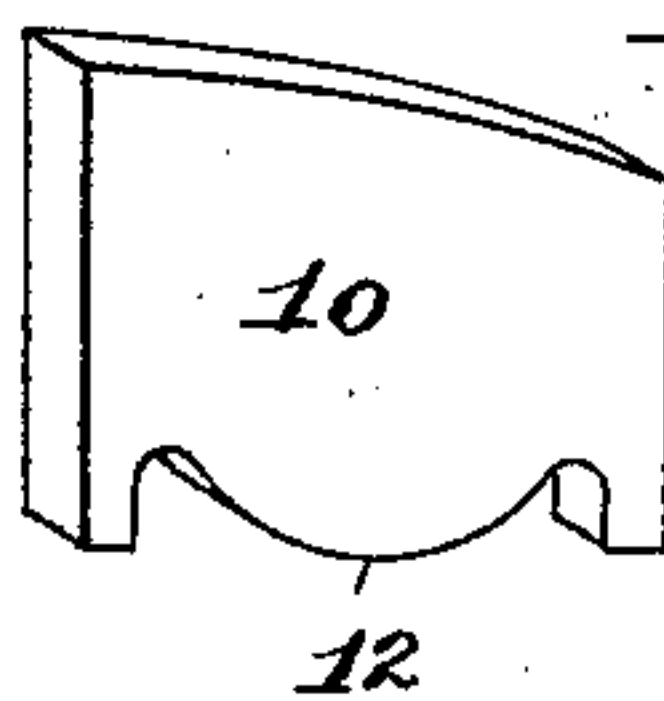


Fig. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWIN D. GRAFF, OF NEW YORK, N. Y.

## RAILWAY APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 441,484, dated November 25, 1890.

Application filed July 31, 1890. Serial No. 360,478. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN D. GRAFF, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Railway Appliances, of which the following is a specification.

My present invention in railway appliances relates to a means for the prevention of accidents to trains by reason of the breakage, washing or carrying away, burning, or other destruction of fixed or permanent bridges over which such trains may have to pass. To this main end I connect with the bridge a device or devices which, upon the parting or destruction of the bridge, shall be automatically moved to a position to co-operate with a portion of the air or other power brake mechanism of a train, and cause said brake mechanism to be automatically actuated and the train to be arrested before reaching the bridge locality.

My invention consists in certain features of detail, construction, and combinations of devices for carrying out the purposes of my improvement, all as will be hereinafter more fully described, and particularly set forth in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of part of a span of a stationary or fixed railway-bridge and of the approach thereto. Fig. 2 is a side view of a locomotive, partly broken away to show a depending arm or lever for throwing into operation the brake mechanism of the train. Fig. 3 is an enlarged vertical section taken at the line  $x x$  of Fig. 1. Fig. 4 is an enlarged detail view to show a joint in the brake-trip and signal-operating rod. Fig. 5 is a perspective view, enlarged, of a portion of the means for actuating the brake-trip, and Fig. 6 is a similar view of the brake-trip.

In the several figures the same part will be found designated by the same numeral of reference.

1 designates the approach to a fixed or stationary railway-bridge 2; 3, the cross-ties, and 4 the tracks. A rod 5 on the bridge extends parallel with and between the two sets of rails and is held in position laterally and guided longitudinally by eyes or brackets 6,

secured at suitable intervals to the cross-ties. The said rod extends past the bridge at either end thereof, and is connected to a rocker-arm 7, fast on a transverse rock-shaft 8, which may be mounted in bearings in depending boxes or guides 9, which contain each a sliding block or trip-piece 10. On said rock-shaft at each end is a lifter 11, extending outwardly from said shaft on each side, and constructed and arranged to raise said blocks or trip-pieces 10 (when said rock-shaft is turned in either direction) by engagement with the convex or cam surface 12, formed at the bottom or base of each of said blocks. Normally the blocks or strips lie within their housings or guides, so that their upper (preferably inclined) surfaces rest or are located below the tops of the rails, as shown by the full lines at Fig. 3. When raised by the lifters 11, the upper portions of said blocks or trips may project or stand above said rails, as shown by the dotted lines at Fig. 3.

On the rod 5 and on one approach to the bridge is a spiral or coiled spring 13, bearing at one end against an eye or bracket 6 and at the opposite end against a lug or head 14, secured on said rod. This spring is arranged to press the rod 5 always in the direction of the arrow at Fig. 1 and against the tension of a similar spring arranged in like manner on the opposite approach to the bridge. (Not shown.) It will be understood, however, that in practice I purpose having a similar construction and arrangement at each approach to the bridge, and that the springs 13 press in opposite directions and balance each other, so that the lifters on each side of the bridge stand normally in the horizontal position shown in full lines at Fig. 3 and the blocks or trips stand in their depressed or inoperative positions. Although I prefer this construction and arrangement so far as the main feature of this part of my invention is concerned, the rod 5 may be rigidly secured or tied at the opposite end in a manner to resist the stress of the spring 13 while the bridge is intact and in working condition.

I prefer to make the bridge portion of the rod 5 in sections or parts and to connect them together by means of a fusible joint, which may consist of an easily-fusible metallic pin 15, passing through eyes in the ends of the



sectional rods. There may be as many of these joints as may be found most expedient.

In operation should a fire occur on the bridge one or more of the joints or pins will  
 5 melt or fuse and separate one or more of the sections of the rod and permit the spring 13 to move the shore portion of the rod 5 in the direction of the arrow. This movement of the shore portion of the rod will in turn ef-  
 10 fect a vibration of the rocker-arm and rock-shaft and cause the lifter to rotate and raise the blocks or trips, as illustrated. In case the bridge should be carried away or otherwise destroyed, the rod 5 on the bridge will be  
 15 broken or separated at one or more points, either at the joints or between joints, thus releasing the spring and causing it to raise the blocks or trips through the intermediate devices above described and as illustrated. In  
 20 the event of a mere sagging or partial displacement of the bridge, insufficient to part the rod 5, said rod will be drawn toward the bridge and turn the lifters in the opposite direction and cause them to elevate the trips,  
 25 as above explained, the spring 13 being coiled or constructed to permit of compression sufficient to allow of this motion of the rod.

When the blocks or trips have been raised, either by the burning of the bridge or the  
 30 partial or complete destruction thereof, they are then in a condition to act upon an arm or lever 16 depending from the locomotive or from some vehicle making part of the train. This arm or lever is connected with the air  
 35 or other power brake mechanism in a manner such that when vibrated at its lower end by contact with the said trip it will automatically throw into operation said brake mechanism and effect a stoppage of the train, all  
 40 as more fully set forth in applications for Letters Patent filed by me May 19, 1890, No. 352,358, and July 23, 1890, No. 359,682. The rod 5 is preferably extended back of the trips a suitable distance (on each side of the bridge)  
 45 and connected through a crank-arm 17, rock-shaft 18, crank-arm 19, link 20, and lever 21 to the vertical shaft 22 of a semaphore or visual signal 23, which is adapted to be turned to indicate "danger" simultaneously with the  
 50 raising of the trips.

In case of accident to the bridge, the locomotive-engineer may stop the train in the ordinary manner in case he should observe the display of the "danger" signal. Should  
 55 this, however, escape his attention the train will be automatically arrested subsequently by reason of the contact or co-operation of the lever 16 with one of the trips or blocks, such contact, as before explained, operating to  
 60 throw into operation the whole brake system.

The fusible joints, it will be understood, are provided in order that the trips or signals may be set in case of a fire upon or burning of the bridge itself, and in lieu of this preferred construction the rod 5 may be made  
 65 entirely or partially of some metal adapted to melt at a low temperature, or, on the other hand, the device 5 may be a tarred or easily-ignitable rope or cable of fibrous material. In case it should not be desired to provide  
 70 for the setting of the trips or signals upon the occurrence of a fire, the device 5 may consist simply of a continuous rod or cable of metal connecting the trips and the signals (or either) with the bridge in a manner such as  
 75 to actuate the same only upon the sagging, parting, or like destruction of the bridge, in which event the springs and joints may of course be entirely dispensed with.

Numerous changes in detail, construction, 80 and arrangement may of course be made without departing from the gist of my invention.

What I claim as new, and desire to secure by Letters Patent, is— 85

1. The combination, with a fixed or permanent railway-bridge, of a trip adapted to co-operate with a portion of the brake mechanism of a railway-train, a rod or cable connected to the bridge and to the trip and fusible at one or more points at a comparatively  
 90 low temperature, and means, substantially as described, for throwing said trip into operative or working condition the instant said rod or cable is divided or sundered, substantially as described. 95

2. The combination, with a railway-bridge, of a rock-shaft, means connecting the rock-shaft with the bridge and adapted to actuate the same in case of accident to the bridge, a  
 100 lifter on each side of said rock-shaft, and a guided trip to co-operate with the air-brake mechanism of a railway-train, substantially as described.

3. The combination, with a rock-shaft and  
 105 means for actuating the same, of a lifter extending outwardly on each side of the rock-shaft, and a guided trip having a convex or cam surface for engagement by said lifter in either direction of its movements, substantially as described. 110

Signed at New York city, in the county of New York and State of New York, this 29th day of July, A. D. 1890.

EDWIN D. GRAFF.

Witnesses:

JACOB FELBEL,  
 M. E. LEES.