

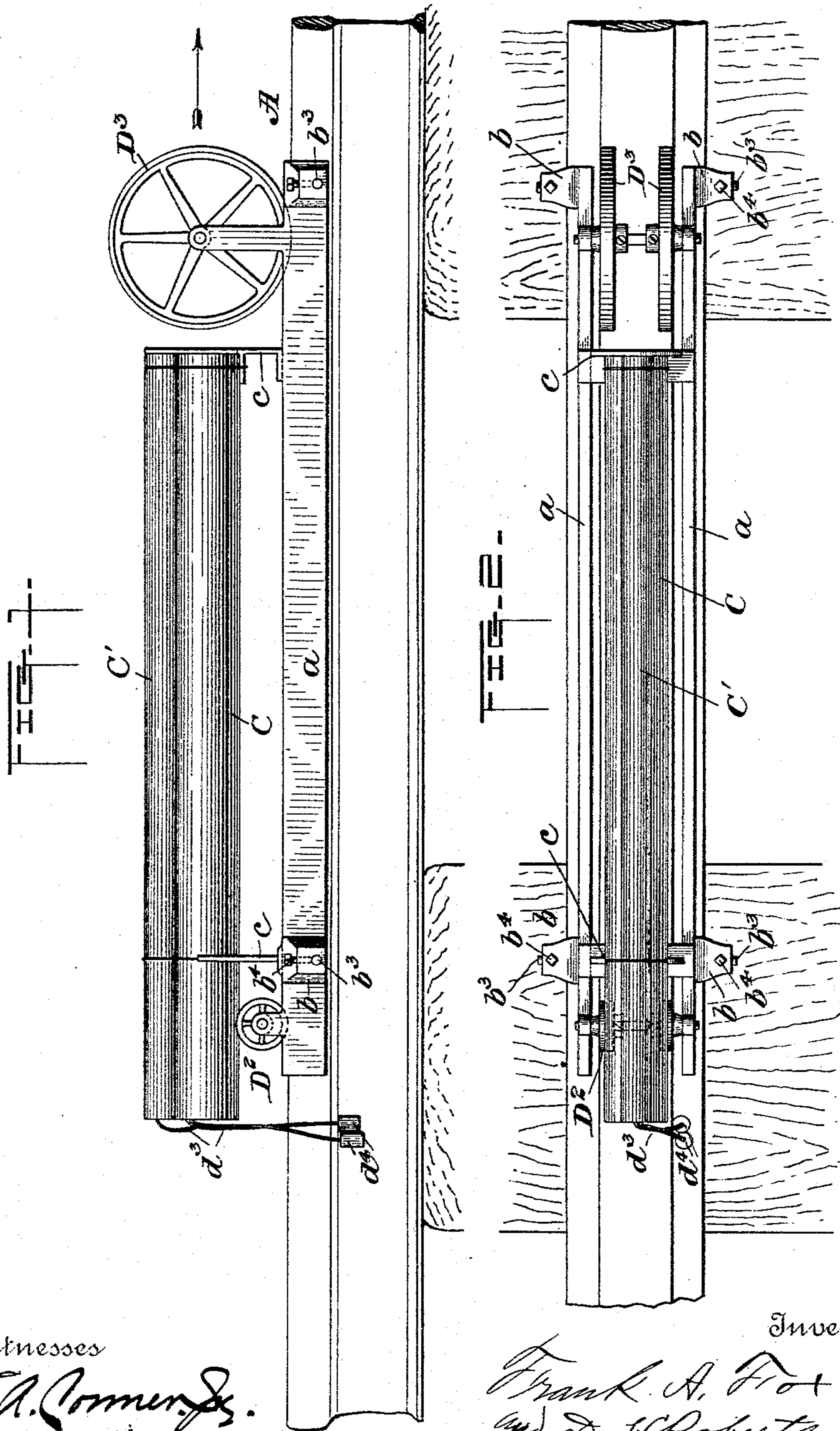
(No Model.)

2 Sheets—Sheet 1.

F. A. FOX & D. H. ROBERTS.
PYROTECHNIC RAILWAY DANGER SIGNAL.

No. 533,531.

Patented Feb. 5, 1895.



Witnesses

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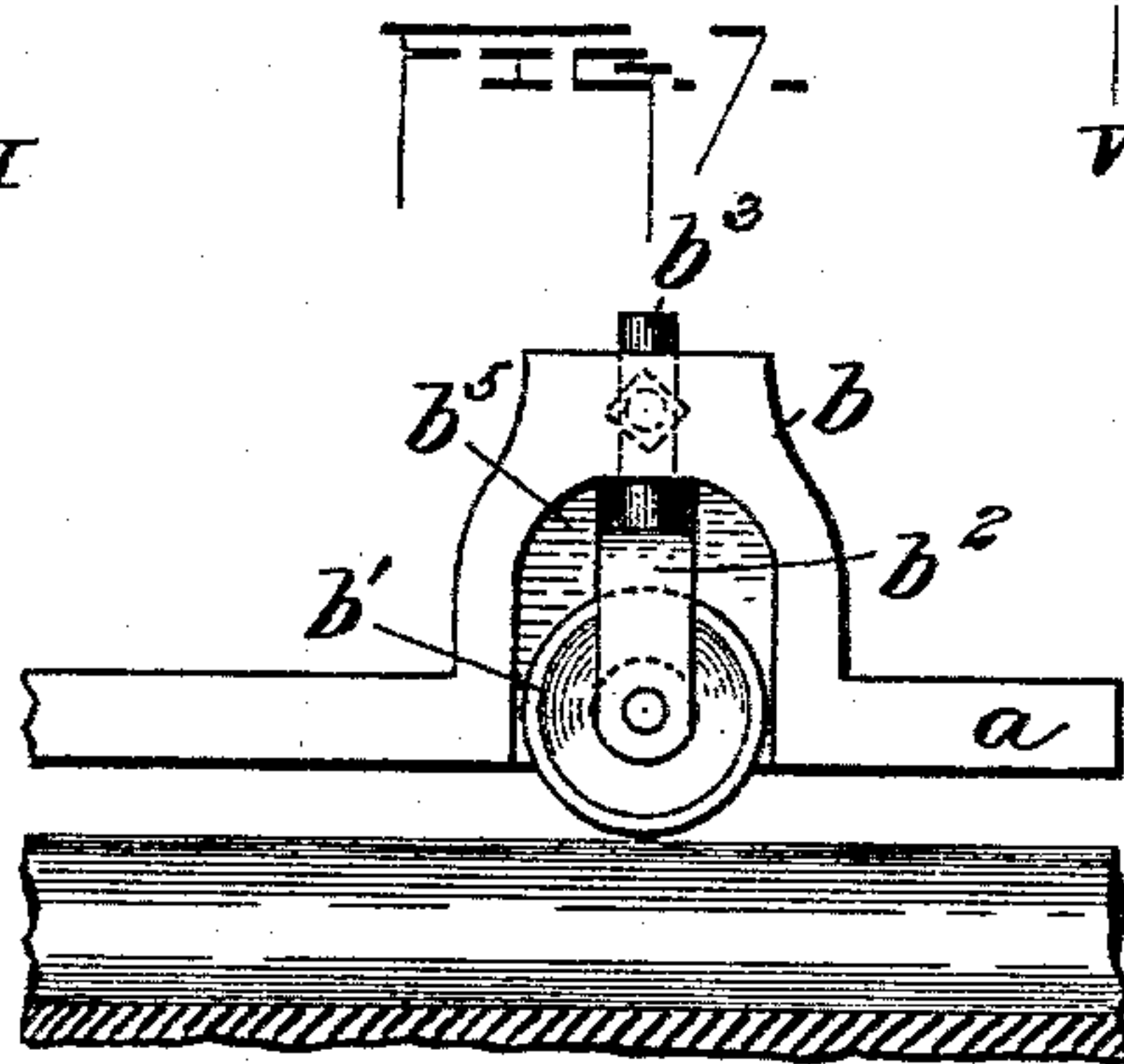
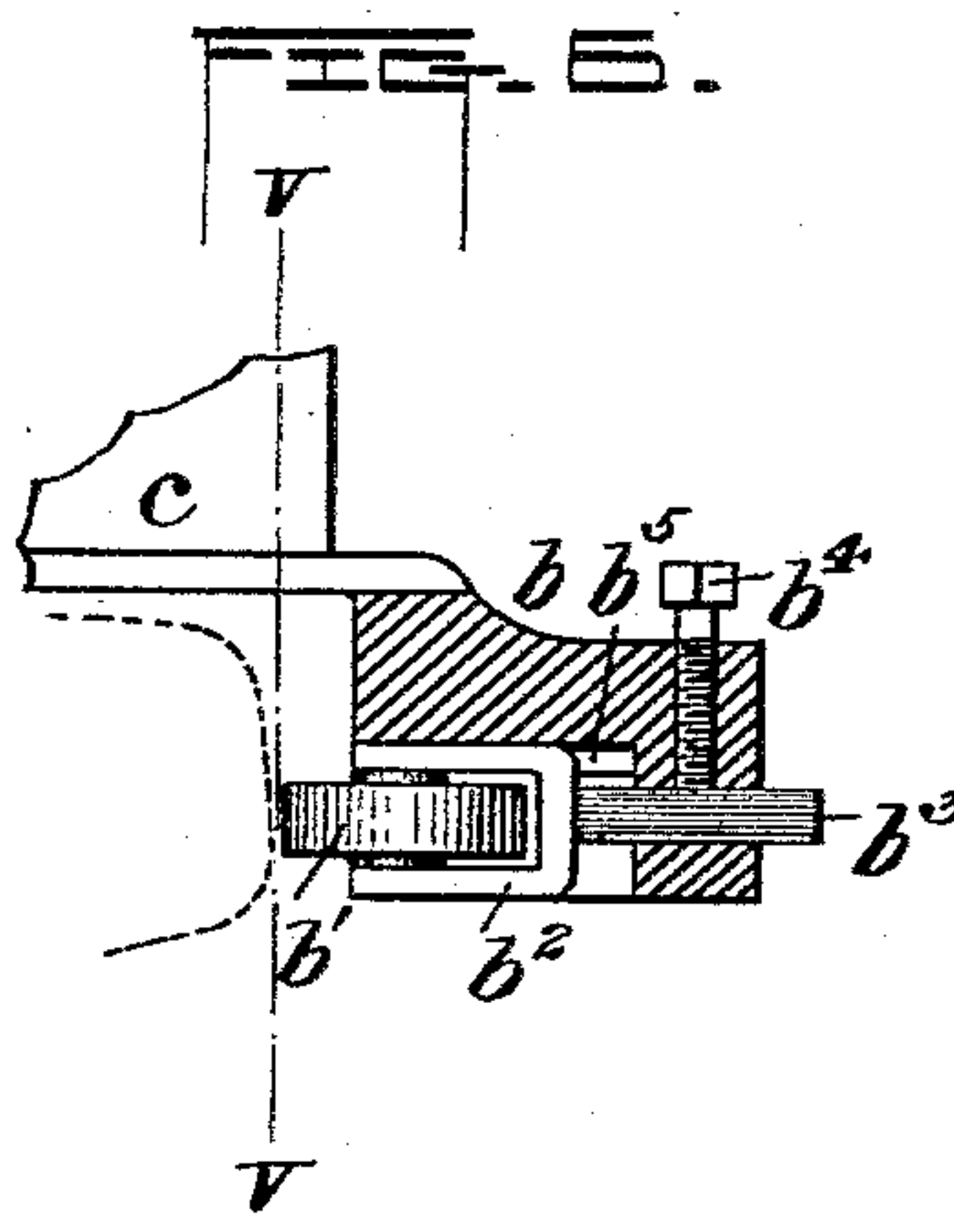
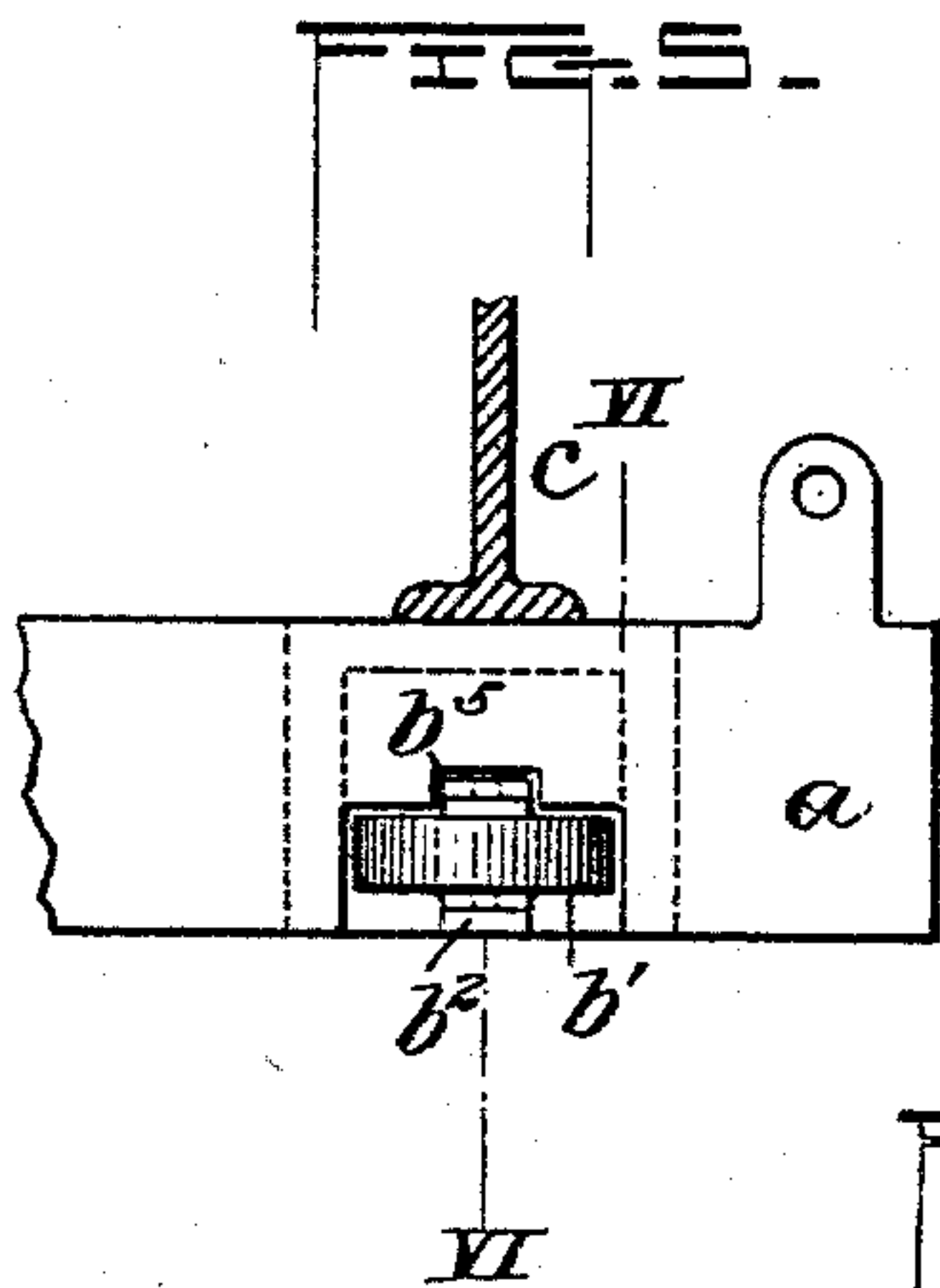
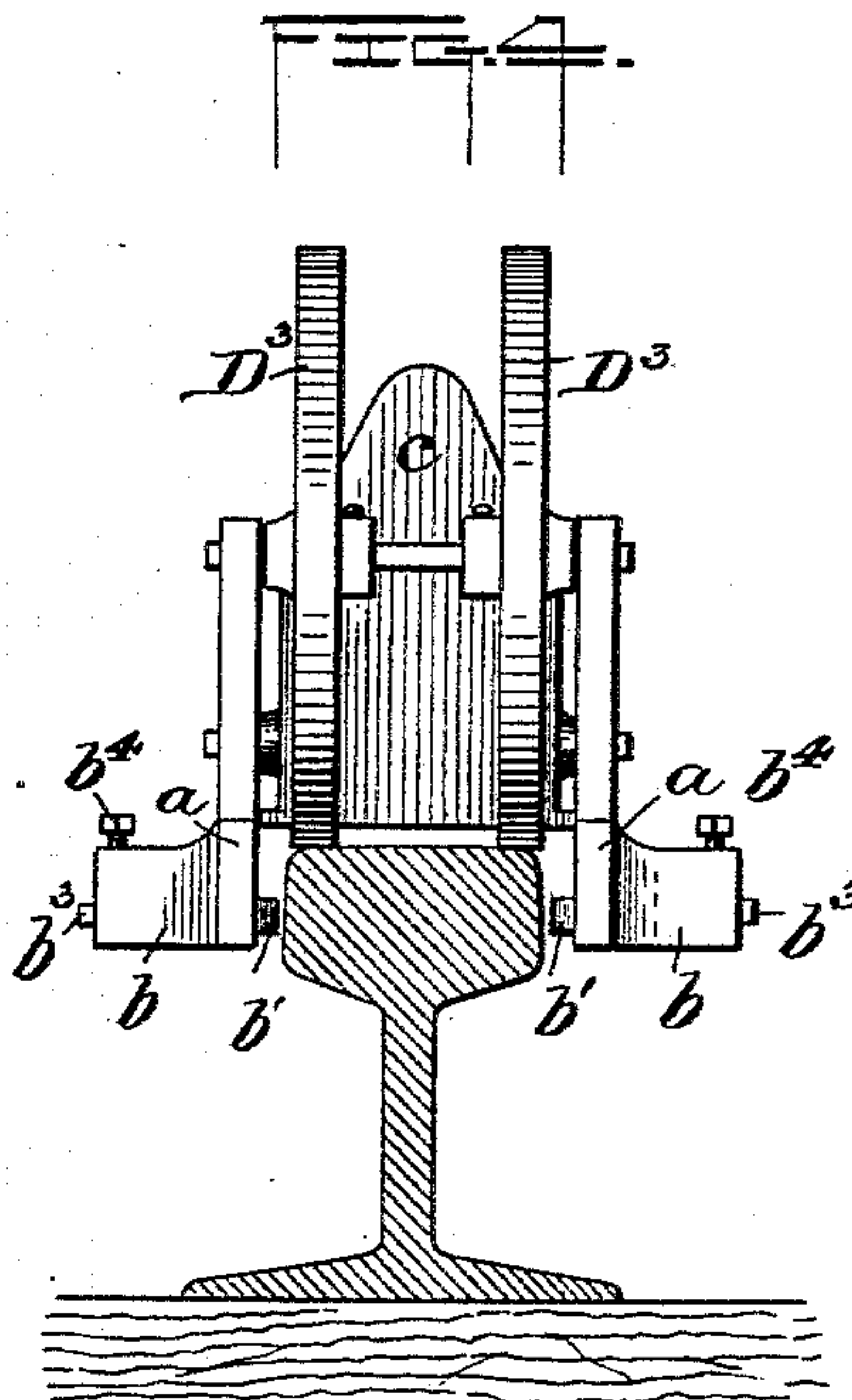
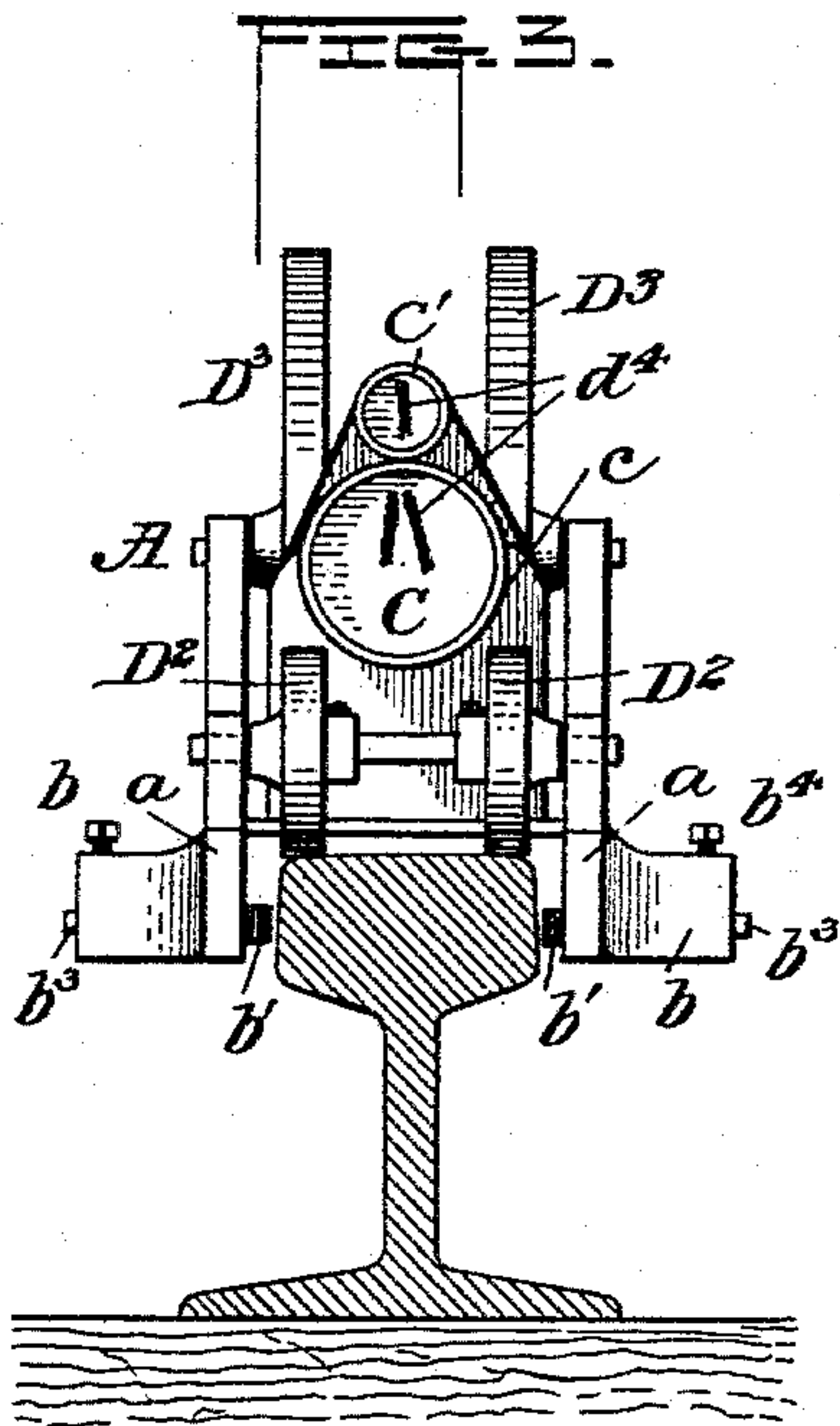
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UNITED STATES PATENT OFFICE.

FRANK A. FOX AND DAVID H. ROBERTS, OF NEW YORK, ASSIGNORS TO THE
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PYROTECHNIC RAILWAY DANGER-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 533,531, dated February 5, 1895.

Application filed May 21, 1894. Serial No. 511,928. (No model.)

To all whom it may concern

Be it known that we, FRANK A. FOX and DAVID H. ROBERTS, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Pyrotechnic Railway Danger-Signals; and we do hereby declare the following to be 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.

This invention relates to improvements in signaling devices for use on railroads, and more particularly to such devices as are disclosed in the application by myself and A. P. Yates, filed January 23, 1894, Serial No. 497,808, for the purpose of sending out danger signals to notify the engineer or fireman of a train in motion approaching a wreck, obstruction or train at rest upon the track, of danger ahead, so as to stop the moving train in time to prevent collision or accident.

The primary object of the invention is to provide a simple, inexpensive and efficient pyrotechnic contrivance, which is readily applied to rails of different widths; which shall offer a minimum of resistance during its travel along the rail; and which shall not be liable to derailment.

The invention will first be described with reference to the accompanying drawings and then pointed out in the claims at the end of the description.

Referring to the drawings, which form a part of this specification, Figure 1 represents a side elevation of the device arranged upon a track rail. Fig. 2 is a plan view. Fig. 3 is a rear elevation of the device illustrating the rail in section. Fig. 4 is a front elevation of the same with the rail in section. Fig. 5 is a section on the line V—V of Fig. 6 illustrating a front elevation of the adjustable guide rollers. Fig. 6 is a vertical sectional elevation on the line VI—VI of Fig. 5; and Fig. 7 is an inverted fragmentary plan view of one of the frame-bars with an adjustable roller arranged therein.

In the drawings, A, designates the frame or

carriage comprising the longitudinal frame-bars *a*, *a* having lateral projections or bosses *b*, *b*, formed at or near their ends; the said bars being recessed in the sides thereof adjacent to the track rail, as shown in Figs. 5, 6 and 7, to receive and house the friction rollers or wheels *b'*, *b'*; the latter being journaled in forked bars or yokes *b²*, *b²*, the stems *b³*, *b³*, of which project through apertures in the ends of the bosses or projections *b*, *b*, and are held in the desired position by means of set screws *b⁴*, *b⁴*. The rollers *b'*, *b'*, are adapted to bear against the sides of the rail, preferably one upon each side at the front and rear of the device and above the web and preferably below where the slivers occur on the outer side of the rail, so as to aid in holding the device upon the rail and prevent it from tipping over or derailment. These rollers are made adjustable so as to adapt the device for use upon rails of different sizes or widths, and they also afford provision for increasing or diminishing the distance between opposite rollers as occasion may require. The stems of the yokes or forks in which the rollers are journaled may be angular in cross-section, to prevent rotation thereof, or the recessed boss may have a groove *b⁵*, in the upper wall of the recess therein to receive and guide the upper arm of the yoke *b²*, as shown in Fig. 5, for the same purpose. Upon the frame and suitably mounted upon the standards or uprights *c*, *c*, is the case C, which contains the inflammable material and is supported in a substantially horizontal position upon said standards or uprights of the carriage frame for the purpose of better retaining the carriage upon the track, it being ascertained by experiment that when the case is placed in a substantially horizontal position there is less friction than when inclined so as to adapt the inflammable propelling substance to exert a downward pressure upon the device, and this position also overcomes a tendency upon the part of the carriage to be thrown from the track. Instead of the casing being partitioned and containing both the inflammable material and the material for producing a red or colored light, as in the

previous patent, it has preferably mounted thereon a smaller tube or case c' , which may contain material for producing a red light. In this instance each case or tube is provided with a fuse d^3 . These fuses may each have upon their outer ends a highly inflammable substance or fulminate d^4 , to afford means for igniting the fuses by merely rubbing the fulminates together, without requiring a match or other ignitable substance which may not be available or at hand when needed. Instead of the hollow rollers shown in the aforesaid patent, the carriage frame in Figs. 1 and 2 is supported at its rear end and also at its front end upon a pair of wheels marked D^2, D^3 , respectively, the rear wheels D^2 , being preferably much less in diameter than the front wheels D^3 , and arranged underneath or below the forward end of the case C, while the front wheels, which are of greater diameter, are arranged in front of said case. These wheels may be constructed of light metal, and in operation they afford less resistance to the progress of the device through the air than the rollers, and they are also less liable to cause the device to be thrown from the track rail in passing over uneven surfaces, such as occur at the joints or meeting ends of adjoining rails.

The operation of the invention will be readily understood from the foregoing description. In the event of an accident or the stoppage of a train (provided with one or more of these devices) the train-man will place the device upon the rail, and ignite the fuse d^3 , by means of a match or by rubbing the fulminates d^4 , together, which will ignite the powder or inflammable substances with which the cylinder or cylinders are charged, and the device will immediately start in the desired direction either up or down the track and at the same time begin to emit light, sending forth a continuous beam or shower of light as it moves so as to attract the attention of the engineer or fireman of an approaching train, in case a train is closely following the train which has stopped. The red light may begin to burn as soon as the device starts, as its movement is so rapid as to render it of little consequence whether the red-light producing substance be ignited before or after its stoppage, or the fuses d^4 , may be so timed or arranged as to cause the red light to burn only after the expiration of a certain period of time corresponding with the time the device may take to travel the required distance.

The device is adapted to be constructed out of inexpensive material and made as light as possible consistent with strength, and destructible, so that it may be rapidly impelled and easily crushed and destroyed by a moving train, so as not to obstruct the track nor

cost enough to render its preservation of any consequence.

It is obvious that the improvements may be used on other traveling danger signals and we therefore do not wish to confine ourselves to the construction shown.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. A railroad danger signal consisting of a pair of bars arranged to straddle a single track rail, a pair of light rollers arranged transversely of and above said bars, and a tubular casing supported upon the carriage in a horizontal position and containing an inflammable substance adapted to propel the carriage along the track, substantially as described.

2. A railroad danger signal comprising a wheeled carriage and means for propelling the same along the track, friction rollers adjustably supported in the carriage frame so as to impinge against the side or sides of the rail, and means for adjusting and securing said rollers in the desired position, substantially as described.

3. The wheeled carriage adapted to travel along a track rail and having an inflammable propelling and signal giving means mounted thereon, in combination with friction rollers adjustably supported in the frame of the carriage so as to impinge against opposite sides of the rail, and means for adjusting and securing said rollers in the desired position, substantially as described.

4. A railway danger signal comprising a vehicle or frame supported on wheels and having a case or cases mounted thereon and charged with an inflammable substance adapted to impel the vehicle and also emit a signal light; said vehicle being adapted to travel along a railroad rail or rails, and a fuse or fuses having a detonating portion adapted to ignite said inflammable substance, substantially as described.

5. A railroad danger signal consisting of a suitable carriage arranged to straddle a single track rail, a pair of rollers arranged at the front end and transversely of the carriage, a pair of rollers of a smaller diameter arranged at the rear and transversely of said carriage, together with a casing containing an inflammable substance for propelling the carriage, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK A. FOX.
DAVID H. ROBERTS.

Witnesses:

ROBERT LENNOX,
GEO. S. BROWN.