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Patented July 15, 1902.

W. C. VAN DERLIP, SR.  
RAILWAY SIGNAL.

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2 Sheets—Sheet 2.

(No Model.)

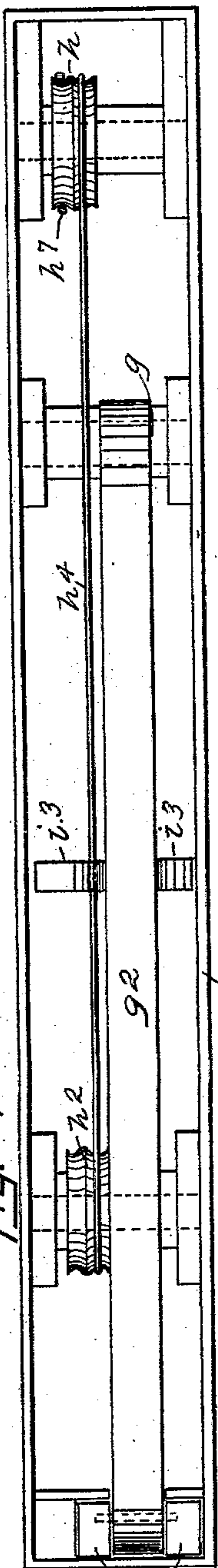


Fig. 4

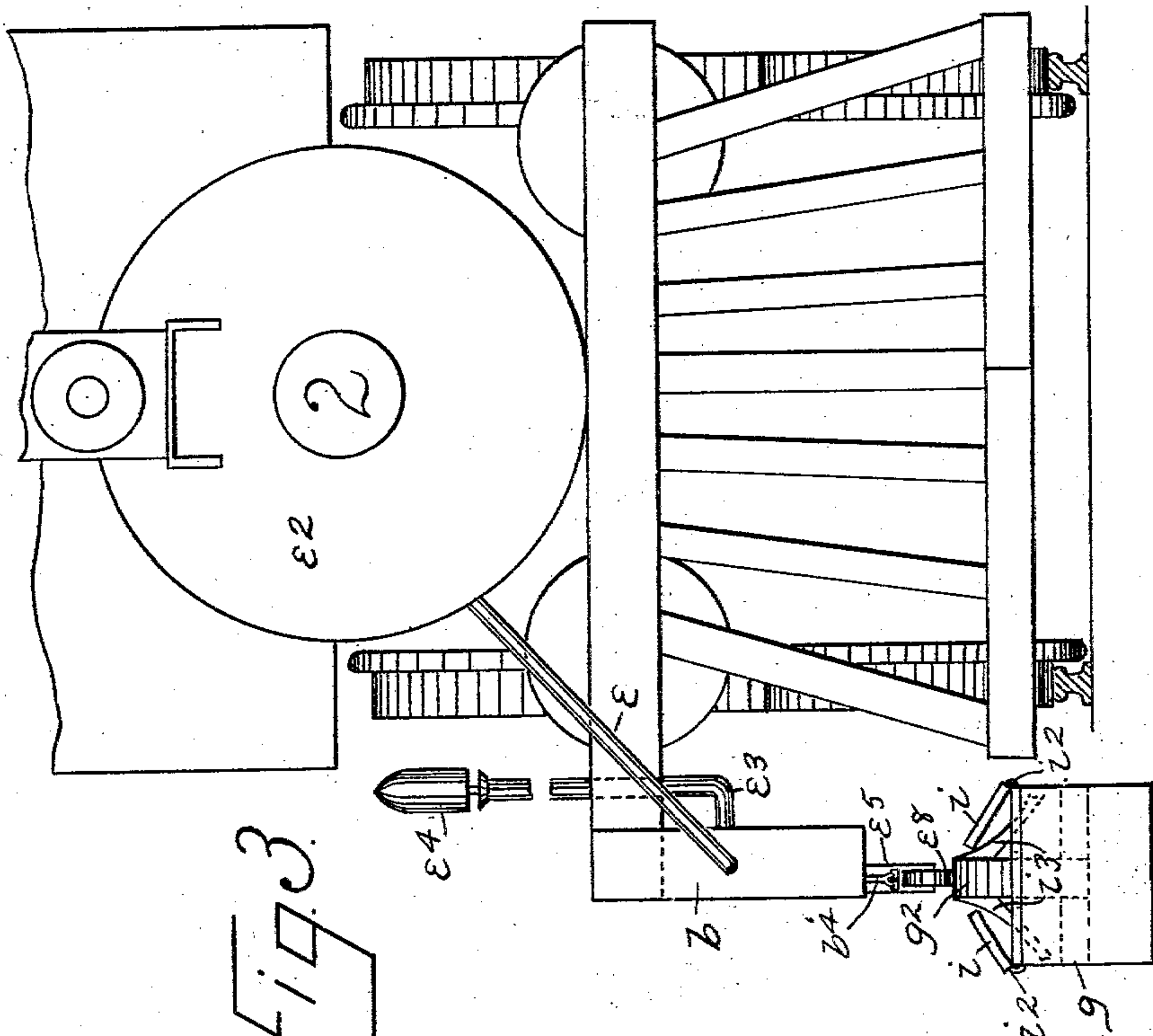


Fig. 3

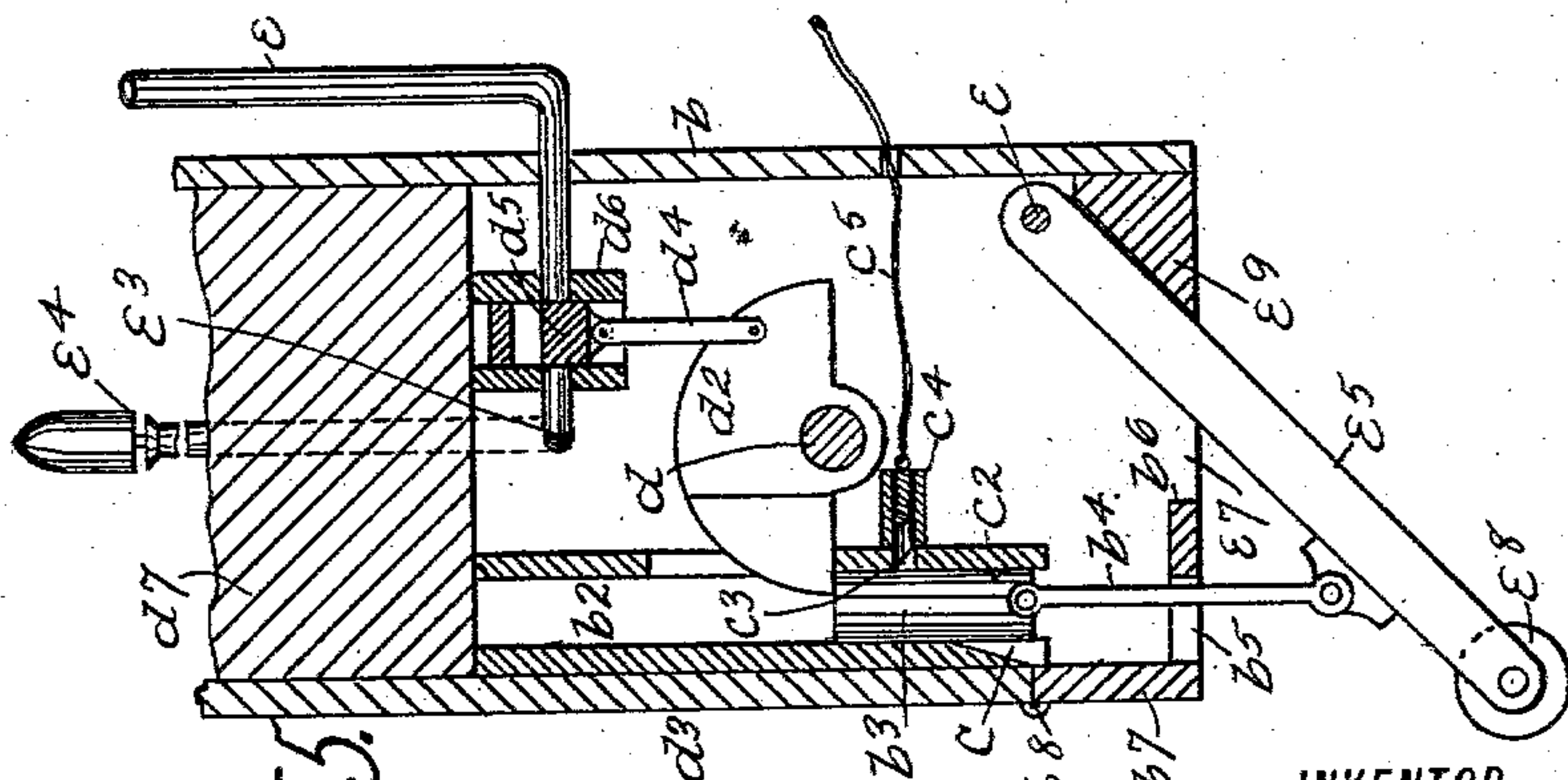


Fig. 5

WITNESSES

J. E. Hansen  
F. A. Stewart

BY

Edgar Tate & Co.

ATTORNEYS

INVENTOR  
Willis C. Van Derlip, Sr.



# UNITED STATES PATENT OFFICE.

WILLIS CURTIS VAN DERLIP, SR., OF CORNING, NEW YORK.

## RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 704,720, dated July 15, 1902.

Application filed April 15, 1902. Serial No. 102,974. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIS CURTIS VAN DERLIP, Sr., a citizen of the United States, residing at Corning, in the county of Steuben and State of New York, have invented certain new and useful Improvements in Railway-Signals, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide an improved railway signal apparatus which is designed to signal the engineer, so as to give him warning of danger ahead of any kind, a further object being to provide a signal apparatus of the class specified part of which is connected with the track and part with the engine, that part which is connected with the track being adapted to be located at any desired point along the track, and particularly at the entrance of a tunnel; and with this and other objects in view the invention consists in a railway signal apparatus constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a side view of a section of the railway-track and the front end of a locomotive provided with my improved signal apparatus; Fig. 2, a longitudinal section of a box or casing containing part of the signal apparatus connected with the track; Fig. 3, a front view of the locomotive; Fig. 4, a plan view of a part of the apparatus shown in Fig. 2 with the cover removed, and Fig. 5 a vertical section or sectional front view of that part of the apparatus connected with the locomotive.

In the practice of my invention as shown in the drawings I form that part of the signal apparatus which is connected with the locomotive in the following manner:

Secured to one side of the buffer *a* of the locomotive is a vertically-arranged casing *b*, at the rear side of which is a piston-cylinder *b*<sup>2</sup>, which is also vertically arranged and the lower end of which is open, and mounted in

said piston-cylinder is a piston *b*<sup>3</sup>, with the lower end of which is pivotally connected a piston-rod *b*<sup>4</sup>, which passes downwardly through an opening *b*<sup>5</sup> in a plate *b*<sup>6</sup>, which is secured to another plate *b*<sup>7</sup>, hinged to the body of the casing *b* at *b*<sup>8</sup> and which constitutes a part of the rear wall of said casing. The rear wall of the piston-cylinder *b*<sup>2</sup> is preferably beveled outwardly, as shown at *c*, and the opening *b*<sup>5</sup> in the plate *b*<sup>6</sup> is much larger in transverse section than the rod *b*<sup>4</sup>, and formed in the front side of the piston *b*<sup>3</sup>, near the lower end thereof, is a notch or recess *c*<sup>2</sup>, adapted to receive a spring-operated catch-plug *c*<sup>3</sup>, mounted in the casing *c*<sup>4</sup>, secured to the front side of the piston-cylinder *b*<sup>2</sup>, and with which is connected a cord or other flexible device *c*<sup>5</sup>, which in practice is under the control of the engineer.

Passing transversely through the casing *b* is a shaft *d*, which is provided, as shown in the drawings, with a transversely-arranged semi-circular plate *d*<sup>2</sup>, which operates as a lever, and one end of which is weighted and passes through a slot *d*<sup>3</sup> in the piston-cylinder *b*<sup>2</sup> and is adapted to bear on the upper end of the piston *b*<sup>3</sup>, and the other end of said plate is provided with a pivoted link *d*<sup>4</sup>, which is pivotally connected with a piston *d*<sup>5</sup>, movable in a vertically-arranged piston-cylinder *d*<sup>6</sup>, which is suspended from the top *d*<sup>7</sup> of the casing *b*. The top *d*<sup>7</sup> of the casing *b* may be constructed in any desired manner and may consist of one side of the buffer *a*, if desired.

Passing through one side of the casing *b* and into the piston-cylinder *d*<sup>6</sup> is a steam-pipe *e*, which is in communication with the boiler *e*<sup>2</sup> of the locomotive, and passing into the opposite side of the cylinder *d*<sup>6</sup> is a signal-pipe *e*<sup>3</sup>, which passes up through the top *d*<sup>7</sup> of the casing *b* and is provided with an ordinary signal-whistle *e*<sup>4</sup>. From the foregoing construction it will be seen that the piston *d*<sup>5</sup> is adapted to close both of the pipes *e* and *e*<sup>3</sup>, and when said piston is lowered, as hereinafter described, the steam will rush through the pipes *e* and *e*<sup>3</sup> and will operate the signal-whistle *e*<sup>4</sup>.

A lever *e*<sup>5</sup> is pivoted in the casing *b* at the front side, near the bottom thereof, as shown at *e*<sup>6</sup>, and this lever passes through an opening *e*<sup>7</sup> in the bottom of said casing and is pivotally connected with the piston-rod *b*<sup>4</sup> and



is provided at its free end with an antifriction-roller  $e^8$ , and beneath the said lever and near its pivotal support is a stop  $e^9$ , which normally holds said lever in a backwardly-directed and inclined position and prevents the same from dropping too low, and in the normal position of said parts the lower end of said lever, which is provided with an antifriction-roller  $e^8$ , is placed approximately near and adjacent to one end of the rails of the tracks and at a predetermined distance outside thereof.

In forming that part of my improved signal apparatus which is placed in connection with or adjacent to the track I provide a box or casing  $f$ , which may be placed at any point along the track—as, for instance, at the end or ends of a tunnel or in any other desired location—and said box or casing is placed outside of one of the rails of the track and at a predetermined distance therefrom. In this box or casing I pivot at  $g$  a lever  $g^2$ , which is arranged longitudinally of the box or casing, the pivotal support  $g$  thereof being near one end thereof, and said lever is curved upwardly and adapted to pass through a longitudinal opening  $g^3$  in the top of said box or casing, and the free end thereof is curved downwardly and connected with a vertically-movable block  $g^4$ , mounted in the casing  $g^5$  in the end of the box or casing  $f$  opposite the pivotal support  $g$  of said lever. The connection between the block  $g^4$  and the lever  $g^2$  is made by a pin  $g^6$ , secured to said block and passing through a slot  $g^7$  in the end of said lever, and by means of this construction the block  $g^4$  may be moved vertically by the lever  $g^2$ , and said block serves as a guide for the free end of said lever and to hold it in proper operative position.

In the end of the box or casing  $f$  opposite the block  $g^4$  is mounted a double pulley  $h$ , and adjacent to the opposite end of said box or casing is mounted another pulley  $h^2$ , which is also preferably a double pulley and the shaft of which is provided with an arm  $h^3$ , which is pivotally connected at  $h^4$  with a lever  $g^2$ , near the free end thereof, and the pulleys  $h$  and  $h^2$  are connected by a belt, chain, or similar device  $h^4$ .

Arranged over the pulley  $h$  and supported in any desired manner, as at  $h^5$ , is a pulley  $h^6$ , which is geared in connection with the pulley  $h$  by a belt, band, or similar device  $h^7$ , and the shaft of the pulley  $h^6$  or the pulley itself is provided with an arm  $h^8$ , which may be operated by hand or by any suitable mechanism from a distance.

The box or casing  $f$  is also preferably provided with a supplemental cover consisting of separate parts  $i$ , which are hinged to the sides thereof at  $i^2$ , and the lever  $g^2$  is preferably provided with downwardly and outwardly directed side arms  $i^3$ , which are adapted to raise the supplemental cover or the separate parts thereof when said lever is raised, and when the lever is lowered the parts of

the supplemental cover will drop back and close the box or casing or the opening  $g^3$  in the top thereof.

The operation is substantially as follows: Suppose that a watchman or attendant at the mouth or entrance of a tunnel desires to signal the engineer of an approaching train that danger is ahead. The arm  $h^8$  is manipulated so as to raise the lever  $g^2$  into the position shown in dotted lines in Figs. 1 and 2 and in full lines in Fig. 3, and as the train approaches the antifriction-roller  $e^8$  in the end of the lever  $e^5$  strikes the beveled upper surface of the lever  $g^2$ , and said lever  $e^5$  is forced upwardly, the piston  $b^6$  is moved upwardly in the piston-cylinder  $b^2$ , the plate  $d^2$ , which serves as a lever, is turned, the piston  $d^5$  is lowered by means of the connecting-link  $d^4$ , and the steam rushes through the pipes  $e$  and  $e^3$  and operates the signal  $e^4$ , and the engineer is thus notified that danger is ahead. When the piston  $b^3$  is in its highest position, the spring-operated catch-plug  $c^3$  is forced into the notch or recess  $c^2$  and said piston is held in its raised position until the cord  $c^5$  is pulled by the engineer, at which time the lever  $e^5$ , the piston  $b^3$ , and the lever or plate  $d^2$  drop back into the position shown in Fig. 5, and the pipes  $e$  and  $e^3$  are closed by the piston  $d^3$ .

It will be understood that that part of my improved signal apparatus which is connected with the track or arranged adjacent thereto may be placed at any desired point on the track, and the lever or the arm  $h^8$  may be operated by a track-walker or it may be operated from a signal-station at any desired distance. I may also connect with the pulley  $h^2$  a supplemental band and connect the same with a semaphore-signal at any point, and this semaphore-signal would be operated at the same time that the lever  $g^2$  is raised into operative position.

Although I have shown my improvement applied for the purpose of operating a steam-signal connected with a locomotive or engine, the same device may be employed for operating the air-brakes of a railway-train, the steam which passes through the pipe  $e$  being used for said purpose.

The entire apparatus is simple in construction and operation and perfectly adapted to accomplish the result for which it is intended, and changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A signal apparatus for railways comprising a casing secured to the engine and provided with a vertically-arranged piston-cylinder which opens downwardly, a piston mounted in said cylinder, a lever pivoted in the bottom of said casing and in operative connection with said piston, a steam-pipe passing



through said casing and in connection with the boiler and devices for opening and closing said pipe, said devices being adapted to be operated by said piston, substantially as shown and described.

2. A signal apparatus for railways comprising a casing secured to the engine and provided with a vertically-arranged piston-cylinder which opens downwardly, a piston mounted in said cylinder, a lever pivoted in the bottom of said casing and in operative connection with said piston, a steam-pipe passing through said casing and in connection with the boiler and devices for opening and closing said pipe, said devices being adapted to be operated by said piston, and means adjacent to the track for operating said lever, substantially as shown and described.

3. A signal apparatus for railways comprising a casing secured to the engine and provided with a vertically-arranged piston-cylinder which opens downwardly, a piston mounted in said cylinder, a lever pivoted in the bot-

tom of said casing and in operative connection with said piston, a steam-pipe passing through said casing and in connection with the boiler and devices for opening and closing said pipe, said devices being adapted to be operated by said piston, and means adjacent to the track for operating said lever, consisting of a box or casing, a lever pivoted therein, two pulleys mounted in said box or casing and geared in connection and one of which is in operative connection with said lever and adapted to raise it above said box or casing; and means for operating the other pulley, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 10th day of April, 1902.

WILLIS CURTIS VAN DERLIP, SR.

Witnesses:

THOMAS W. COWLEY,  
M. J. OARK.