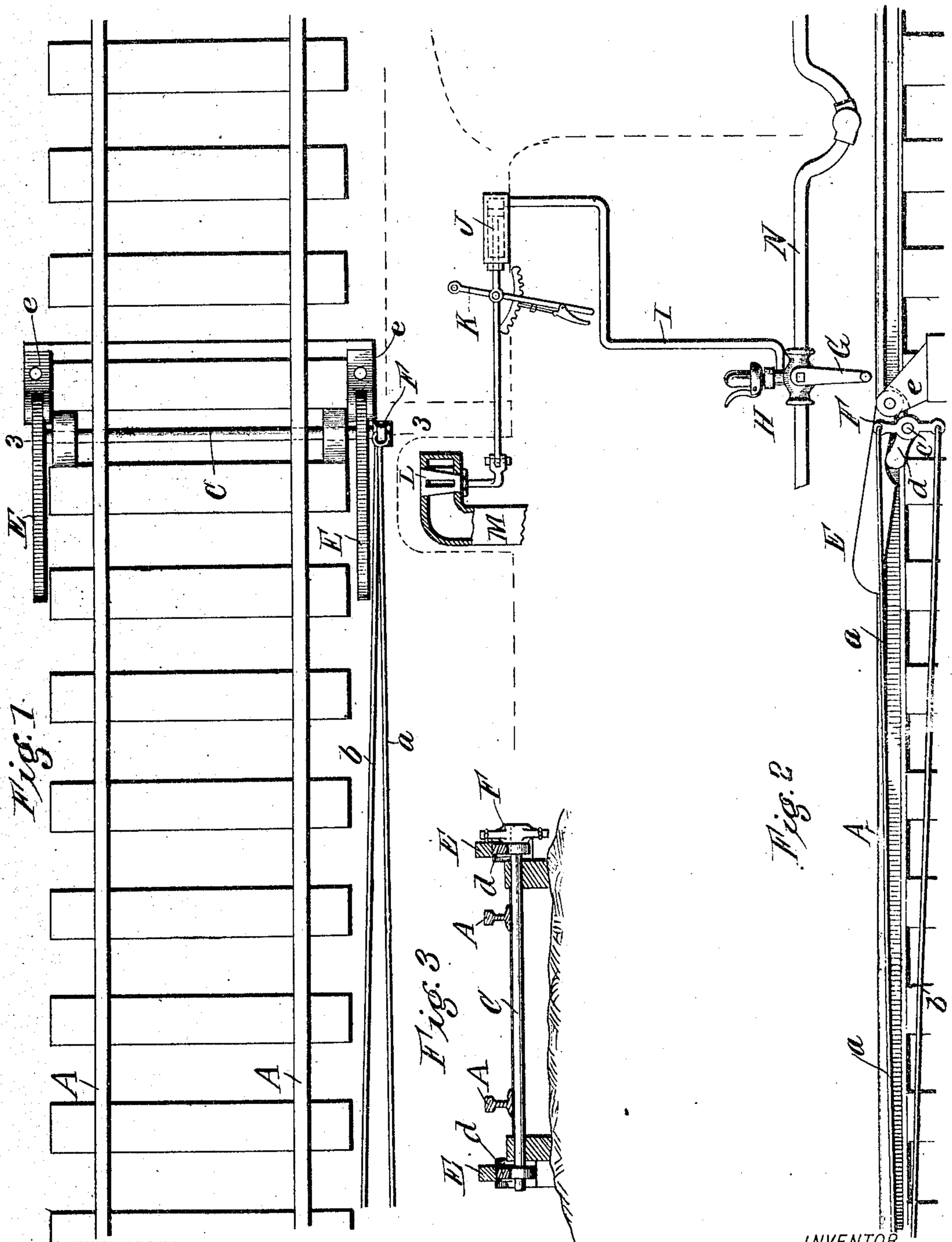
No. 860,464. PATENTED JULY 16, 1907.

G. J. GUMM.

TRAIN STOPPING DEVICE.

APPLICATION FILED JAN. 30, 1907.

3 SHEETS—SHEET 1.



WITNESSES

C. E. Chaffee

Edw. T. Flynn.

INVENTOR

GUSTAVE J. GUMM

BY Munn & Co.

ATTORNEYS

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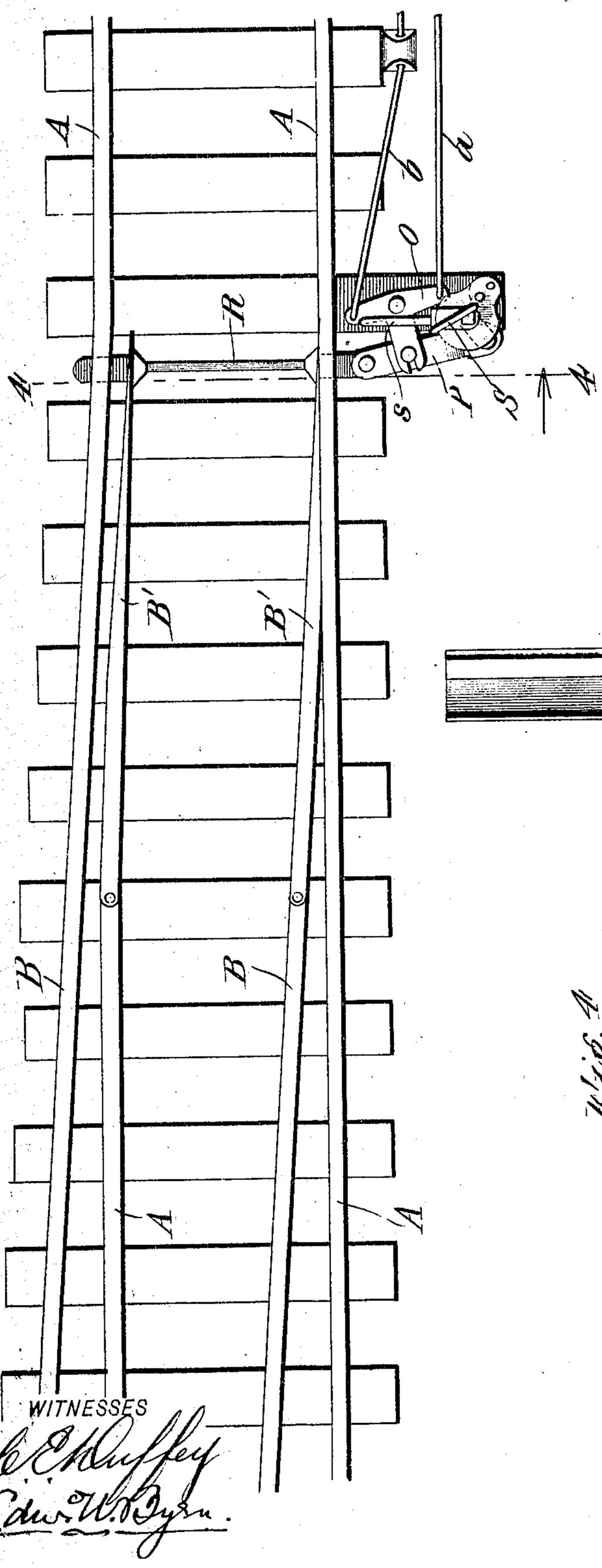

Fig. 1a

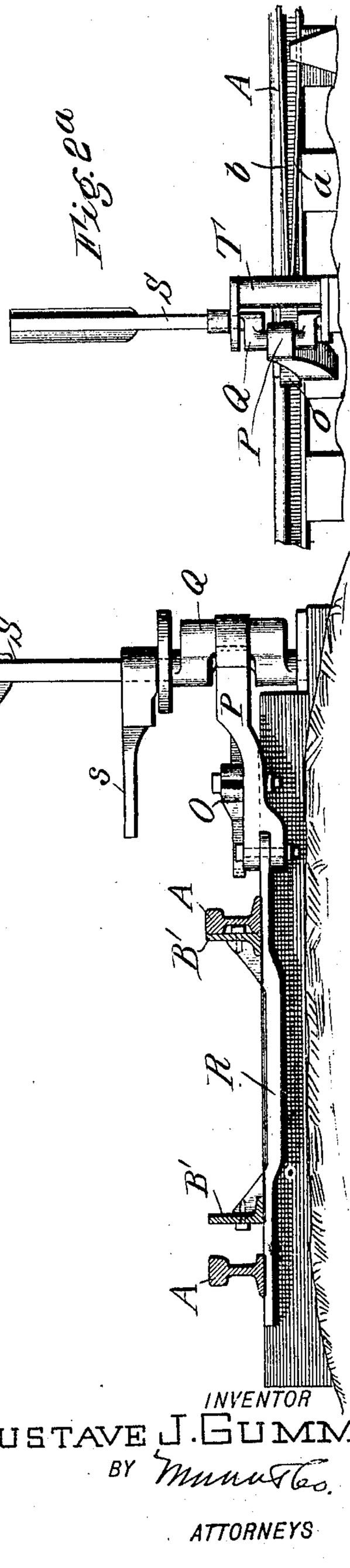

Fig. 2a

Fig. 4

WITNESSES

E. C. Hinsley

Edw. W. Byrn.

INVENTOR

GUSTAVE J. GUMM

BY Munn & Co.

ATTORNEYS

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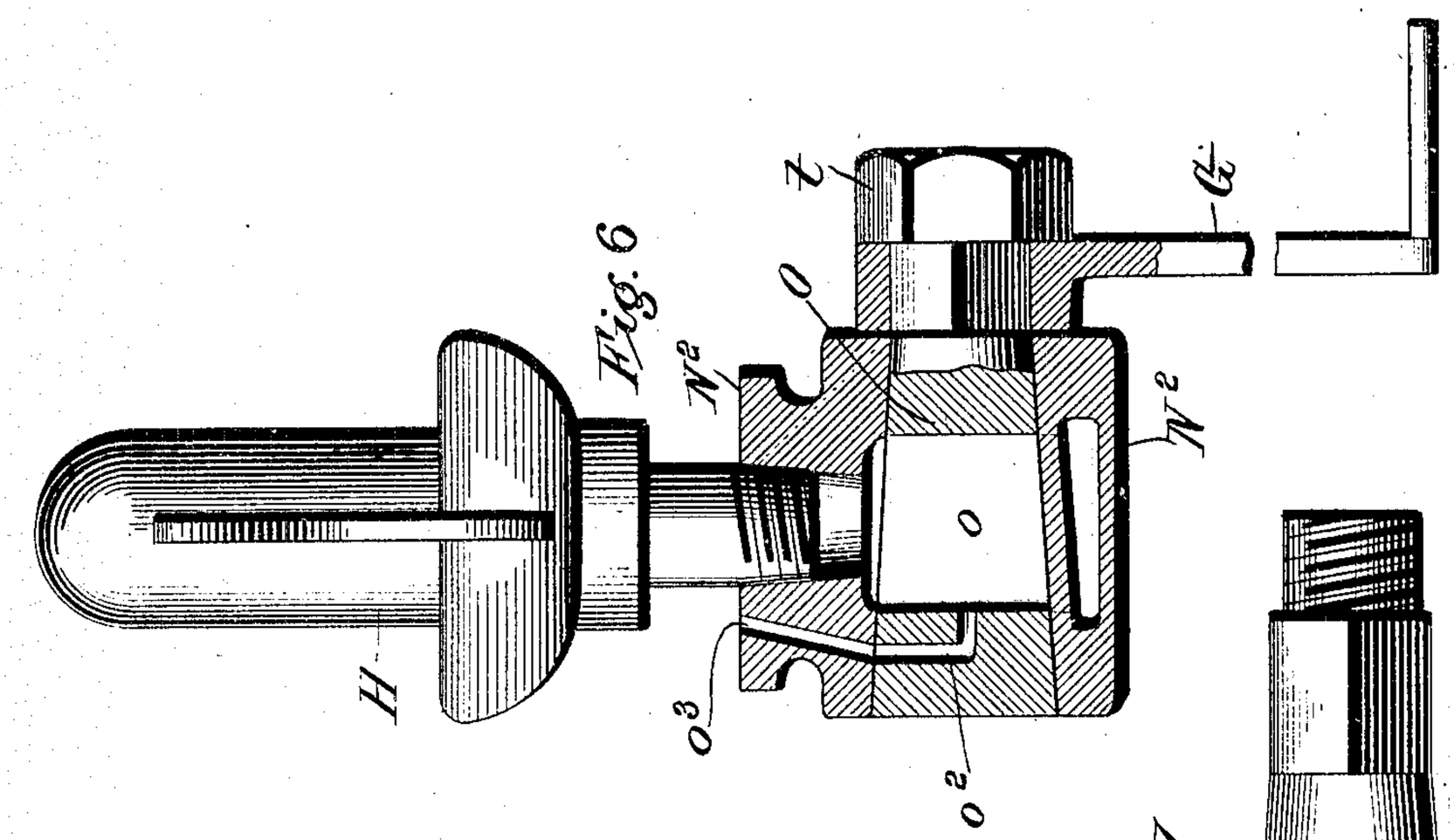
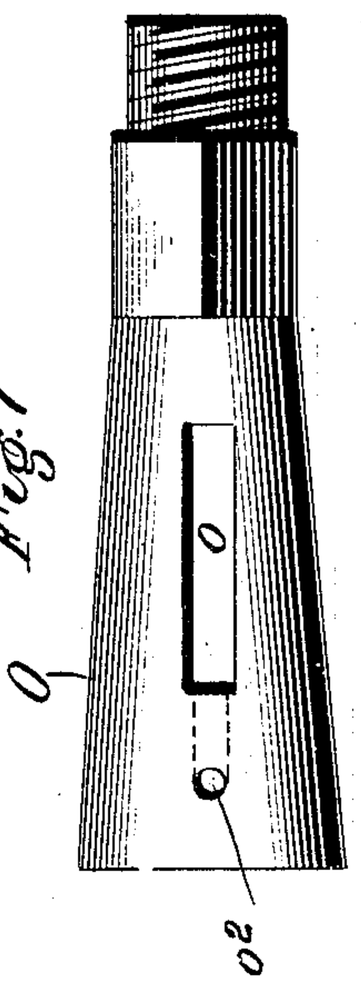
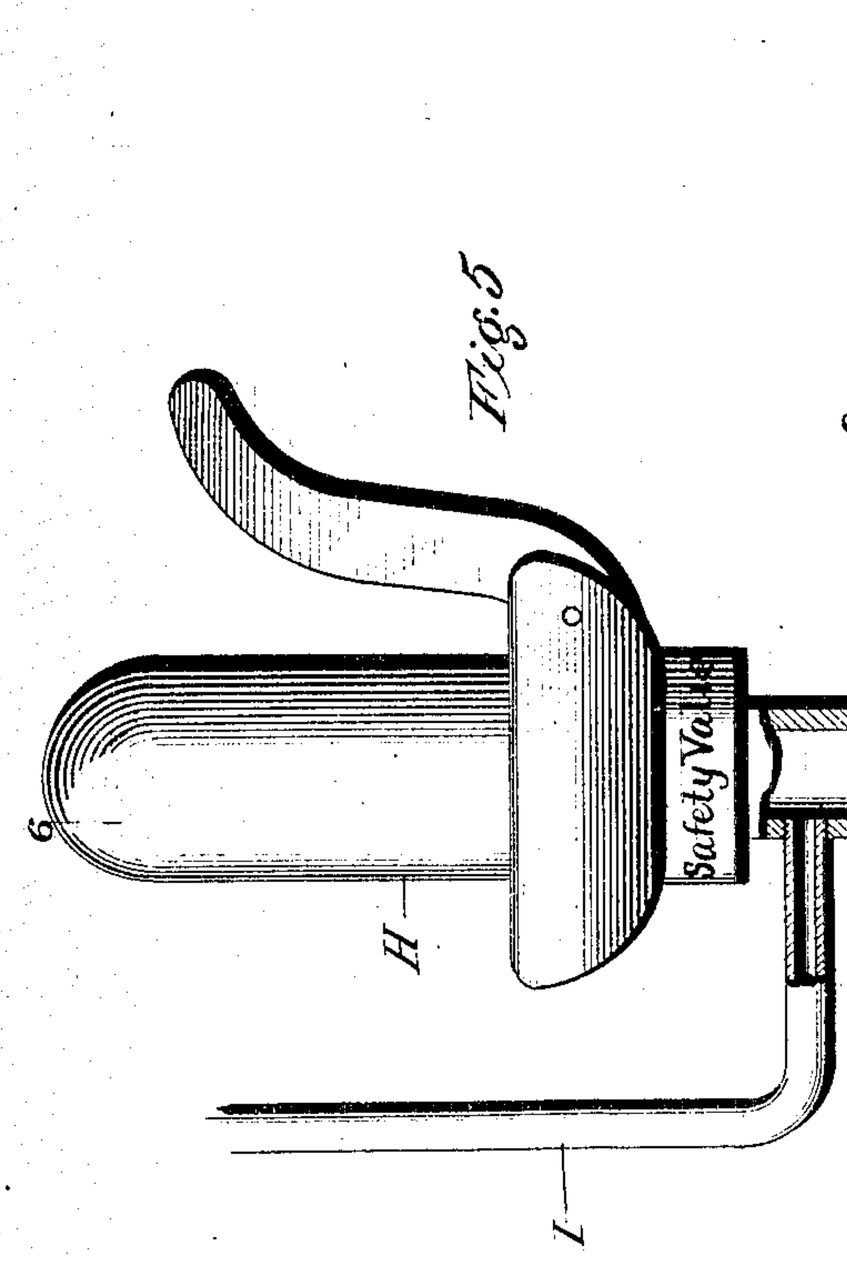
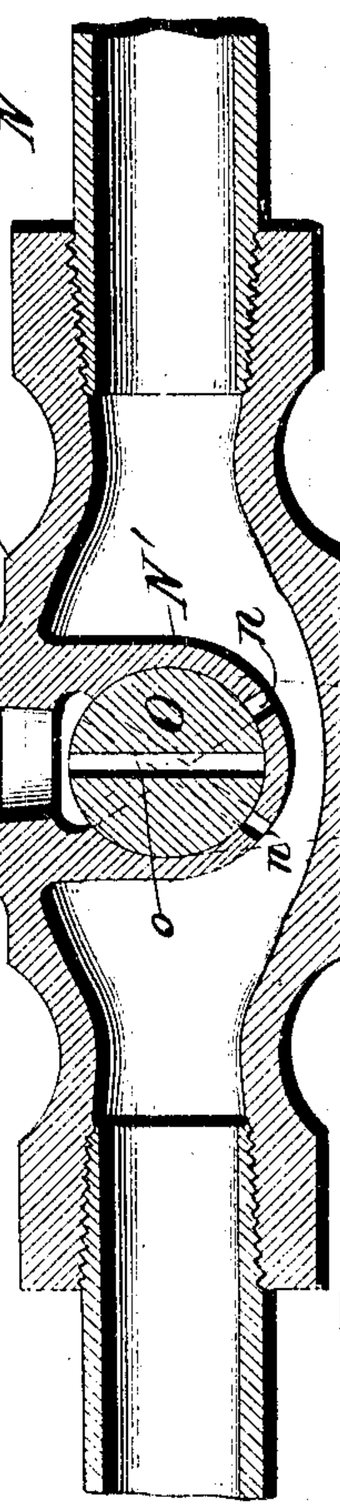
3 SHEETS—SHEET 3.









WITNESSES

C. C. Duffey

Edw. W. Dyer.

INVENTOR

GUSTAVE J. GUMM

BY Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GUSTAVE J. GUMM, OF CHETEK, WISCONSIN, ASSIGNOR OF ONE-HALF TO FRANKLIN CHARLES DURKEE, OF BLOOMER, WISCONSIN.

TRAIN-STOPPING DEVICE.

No. 860,464. Specification of Letters Patent. Patented July 16, 1907.

Application filed January 30, 1907. Serial No. 354,892.

To all whom it may concern:

Be it known that I, GUSTAVE J. GUMM, a citizen of the United States, residing at Chetek, in the county of Barron and State of Wisconsin, have invented a new and useful Improvement in Train-Stopping Devices, of which the following is a specification.

My invention is in the nature of an apparatus for stopping trains automatically in case of a misplaced switch, open drawbridge, &c., and it consists in the novel construction and arrangement of the switch operating mechanism in connection with track devices set at a distance away from the switch, and coöperating devices carried by the train, so that if the switch be open the air brakes on the train are set, and the throttle valve closed in an automatic manner, thereby bringing the train to a stop before the open switch is reached.

Figures 1 and 1ª are plan views of two parts of the same track, with my invention applied thereto. To understand the relation of these views the left hand end of Fig. 1 is supposed to join directly on to the right hand end of Fig. 1ª. Figs. 2 and 2ª are side elevations of the same parts shown in Figs. 1 and 1ª, the relation of Fig. 2 to Fig. 2ª being the same as the relation of Fig. 1 to Fig. 1ª. Fig. 2 also shows the coöperating parts carried by the engine. Fig. 3 is a cross section on line 3—3 of Fig. 1. Fig. 4 is an enlarged cross section on line 4—4 of Fig. 1ª. Fig. 5 is an enlarged sectional view of the train pipe valve for applying the brakes and closing the throttle. Fig. 6 is a section of the same on line 6—6 of Fig. 5 and Fig. 7 is a detail view of the rotary plug of said valve.

In the drawing, A A are the rails of the main track, and B B, Fig. 1ª, are the rails of a switch or siding.

B′ B′ are the movable switch tongues which are operated simultaneously by the cross bar R connecting them, which cross bar through a pitman P is connected to a crank Q, Fig. 4, on a vertical shaft S turning in bearings in the switch stand and carrying a semaphore blade at the top and a horizontal turning arm *s*. As shown in Fig. 1ª the switch is shown as open, the continuity of the main rails being broken.

O, Fig. 1ª, is a double bell-crank one arm of which is loosely connected to the pitman P which adjusts the switch and the other two oppositely projecting arms of which are respectively connected to two wires *a* and *b* which extend along the track from the switch in Fig. 1ª to a point, Fig. 1, far enough removed to stop a train before arriving at the switch. The wires *a* and *b* at this remote point from the switch, see Figs. 1 and 2, are connected to the opposite ends of a T-head lever F which at the middle is rigidly attached to a horizontal rock-shaft C journaled in bearings in the track. This rock-shaft has rigidly attached to it two lifter arms *d*, see Fig. 2, which rest beneath tripping bars E pivoted at one end to stationary brackets *e* beside the track. The lifter arms *d*, being immediately under the tripping bars, serve to raise or lower these bars according to the position of the rock-shaft, which is controlled through the pull wires *a b* by the movement of the switch operating devices. When the switch is open, as shown in Fig. 1ª, the tripping bars E are elevated as seen in Fig. 2; and when so elevated they are in range to be struck by a projecting arm G carried by the train. This arm G is attached to and controls a three-way valve H in the air pipe N of the train, so as to discharge the air and apply the brakes and said valve also opens an air port into the pipe I. This pipe is on the engine, as shown by dotted lines, and it communicates with an air cylinder J in which a piston works and is connected with the engineer's lever K through which the throttle valve L is operated to admit steam through pipe M to the engine cylinders.

When the arm G is in its lowest position, as seen in Fig. 2, the air valve is closed, but should a train passing over this point find the tripping bars E up, as shown, which means an open switch, then the arm G coming in contact with one of the tripping bars E is deflected and as the arm G is turned it opens the air valve and automatically applies the brakes and at the same time it passes air up to the cylinder J through pipe I and, forcing forward the piston, moves the engineers lever to the position which closes the throttle valve.

When the switch is properly set the tripping bars E are down and out of the way of the arms G of passing trains and nothing takes place to interrupt the passage of the train.

The valve H is constructed like a safety valve and is set to close at certain pressure, so that the brakes would be applied and yet avoid the complete exhaustion of the air from the main pipe and without damage to the cars or engine. The detailed construction of this valve is shown in Figs. 5, 6, and 7. H is an ordinary pressure relief or safety valve capable of opening at any predetermined pressure into the lower part of which valve the pipe I is tapped. The neck of this relief valve is screwed into the top of a coupling N^2 in the train pipe N which coupling has a taper bored housing N′ in it, in which turns a tapered plug O, Fig. 7, on the squared end of which is rigidly secured the tripping arm G by means of a nut *t*. Two ports *n n* are formed in this housing which open into the train pipe and a transverse passageway *o* is formed in the plug O which, when the plug is turned by the deflection of the arm G, as indicated by dotted lines in Fig. 5, causes the air in the train pipe to pass through a port *n* and passageway *o* to the relief or safety valve. This causes air to escape through the safety valve which is adjusted to operate about 60 pounds pressure, so that if the normal pressure

in the train pipe is 80 pounds the escape of air through the safety valve and reduction of pressure to 60 pounds will cause the brakes to be applied in the well known way. The air pipe will not be exhausted of air, however, for the reason that the safety valve will close at 60 pounds pressure. This prevents the waste of the air, and also maintains enough pressure through pipe I to close the throttle valve.

After the train has been brought to a stop and the arm G is adjusted to the vertical or running position, as shown in full lines in Figs. 2 and 5, the passageway *o* is thrown out of registration with the port *n* and the air in the throttle operating cylinder J is allowed to escape as follows: A port o^3 is formed in the coupling N^2 as seen in Fig. 6 and a vent port o^2 is formed in the plug in communication with the passageway *o*, and when the plug O is in the running position, shown in full lines in Fig. 5, closing ports *n*, the port o^2 Fig. 3 is in registration with o^3, so that the air imprisoned in the cylinder J may pass down pipe I to the passageway *o* and out through o^2 o^3 to the air, thus permitting the engineer to open the throttle.

I claim

1. The combination with the air brake train pipe and tripping devices along the road bed, of an automatic pressure relief safety valve having a projection adapted to be struck by the tripping devices in the road bed to open the safety valve to the train pipe.

2. A train stopping device comprising tripping devices along the road bed, an air brake train pipe, a throttle valve, a pneumatic cylinder with piston for operating the throttle valve, an automatic pressure relief safety valve connected to both the air brake pipe and the pneumatic cylinder, said pressure relief valve being provided with a projection adapted to be struck by the tripping devices in the road bed and being constructed to automatically open at a normal train pressure and close at the lower brake applying pressure.

3. The combination with tripping means in the road bed for operating a train stopping device on the train; of a pressure relief valve for the train pipe having a projection arranged to be struck by the tripping devices in the road bed, said relief valve being arranged to open at the normal train pipe pressure and to close at a lower and brake applying pressure.

4. The combination with tripping means in the road-bed for operating a train stopping device on the train; of a pressure relief valve for the train pipe having a projection arranged to be struck by the tripping devices in the road bed, said relief valve being arranged to open at the normal train pipe pressure and to close at a lower and brake-applying pressure, and a pneumatic throttle closing device having its air pipe tapped into the passageway between the train pipe and relief valve.

5. The combination with tripping means in the road bed for operating a train stopping device on the train; of a coupling in the train pipe with plug housing N′ and ports *n*, *n*, a rotary plug O with passageway *o* and arm G and a pressure relief valve communicating with the train pipe coupling on the opposite side from its ports *n*.

6. The combination with tripping means in the road bed for operating a train stopping device on the train; of a coupling in the train pipe with plug housing N′ and ports *n n* and o^3, a rotary plug O with passageways *o* o^2 and arm G, and a pressure relief valve and pneumatic throttle closing devices, the throttle closing devices having an air pipe extending to the opening between the train pipe coupling and relief valve.

7. A train stopping device consisting of switch operating bar, a double bell-crank attached thereto, two pull wires attached to the opposite ends of the bell-crank, a horizontal rock-shaft in the road bed having opposite lever arms attached to the pull wires and a rigid lifting arm, a pivoted tripping bar arranged in a plane immediately above the lift arm and a valve carried by the train and having a projection adapted to be struck by the tripping bar.

GUSTAVE J. GUMM.

Witnesses:
J. G. PRUEHE,
NETTIE BROOKS.