

No. 871,166.

PATENTED NOV. 19, 1907.

G. W. GERLACH.
RAILWAY SIGNAL AND SAFETY APPLIANCE.

APPLICATION FILED MAR. 28, 1907.

3 SHEETS—SHEET 1.

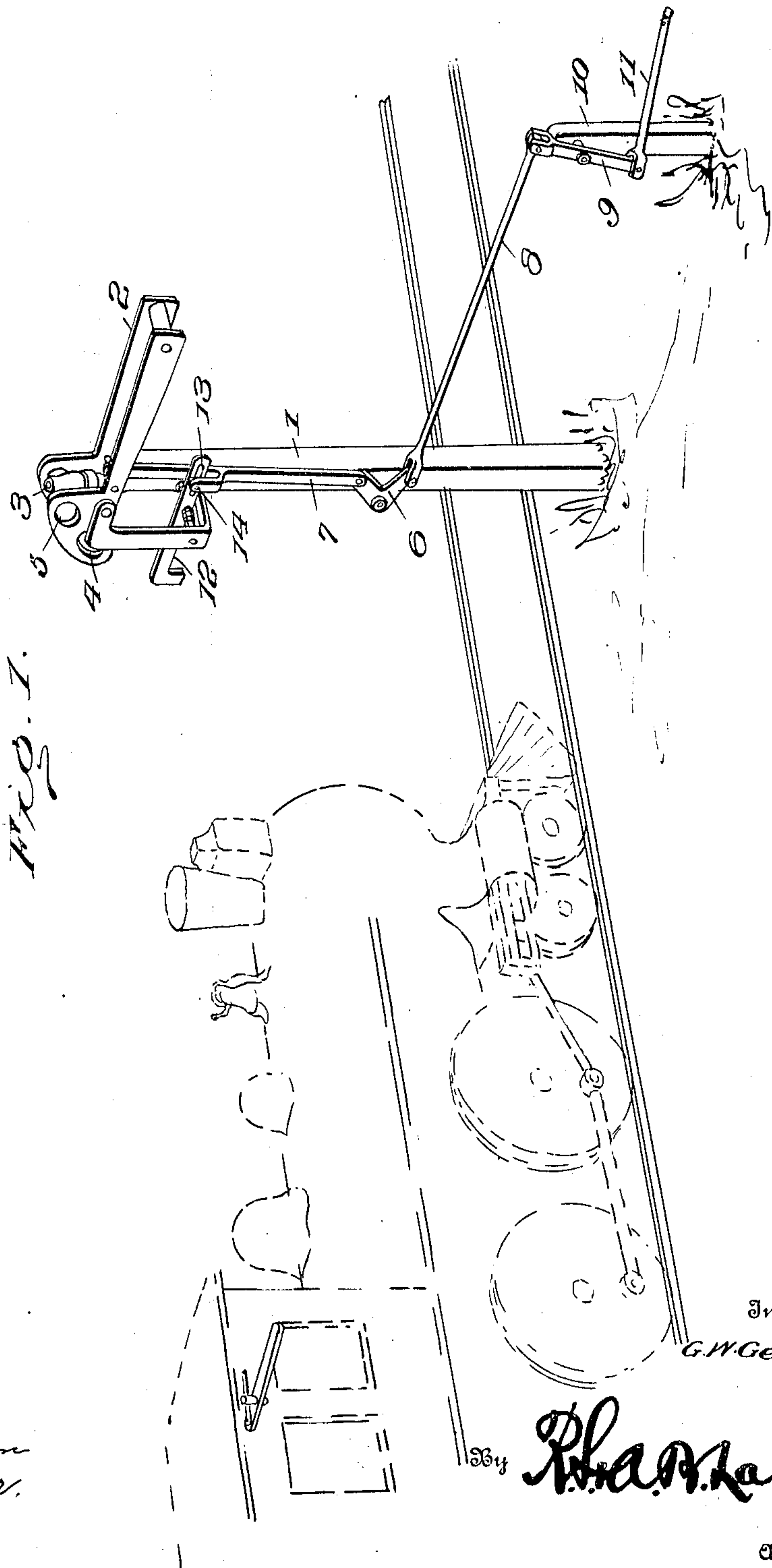


Fig. 1.

Witnesses
W. V. Woodson
A. T. Measer.

Inventor
G. W. Gerlach

By *R. A. M. Lacy*

Attorneys

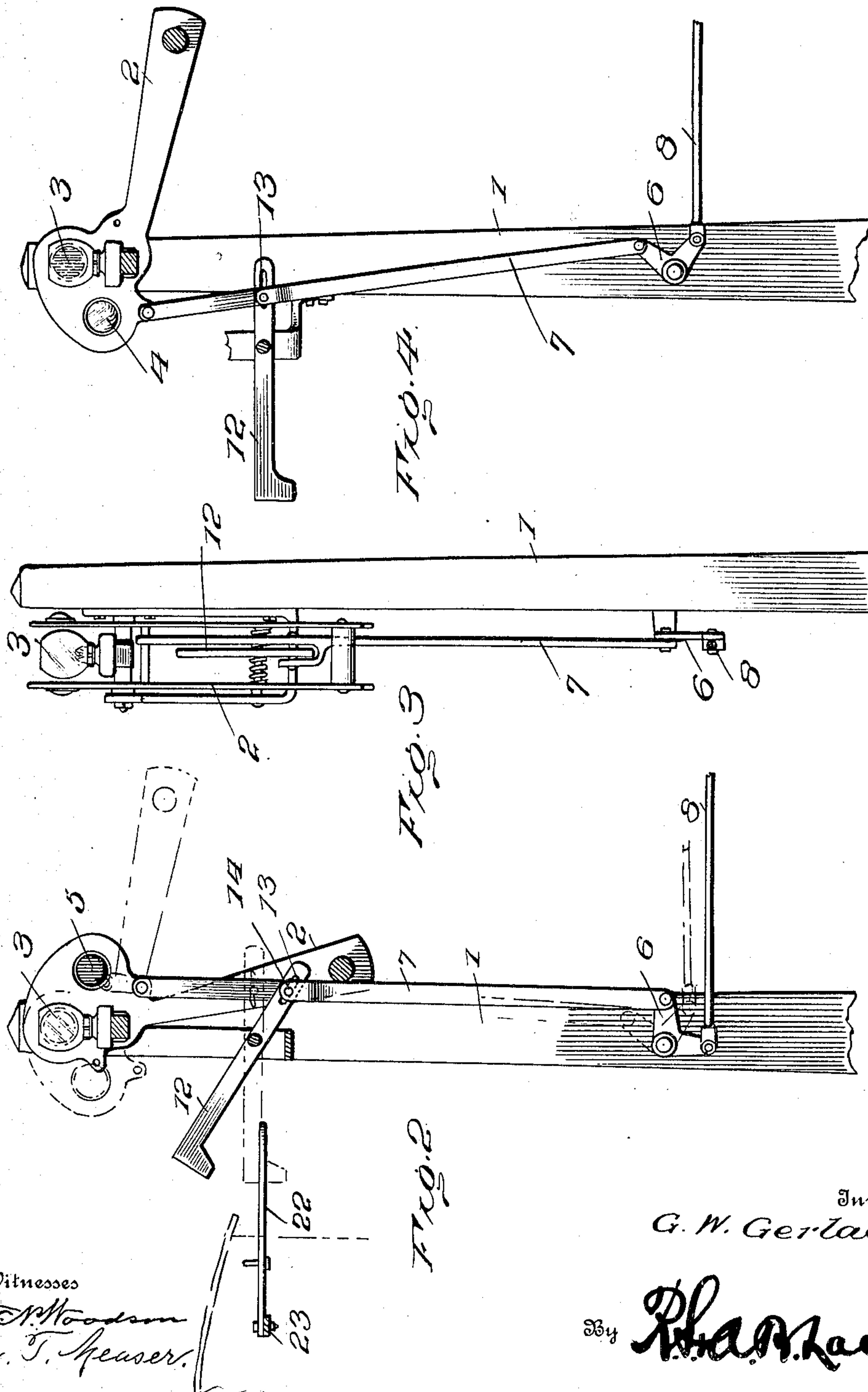
No. 871,166.

PATENTED NOV. 19, 1907.

G. W. GERLACH.
RAILWAY SIGNAL AND SAFETY APPLIANCE.

APPLICATION FILED MAR. 28, 1907.

3 SHEETS—SHEET 2.



Inventor
G. W. Gerlach

By

R. H. Macy,

Attorneys

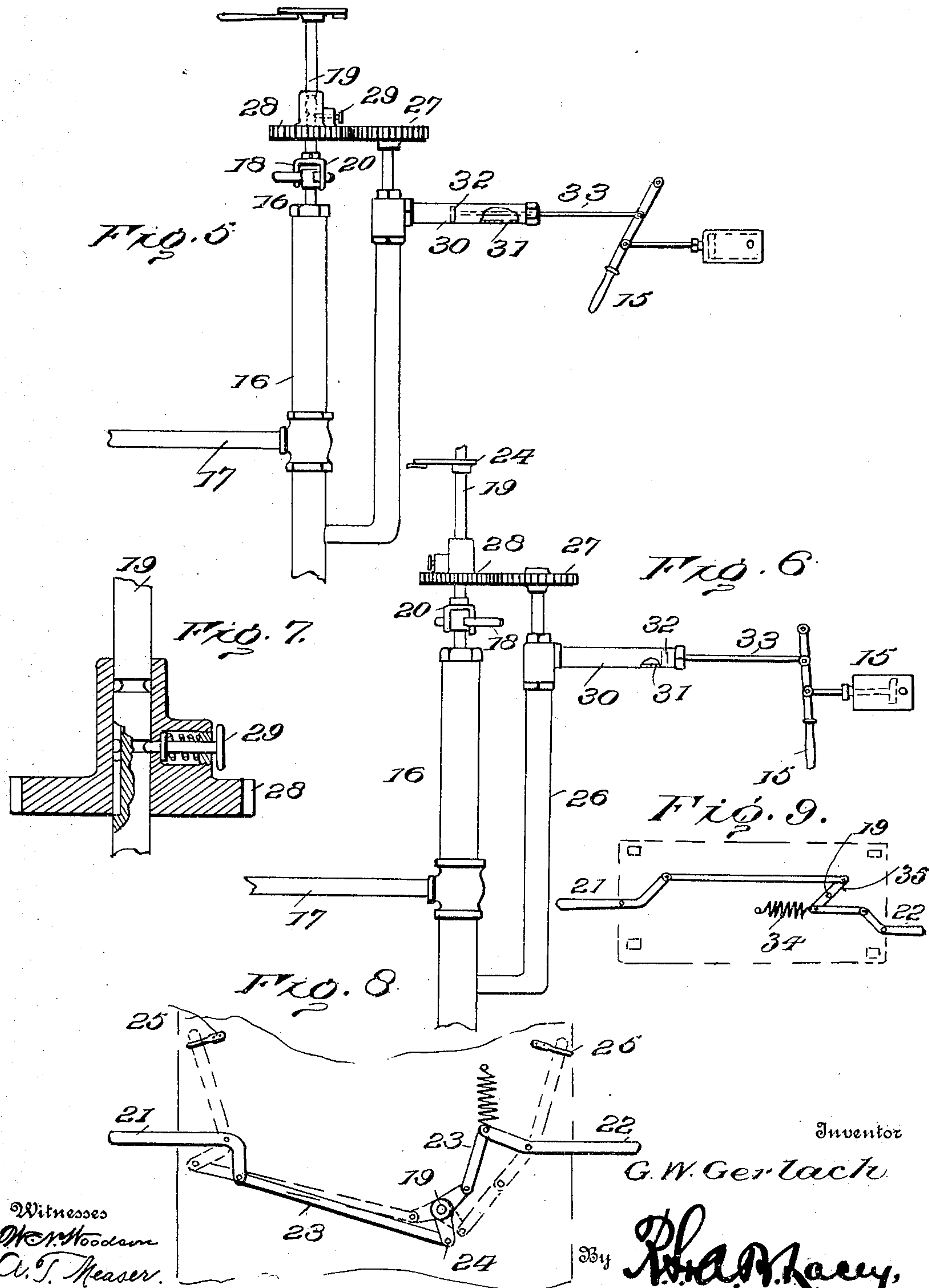
No. 871,166.

PATENTED NOV. 19, 1907.

G. W. GERLACH.
RAILWAY SIGNAL AND SAFETY APPLIANCE.

APPLICATION FILED MAR. 28, 1907.

3 SHEETS—SHEET 3.



Witnesses
W. H. Woodson
A. T. Measer.

Inventor
G. W. Gerlach

By *Ph. M. Ray*
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. GERLACH, OF CUMBERLAND, IOWA.

RAILWAY SIGNAL AND SAFETY APPLIANCE.

No. 871,166.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed March 28, 1907. Serial No. 364,990.

To all whom it may concern:

Be it known that I, GEORGE W. GERLACH, a citizen of the United States, residing at Cumberland, in the county of Cass and State of Iowa, have invented certain new and useful Improvements in Railway Signals and Safety Appliances, of which the following is a specification.

This invention relates to means for controlling railway trains and to provide for automatically shutting off motive power and setting the brakes should the engineer or other operator of a train either fail to observe the signal, or seeing the same, not heed the warning and attempt to run by a danger signal.

The invention consists of a novel semaphore and trip located at a point or station to give warning at a dangerous place.

The invention also embodies novel trip devices upon the locomotive or other part of the train to shut off the motive power and to bring the brakes into play.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a perspective view of a semaphore, signal and trip embodying the invention. Fig. 2 is a detail view showing the two positions of the semaphore and trip, the one indicating safety, the other danger. Fig. 3 is a view of the parts seen in Fig. 2 as they appear looking from a point at a right angle thereto. Fig. 4 is a view of the semaphore and trip as they appear when set to danger. Fig. 5 is a detail view of the safety appliances mounted upon the locomotive. Fig. 6 is a view of the parts shown in Fig. 5 when operated to close the throttle and apply the brakes. Fig. 7 is a detail view of the spur gear for transmitting motion from the trip shaft to the air valve. Fig. 8 is a detail view of the trip mechanism for actuating the trip shaft when the parts are arranged to hold a train, the full lines showing the trip levers projected, and the dotted lines indicating

the position of the trip levers when drawn back out of the way and secured so as not to be operated by the trip of the signal at the station or other point to be safeguarded. Fig. 9 is a view of corresponding parts as shown in Fig. 8 illustrating a modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

A post 1, or other support, such as a tower is located at one side of the track at the selected point to give warning to an approaching train of impending danger. A semaphore arm 2 is pivoted to the post or support 1 and is adapted to indicate safety or danger according to its position. The semaphore arm indicated is composed of companion members transversely spaced so as to receive between them a lantern 3 for use at night. A quadrant is provided at one end of the semaphore arm and is provided with a white lens 4 and a red lens 5, the latter indicating danger and the former safety, or a clear track. These lenses register with the lantern 3 according as the semaphore is lowered or raised.

The signal is adapted to be operated from a convenient point, connections being interposed from the operating lever to the semaphore arm for transmitting motion to the latter. As shown a bell crank 6 pivoted to the post or support 1, has one arm connected by rod 7 to the semaphore arm and its other arm connected by rod 8 to one end of a lever 9 pivoted to a post 10, a rod 11 extending from the other end of the lever 9 to any convenient point. A trip 12 is pivoted between its ends to the post or support 1 and has a slot 13 at one end to receive a pin or fastening 14 by means of which connection is had between the bar or rod 7 and the said trip, whereby the trip and semaphore arm are simultaneously operated.

It is of advantage in assembling and constructing the parts to have them counterbalanced or as nearly so as practicable, whereby they are rendered more responsive to the operating lever. The trip and semaphore arm move together. In one position of the trip 12, it is adapted to set the safety appliances provided upon the locomotive or other part of the train, and in another position of the trip, it clears the projecting arm or part of the safety appliances, thereby permitting the train to pass by the

station without operating the safety mechanism provided thereon. The operating position of the trip 12 may be, and usually is, that position assumed when the semaphore arm indicates danger. However, the trip 12 may actuate the safety appliances when the semaphore arm is pendent.

On the locomotive is arranged the means for cutting off the power and applying the brakes and these means in a locomotive operated by steam consist of a throttle lever 15 and an engineer's valve 16. A pipe 17 leads from the engineer's valve to the brake mechanism to effect setting of the same in an emergency or when required. A lever 18 enables the engineer's valve to be instantly operated. A trip shaft 19 is mounted in axial alinement with the engineer's valve and is provided with a fork 20 to straddle the lever 18 to operate the latter when the trip shaft 19 is actuated. Levers 21 and 22 are mounted upon opposite sides of the locomotive and each has an arm connected by means of a link 23 with a bell crank 24 fast to the trip shaft 19. Under normal conditions, one arm of the levers 21 and 22 projects beyond a side of the locomotive to be engaged by the trip 12 when backing the train. The levers 21 and 22 may be moved to bring their projecting arms within the sides of the locomotive as indicated by dotted lines in Fig. 8, said levers being secured by clips 25. An air valve 26 has connection with the engineer's valve or the pipe leading therefrom to the reservoir and its stem is provided with a spur gear 27 adapted to mesh with a spur gear 28 mounted upon the trip shaft 19 so as to be moved to throw the spur gears 27 and 28 into or out of gear. A spring actuated catch 29 coöperates with the spur gear 28 and the trip shaft 19 to hold said spur gear in either of its extreme positions. A cylinder 30 has connection with the air valve 26 and is provided in a side with an opening 31. A piston 32 is arranged to operate in the cylinder 30 and its stem 33 is connected with the throttle lever 15. When the throttle lever occupies the position shown in Fig. 5, steam is admitted to the engine for operating the same and when the throttle lever occupies the position shown in Fig. 6, the steam is cut off. The throttle lever may be operated at any time, the opening 31 in the cylinder 30 admitting of the piston 32 working freely. In an emergency, when the trip shaft 19 is actuated by the trip 12 coming in contact with one or the other levers 21 or 22, the engineer's valve 16 is operated, thereby permitting the brakes to be automatically applied and the valve 26 opened so that air may pass into the cylinder 30 in the rear of the piston 32 and move the latter to operate the throttle lever 15 and shut off the steam.

The fork 20 admits of the engineer's valve being operated at any time, and by throwing the spur gear 28 out of mesh with the spur gear 27, the throttle and engineer's valve may be independently operated and the levers 21 and 22 may be moved so as not to come in contact with the trip 12 upon backing a train and thereby cause disaster to the signal and safety mechanisms. A spring 34 returns the parts to normal position after the trip has cleared the lever 21 or 22 engaged thereby.

In the modification shown in Fig. 9 the bell crank 24 is placed by means of a straight lever 35 which is attached to the trip shaft 19 and the levers 21 and 22 have a different formation. The spring 34 for returning the parts to normal position is differently positioned but performs the same office, viz: to return the levers 21 and 22 to normal position and to close the air valve 26 thereby preventing air passing to the cylinder 30 and wasting through the opening 31.

Having thus described the invention, what is claimed as new is:

1. In railway safety appliances, the combination of a valve controlling the brakes, a second valve controlling the throttle, connecting means between the two valve stems, a trip shaft for operating one of the valves, a lever having an operative connection with the trip shaft, and a trip for engaging the lever.

2. In railway safety appliances, the combination of a valve controlling the brakes, a second valve controlling the throttle, gearing connecting the valve stems, a lever for operating the valves, and a trip for engaging the lever.

3. In railway safety appliances, the combination of an air valve controlling the brakes, a cylinder, a second valve controlling the admission of air to the cylinder, a piston mounted within the cylinder, a throttle lever controlled by the piston, gearing connecting the two valves, a lever for opening the valves, and a trip for engaging the lever.

4. In railway safety appliances, the combination of a valve controlling the brakes, a second valve controlling the throttle, means for simultaneously operating the valves, a trip shaft for operating one of the valves, a crank arm carried by the trip shaft, a trip lever having an operative connection with the crank arm, and a trip for actuating the trip lever.

5. In railway safety appliances, the combination of a valve controlling the brakes, a second valve controlling the throttle, a gear wheel adjustably mounted upon the stem of one of the valves, a second gear wheel mounted upon the stem of the second valve, the first mentioned gear wheel being designed to be moved into and out of engagement with the

second mentioned gear wheel, and a trip mechanism for actuating the first mentioned valve.

5 6. In railway safety appliances, the combination with the engineer's valve of a trip shaft, a trip lever for operating the trip shaft, a fork attached to the trip shaft and adapted to couple the same to, or admit of uncoupling the trip shaft from the stem of the air
10 valve, a cylinder having connection with the air valve, connecting means between the air valve and trip shaft, a piston arranged to operate in the cylinder and connecting means between said piston and the lever for cutting
15 off power.

7. In railway safety appliances, the com-

bination of a valve controlling the brakes, a second valve controlling the throttle, gearing connecting the valves for simultaneous operation, a trip shaft for operating one of the
20 valves, a crank arm carried by the trip shaft, a trip lever having an operative connection with the crank arm, a semaphore signal, and a trip actuated by the semaphore signal for engagement with the before mentioned trip
25 lever.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. GERLACH. [L. s.]

Witnesses.

JOHN SMITH,

W. T. PETTINGER.