

C. A. THORSLAND.
RAILWAY SAFETY APPLIANCE.
APPLICATION FILED JULY 3, 1911.

1,059,088.

Patented Apr. 15, 1913.

3 SHEETS-SHEET 1.

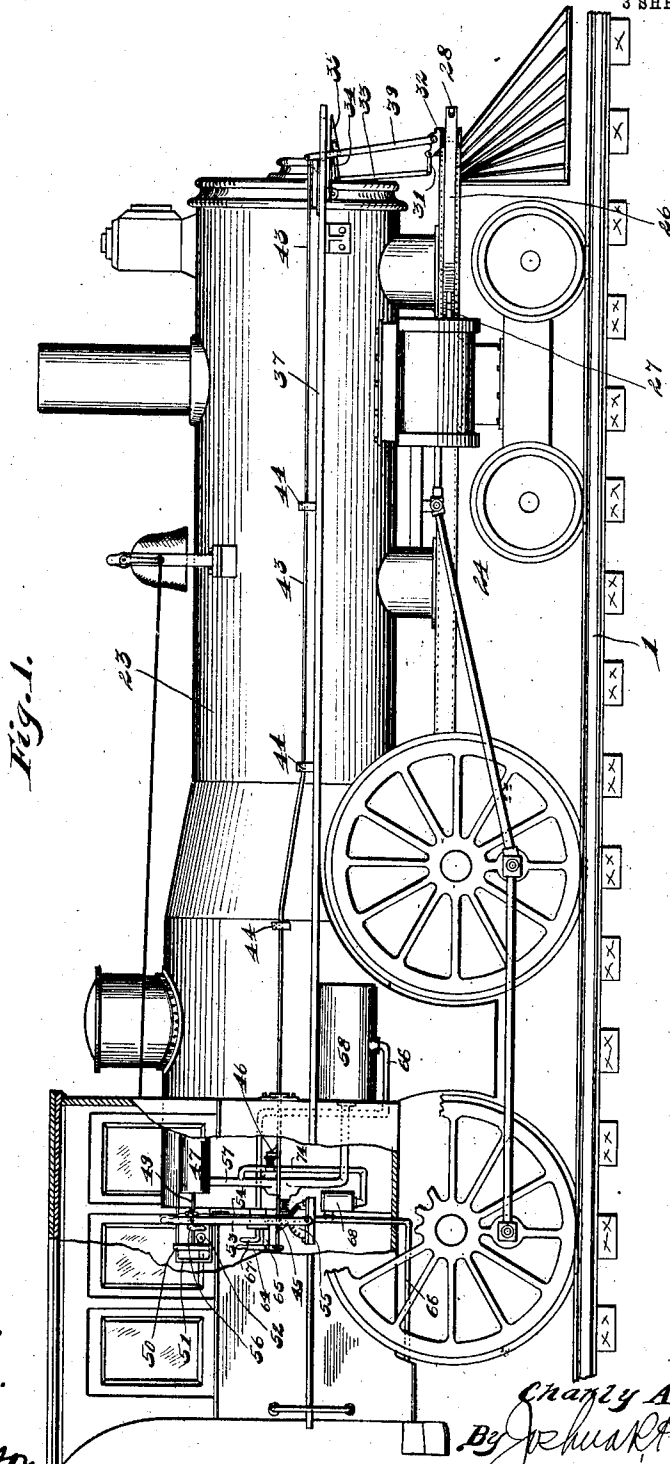


Fig. 1.

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Inventor:

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3 SHEETS—SHEET 2.

Fig. 2.

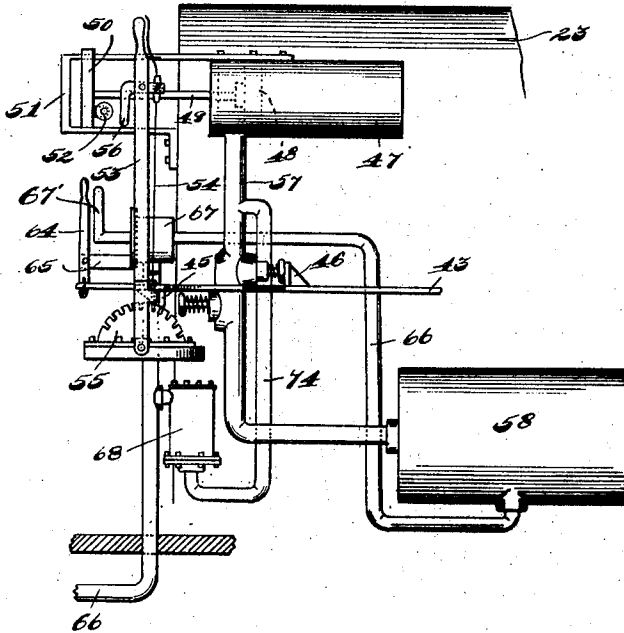


Fig. 4.

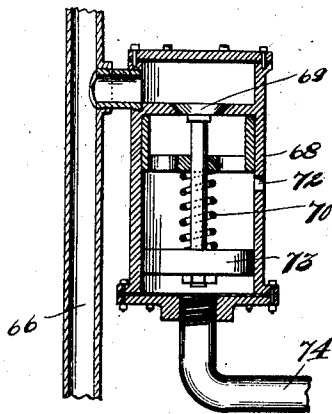
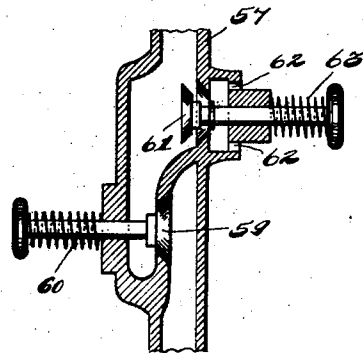


Fig. 3.



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Fig. 5.

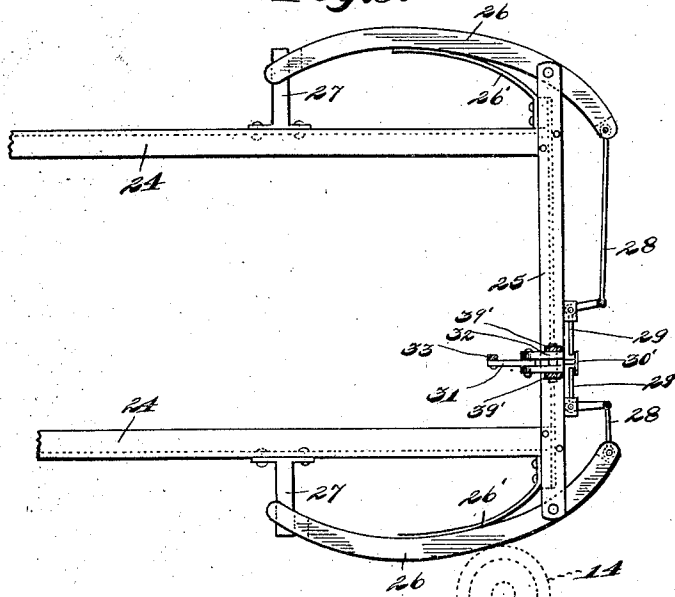


Fig. 6.

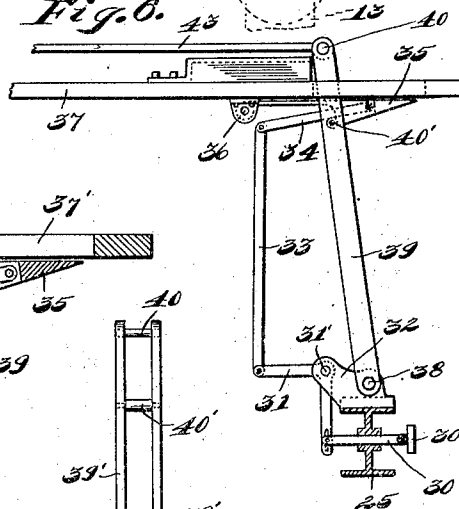


Fig. 7.

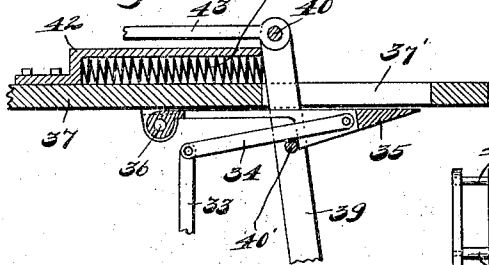
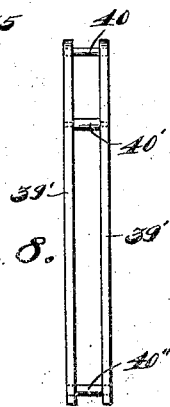


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLY A. THORSLEND, OF BERWYN, ILLINOIS.

RAILWAY SAFETY APPLIANCE.

1,059,088.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed July 3, 1911. Serial No. 636,621.

To all whom it may concern:

Be it known that I, CHARLY A. THORSLEND, a citizen of the United States, and a resident of the city of Berwyn, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Railway Safety Appliances, for which I filed application for patent July 3, 1911, Serial No. 636,621.

My invention relates to improvements in railway safety appliances and has for its object the production of a mechanism of this character through the medium of which a locomotive may be automatically stopped in the event of disregard of danger or stopping signals by the engineer or fireman.

A further object is the production of a safety mechanism as mentioned which will be of durable and economical construction and efficient in operation.

With these objects in view my invention consists in a railway safety appliance characterized as above mentioned and in certain details of construction and arrangement of parts hereinafter described and claimed.

My invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a side elevation of an ordinary railway track upon which is mounted a locomotive equipped with mechanism embodying my invention, portions of the locomotive being broken away in order to expose underlying parts, Fig. 2 is a detail side elevation of the rearward end portion of the locomotive boiler, Fig. 3 is a sectional detail of valves included in the construction, Fig. 4 is a sectional detail of the pressure varying valve included in the construction, Fig. 5 is a top plan view of the forward end portion of the frame of the locomotive equipped with my construction, Fig. 6 is an enlarged sectional side elevation thereof, Fig. 7 is an enlarged longitudinal section of the upper portion of the construction shown in Fig. 6, and Fig. 8 is a detail of the lever included in the construction shown in Figs. 6 and 7.

Referring now to the drawings 1 designates an ordinary railway track adjacent to which and at one side thereof is arranged a suitable signaling device or semaphore.

Arranged for travel upon the track 1 is a locomotive of any ordinary or preferred construction, 23 indicating the boiler and

24 the longitudinally extending base or frame bars thereof. The forward ends of the frame bars 24 are connected by a transversely extending bar 25 to the respective extremities of which are fulcrumed curved contact levers 26, the rearward free ends of said levers being slidably supported upon brackets 27, said ends of said levers being bifurcated for the reception of said brackets. Leaf-springs 26' engaging against the inner sides of the rearward free ends of said levers serve to normally hold said ends at their outward limits of movement, as clearly shown in Fig. 8. The levers 26 are arranged coplanar with rollers 14 on the arms 13 of the signaling device, so that when the locomotive passes either of said device the outer ends of the arms 13 will contact and effect the inward rocking of the rearward or free end of the lever 26 provided at the adjacent side of the locomotive. By providing levers 26 of curved construction as shown it is clear that provision is made whereby when the locomotive is running backward operation of said levers by the arms 13 will be effected in just the same manner as when the locomotive is moving forward. The rollers 14 are provided to alleviate friction, and levers 26 are arranged at both sides of the locomotive in order that one will always be positioned for engagement with the contact post no matter which side of the locomotive is adjacent thereto.

The forward ends of the levers 26 are connected by means of rods 28 with bell-crank levers 29, the inner ends of said levers 29 being positioned for engagement against the rearward side of the head 30' of the sliding pin 30. The arrangement is such that inward movement of the rearward ends of the levers 26 effects rocking of the bell-cranks 29, such rocking of either of the latter effecting forward movement of the pin 30. The rearward end of the pin 30 is operatively connected with the lower end of a bell-crank 31 which is fulcrumed at 31' to a bracket 32, the opposite end of said bell-crank being connected with a rod 33 which is pivotally connected at its upper end with an arm 34 the forward end of which is pivotally connected with the free end of a hook or detent 35 pivoted at 36 to the underside of the adjacent running board 37 of the locomotive. Fulcrumed at 38 to the bracket 32 is a lever 39 comprising the longitudinal members 39' which are spaced apart and

rigidly connected by pins 40, 40' and 40". The upper end of the lever 39 projects through a slot 37' provided in the running board 27, said slot 37' serving to limit the amplitude of oscillatory movement permitted said lever. A compression spring 41 inclosed in the housing 42 is arranged for cooperation with the lever 39, said spring being adapted to move the lever 39 to its forward limit of oscillation. Said lever 39 is held at its rearward limit of oscillation, or in the position shown in Figs. 9 and 10 through the medium of the detent 35 which is adapted to engage the transverse pin 40' of said lever. The arm 34, when the detent 35 is in engagement with the pin 40' rests upon the upper side of said pin so that downward rocking of the rearward or free end of said arm 34 will effect the upward movement of the forward or free end of the lever 35 to release said pin 40'. Hence with this construction it will be observed that upon forward movement of the pin 30 as is caused by depression of the rearward or free end of either of the levers 26, the lever 39 will be released it being clear that such forward movement of the pin 30 effects through the medium of the bell-crank 31 and the rod 33 downward rocking of the rearward end of the arm 34.

Connected at its forward end with the upper end of the lever 39 is a rod 43 which extends rearwardly therefrom, said rod being slidably mounted in guide blocks 44 provided upon the upper side of the running board 37 and the adjacent side of the boiler 23. The arrangement is such as will be observed that forward rocking of the lever 39 which is affected as above described upon depression of the rearward free end of either of the levers 26, said rod 43 will be moved or drawn forwardly by said lever 39. The rearward end of the rod 43 terminates within the locomotive cab, said end being provided with projecting contacts 45 and 46 adapted to operate in a manner hereinafter described.

Mounted upon the side of the boiler 23 at the rearward end thereof and within the locomotive cab is a pressure cylinder 47 in which is slidably mounted an ordinary piston 48. The piston rod 49 of the piston 48 projects rearwardly and is provided with a cross head 50 which is slidably mounted upon a bracket 51 secured to the cylinder 47 and the rearward end of the boiler 23. Carried upon the cross head 50 is an outwardly projecting roller arm 52 which is arranged coplanar with the throttle lever 53. The latter as is known is held at its various positions of adjustment through the medium of a pawl device 54 which engages with a segmental rack 55, movement of said lever being effected only after operation of said pawl device to effect release thereof. The

upper end of the pawl device 54 is connected with a bell-crank 56, the arrangement being such that upon inward rocking of the lower end of said bell-crank said pawl device will be moved upwardly to disengage the rack 55 and release the lever 53. The lever 56 as will be observed is disposed for engagement by the roller 52, the arrangement being such that upon forward movement of the piston 48 and hence the piston rod 49, said roller 52 will first rock the bell-crank 56 to effect release of the throttle lever, continued movement of the piston in this direction effecting forcing of the throttle lever to throttling or stopping position. With this arrangement then it will be seen that forward movement of the piston 48 will effect automatically the release of the throttle lever and the rocking thereof to stopping position.

The cylinder 47 is connected by a pipe 57 with the compressed air reservoir 58 of the locomotive, the arrangement being such that compressed air fed to the cylinder 47 through said pipe 57 will be discharged into the forward end of said cylinder for operation upon the piston 48 to effect rearward movement thereof as above mentioned. Interposed in the pipe 57 is a poppet valve 59 adapted when in seated or in closed position to shut off communication between the reservoir 58 and the cylinder 47, a compression spring 60 being provided for normally holding the valve 59 in seated position. Also provided in the pipe 57 is a valve 61 which controls communication between the passage through the pipe 57 and exhaust ports 62, the arrangement being such that when said valve is unseated, as shown in Fig. 6 exhaust from the pipe 57 will be permitted and when said valve is in seated position such exhaust will be stopped. A compression spring 63 is provided to normally hold the valve 61 in seated position. The valves 59 and 61 are so arranged that the exteriorly projecting stems thereof are disposed for engagement with the contact fingers 45 and 46 respectively of the rod 43. The arrangement is such that upon forward movement of the rod 43 in the manner above described through release of the lever 39, contact 45 will engage the stem of valve 59 to effect opening of the latter, contact 46 being in this movement of the rod 43 moved out of engagement with the stem of valve 61 to permit of closing of the latter. With this arrangement then upon forward movement of the rod 43 communication will be established between the reservoir 58 and the cylinder 47 to effect forward movement of the piston 48 and consequently release of the throttle lever 53 and movement thereof toward stopping position.

The rod 43 is returned to normal position through the medium of a hand operable lever 64 which is fulcrumed intermediate its

ends to a bracket 65, the lower end of said lever 64 being connected with the rearward end of the rod 43. With the rod 43 in normal position that is at its rearward limit of movement the contact 45 will be positioned out of engagement with the stem of valve 59, the contact 46 being positioned in engagement with the stem of valve 61 maintaining the latter in open position. Hence under normal conditions the air will be exhausted from cylinder 47 and the piston 48 manually positioned at its forward limit of movement with the contact roller 52 in position out of engagement with the ball-crank 56 of the throttle lever 53, permitting of free manual operation of the throttle lever by the engineer or fireman.

Connected with the reservoir 58 is the pressure pipe 66 of the air-brake system of the locomotive. Interposed in the pipe 66 is the usual engineer's valve or controller 67, 67' designating the controlling lever through the medium of which the pressure in the brake system may be controlled in order to effect setting or release of the brakes. As is known by those familiar with this construction decreasing the pressure in the brake system will effect setting of the brakes. Interposed in the pipe 66 below the controller 67 is an exhaust valve which comprises the casing 68, the poppet valve 69 which is held normally seated by a compression spring 70, an exhaust port 72, and a piston 73 which is mounted for operation in the lower end of the cylinder 68. The arrangement is such that the exhaust of air from the brake system pipe 66 will be effected upon elevation or opening of the valve 69. The lower end of the cylinder 68 is connected by means of a pipe 74 with the pipe 57, the point of connection with said pipe 57 being as will be observed intermediate the valves 59 and 61 and the cylinder 47. With this arrangement it will be seen that upon opening of the valve 59 in the manner above described the compressed air from the reservoir 58 which by such opening of said valve passes into the upper end of the pipe 57 will enter the pipe 74 and the lower end of the valve casing 68 to act upon the piston 73 in order to effect upward movement or opening of the valve 69. With this arrangement then upon forward actuation of the rod 43 in addition to release of the throttle lever 53 and movement thereof to stopping position, the pressure in the pipe 66 that is in the air-brake system will be varied, more precisely reduced, such variation or reduction of pressure as above mentioned being sufficient to effect setting of the brakes and consequently stopping of the locomotive and train.

With a construction as above set forth then it will be seen that provision is made whereby in the event of the engineer or fire-

man disregarding the danger signal as indicated by the semaphore, the locomotive regardless of any action on the part of engineer or fireman will be automatically brought to a stop, since with the semaphore in danger signaling position, upon the passage of the locomotive by either one of the actuating or operating posts arranged along the track, the contact of said posts with either of the levers 26 will effect the release of the rod 43, the forward movement of said rod and the consequent throwing of the throttle lever and setting of the brakes.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I therefore do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. In a railway safety mechanism, the combination with a locomotive having a throttle lever provided with a ratchet and pawl and an air brake system, of a cylinder having a piston and piston rod therein, a head on the outer end of said piston rod, a bell crank lever on said throttle lever having one arm thereof in the path of travel of said head, a connection between the other arm thereof and said pawl, the arrangement being such that movement of the piston effects engagement of said head with said bell crank lever whereby the pawl is released from said ratchet and whereby further movement of said piston effects movement of said throttle lever, together with an air supply pipe from said air brake system to said cylinder, a valve in said pipe, a reciprocating rod having a stop thereon, said stop arranged to engage said valve whereby a supply of air is admitted from said air brake system to said cylinder, and means for reciprocating said rod, a second valve in said pipe and a second stop on said reciprocating rod arranged to engage said second valve whereby said valve is opened and pressure from said cylinder discharged, substantially as described.

2. In a railway safety mechanism, the combination with a locomotive having a throttle lever provided with a ratchet and pawl and an air brake system, of a cylinder having a piston and piston rod therein, a head on the outer end of said piston rod, a bell crank lever on said throttle lever having one arm thereof in the path of travel of said head, a connection between the other arm thereof and said pawl, the arrangement being such that movement of the piston ef-

fects engagement of said head with said bell crank lever whereby the pawl is released from said ratchet and whereby further movement of said piston effects movement of said throttle lever, together with an air supply pipe from said air brake system to said cylinder, a valve in said pipe, a reciprocating rod having a stop thereon, said stop arranged to engage said valve whereby a supply of air is admitted from said air brake system to said cylinder, and means for reciprocating said rod, a second valve in said pipe and a second stop on said reciprocating rod arranged to engage said second valve whereby said valve is opened and pressure from said cylinder discharged, a cylinder having a piston and valve therein, a pipe leading from said air supply pipe to said last mentioned cylinder a pipe leading from said last mentioned cylinder to said air brake system, whereby air pressure operating on said piston opens said valve and reduces the pressure in said air brake system, substantially as described.

3. In a railway safety mechanism, the combination with a locomotive having a throttle lever provided with a ratchet and pawl, and an air brake system, of a cylinder having a piston and rod for operating said pawl and throttle lever, a pipe connecting said cylinder with said air brake system, a poppet valve in said pipe arranged to admit air from said air brake system and said cylinder and another poppet valve in said pipe arranged to exhaust air from said cylinder, a reciprocating rod having stops arranged to engage alternately said poppet valves during the reciprocation of said rod, substantially as described.

4. In a railway safety mechanism, the combination with a locomotive having a throttle lever provided with a ratchet and pawl, and an air brake system, of a cylinder having a piston and rod for operating said pawl and throttle lever, a pipe connecting said cylinder with said air brake system, a poppet valve in said pipe arranged to admit air from said air brake system and said cylinder and another poppet valve in said pipe arranged to exhaust air from said cylinder, a reciprocating rod having stops arranged to engage alternately said poppet valves during the reciprocation of said rod,

means for moving said rod in one direction, and a hand lever arranged to move the rod in the other direction, substantially as described.

5. In a railway safety mechanism, the combination with a locomotive having a throttle lever provided with a ratchet and pawl, and an air brake system, of a cylinder having a piston and rod for operating said pawl and throttle lever, a pipe connecting said cylinder with said air brake system, a poppet valve in said pipe arranged to admit air from said air brake system to said cylinder and another poppet valve in said pipe arranged to exhaust air from said cylinder, a reciprocating rod having stops arranged to engage alternately said poppet valves during the reciprocation of said rod, means for moving said rod in one direction, and a hand lever arranged to move the rod in the other direction, a pipe leading from said first mentioned pipe, a cylinder thereon provided with a piston having a valve at one end of the stem thereof, and an air passage from said cylinder above said valve to the air brake system, the arrangement being such that the stroke of said piston opens said valve, exhaust ports in said cylinder beneath said valve whereby the pressure in said air brake system is reduced when said cylinder valve is opened, substantially as described.

6. In a railway safety mechanism, the combination with a locomotive having a throttle lever provided with a ratchet and pawl, and an air brake system, and means for operating said pawl and throttle lever by air pressure, and valves for regulating the flow and discharge of air, a reciprocating rod having stops thereon arranged to operate said valves alternately, a lever at the end of said rod and a third lever connected by mechanism to said second mentioned lever whereby horizontal movement of said third lever reciprocates said rod longitudinally, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLY A. THORSLAND.

Witnesses:

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BRAYTON G. RICHARDS.