

No. 864,974.

PATENTED SEPT. 3, 1907.

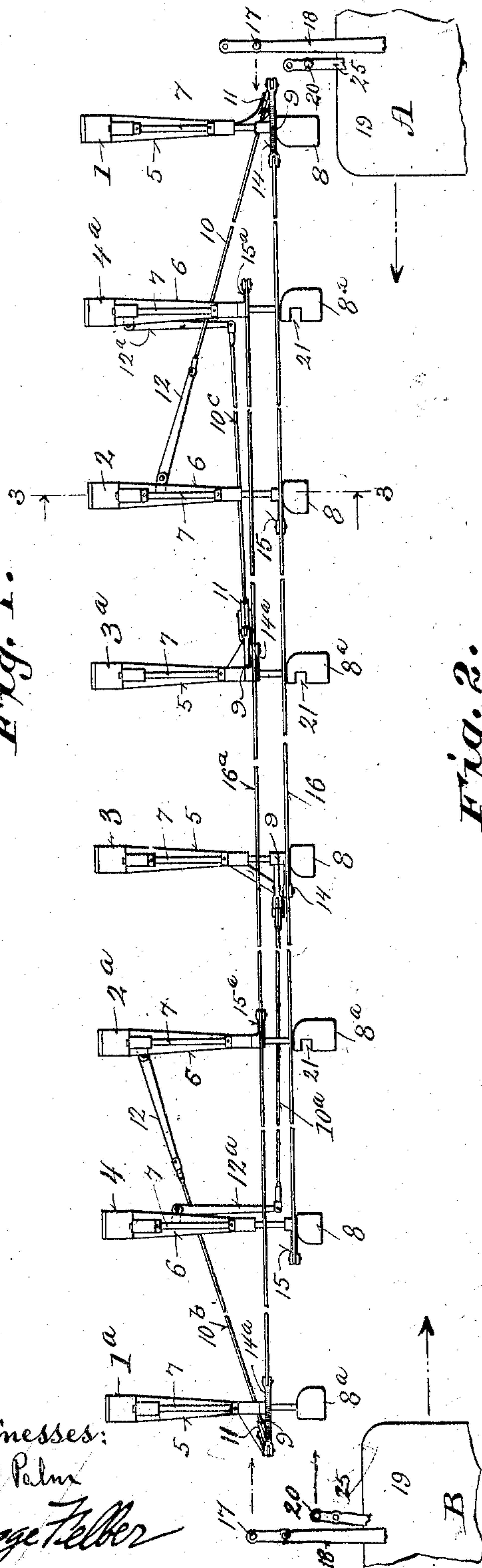
H. LONGAUER.

RAILWAY BLOCK SYSTEM AND LOCOMOTIVE EQUIPMENT FOR OPERATING
THE SAME.

APPLICATION FILED MAY 16, 1907.

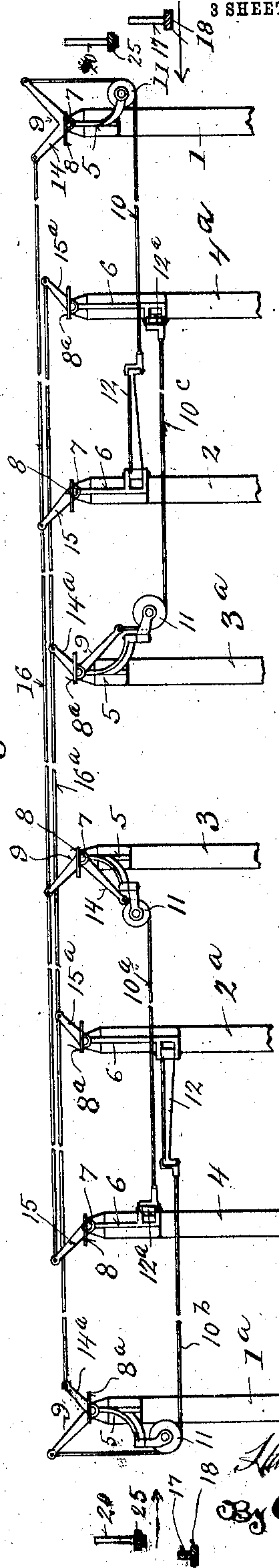
3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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Fig. 2.



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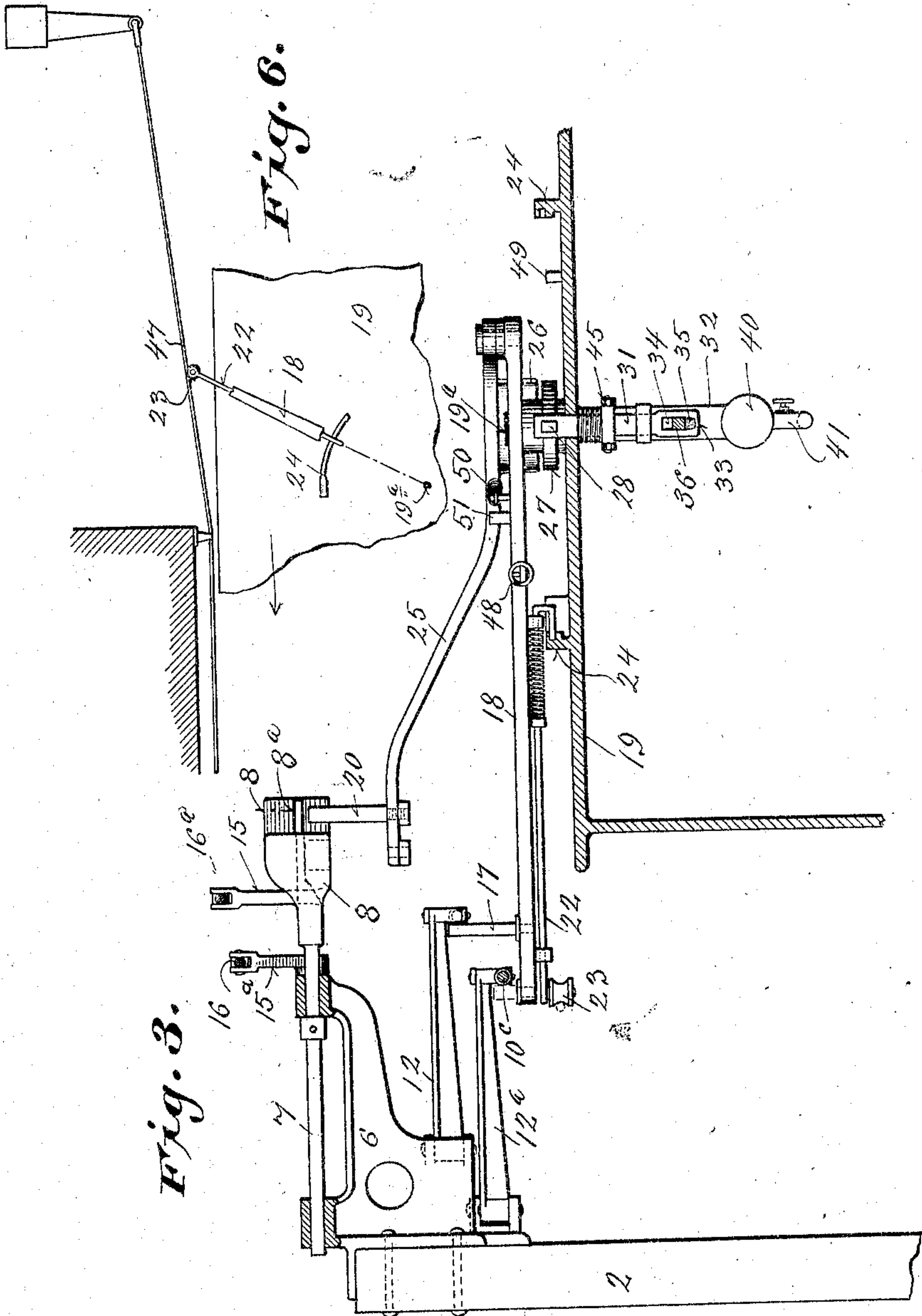
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3 SHEETS—SHEET 2.



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Fig. 4.

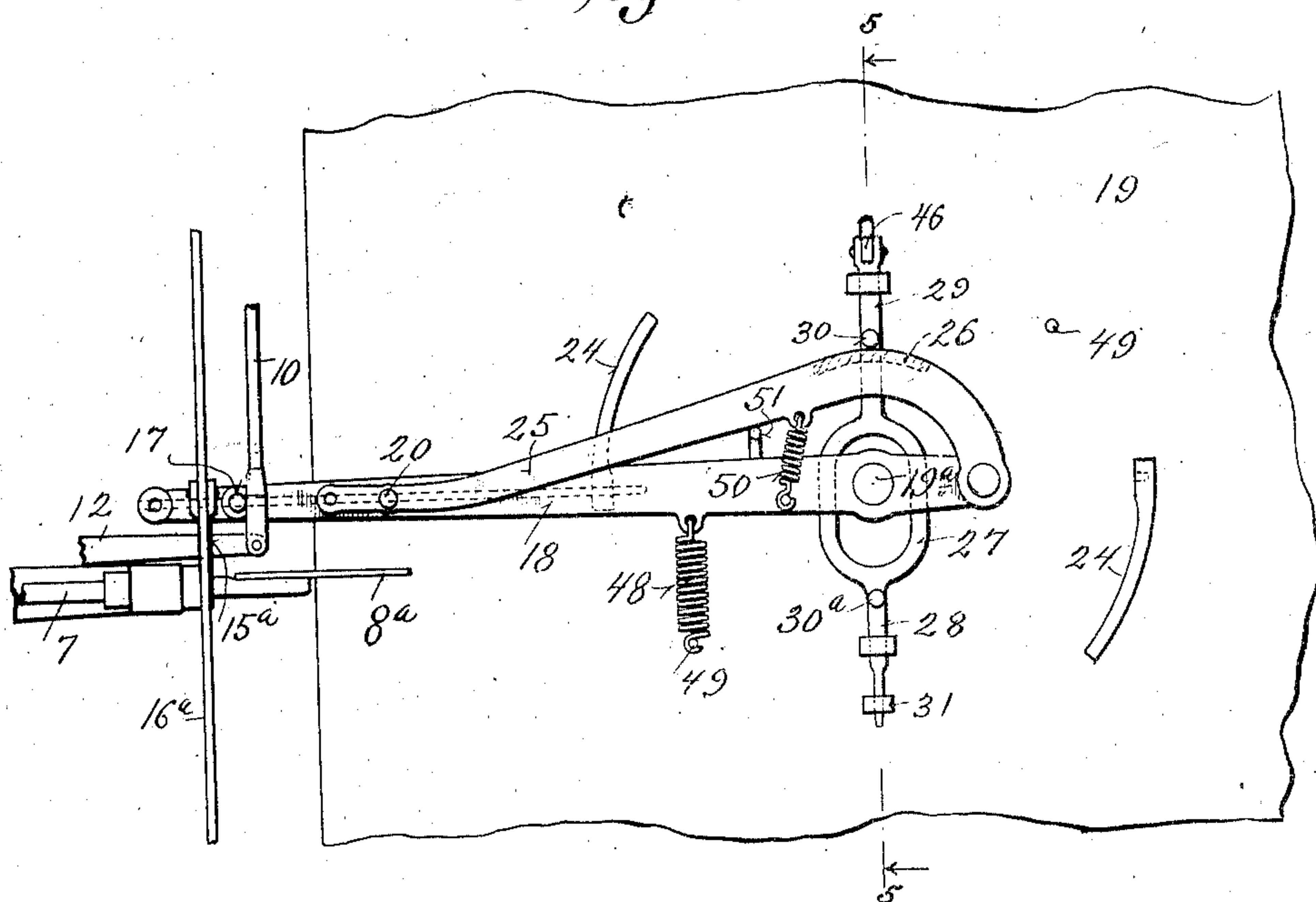
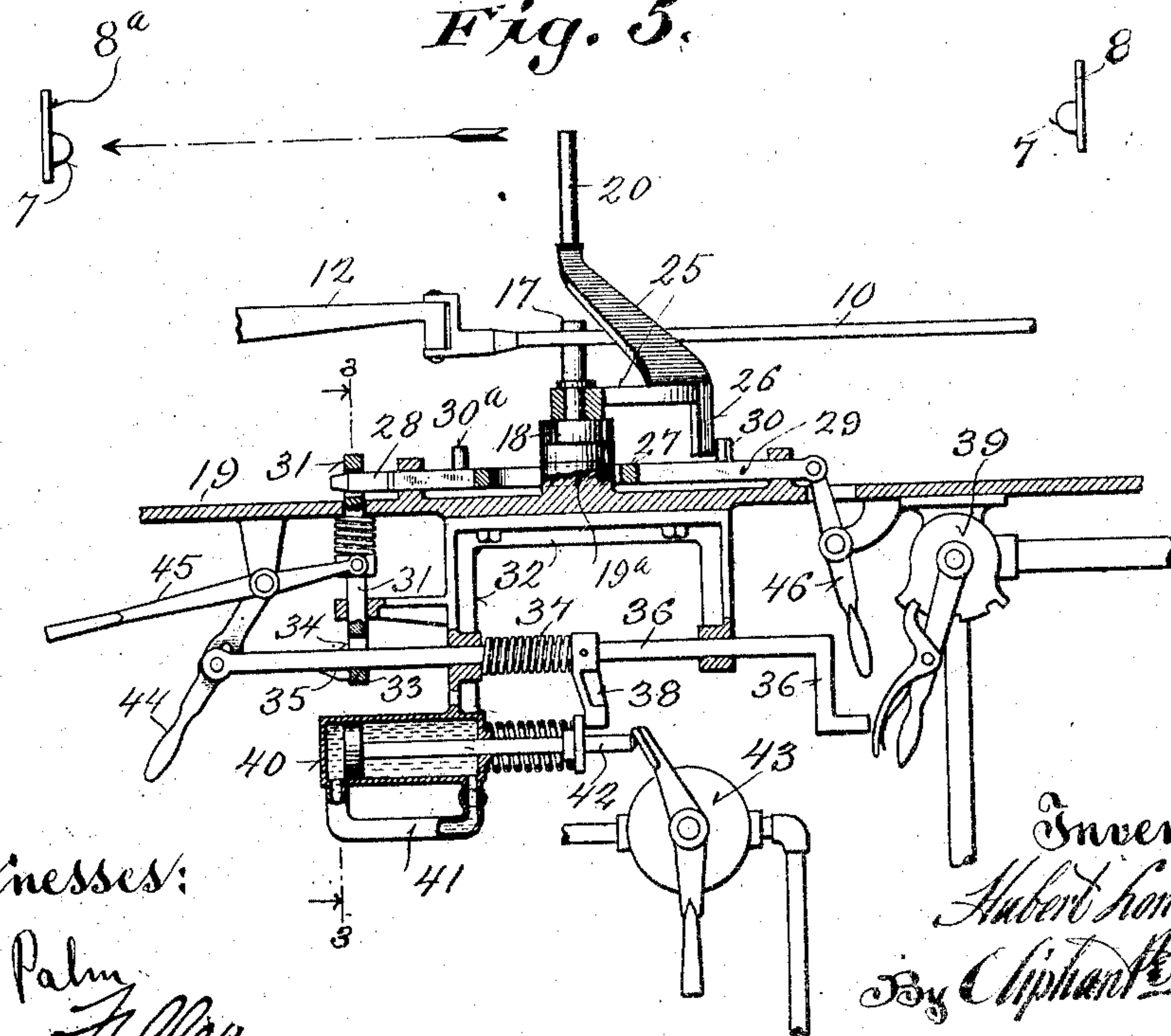


Fig. 5.



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UNITED STATES PATENT OFFICE.

HUBERT LONGAUER, OF WAUWATOSA, WISCONSIN, ASSIGNOR OF FORTY-FIVE ONE-HUNDREDTHS TO JACOB GUSCHL, OF MILWAUKEE, WISCONSIN.

RAILWAY BLOCK SYSTEM AND LOCOMOTIVE EQUIPMENT FOR OPERATING THE SAME.

No. 864,974.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed May 16, 1907. Serial No. 374,055.

To all whom it may concern:

Be it known that I, HUBERT LONGAUER, a citizen of the United States, and a resident of the town of Wauwatosa, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Railway Block Systems and Locomotive Equipment for Operating the Same; and I do hereby declare that the following is a full, clear, and exact description thereof.

10 The object of my invention is to provide a simple and positively actuated railway block-system, the system being so arranged in connection with equipment carried by the locomotives of trains, as to mechanically cut off the motive-power and effect a setting of the
15 brakes of trains running upon a single track, when the same enter a common block of said system.

The invention therefore consists in certain peculiarities of construction and combination of parts as hereinafter described with reference to the accompanying
20 drawings and subsequently claimed.

In the drawings: Figure 1 represents a plan view, in diagram, of a single block of a system, comprising a series of connected signals placed parallel with and adjacent to one side of a railway-track (not shown) with
25 portions of engines carrying actuating-devices therefor at either end of the block; Fig. 2, an elevation of the same looking from the track-side; Fig. 3, an enlarged cross-section, as indicated by line 3—3 of Figs. 1 and 5, a portion of a locomotive-cab with signal-operating attachment being shown in operative position
30 with relation to the block-signal mechanism; Fig. 4, a detail plan view of the engine-cab and engine operating-mechanism, the same being shown in connection with a fragment of the block-system; Fig. 5, a longitudinal sectional view of the same, as indicated by line
35 5—5 of the preceding figure, and Fig. 6, a plan view, in diagram, illustrating the means for clearing the signal-operating mechanism from the side of a tunnel as the train passes therethrough.

40 Referring by characters to the drawings, 1, 2, 3, and 4, indicate a series of posts, having secured thereto overhead brackets 5, 5, and 6, 6, which brackets serve as supports for horizontal rock-shafts 7 that project towards the outer rail of a track (not shown) and carry
45 signal-flags 8 at their ends. The first flag of the series, which is carried by post 1, is of greater length than those carried by the other posts, said flag being designed to guard against "rear-end" collisions only. The above mentioned series of flags are arranged to be operated by mechanism carried by a locomotive A, travel-
50 ing from right to left, as shown in Fig. 1 of the drawings, it being understood that an indefinite number of such flags and intermediate posts may be utilized, as in practice the distance covered by a single block of the system
55 from post 1 to post 4 would be approximately fifteen

hundred feet. The shank of the flag carried by post 1 has projecting therefrom a bell-crank 9, one arm of which crank is connected to a trip-cable 10 that passes downward and over a pulley 11, and is linked to the end of a gate 12, the gate being hinged between ears
60 projecting from the rear portion of bracket 6 that is secured to post 2 of the series. Post 3 of the system is provided with a duplicate equipment of post 1 just described, the gate 12^a in this case, to which a trip-cable 10^a is linked being hinged to bracket 6 of the last post 4
65 of the series.

Arms 14 of the bell-cranks and corresponding arms 15, which project from the shanks of each of the remaining flags, are all connected by a common actuating cable 16, by means of which cable motion is trans-
70 mitted to the entire series of flags, whereby their position is changed from a horizontal, indicating a clear track, to that of a vertical position, indicating danger. The above changes of position are effected by a vertical spindle 17 mounted upon a boom 18, which boom
75 is carried by and projects beyond the locomotive cab-roof 19, and as shown in Fig. 1, the spindle of engine A, when traveling in the direction indicated by the arrow, will engage trip-cable 10, it being understood that the system is now clear and all flags are set in a
80 longitudinal position. The several parts being in the clear position, as indicated, cable 10 will be obliquely across the travel of the spindle 17, the gate 12 forming a continuation of the oblique line of the trip-cable, and trip-cable 10^a at the opposite end of the block
85 lies parallel to travel of the spindle, while its gate 12^a stands at a right-angle thereto.

As locomotive A passes the first post of the system, its spindle 17 engages the trip-cable 10, this causes said cable to gradually assume a parallel position, and
90 in doing so rocks the connected bell-crank, which crank through its connection imparts a quarter turn to all the flags, causing the same to take a vertical position indicating danger. The spindle then passes under the end of the gate to which the trip-cable is
95 connected, said gate at this time being in a position at a right-angle to the cable. The opposite end trip-cable 10^a in the meantime, through its bell-crank connection, has taken an oblique position corresponding to that previously assumed by trip-cable 10 just acted
100 upon. Should the locomotive or train be free to pass out of the block, the spindle 17 will act upon the trip-cable 10^a, which is now oblique, in a similar manner to that just described, and thus restore the signal flags to their clear position, as the locomotive or train leaves
105 the block.

The long flag carried by post 1 of the series described, serves as a protection for a train traveling upon the block from right to left against rear-end collisions, while the remaining flags protect said train against
110

head-on collisions, by a train traveling from left to right. These flags not only serve as signals to forward and rear trains, but when turned to their "danger" position project in the path of pins 20, one of which is carried by each locomotive and is connected by mechanism to the throttle-valve of the engine and also to the air-brake controlling-valve in such a manner that when the pin 20 strikes a flag, it will cause automatic cut-off of said throttle-valve and open the air-brake valve, thus setting the brakes, and cutting off the steam-supply automatically, should the engineer fail to observe the "danger" signal. The above operation causes engines at the front and rear of trains in the block to be stopped, but in order to also protect a train that has been stopped in said block from "head-on" collision with the moving train, which has operated the flags, a similar series of flags to that previously described are provided, said flags being actuated in this instance, by a locomotive B traveling from left to right, as shown in Fig. 1 of the drawings. This second series of flags indicated by 8^a, which completes a block, in construction are duplicates of the first series, except that said flags in this instance project forward upon a different vertical plane than those of said first series, as do also their arms 15^a, which are fast to the rock-shafts, and their actuating-cable 16^a, these forward projecting flags being necessary, in order that the pins 20 carried by the locomotives will only engage the flags of the series actuated by another locomotive, the pins of locomotives traveling in different directions being set on different vertical planes corresponding to the flags. The flag-mechanism of the second series is supported by posts 1^a, 2^a, 3^a, 4^a, post 1^a being the first from left to right, as shown in the drawings, the remaining posts alternating with those of the first series throughout the block. The trip-cables 10^b, 10^c, of said second series are arranged upon a lower horizontal plane than those of said first series, so that the spindles 17 of locomotives traveling in opposite directions will act upon the trip-cables for which they are intended, and clear the trip-cables of the other series, the spindles being supported upon their respective booms at different vertical and horizontal planes, corresponding to the series of flags with which they co-act.

Referring to Figs. 1 and 2 of the drawings, should locomotive A enter the block, its spindle 17 will engage the oblique trip-cable 10, causing all flags of the series 8 to assume a vertical position, these flags with the exception of the first of the series being short, the pin 20 of the locomotive will clear them and said locomotive with its train will be free to pass on. Should a locomotive from the rear attempt to enter the block at this time, its pin 20 would strike the first flag and thereby be automatically stopped. If locomotive B enters the block however at this time from the opposite direction, its spindle 17 would actuate the second series of long flags 8^a. As soon as locomotive A reached one of these flags 8^a, after the same had been turned to a vertical position, the pin carried by said locomotive A would strike the flag and bring the aforesaid locomotive A to a stop. Should locomotive B enter the block, the same being "clear", it would move all flags of its series 8^a to a vertical position as a signal to front and rear trains, but would not be interrupted

for the reason that its pin 20 would pass under the flags 8 of the first series and through apertures 21 in its flags 8^a, which apertures are formed for the purpose of permitting this clearance. The first flag of the second series 8^a, which is short, when acted upon by locomotive B will prevent "rear-end" collision of trains traveling from left to right, in a similar manner to that described in connection with the first flag of the series acted upon by locomotive A.

The means employed for actuating the signals and causing automatic cut-off of the power, together with the setting of the brakes of a locomotive or train is as follows:

The locomotive cab-roof 19 has projecting therefrom a stud 19^a, on which is swiveled the boom 18 having spindle 17 in threaded-connection with one of two apertures in its end. The boom-end projects over the side of the cab and is locked in this position by means of a spring-controlled rod 22 guided in ears depending from the lower face of said boom, the rod being provided at its outer end with a vertically disposed trolley 23, and having its inner end terminate in a plunger, which plunger is adapted to engage recesses of one of a pair of segmental tracks 24 that project from the cab-roof. Pivoted to a short arm of the boom is a lever 25, having a depending rib 26, which rib is circumferentially disposed with relation to the swivel stud 19^a of said boom. The free end of the lever 25 extends outward and terminates at a point directly under the flags of the block-system, the pin 20 being threaded into one of two openings in said lever, and arranged to contact with any of said flags of a series, should the latter be in their "danger" position. A looped slide 27 surrounds the stud 19^a, having tongues 28, 29, which are guided in ways projecting from the cab-roof, the tongue of the slide being provided with pins 30, 30^a upon opposite sides of said stud 22 for engagement with the rib 26 of the lever 25. The forward tongue 28 of the slide serves as a lock for a spring-controlled latch 31, the tongue being adapted to enter an aperture in the head of the latch and lock the same against spring-tension. The latch-head is guided in an opening in the cab-roof and also in an arm of a bracket 32 secured to the underside of said cab-roof. When the latch is locked, as shown in Fig. 5, of the drawings, a bridge-piece forming the end of a slot 34 engages a lug 35 of a rod 36 and prevents longitudinal movement of the same. This rod is guided in openings in the bracket 32 and has a coil-spring 37, under compression between an arm of said bracket, a finger 38 secured to the rod, one end of the latter being in the path of travel of the controlling-lever of a steam throttle-valve 39. An oil-filled dash-pot 40 extends from an arm of said bracket 32, the dash-pot being provided with a valve-controlled by-pass connecting its ends, and a spring-controlled piston. The piston is held under its spring-tension by the finger 38, and has its end arranged to contact with and move the handle of an air-brake valve 43, when the spring-tension is released therefrom. In operation, when pin 20 strikes a flag, it causes the lever 25 to swing backward, rib 26 of which will then, through its pin-engagement with the slide 27, retract said slide. This action permits the spring-controlled latch 31 to drop, thereby releasing the rod 36, which rod shoots forward, releases the controlling lever of the throttle-

valve 39 and moves said lever to cut off the steam-supply. When the rod 36 moves forward, its finger 38 frees the spring-controlled dash-pot piston 42, which piston now moves forward and acts upon the handle of the air-brake valve 43 to cause the brakes to be set, the valve in the by-pass 41 being regulated, if desired, so as to choke the free flow of oil from circulating through said by-pass and thereby controls the time of setting the brakes. The above mechanism is reset by first retracting the rod 36, a handle 44 being connected thereto for this purpose, this rod, through its connections, also retracts the dash-pot piston. The operator next lifts the latch 31, by means of a handle 45, and then pushes tongue 28 of the slide into the aperture of said latch, by means of a handle 46, thus locking all parts in position to be tripped by the pin 20, should it again strike a flag, it being understood that the engineer's valves may be freely used without interference of said automatic cut-off mechanism.

As illustrated in Fig. 6 of the drawings, the mouth of a tunnel is shown equipped with a guard-wire 47, this wire is fast to a post at the required distance from the tunnel and is set at an angle to its mouth, being supported on a bracket at this point, from whence it runs parallel with the walls of the aforesaid tunnel. The wire is upon the same horizontal plane as the face of trolley 23 of the boom-mechanism, and when the roller engages said wire, travel of the locomotive will cause said roller to exert pressure upon the spring-controlled rod 22, which action releases its plunger-end from the recessed segmental track 24, thus permitting the boom and connected parts to swing back and clear the tunnel-walls. The trolley then travels upon the parallel portion of the wire until it runs off at the opposite end of the tunnel, at which time a spring 48 connecting the boom and one of a pair of pins 49 on the cab-top, draws said boom back to its normal locked position. The boom is swiveled upon its stud 19^a to permit the same being shifted from one side of the locomotive-cab to the other, so that the mechanism will operate upon the block-system regardless of the direction of travel of said locomotive. The change is accomplished by simply unlocking the rod 22, disconnecting the spring 48 from the pin 49 and swinging the parts over to the duplicate segmental track. The spring 48 is then fastened to the duplicate pin and the device is ready for use, the rib 26 of lever 25 being now in position to act upon pin 30^a of the slide 27.

Both the boom 18 and lever 25 as previously stated, are provided with double apertures, and as shown in the diagram, locomotive A, is traveling from left to right, the pin 20 and spindle 17 would be set in the apertures nearest the locomotive-cab, but if the direction of travel of this locomotive should be reversed, as shown by locomotive B, the boom would be shifted and the pin and spindle inserted into the apertures at the extreme ends of the boom and lever, the spindle in this instance being shorter to prevent snaring in the trip-cables of the flags of the series actuated by a locomotive traveling in the opposite direction.

While I have shown and described a complete block-system and mechanism for actuating the same, together with mechanism to be engaged by the flags for cutting

off steam and setting the brakes of a locomotive, it is understood that the details of said mechanisms may be varied to accomplish the same result, by those skilled in the art of mechanics, and I do not wish to confine myself to such details.

In order to hold the lever 25 up to its working-position, and at the same time permit yield thereto when said lever strikes a flag, I provide a spring 50, which is connected to the aforesaid lever and boom 18, serving to hold the lever against a stop-pin 51 that extends from the boom, as best shown in Figs. 3 and 4 of the drawings.

I claim:

1. A railway block-system comprising a series of connected flags, actuating-mechanism connected to the series of flags at both ends, means carried by a locomotive for engagement with the actuating-mechanism of the flags, whereby the position of said flags is changed as the locomotive enters the block, and restored to their normal position as said locomotive leaves the block, means in connection with the controlling-valves of another locomotive arranged to be engaged by any one of the aforesaid flags when the position of same has been changed by the first named locomotive on entering the block, a duplicate series of flags, means carried by the last named locomotive for actuating the duplicate series of flags, as said locomotive enters and leaves the block, and means in connection with the controlling valves of said first named locomotive arranged to be engaged by any one of the flags of said duplicate series.

2. A railway block system comprising a series of connected flags, actuating-mechanism connected to the series of flags at both ends, and means carried by a locomotive for engagement with the actuating-mechanism of the flags, whereby the position of said flags is changed as the locomotive enters the block, and restored to their normal position as said locomotive leaves the block, means in connection with the air-brake and throttle valves of another locomotive arranged to be engaged by any one of the aforesaid flags, when the position of same has been changed by the first named locomotive on entering the block, a duplicate series of flags, means carried by the last named locomotive for actuating the duplicate series of flags as said locomotive enters and leaves the block, and means in connection with the air-brake and throttle-valves of said first named locomotive arranged to be engaged by any one of the flags of said duplicate series.

3. A railway block-system comprising duplicate series of connected flags, actuating-mechanism connected to both series of flags at their ends, the first flag of each series being in a different vertical plane from all other flags of its series and upon the same plane as that of the other series; the combination of locomotives provided with means for engaging the actuating-mechanism of one of the series of flags, and other means in connection with the controlling valves of the locomotives for engagement with the flags actuated by the engaging means of the other locomotive.

4. A railway block-system comprising series of connected flags, actuating-mechanism connected to the flags; the combination of a locomotive throttle and air-brake valves, spring-controlled mechanism for actuating the same, means for locking the spring-controlled mechanism, releasing means in connection with the locking-mechanism for engagement with the flags of the block-system, other means projecting from the locomotive for engagement with the actuating-mechanism of the flags, and mechanism in connection with the lock-releasing and flag-engaging means, for shifting the same from side to side of the locomotive.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

HUBERT LONGAUER.

Witnesses:

GEO. W. YOUNG,
JOSEPH GUSCHL.