

No. 695,794.

Patented Mar. 18, 1902.

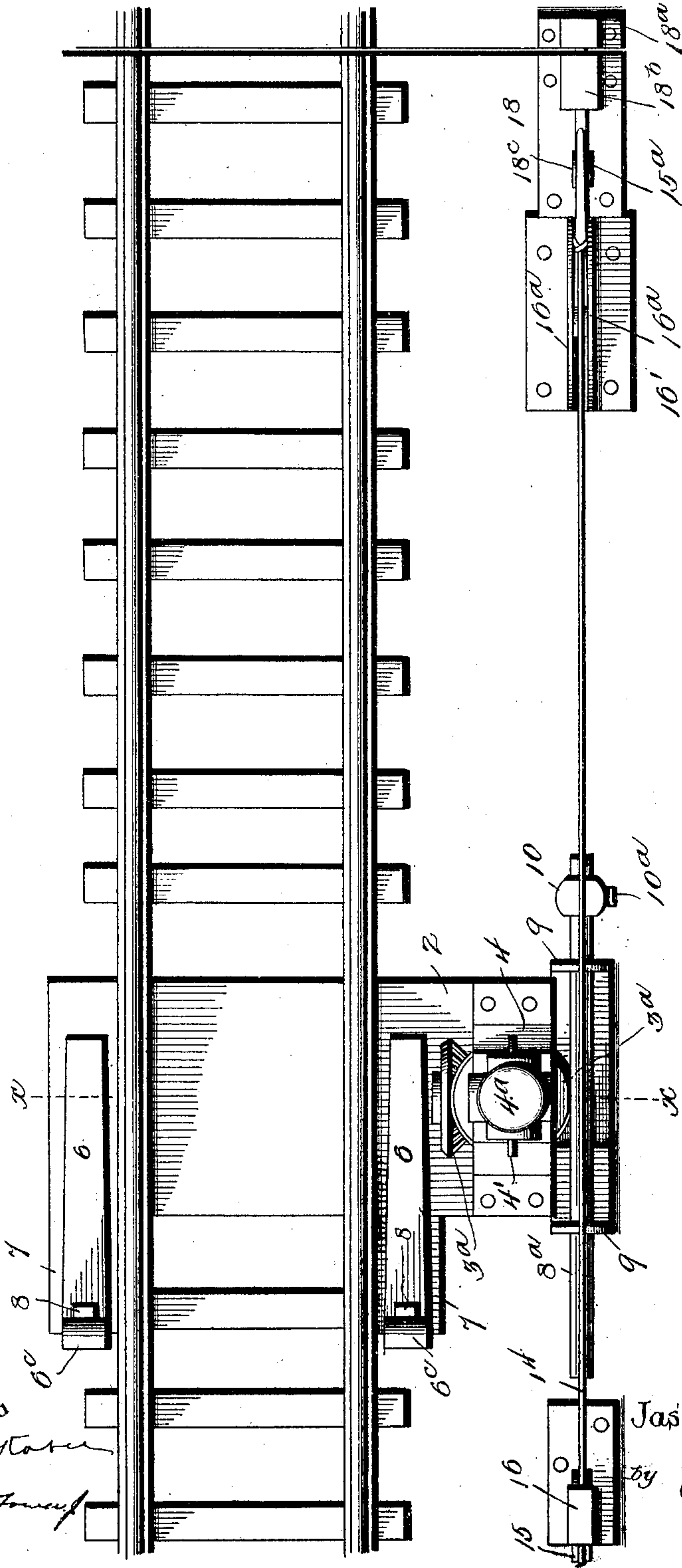
J. H. CLARK.
RAILWAY SIGNAL.

(Application filed Sept. 23, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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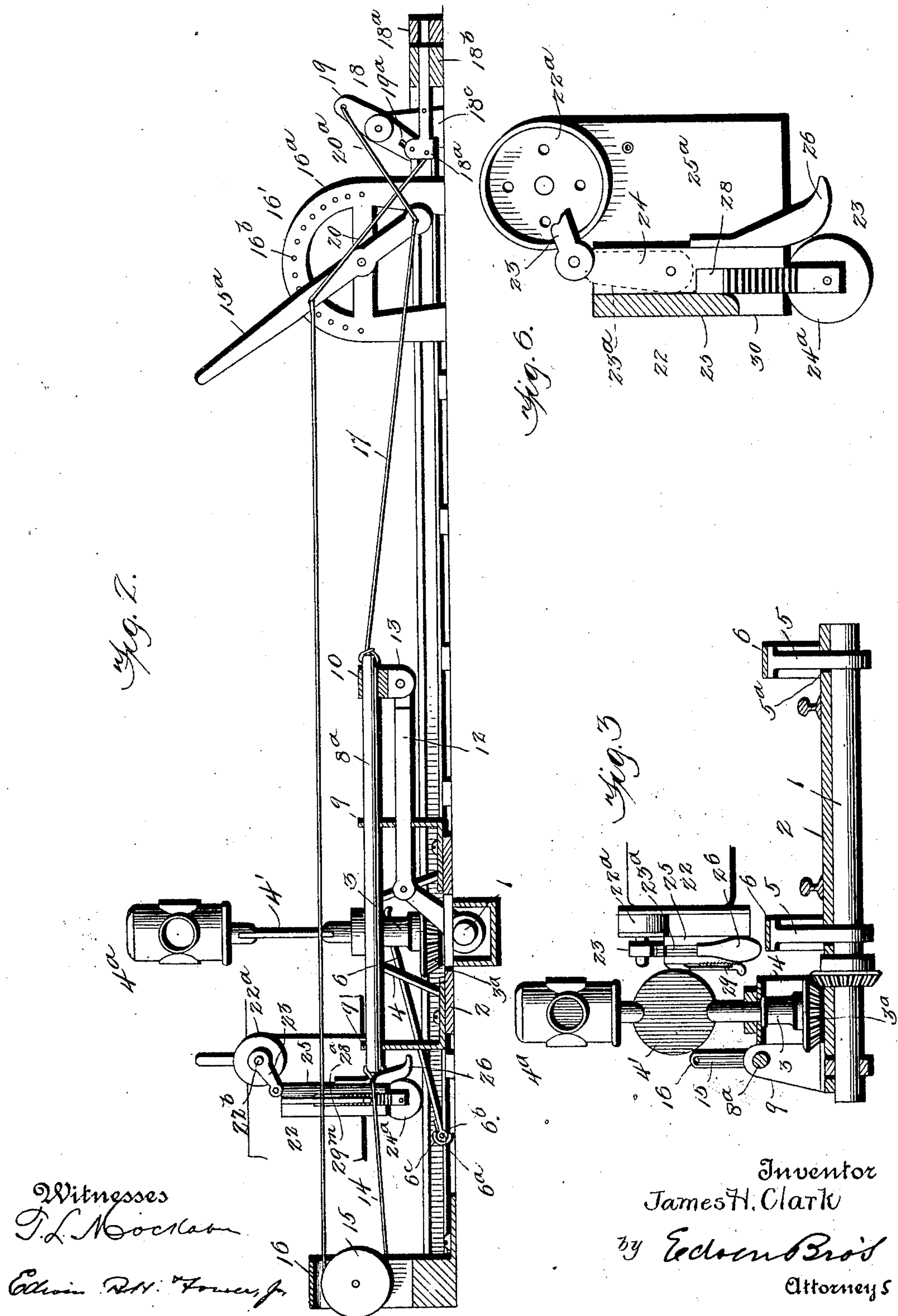
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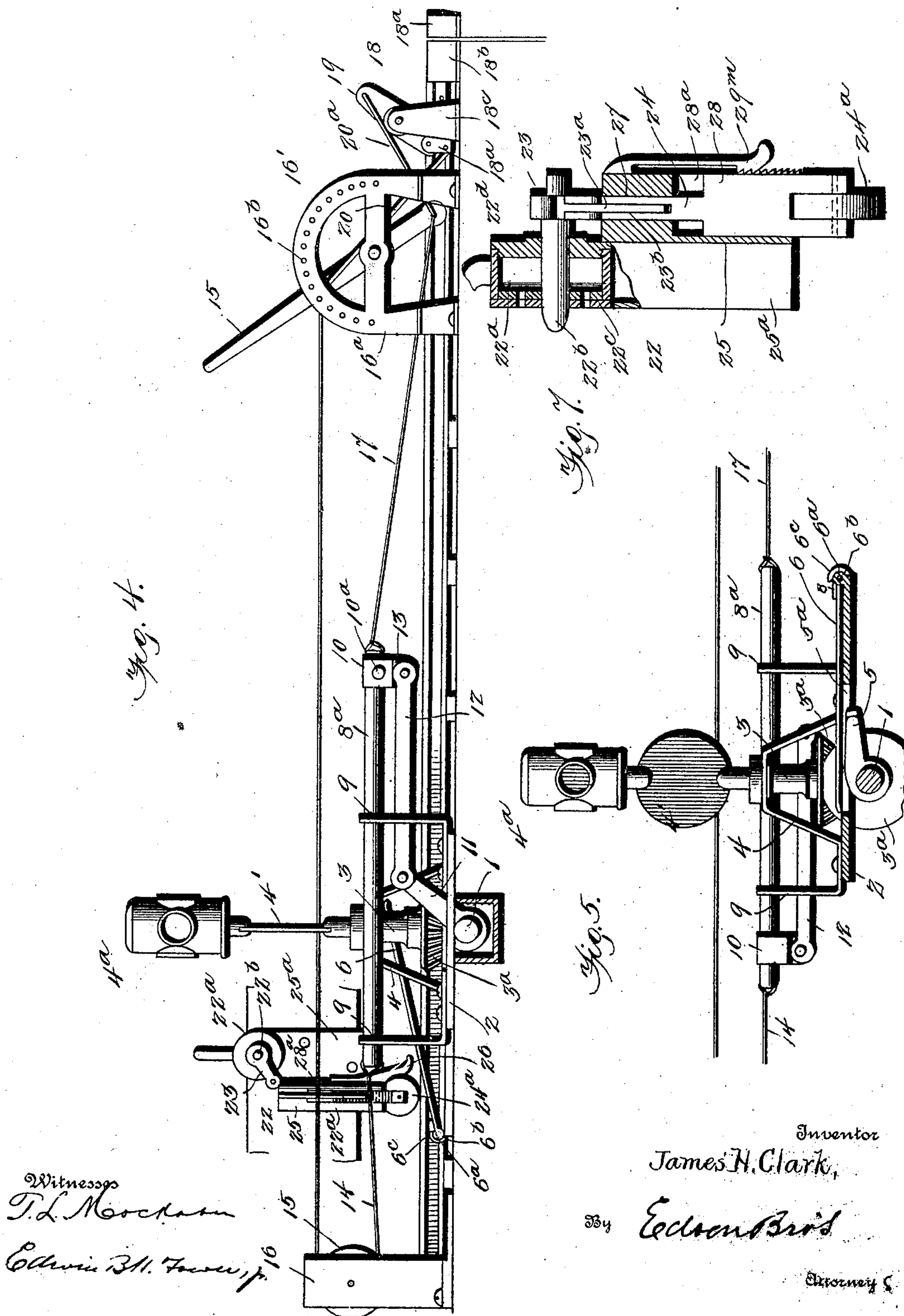
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JAMES H. CLARK, OF PORTAGE, WISCONSIN.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 695,794, dated March 18, 1902.

Application filed September 23, 1901. Serial No. 76,274. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. CLARK, a citizen of the United States, residing at Portage, in the county of Columbia and State of Wisconsin, have invented certain new and useful Improvements in Railway-Signals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in signaling devices, more particularly for railroads at street-crossings, bridges, junctions, or other danger-points. It provides for guarding against accidents, as are very liable to occur at said points, and to effect the automatic setting of the brakes of a train upon its approaching the place of danger, whether it be moving slowly or rapidly or forward or backward, to provide for the simultaneous actuation of a bolt, as may be employed at a bridge-drawer with the setting of a signal, and to readily operate or adjust the parts or mechanism in setting the signal.

It consists of sundry combinations and arrangements of parts, including their construction, substantially as hereinafter more fully disclosed, and particularly pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figure 1 is a plan view thereof. Fig. 2 is a longitudinal section. Fig. 3 is a transverse section taken on the line $x x$ of Fig. 1, with the air-brake-setting-valve-actuating contrivance or shoe in end elevation. Fig. 4 is a side elevation with the air-brake-setting-valve-actuating contrivance or shoe as adjusted for engagement with the signal apparatus or device. Fig. 5 is a broken longitudinal sectional view with the signal for "clear." Fig. 6 is an enlarged detail view of the air-brake-setting-valve-actuating contrivance or shoe proper in vertical section with a portion of the air-valve removed, disclosing the ports thereof. Fig. 7 is an enlarged detail section taken through said valve at right angles to the section of the last-referred-to figure.

Latitude is allowed herein as to details, as they may be changed or varied at will without departing from the spirit of my invention

and the same yet remain intact and be protected.

In carrying out my invention I suitably arrange, preferably in an excavation under and transversely of a railway-track, as shown, a horizontal rock-shaft 1, hung or journaled in a suitable manner upon the lower side, preferably, of a plate or platform 2, adjacently to a street-crossing, junction, bridge-drawer, or other danger-point. Said horizontal shaft has geared thereto by suitable gearing 3^a 3^a a vertical or upright shaft 3, journaled in a suitable bearing or support 4, screwed or otherwise fastened in place, preferably upon the plate or platform 2. Said upright shaft carries the usual conventional signal, comprising a disk 4 and a lantern 4^a, having bull's-eye lenses, said disk being red and two of the lenses being of a corresponding color and facing in the same direction as said disk and the other two lenses of said lantern being plain glass and facing at right angles with said colored lenses. Said horizontal shaft 1 has fixed thereto two cam projections or lugs 5, arranged to occupy positions upon opposite sides of the track, respectively, and having their free ends preferably extended slightly laterally, the plate or platform 2 having openings 5^a 5^a to permit the movement therethrough of said lugs or projections as they are thrown up or depressed, as presently more fully referred to.

Cam plates or levers 6 are suitably pivoted or hinged alongside of the track, preferably by bending or curving upward one end of each into an eye 6^a, which receives a pintle 6^b, preferably fixed in eye-ended terminals 6^c or plates 7, secured or screwed to the rail-ties. The same ends of the plates 7 may have preferably brazed thereto upon the under side the lower ends of upturned metal pieces 8, overhanging the pivoted or hinged ends of the levers or plates 6, beneath which extend the terminals of the eyes 6^a of said levers or plates and which serve to house the pivotal points of the last-named and to form stops against the possible upward displacement of these levers. The free ends of said levers or arms are preferably curved slightly downward to permit in backing of the car or train when the signal is set the ready passing thereon of the brake-setting shoe or contrivance.

A slide or rod 8^a is suitably supported in apertured or eye-ended right-angled brackets 9, secured, preferably, to the platform or plate 2, and upon one end of said rod or slide 5 is secured or carried a block or coupling 10, preferably held adjustably thereon by a set-screw 10^a. The horizontal shaft 1 has suitably secured thereto, near one end, a crank-arm 11, to which is connected a link 12, having 10 its bifurcated or forked end embracing and pivoted to the upper or outer end of said crank-arm, its opposite end being, preferably, likewise forked or bifurcated and embracing and pivoted to a pendent lug 13 of the block 15 or coupling 10. Said link 12 may be and is preferably passed through an opening in one of the brackets 9, the same thus acting as a guide thereto during movement.

To one end of the slide or rod 8, having, 20 preferably, an aperture therethrough, is connected one end of a cable or wire 14, its connection or fastening to said rod or slide being aided by said aperture and is passed over a pulley or wheel 15, hung in a suitable support 25 or bracket 16, preferably secured to a plate or base-piece suitably anchored or embedded in place. Said cable or wire is connected at its opposite end to a hand-lever 15^a, pivoted a short distance from its lower end to a suitable support 16', suitably secured in place, 30 and to said end of said lever is connected one end of another wire or cable 17, whose opposite end is connected to the other end of said slide or rod 8, preferably having an additional 35 aperture therethrough for aiding the securing of said cable or wire thereto. Said support 16' is preferably composed of duplicate upper end-curved frames or quadrants 16^a, between which the hand-lever 15^a is arranged and 40 which have their curved or arcuate portions provided with coincident or registering apertures 16^b, through which and an aperture in said hand-lever may be passed the shackle or bolt of a padlock or other suitable fastening in locking said lever in place to prevent unauthorized movement thereof; also, 45 suitably connected, as presently disclosed, to the hand-lever 15^a is a bolt or latch 18 for engagement with a keeper 18^a, secured 50 to a bridge-drawer, whereby simultaneously with the throwing of the signal device said drawer-bridge is locked and unlocked, as will be presently understood. Said bolt or latch, preferably cylindrical, has a cross-pin fixed 55 therein, the projecting ends of which form stops to limit the movement of said bolt, said cross-pin engaging the bolt-housing 18^b and the upstanding parallel supports 18^c for that purpose, both said housing and supports being 60 brazed or cast with a base-plate. To the rear end of said bolt, with which is brazed or cast upon its upper surface a bifurcated or slotted extension 8^d, is connected a centrally-pivoted lever 19, fulcrumed between supports 18^c at their upper ends. Said connection is effected by a pin 18^e, spanning the

space between and fixed on the brackets or arms of the bolt extension 18^d and engaging or passing through an elongated slot 19^a of the lever 19, said lever being received between said arms or branches and said slot allowing the requisite differential movement between the parts, as will be appreciated. 70 The connection between the hand-lever 15 and said latch or bolt is effected as follows: 75 Two wires or cables 20 20^a are connected one to the extreme rear end of the bolt extension 18^d and the other to the upper end of the lever 19, each preferably having an aperture to aid in effecting this connection. Said 80 wires or cables are then extended back and connected to said hand-lever 15 at points upon opposite sides of its pivot or fulcrum.

Suitably arranged and connected to the air-brake-setting valve 22, located upon the engine-frame, is a contrivance or shoe 23 for actuating said valve, as presently explained. Said valve comprises a cylinder or chamber 22^a, preferably circular, communicating with the train air-brake pipe and having the usual 90 air-ports, and within this chamber is arranged a central valve stem or spindle 22^b, turning therein, its inner end bearing in a central seat or socket in the inner wall of said chamber. Said spindle or stem has fixed to it a 95 disk or valve proper, 22^c, having ports there-through corresponding with the ports in the chamber 22^a, said stem or spindle also bearing or passing through the outer head 22^d of said chamber or cylinder adapted to be 100 screwed in place. The outer or projecting end of the spindle or stem 22^b carries an arm 23, fixed thereon preferably by a pin passed therethrough. To the outer or free end of said arm is pivoted or loosely connected the 105 upper end of a link 23^a, let into a slot 23^b in a bar or slide 24 and pivoted to said bar or slide. Said bar or slide is preferably equipped at its lower end with a wheel of shoe 24^a, adapted in practice to ride upon or be engaged by either of the pivoted or hinged cam 110 levers or plates, according to the side of the engine upon which it may be arranged. Said bar or slide is housed and moves in a casting or tube 25 integral or cast with the offset portion of a bracket or plate 25^a, suitably secured to the framework of the engine, and 115 to which is also connected the valve-casing, the same also affording a convenient means for the attachment thereof to said framework. 120 Said bar or slide has preferably cast there-with upon its forward edge a plow attachment 26, reaching down sufficiently to guard the shoe or wheel 24^a and to remove snow, &c., in front thereof, as in the winter season, 125 when the train is in motion. The tube or casing 25 has a longitudinal slot 27 through its front portion, into which the forward edge of the bar or slide carrying the plow attachment extends, permitting said edge to stand 130 flush with the outer surface of said tube or casing and said plow attachment to occupy a

position outside of said tube or casing. Said bar or slide has lateral vertical extensions or guides 28, extending into corresponding lateral slots 28^a, produced in the tube or casing 25, one of said extensions or guides having upon its outer surface a ratchet or series of notches, with which automatically engages a spring pawl or detent 29, carried by said tube or casing and normally engaging said ratchet to retain the slide or bar 24 elevated after having been acted upon by a cam arm or lever 6, as presently seen. The tube or casing 25 has also in its rear side, opening through the lower end or edge thereof, a slot 30, which with the corresponding portion of the slot in the front side of said tube or casing provides for the reception of the wheel or shoe carried by the bar or slide 24 as it is raised to its maximum altitude, as when acted upon by a contacting cam plate or lever 6.

In operation, it being assumed by way of one example of illustrating the operation of the invention it is required, for instance, to open a bridge-drawer, the hand-lever is manipulated or adjusted and locked in such position so as to set the signal to "danger," displaying the red disk and corresponding lenses of the lantern for use at night in the direction of the line of travel, the drawer-bolt at the same time being withdrawn or disengaged from its keeper; also, simultaneously with the setting of the signal, &c., the horizontal or rock shaft will be actuated so as to dispose by the action of its lugs or cams the cam plates or levers 6 in an inclined position. Should even the engineer of an approaching train not happen to discover the displaying of the danger-signal and not open the brake-setting valve, the inclined cam-plates would intercept the shoe or wheel equipped slide or bar and effect its elevation, and thus be maintained by the spring pawl or detent carried by the inclosing casing or tube of said bar or slide. This action of the cam-plate upon said slide or bar will actuate the air-brake-setting valve and result in the application of the train-brakes, causing the "slowing down" and duly stopping of the train, thus avoiding what would otherwise have ended in a wreck and in all probability the maiming of limbs, loss of life, and destruction of property or rolling-stock. Of course after the closing of the drawer the signal can be set for "clear" by oppositely or reversely adjusting the hand-lever, when the horizontal rock-shaft will be so actuated as to depress its cams or lugs, permitting the lowering of the cam-plates flush with the ground-surface or plate containing the same; also, the drawer-bolt will be projected into its keeper, effecting the locking of the drawer against unauthorized opening, the hand-lever being also locked in position.

It is observed that this device is applicable for use in connection with what is known as the "block" system, as well as generally in devices of this character.

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

1. The combination of a rock-shaft carrying cam-lugs, its actuating-lever, a slide arranged intermediately of, and connected to, said rock shaft and lever, cam-plates acted upon by said cam-lugs, and means carried by a moving object adapted to be acted upon by said cam-plates, substantially as set forth.

2. The combination of a rock-shaft carrying cam-lugs, its actuating-lever, a slide or rod, a crank-arm and link connection between said rock-shaft and slide or rod, cam-plates adapted to be engaged by said cam-lugs, means effecting connection between said slide and said lever, and means carried by a moving object adapted to be acted upon by said cam-plates, substantially as set forth.

3. The combination of a rock-shaft equipped with cams or lugs, its actuating-lever, a slide or rod, a crank-arm and link connection between said rod or slide and rock-shaft, a wire or cable compassing a pulley or wheel and connected to said rod or slide and lever, cam-plates adapted to be engaged by said cams or lugs, and means carried by a moving object, adapted to be acted upon by said cam-plates, substantially as set forth.

4. The combination of a rock-shaft equipped with cams or lugs, a lever for actuating said shaft, cam-plates adapted to be acted upon by said cams or lugs, a slide or rod carrying a block or coupling at, or near, one end, a crank-arm carried by said rock-shaft, a link connected to said crank-arm and block or coupling, means for connecting said rod to said lever, and means carried by a moving object adapted to be engaged by said cam-plates, substantially as set forth.

5. The combination of a rock-shaft carrying cams or lugs, pivoted or hinged cam-plates adapted to be engaged and moved into an inclined position by said cams or lugs, an actuating-lever for said shaft, a slide or rod, means of connection between said rod or slide and said lever, and means for effecting connection between said slide and rocking shaft, substantially as set forth.

6. The combination of a rock-shaft equipped with cams or lugs, pivoted cam-plates adapted to be engaged by said cams or lugs, a slide or rod, a crank-arm and link connection between said rock-shaft and rod, a wire or cable compassing a pulley or wheel and connected to said rod or slide and lever, substantially as set forth.

7. The combination of a rock-shaft equipped with lugs or cams, means for actuating said rock-shaft, cam-plates adapted to be engaged by said cams or lugs, an air-brake-setting valve comprising an axial stem or spindle, a slide adapted to be engaged by said cam-plate, a crank-arm carried by said stem or spindle, and a link pivoted in a slot in said slide and connected to said crank-arm, substantially as set forth.

8. The combination of a rock-shaft equipped with lugs or cams, means for actuating said rock-shaft, pivoted cam-plates adapted to be engaged by said cams or lugs, an air-brake-setting valve, a slide or bar adapted to be engaged by said cam-plates and connected to the stem or spindle of said valve, and having a plow attachment, substantially as set forth.

9. The combination of a rock-shaft equipped with cams or lugs, means for actuating said rock-shaft, pivoted cam-plates adapted to be engaged by said lugs or cams, an air-brake-setting valve, a slide or bar adapted to be engaged by said cam-plates, means effecting communication between said slide and valve, a casing or tube carried by an offset of a bracket attached to a moving part, and containing said slide, said slide or bar having lateral vertically-extending portions let into corresponding slots in said casing or tube, substantially as set forth.

10. The combination of a signal-displaying device and means for connecting said device with a bolt or fastening, a centrally-fulcrumed lever having pivotal connection with said bolt or fastening, at its rear end, an actuating-lever, and wires or cables connected to said actuating-lever, at points upon opposite sides of its fulcrum and to the first-referred-to lever, at its upper end, and said bolt or fastening, substantially as set forth.

11. The combination of a signal-displaying device and means for connecting said device

with a bolt or fastening, a centrally-pivoted lever, a bracket forming the fulcrum for said lever, said bolt or fastening having upon its upper surface, at the rear end thereof, a slotted or bifurcated extension receiving the lower end of said lever, a pin-and-slot connection between said extension and said actuating-lever, and means effecting connection between said actuating-lever and bolt and centrally-pivoted lever, substantially as set forth.

12. The combination of a signal-displaying device and means for connecting said device with its actuating-lever, a bolt, a centrally-pivoted lever having pivotal connection with said bolt, and means for effecting connection between said actuating-lever and said bolt and centrally-pivoted lever, substantially as set forth.

13. The combination of a signal-displaying device and means for connecting said device with a signal-displaying device and its actuating-lever, a bolt, a centrally-pivoted lever having pivotal connection with said bolt, and wires or cables effecting connection between said actuating-lever and said bolt and centrally-pivoted lever, substantially as set forth.

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

JAMES H. CLARK.

Witnesses:

J. M. RUSSELL,
F. L. SANBORN.