

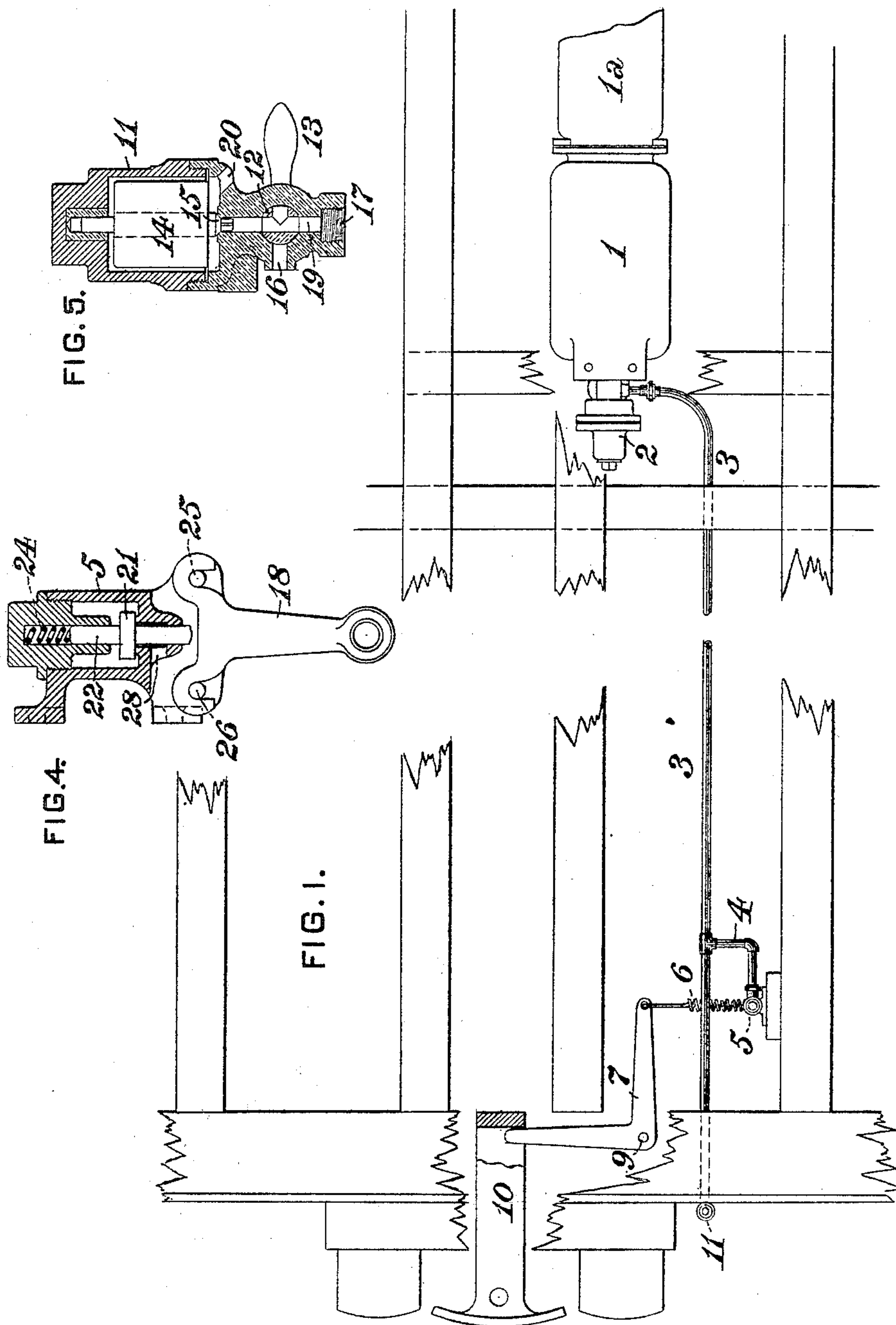
(No Model.)

2 Sheets—Sheet 1.

G. WESTINGHOUSE, Jr.
FLUID PRESSURE AUTOMATIC BRAKE.

No. 437,740.

Patented Oct. 7, 1890.



WITNESSES:

John H. Bell,
F. E. Gaither

INVENTOR,

Geo. Westinghouse Jr.
by George H. Christy
Att'y.

(No Model.)

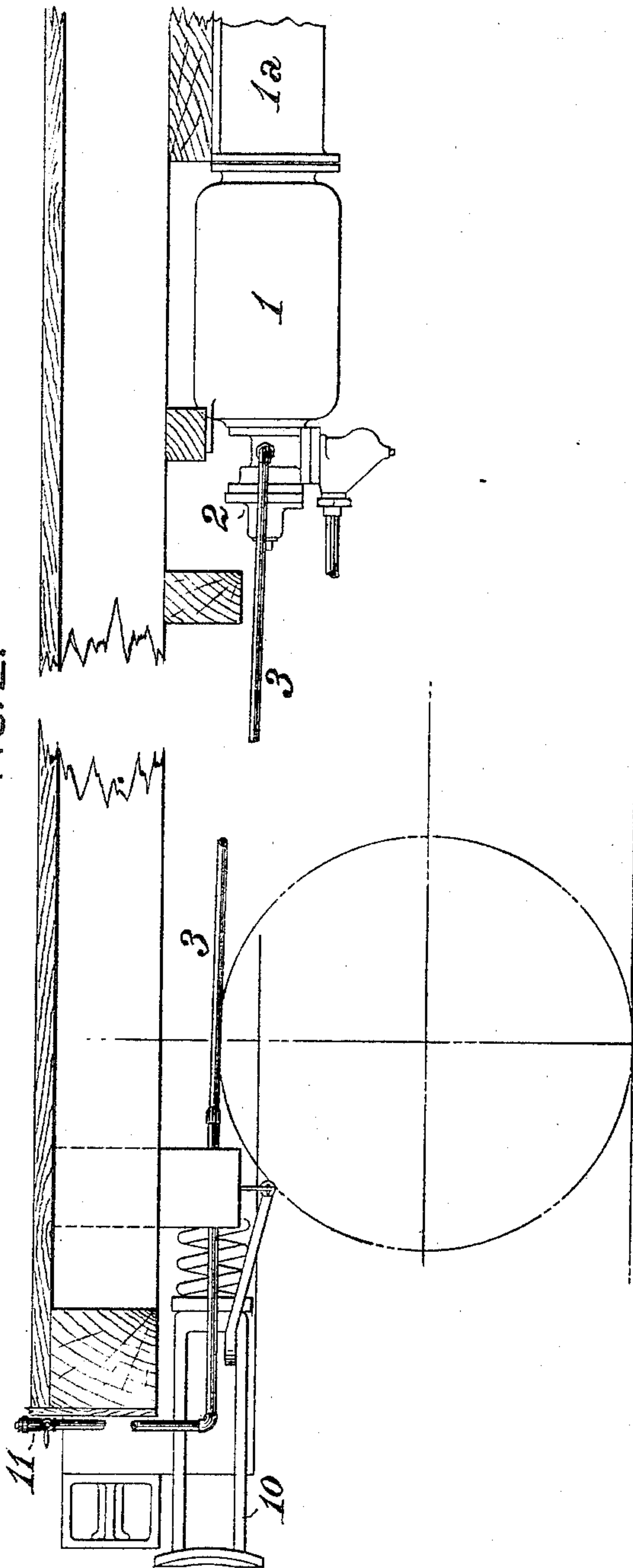
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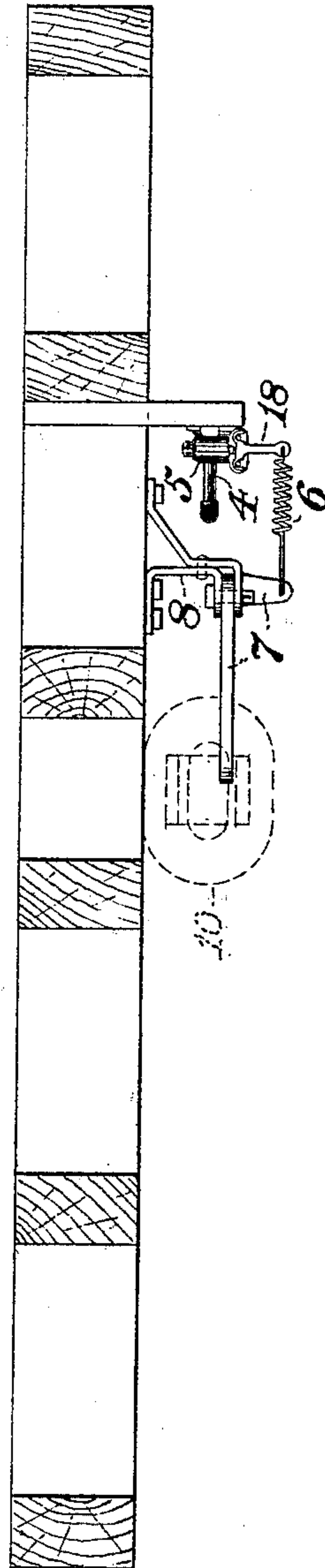
FIG. 2.



WITNESSES:

J. Snowden Bell,
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FIG. 3.



INVENTOR,

Geo. Westinghouse Jr.
by George H. Christy
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UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

FLUID-PRESSURE AUTOMATIC BRAKE.

SPECIFICATION forming part of Letters Patent No. 437,740, dated October 7, 1890.

Application filed June 20, 1890. Serial No. 356,070. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, Jr., a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Fluid-Pressure Automatic Brakes, of which improvement the following is a specification.

10 The object of my invention is to provide for properly regulating the application of fluid-pressure automatic brakes in controlling the movement of trains when descending long and heavy grades, by automatically effecting
15 a release of pressure in the brake-cylinders by and in accordance with the outward or forward movement of the draw-bar resultant upon the application of draft thereto from the engine hauling the train.

20 To this end my invention, generally stated, consists in the combination of a brake-cylinder, a release-valve controlling an exhaust-passage from said cylinder to the atmosphere, and mechanism interposed between the re-
25 lease-valve and the draw-bar, and adapted to effect the opening of the former by the movement of the latter in direction to exert draft upon the car.

The improvement claimed is hereinafter
30 fully set forth.

In the accompanying drawings, Figure 1 is a plan or top view of a portion of the frame of a railroad-car illustrating the application of my invention; Fig. 2, a longitudinal section
35 through the frame, showing the mechanism in elevation; Fig. 3, a transverse section, with the release-valve and operating-lever in elevation, as seen from the left of Fig. 1; Fig. 4, a vertical central section, on an enlarged scale,
40 through the release-valve; and Fig. 5, a similar section through the pressure-retaining valve.

When a train of cars is descending a long and steep grade with the brakes released or
45 applied to retard the speed of the train, the draw-bars of the several cars of the train ordinarily bear one against the other, by reason of the tendency of each car, due to gravity, to push or bear forwardly against the car in
50 advance of it. When the speed has been decreased to the limit desired by the application of the brakes, the release of the same is

effected under my invention primarily by increasing the pressure in the train-pipe, to move the slide-valves of the triple valves to
55 release position, and thereupon giving steam to the engine, so as to exert draft upon the draw-bars of the several cars, by the outward movement of which, in stretching the train, release-valves are opened, which permit the pressure
60 in the brake-cylinders to escape and release the brakes. The interval between the movement of the triple valve-slides and the release of pressure from the brake-cylinders by the
65 outward movement of the draw-bars affords opportunity for the recharging of the auxiliary reservoirs, and the entire or partial release of the brakes may be effected as required by the
70 engineman by proper regulation of the application of draft to the train, immediate and automatic release of braking-pressure being
75 effected by a pull upon the draw-bar.

My improvement is illustrated as applied in connection with the standard automatic freight-brake of the Westinghouse system, the general features of which, being well
80 known to those skilled in the art, need not be herein at length described.

The admission of air under pressure from the main reservoir and main air or brake pipe
85 to the auxiliary reservoir 1 and from the auxiliary reservoir to the brake-cylinder 1^a and the exhaust of air from the brake-cylinder, are, as heretofore, effected by means of a triple
90 valve 2, secured upon the end of the auxiliary reservoir and communicating therewith and with the brake-cylinder by the usual connections. In order to maintain the train under control during the recharging of the auxiliary reservoirs while descending grades, the
95 brakes are not completely released in such operation, but are held applied to the wheels by a pressure-retaining valve, by which a determined pressure of comparatively small degree, as say, fifteen pounds, is retained in the
100 brake-cylinders.

The pressure-retaining-valve device 11 heretofore employed by me, which is located at one end of the car so as to be readily accessible, and controls a pipe 3 leading from the
105 brake-cylinder discharge-port, is shown in Fig. 5. The valve-casing 11 is connected with the pipe 3 by a threaded nozzle 17, from which a passage 19 leads to the interior of the casing,

the passage 19 being controlled by a valve 15, which is normally held to a seat by a weight 14, or equivalently by a spring which imposes upon the valve a pressure corresponding with that which is desired to be retained in the brake-cylinder during the recharging of the auxiliary reservoir, the valve being unseated by any higher pressure in the pipe 3 and passage 19, and thereby effecting the discharge of the excess through a discharge-port 20 leading from the interior of the valve-casing to the atmosphere.

In order to admit of the free discharge of air from the brake-cylinder under the ordinary conditions of service on levels or slight grades in which the pressure-retaining valve is not desired to be used, a three-way cock 12 is fitted in the passage 19, between the discharge-valve 14 and nozzle 17, the cock 12 when turned by its handle 13 into one position establishing a passage for air from the pipe 3 to the valve 14, as shown in Fig. 5, and when in the other position cutting off communication with the valve 14 and opening a free discharge from the pipe 3 through the discharge-port 16.

To effect the release of the pressure retained in the brake-cylinder by the pressure-retaining valve, when in descending a grade such pressure proves to be unduly great and checks the car, so that a pull is exerted upon the forward draw-bar, I connect the latter by suitable interposed mechanism, with a release or discharge valve controlling a discharge-opening leading out of the pipe 3, through which the air is exhausted from the brake-cylinder in such manner that the release-valve shall be opened by the outward or forward movement of the draw-bar in the exertion of draft upon the car. I have in this instance exemplified the employment of an independent release-valve; but do not limit myself to such construction, as it will be within my invention to adapt the pressure-retaining valve to the performance of the additional function of a release-valve by correspondingly effecting its opening movement by the forward movement of the draw-bar.

The independent release-valve device herein shown is of the class ordinarily known as a "car-discharge valve," in the compressed-air-signal system, and consists of a valve casing 5 connected by a branch-pipe 4 with the main discharge-pipe 3, a valve 21, secured upon a guide-stem 22, working in the casing and controlling a discharge-port 28 leading therefrom to the atmosphere, an operating-lever 18 by which the valve 21 may be opened or unseated, and a spring 24 by which the valve is returned to and normally held to its seat upon the release of draft on the lever 18. The lever 18 is provided at its upper end with lateral arms, which are recessed to fit over pins 25 and 26, secured to the valve-casing, the lever being adapted to be moved in either direction upon one or the other of said pins as a pivot, and by such movement to bear

against the end of the valve-stem 22 and unseat the valve 21, thereby opening the discharge-port 28 and effecting the exhaust of air from the brake-cylinder and the pipe 3 through said port.

The movement of the lever 18 and consequent opening of the release-valve 21 is effected in and by the outward or forward movement of the draw-bar 10 in the exertion of draft on the car, through the intermediation of a bell-crank lever 7, journaled by a pin 9 to a bracket 8, secured to one of the sills of the car. One arm of the lever 7 is coupled by a suitable connection, which is preferably, as shown, a spring 6, to the lower end of the release-valve lever 18, and the other arm bears against a shoulder or face located on the draw-bar 10 in such position that the outward movement of the draw-bar moves the lever 7 upon its pivot, and through the connection 6 and lever 18 opens the release-valve 21, thereby effecting the exhaust of air from the brake-cylinder and pipe 3. The opposite or inward movement of the draw-bar on the cessation of draft releases its bearing on the lever 7, which is returned by the spring-connection 6 to normal position, the spring 24 thereupon seating the release-valve 21.

The period of opening of the release-valve will be coincident with and equal in duration to the continuance of draft upon the draw-bar, during which period, as before explained, the release-valve is opened by such draft.

The application of my invention will further obviate the necessity which now exists of turning the cocks of the pressure-retaining valves so as to cut off said valves from the main discharge-pipe to permit free exhaust of air when running under ordinary conditions on levels or slight grades, as the pull on the draw-bars in starting and hauling the train will open the release-valves and hold them unseated during draft by the engine on the train. It will also be seen that my invention may be used either in connection with or without a triple valve, and that the release-valve may serve to control either the exhaust-port of a triple valve or an exhaust-port in the brake-cylinder, the essential characteristic of my improvement being a construction in which a valve is opened to release brake-cylinder pressure by draft upon the draw-bar.

Any suitable mechanism may be interposed between the draw-bar and release-valve, the specific form shown not being an essential one.

I claim as my invention and desire to secure by Letters Patent—

1. In a fluid-pressure-brake mechanism, the combination of a brake-cylinder, a discharge-passage leading therefrom to the atmosphere, a release-valve controlling said passage, and connections interposed between said valve and the draw-bar of the car for effecting the opening of the valve by the movement of the draw-bar, substantially as set forth.

2. In a fluid-pressure-brake mechanism, the combination of a brake-cylinder, a triple valve, a discharge-passage leading from the exhaust-port of the triple valve to the atmosphere, a release-valve controlling said passage, and connections interposed between the release-valve and the draw-bar of the car for effecting the opening of said valve by the movement of the draw-bar, substantially as set forth.

3. In a fluid-pressure-brake mechanism, the combination of a brake-cylinder, a discharge-passage leading therefrom to the atmosphere, a pressure-retaining valve controlling said passage, a release-valve controlling an outlet from said passage independently of the pressure-retaining valve, and connections interposed between the release-valve and the draw-bar of the car for effecting the opening of said valve by the movement of the draw-bar, substantially as set forth.

4. In a fluid-pressure-brake mechanism, the combination of a brake-cylinder, a triple valve, a discharge-passage leading from the exhaust-port of the triple valve to the atmosphere, a pressure-retaining valve controlling said passage, a release-valve controlling an outlet from said passage independently of the pressure-retaining valve, and connections in-

terposed between the release-valve and the draw-bar of the car for effecting the opening of said valve by the movement of the draw-bar, substantially as set forth.

5. In a fluid-pressure-brake mechanism, the combination of a brake-cylinder, a discharge-passage leading therefrom to the atmosphere, a release-valve controlling said passage, a lever pivoted to the car-frame and bearing against the car draw-bar, and a connection coupling said lever with a lever which actuates the release-valve, substantially as set forth.

6. In a fluid-pressure-brake mechanism, the combination of a brake-cylinder, a discharge-passage leading therefrom to the atmosphere, a release-valve controlling said passage, a lever pivoted to the car-frame and bearing against the car draw-bar, and an elastic connection interposed between and coupled to said lever and to a lever which actuates the release-valve, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEO. WESTINGHOUSE, JR.

Witnesses:

W. D. UPTEGRAFF,
J. SNOWDEN BELL.