(No Model.) 3 Sheets—Sheet 1.

G. W. CISCO.

DEVICE FOR OPERATING BRAKES.

No. 407,576. Patented July 23, 1889.

Fig. 1.

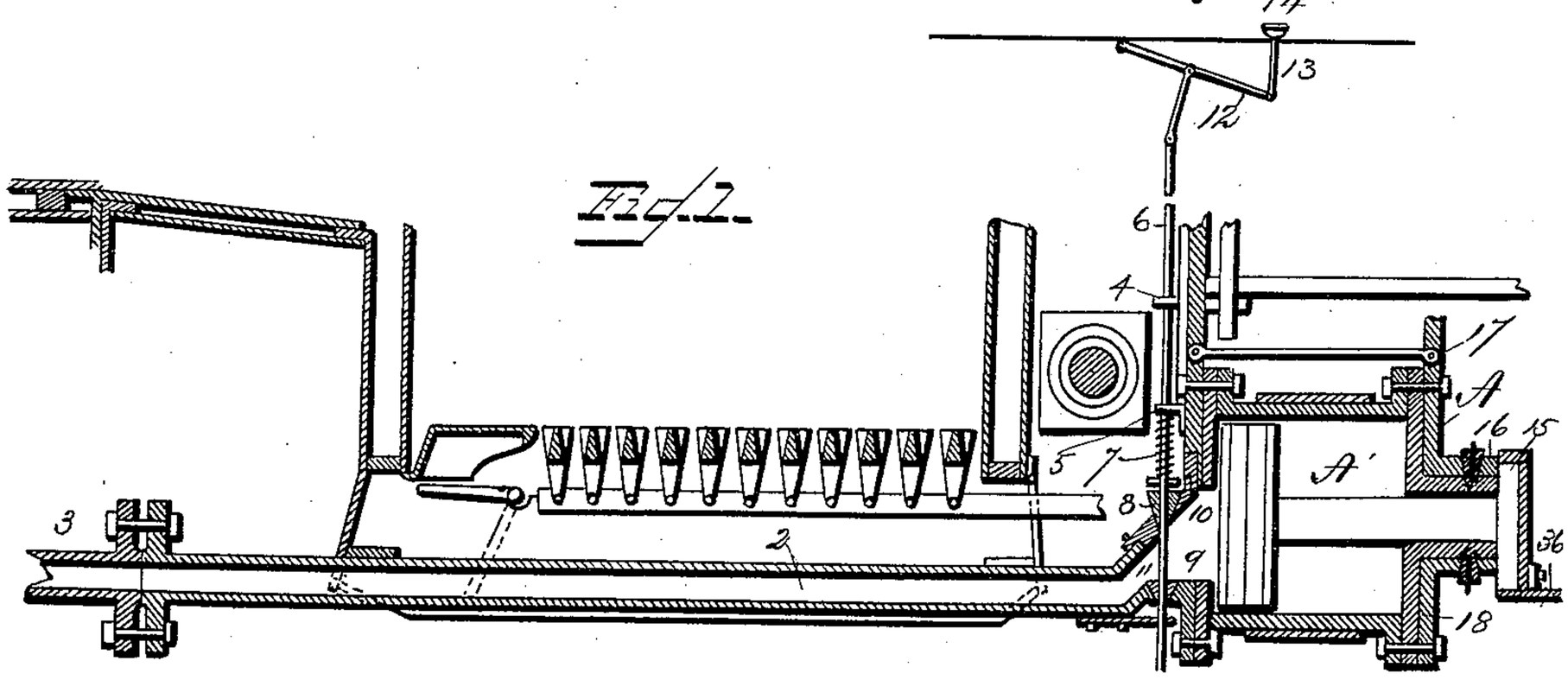
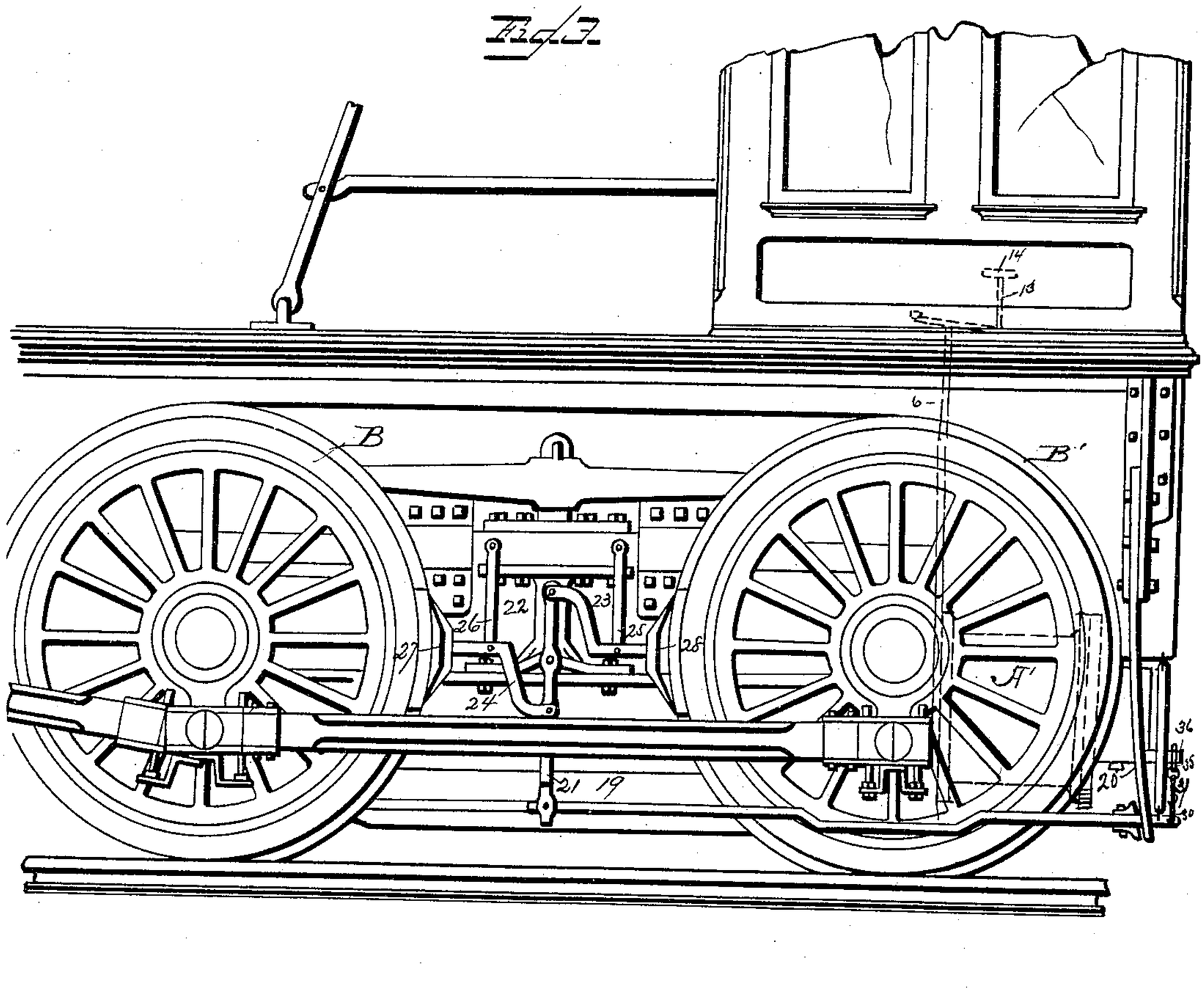


Fig. 2.



WITNESSES

F. L. Ourand.

R. W. Elliott.

INVENTOR

George W. Cisco,

by Louis Bagger & Co.

Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

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Fig. 4.

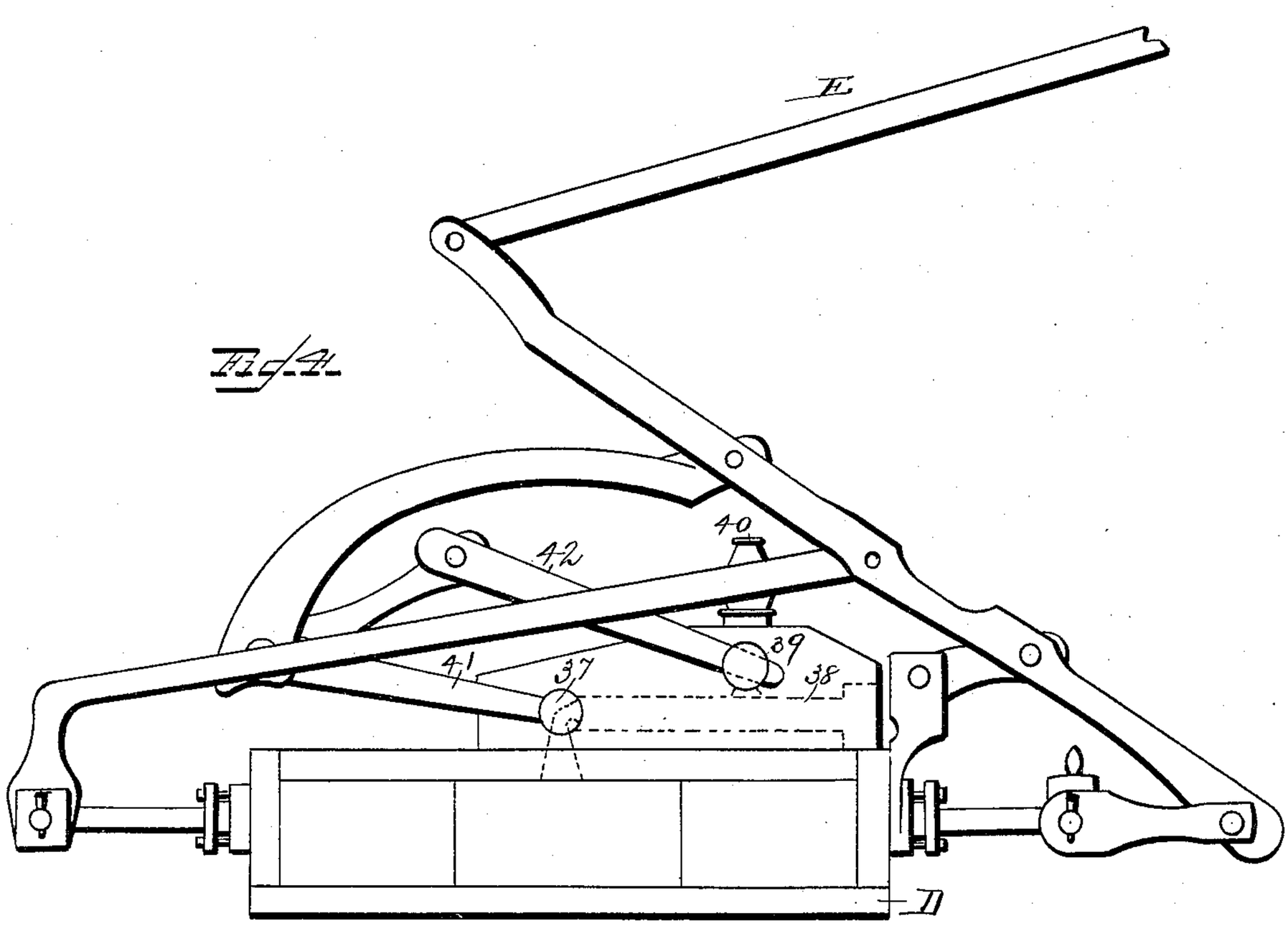


Fig. 5.

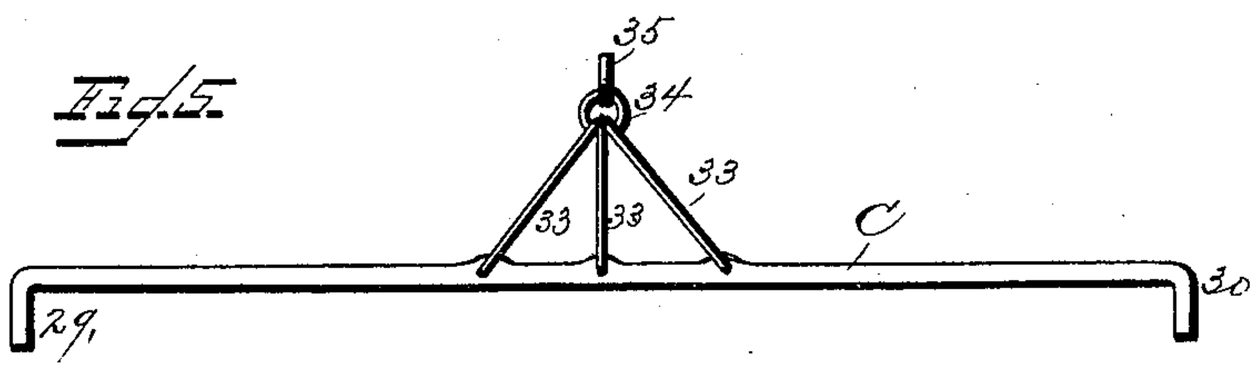
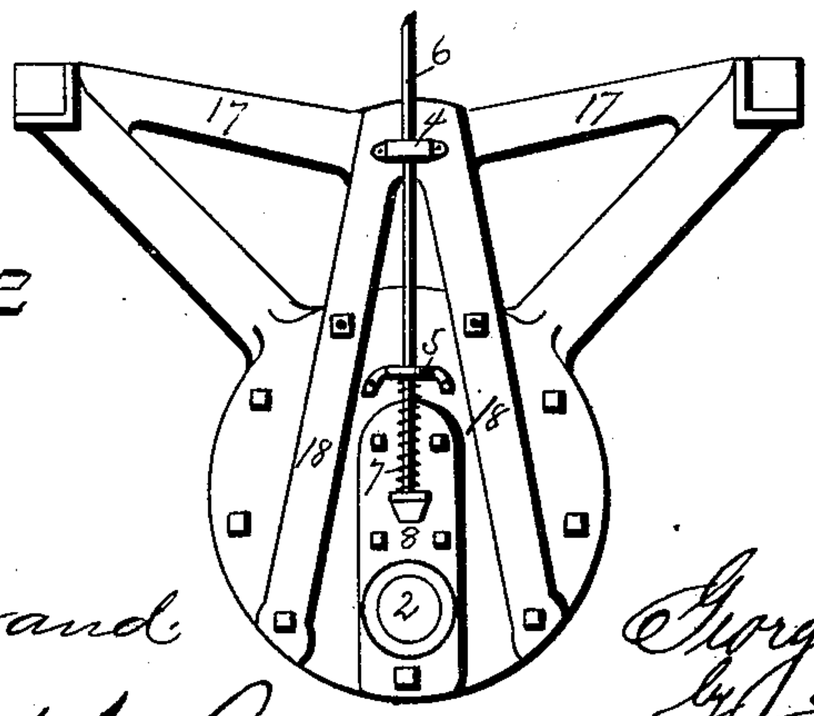


Fig. 2.



WITNESSES

F. L. Ourand.

P. W. Elliott Jr.

INVENTOR

George W. Cisco,

by Louis Dagger & Co

Attorneys.

(No Model.) 3 Sheets—Sheet 3.

G. W. CISCO.

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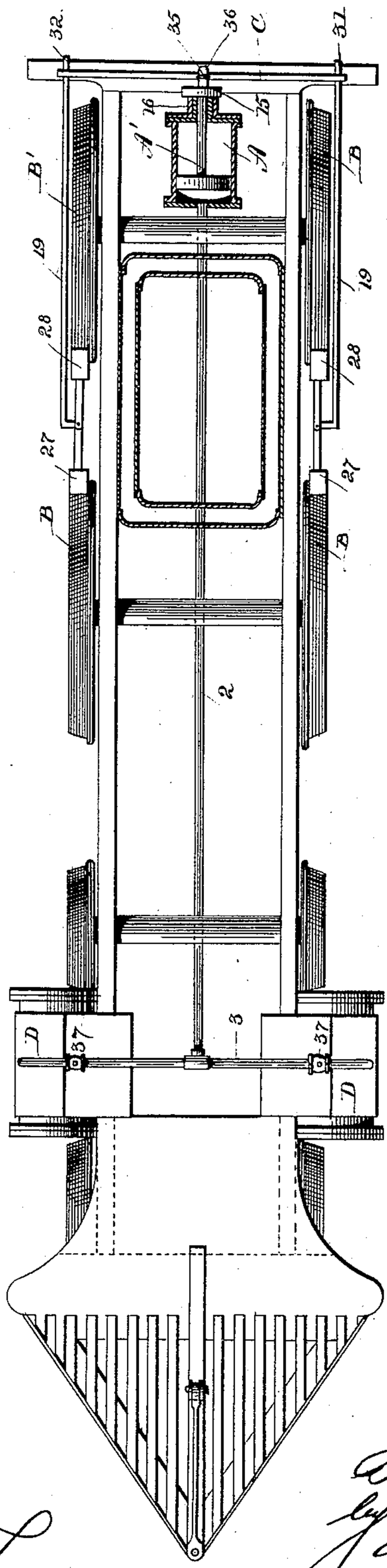

Fig. 6.

WITNESSES
F. L. Ourand.
R. W. Dietrich

INVENTOR
George W. Cisco,
by James Bagger & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON CISCO, OF MONTVALE, NEW JERSEY.

DEVICE FOR OPERATING BRAKES.

SPECIFICATION forming part of Letters Patent No. 407,576, dated July 23, 1889.

Application filed August 18, 1888. Serial No. 283,072. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WASHINGTON CISCO, a citizen of the United States, and a resident of Montvale, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Devices for Operating Brakes on Locomotives and Cars; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for operating the brakes on locomotives and cars.

The object is to produce a device to be attached to a locomotive, by means of which the brakes may be applied to and removed from the wheels in a certain and direct manner; furthermore, to produce a device which shall be simple of construction, efficient and durable in use, and which may be constructed and attached to an ordinary locomotive at a nominal expense.

With these objects in view the invention consists in the improved construction and combination of parts of a brake-operating mechanism, as will be hereinafter fully described in the specification, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, forming part of this specification, and in which like letters of reference indicate corresponding parts, Figure 1 is a longitudinal sectional view of the lower rear portion of a locomotive, showing a cylinder for containing the steam for operating the brakes and the pipe leading therefrom to the steam-chest. Fig. 2 is an end elevation of the cylinder, showing a device for relieving steam-pressure in the same when the locomotive is stopped. Fig. 3 is a side elevation of a locomotive, showing my peculiar brake secured to the same. Fig. 4 is a side elevation of a steam-chest, showing the levers for opening and closing the valves for admitting steam to the cylinder. Fig. 5 is a detail view of a bar for connecting the bars that operate the brakes on the engine, so as to cause them to operate simultaneously; and Fig. 6 is a top plan view of the running-gear of a locomotive with the boiler removed, showing more particularly the position of the steam-chest for operating the brakes, the pipe leading therefrom and connecting with a branch pipe leading to the steam-chest, and the position of the said chests.

Referring to the drawings, A designates a cylinder, which is placed at the end of the boiler of a locomotive in such a position as to be out of contact with any of the movable parts of the machinery. The inner end of the cylinder is bolted to a brace-plate 1, through which passes a pipe 2. This pipe extends through the ash-pan and along under the boiler and connects with a branch pipe 3, which communicates with the steam-chests on each side of the boiler, as will be clearly seen by reference to Fig. 6. The object for having the pipe for supplying steam to the brake-cylinder connect with the steam-chests instead of the boiler is, that when the steam is cut off from the cylinders, by mechanism hereinafter described, it will at the same time be cut off from the brake-cylinder, and thus permit the brakes to act, which would not be the case were the supply-pipe connected with the boiler, inasmuch as the steam would be constantly fed to the cylinder. Thus steam is supplied to the cylinder A from two points, and by reason of the position of the pipe is kept superheated, thereby preventing any condensation and rendering the action of the piston certain at all times.

To the outer surface of the brace-plate are secured two guides or boxes 4 and 5, and through these passes a rod or stem 6, having a coiled spring 7 placed thereon. On this rod are also secured two cone-shaped disks 8 9, designed to fit in similarly-shaped openings or seats 10 11, formed in the steam-pipe and at a point adjacent to the piston-head. At its upper end the rod or stem connects with a lever 12, one end being pivoted to the under part of the tread-board of the engine and the opposite end to an arm 13, which passes up through the said board and has a handle 14 formed on its upper end. The object for which this device is designed will be explained farther on.

A′ is the piston-rod, having a piston of ordinary construction on its inner end. At the outer end a plate 15 is secured, which rests against the neck 16 of the cylinder, and is de-

signed to prevent the piston-head from striking the rear cylinder-head when pressure is removed from the piston. The neck portion is suitably supported and strengthened by means of a collar 17, which fits over the neck, and is secured to the frame of the engine by a rod 18.

B B′ designate the driving-wheels of the locomotive, between which is mounted a brake constructed and operated in the following manner:

19 designates a rod or lever, one end of which passes through and extends beyond a flat spring 20 on the frame of the locomotive, and the other end connects with a depending lever 21, pivoted to a support-block 22 on the engine-frame. At points respectively above and below the pivotal point of the depending lever are secured bent arms 23 24, pivoted to hangers 25 26. The outer ends of the arms have brake-shoes 27 28 secured to them, designed to press against the rim or tire of the driving-wheels when the brakes are operated. It is to be understood that the same mechanism is employed on both sides of the engine, and that it is necessary to employ means to operate them simultaneously. To accomplish this, the following mechanism is employed:

C designates a rod of sufficient length to extend across the engine. The ends of the rod are bent to form arms 29 30, which are connected on each side of the locomotive to the ends 31 32 of the rod 19. To this rod are secured a number of links 33, which connect with smaller links 34 35. The upper link 35 passes over an arm or projection 36 on the piston-rod, which, when operated, carries the rod C with it, thereby operating the rod or lever 19, which in turn operates the brakes and causes them to release the wheels of the engine.

In order to cause the piston to operate in a certain and direct manner, it is necessary that the steam for operating it should be supplied to it in such a manner that the instant the steam is shut off from the steam-chests it will also be shut off from the brake-cylinder, thus allowing the springs 20 to operate the brakes on the engine to cause them to lock the driving-wheels. This portion of the mechanism is constructed as follows:

D designates a room or casing secured to the steam-chest. A globe or other suitable form of valve 37 is used to open or close a pipe 38, which leads from the steam-chest to the branch pipe 3 on each side of the engine.

39 designates another valve, which is designed to open or close an escape-pipe 40, also connecting with the pipe 38.

41 42 designate levers which connect with the valves and are operated as follows: When the engineer draws back the rod E, the supply of steam to the steam-chest is cut off by means of mechanism which forms the subject-matter of another invention filed April 2, 1888, Serial No. 269,286, but which is shown here in order to make this invention clear. The valve 37 being then closed, the steam escapes from the pipe 40 into the air, thereby relieving all pressure from the piston-head and allowing the brakes to apply themselves by means of the springs, as before described. When the engine is started again, the rod E is pushed forward, thereby closing the valve on the escape-pipe and opening the valve on the pipe leading to the branch pipe, thereby allowing the steam to enter the cylinder and force the piston back and keep it in that position until it is necessary to apply the brakes again.

When the engineer wishes to back his engine to couple with the train, it is desirable that he should be able to apply the brakes lightly to prevent severe jarring. To effect this, it is only necessary to pull up the rod 6, when the steam will escape around the disks 8 9, thereby allowing the piston to move far enough to apply the brakes lightly.

It will thus be seen by this peculiar construction of a brake and the mechanism for operating the same that the brakes will automatically apply themselves as soon as the steam is cut off from the steam-chests, thereby making it unnecessary for the engineer to apply them, as is the case with all other forms of automatic brakes, that it is exceedingly simple of construction, and may be applied to an ordinary engine without any very great outlay of money.

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

1. In a device for operating brakes, the combination of the casings, the pipe communicating therewith, having controlling-valves, the pipe leading from said pipe, the cylinder in communication with said pipe, the piston working in said cylinder, the cross-bar connected with the piston-rod, the rods connected to the ends of the said cross-bar, the lever fulcrumed to the engine-frame and pivoted to the last-named rods, and the arms carrying the brake-shoes, pivoted to the lever, all of said parts being arranged and adapted to operate substantially in the manner, and for the purpose described.

2. In a device for operating brakes, the combination of the cylinder, the pipe for supplying steam thereto having openings therein, the spring-actuated rod having plugs adapted to close said openings, and the lever or handle for operating said rod, substantially in the manner, and for the purpose described.

3. In a device for operating the brakes on locomotives and cars, the combination of the cylinder, the piston working therein, a plate secured to its outer portion to prevent the piston-head from striking the cylinder-head, an arm secured to the said outer portion to support a bar for operating the brake-rods on the engine, and rods 19, passing from the said bar to a depending lever pivoted on the engine-frame to operate the brakes carrying the shoes, substantially as described.

4. In a device for operating brakes, the combination of the steam-supply pipe having openings therein, the spring-actuated rod having plugs for closing said openings, the cylinder communicating with the steam-supply pipe, the piston therein, the cross-rod connected to the piston-rod, the rods connected to the cross rod or bar, the lever for operating the brake-shoes, connected to the said rods, the links on the cross-bar, and the arm or projection on the piston-rod connected to said links, all of said parts being arranged as shown, and operating in the manner described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

GEORGE WASHINGTON CISCO.

Witnesses:
JOSEPH JAY CISCO,
H. F. BAUER.