G. WESTINGHOUSE, Jr.

Cocks for Fluid-Pressure Brake.

No. 214,602. Patented April 22, 1879.

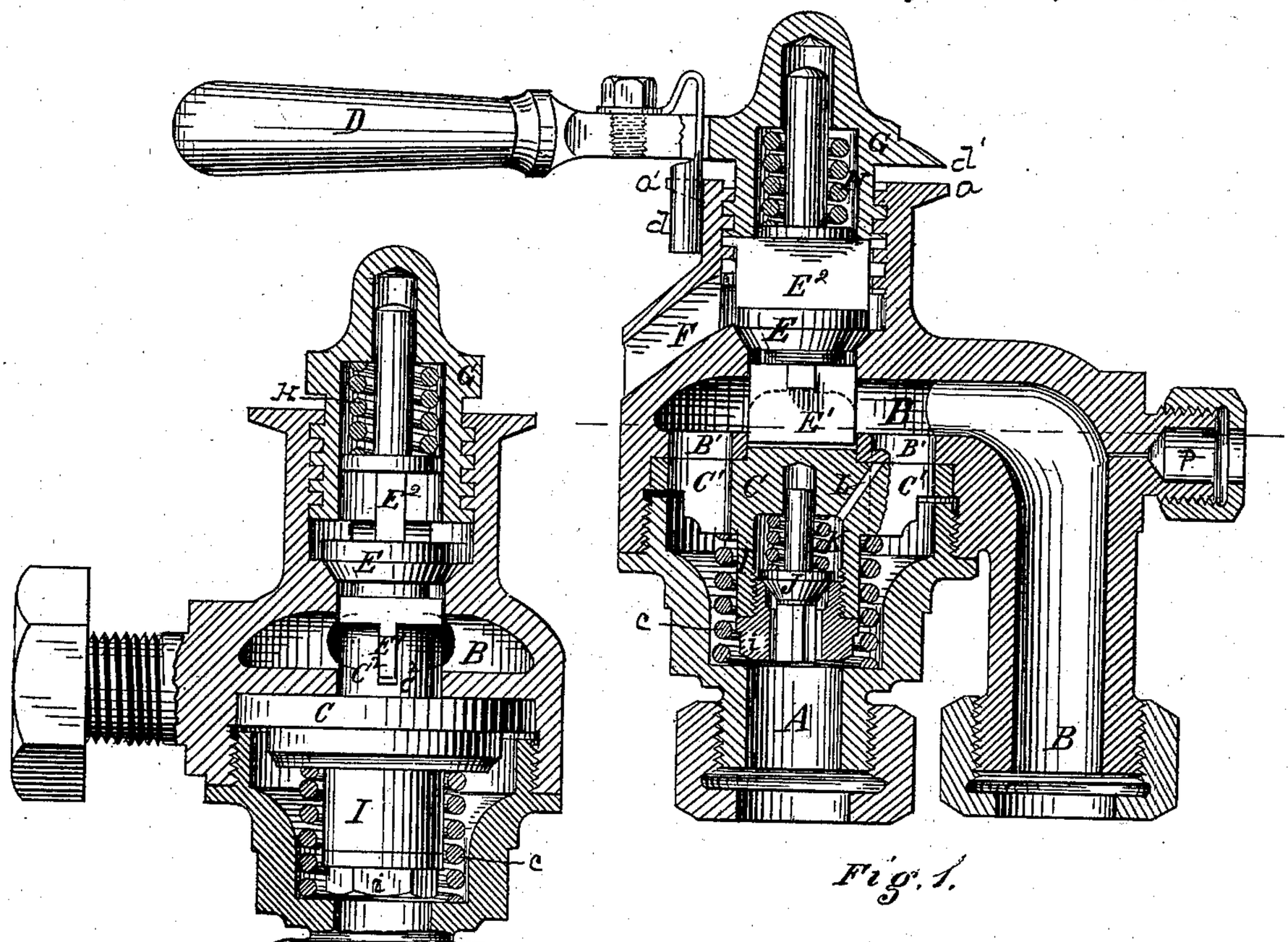

Fig. 1.

Fig. 2.

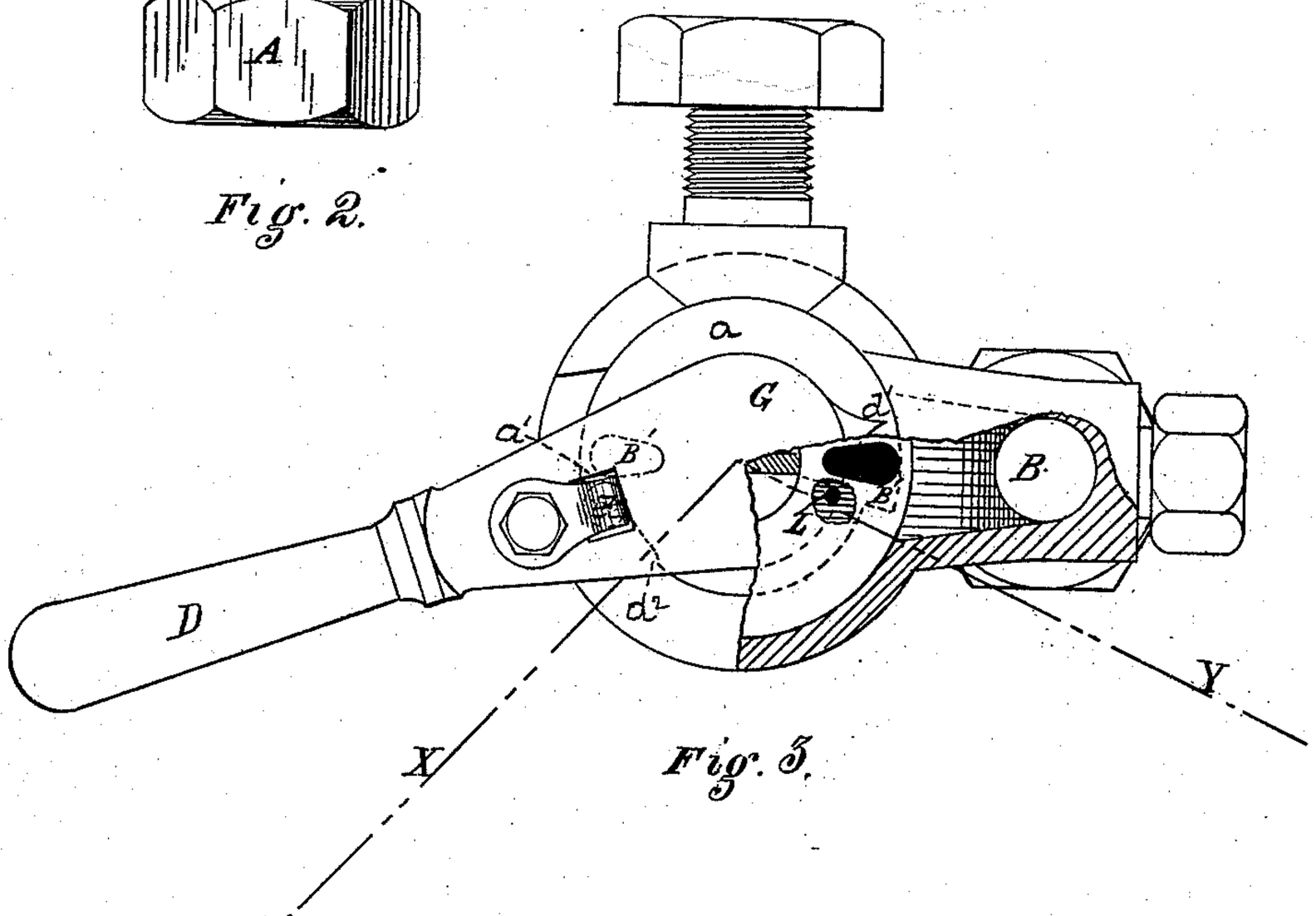

Fig. 3.

Witnesses
C. L. Parker
J. McStull.

Inventor George Westinghouse Jr.
By Attorney George H. Christy

UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN COCKS FOR FLUID-PRESSURE BRAKES.

Specification forming part of Letters Patent No. **214,602**, dated April 22, 1879; application filed March 19, 1879.

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, Jr., of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Cocks for Fluid-Pressure Brakes; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 shows a longitudinal vertical section of my improved cock device. Fig. 2 is a cross-section thereof; and Fig. 3 is a plan view, partly in section, as shown.

My present invention relates to certain features of improvement in the cocks employed on locomotives, in connection with or as a part of fluid-pressure brake apparatus, and more particularly the brake apparatus commonly known as the "automatic." Cocks of this class, as heretofore made and used, have most commonly been such as to enable the engineer to charge the brake-pipes and auxiliary reservoirs with air-pressure from the main reservoir, to maintain such pressure so as to keep the brakes out of action, and to discharge to a greater or less degree, as may be desired, the air-pressure from the pipes when it is desired to apply the brakes.

The present improved construction has mainly for its object to enable a definite or any desired higher pressure—say fifteen pounds to the square inch, more or less—to be maintained in the main reservoir above that which is maintained in the brake-pipes, while nevertheless the air-pressure is able to pass from the former into the latter whenever the pressure in the brake-pipe may become reduced below the determined or desired amount. The other features of improvement will be subsequently mentioned.

The shell or valve-case may be of any suitable construction.

A represents the branch which communicates by a suitable pipe with the main reservoir, and B represents the passage which is connected to the brake-pipe. In the case or shell I arrange a rotary slide-valve, C, having one or more ports or openings, C^1, which in the adjustment shown in Fig. 1 communicate with openings or ports B′, made in a transverse diaphragm, the latter ports, B′, opening into the air-passage ways, B. These openings or ports C^1 B′ are preferably of the form shown in Fig. 3—that is, radially elongated and transversely narrow—though the form may be varied at pleasure.

With the devices in the position shown, the air-pressure can flow freely from A to B, and so charge the brake-pipes and auxiliary reservoirs; but when the cock-handle D is turned from the position shown in full lines in Fig. 3 into either of those indicated by the dotted lines X and Y, or to any intermediate position, the ports C^1 and B′ no longer open into each other, and communication by such ports from A to B is cut off.

In effecting this motion the rotary valve C is turned by means of a rib, E^1, on the lower side of a puppet-valve, E, which rib occupies a recess or slot between the projections C^2 on the slide-valve C, and the valve E (which opens and closes communication between B and the escape passage or port F) is turned by means of a rib, E^2, on its upper side, which enters a slot or recess in the lower end of a screw-cap, G. This screw-cap is turned (and in turning is raised and lowered on the screw-threads) by means of the handle D, which is fixedly or rigidly connected therewith.

A spring, H, is arranged above the valve E, so as to hold it to its seat as against all ordinary working air-pressures when the handle D is in the position shown in full lines, or is in the position indicated at X; but if the handle D is turned to the position Y, Fig. 3, the screw-cap G is raised on its threads. The downward pressure exerted by the spring H is thereby relieved or lessened to such extent that the valve E is raised or forced from its seat by the air-pressure in B and in the brake-pipes, and such pressure consequently escapes into the outer air through the opening F. This reduction of air-pressure in the brake-pipes causes the brakes to be applied in the manner common in the automatic brake; and the amount of reduction of air-pressure thus

effected may be varied by stopping the lever D a greater or less distance short of the Y position, since the less the spring H is relaxed the less distance will the valve E be raised, and the less will be the reduction of air-pressure in the brake-pipes. In this operation of applying the brakes the communication between A and B will be cut off, as already stated.

On the under side of the rotary valve C is a tubular stem, I, partially closed by a tubular screw-plug, *i*, the tubular opening of the plug communicating with the branch A. This opening is closed by a valve, J, held down by a spring, K, and this spring is constructed or adjusted so as to exert a pressure on the valve J equal, or about equal, to the difference of air-pressure which it is desired should be maintained between the main reservoir on the one hand and the brake-pipes and auxiliary reservoirs on the other.

The chamber above the valve J has a comparatively small port or passage, L, leading thence through the valve C, and opening at its upper end a little to one side of a port, C^1, but in such position that when the valve C has been turned till the handle D is in the X position the said port L communicates with the adjacent port, B′, and thus establishes a communication between the main reservoir and auxiliary reservoirs through A, I, and B, when J is raised, as presently to be described.

From this arrangement it will be seen that if, after having once charged the brake-pipes and auxiliary reservoirs with air-pressure from the main reservoir, the valve C be turned from the open position shown in the drawings into the position X, and left there, then before any additional air-pressure can pass from A to B the pressure in the main reservoir must be as much in excess of that in B as is required to open the valve J against the pressure of the spring K, and consequently the pressure in the brake-pipes will, while the train is running with brakes off, be always maintained at the required amount below that in the main reservoir.

In this way a degree or amount of air-pressure can be maintained in the main reservoir in excess of what is required in braking under ordinary circumstances, so that emergencies are provided for; and also, in ordinary braking, such excess will be highly advantageous in recharging the brake-pipes and auxiliary reservoirs, and thereby effecting a quick release of the brakes after having been applied.

In order to give the engineer an audible indication of the valve C having been accurately brought into the last-described position, the valve-casing may be provided with an escape-passage communicating with A, which passage would be closed by C when shifted to the proper position, so that until this was done the noise of the air-pressure escaping by the said passage would be heard; but for the same purpose a stop, a^1, may be made on the periphery of a plate, *a*, to fix the position of the handle D at one end of its motion, a like stop at the other end, and a reduced shoulder or incline, a^2, at the X position, of such size that it will be felt when engaged by a spring-catch, *d*, while such spring-catch may pass it when necessary; or the same result may be attained by graduating the plate *a* in such manner that a pointer or index, *d′*, shall indicate the proper adjustments of the handle.

The spring H enables the valve E to perform the additional function of a safety-valve. In case the pressure in the brake-pipes, either from accident or carelessness, becomes so great as to endanger the hose or other connection, the back-pressure will compress the spring, lift the valve, and escape to the extent of the excess.

The rotary valve C is held up to its seat by a suitable spring, *c*, or in other convenient way.

The port and connection P are designed for the attachment of a pressure-gage.

Modifications of structure, changes of form, and substitution of devices which are the mechanical equivalents of those described, the mode of operation remaining substantially the same, are hereby included herein.

I claim as my invention—

1. In a cock for charging and discharging the fluid-pressure of air-brake apparatus, an air-passage leading from the main-reservoir connection or branch through such cock to the brake-pipe connection or branch, in combination with a valve arranged in such air-passage, held to its seat by a force equal, or about equal, to the excess of pressure desired in the main reservoir, but free to be opened when the main-reservoir pressure exceeds the aggregate of such excess plus the brake-pipe pressure, substantially as set forth.

2. A rotary slide-valve, C, having one or more ports, C^1, and a port, L, in combination with valve J and port or ports B′, relatively arranged substantially as set forth, whereby in one adjustment of the handle D the ports C^1 B′ shall only be open, in another these ports shall be closed and L shall open into B′, and in a third all shall be closed.

3. The combination of screw-threaded cap G, valve E, spring H, and rotary slide-valve C, with connections between the screw-cap and the two valves, substantially as set forth, whereby the valve E shall be held to its seat in charging and maintaining air-pressure in the brake-pipe, but shall, when the handle is brought to a discharging position, be subject to a degree of spring-pressure less than the air-pressure beneath.

4. The valve E, in combination with spring H, threaded screw-cap G, brake-pipe connection or branch B, and discharge-port F, substantially as set forth, whereby said valve E

performs the double function of holding ordinary working-pressure and of discharging the same, and also acts as a safety-valve as against undue or excessive pressure.

5. The valve J, arranged in a chamber below the valve C, in combination with spring K, port L, and connections A B, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEORGE WESTINGHOUSE, JR.

Witnesses:

CHAS. BERKLEY HARRIS,
17 *Gracechurch Street, London, E. C.*

JNO. DEAN,
17 *Gracechurch Street, London, E. C.*