

G. WESTINGHOUSE, Jr.  
Brake-Pipe Coupling.

No. 214,335.

Patented April 15, 1879.

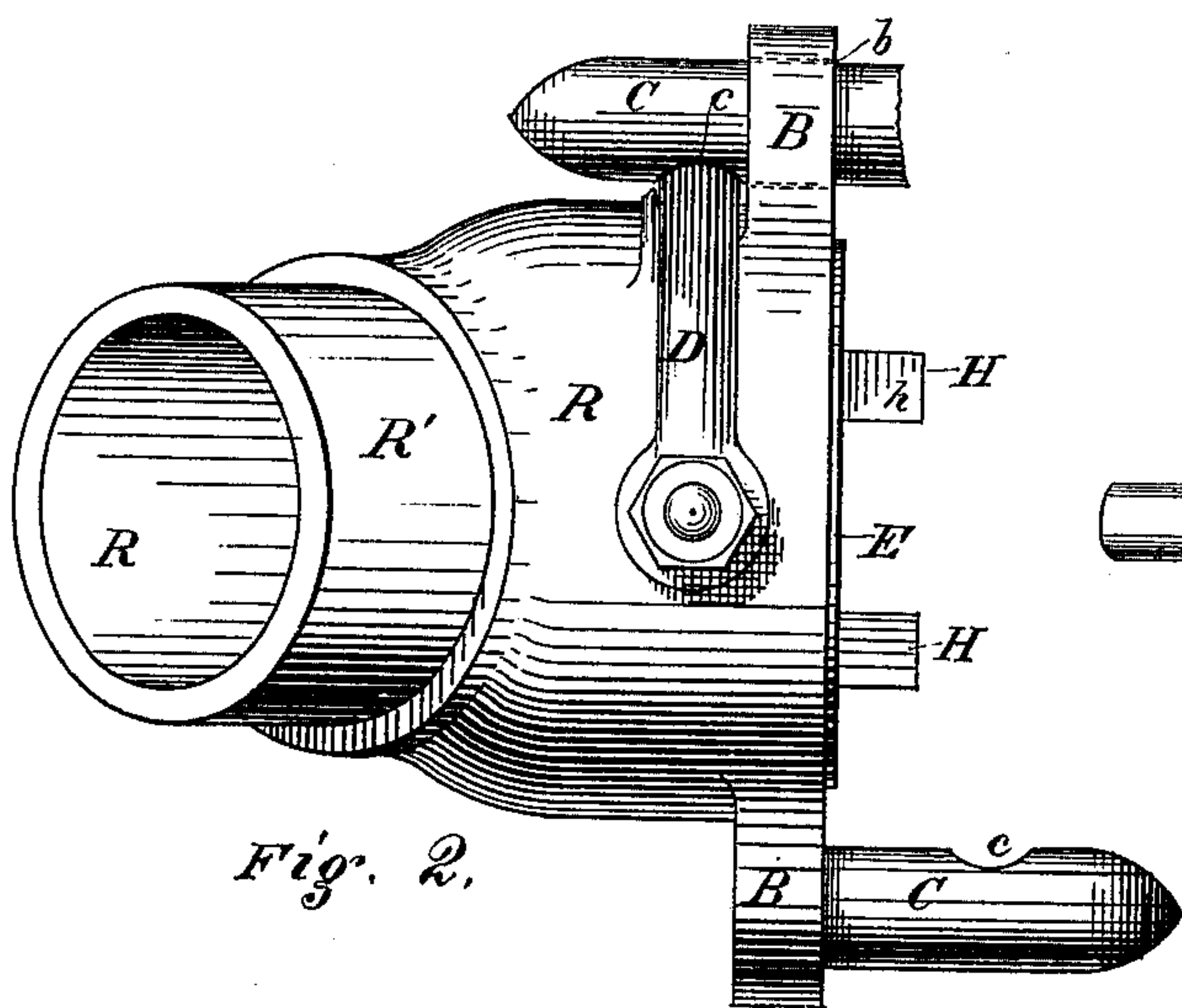


Fig. 2.

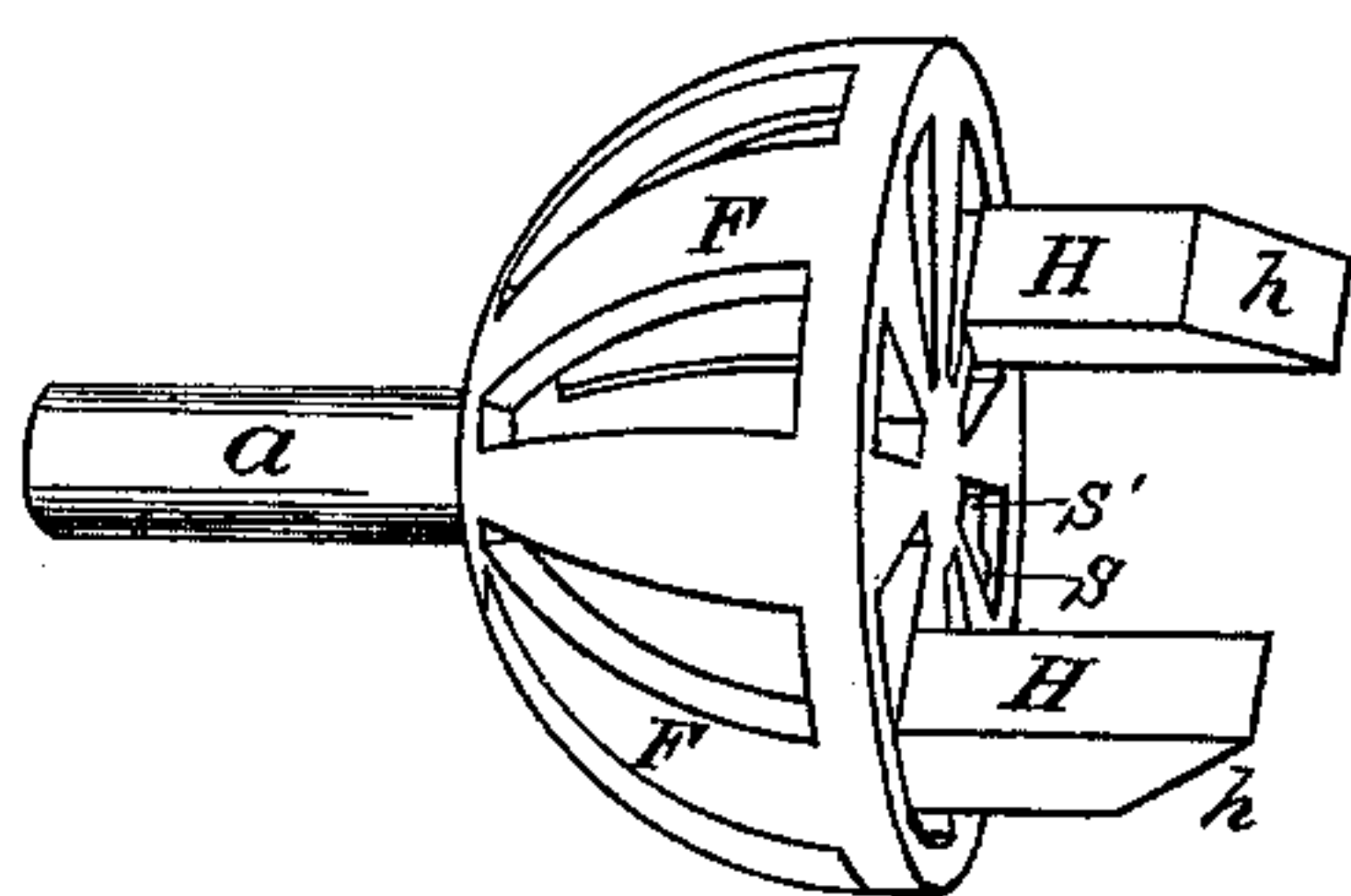


Fig. 4.

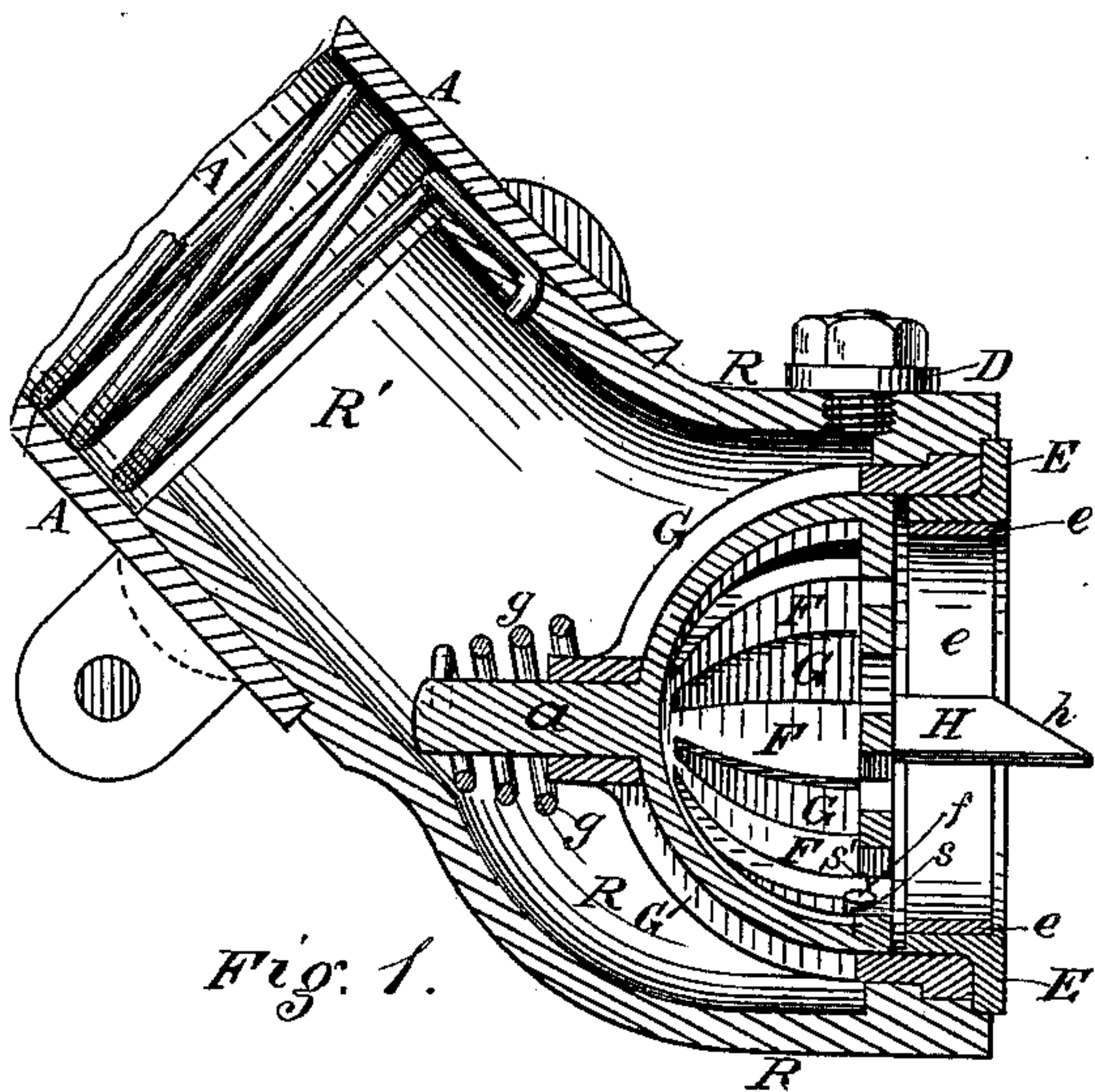


Fig. 1.

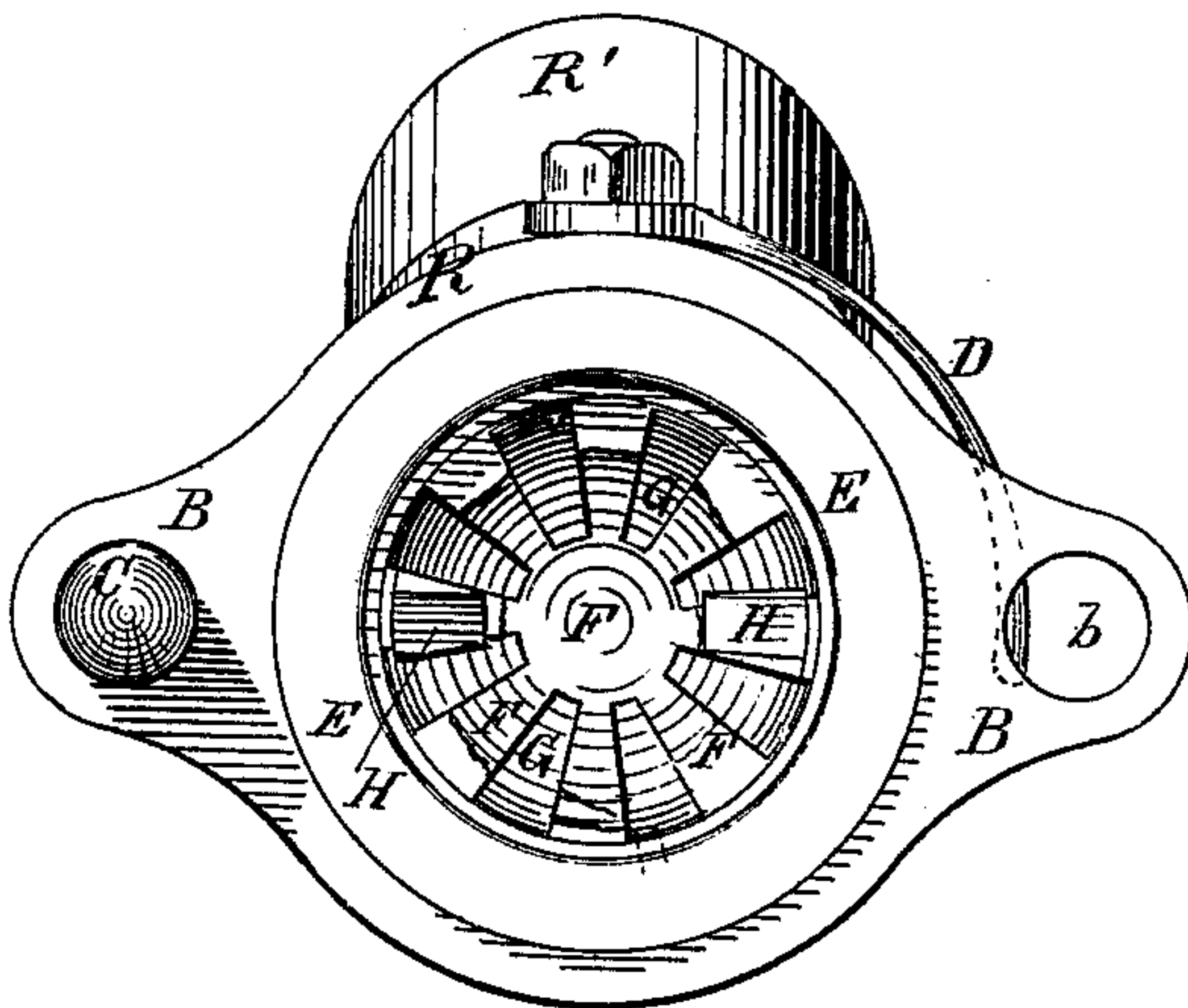


Fig. 3.

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# UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN BRAKE-PIPE COUPLINGS.

Specification forming part of Letters Patent No. **214,335**, dated April 15, 1879; application filed February 28, 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 Brake-Pipe Couplings; 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 is a longitudinal sectional view of one half of my improved coupling. Fig. 2 is a plan view thereof. Fig. 3 is an end view of the same, and Fig. 4 is a detached view of the inner rotating half of the valve proper.

The use of flexible hose, carrying couplings at their outer ends, for the purpose of connecting together the operating-pipes of power-brake apparatus, is well known.

My present improvement relates to the construction, for such use, of valved couplings of that class wherein it is desired that, when the half-couplings are separated or uncoupled, their ported ends should be automatically closed, and wherein the act of coupling shall necessitate the opening of the valves. The half-couplings are also duplicates of each other, so that any two may be coupled together.

The present coupling is designed to be used chiefly as a part of a vacuum-brake apparatus, though it may also be used in that class of brake apparatus wherein fluid-pressure is transmitted directly from a pump or main reservoir to the several brake-cylinders on the cars.

A portion of one of the flexible hose is represented at A, and to it is secured in any convenient way the nozzle R' of the half-coupling R, and this nozzle is inclined to the axis of the coupling, so that when the two half-couplings are connected the flexible pipes hang in an easy curve, without being strained by abrupt bends over the edges of the nozzles. Each half-coupling is provided with a pair of laterally-projecting ears, B, one of them having secured thereto by riveting or otherwise a taper-pointed pin, C, having a side notch,

c, and the other one having a hole, b, bored through it of proper size, and in proper position for the insertion of a like pin, C, attached to one of the ears of the opposite half-coupling. As this pin C is in every case fixed to the same ear—say, the left-hand ear—in all half-couplings, while the hole b is in every case made in the opposite ear, the half-coupling at the end of every car, whichever end of the car may be presented to the next car, is adapted to couple with the half-coupling on the adjacent end of such next car, the pin C of one half-coupling being thrust through the hole b of the other. When the two half-couplings are pressed together or coupled a spring, D, on each catches into the notch c of the pin of the other, and thus the two are held together as against all ordinary strains; but the notches c and the ends of the springs D, one or both, being rounded or beveled, automatically disengage under unusual strain, and so allow the two halves to become uncoupled without injury to either. Each half-coupling is provided with an elastic packing-ring, E, of india-rubber or other suitable material, which is held in place by a tight-fitting band, e, pressed inside of its tubular part, or in any other suitable way. This ring, or the lip part of it, projects sufficiently far beyond the end of the shell of the coupling, so that when two come together face to face or end to end in coupling they will make a tight packing and prevent material loss from leakage.

In order now that the ports of such half-couplings may be closed when they are uncoupled, and open when coupled, I provide in each half-coupling a valve, which consists of a grating, F, preferably of hemispherical shape, (though other form of grating may be employed capable of rotating on its axis,) on the face of a correspondingly-shaped fixed grating, G, securely fitted within the coupling-shell. The rotating half F of the valve has a stem, a, which projects through an eye made in G. A spring, g, secured at one end to the stem a and at its other end to the fixed grating G, is so connected that its elastic force, acting on the stem a, causes the part F to turn till a



shoulder, *s*, made therein comes against a fixed stop-pin, *f*, in which position the bars of the valve *F* cover the apertures between the bars of *G*. By this means the mouth of the coupling or its ports or through passage-ways are closed.

In order that such ports may be opened when the two half-couplings are united, I attach to the revolving grating *F* two studs, *H*, preferably made with their ends beveled or inclined, as at *h*, so that when the ends of the pins *C* enter the holes *b* in the coupling operation the inclined faces of the studs *H* of one half-coupling, acting on the inclined faces of those of the other, shall cause the gratings *F* of both half-couplings to turn on their axes in opposition to the force exerted by the springs *g* until the bars of *F* coincide, or nearly so, with those of *G*, thus leaving the apertures between the bars open, and giving open ports or through passage-ways from one length of pipe to the other; but in order to insure no more than the necessary length of rotary motion in each grating I provide a stop-shoulder, *s'*, which shall bear against the stop-pin *f* as soon as the bars of the grating come into line with each other or coincide. The gratings or valves in each half-coupling will then be fully opened; but on the disconnecting of the couplings, either intentionally or by accident, the springs *g* will cause the gratings *F* to turn back and close the ports or apertures in *G*.

This construction of coupling and self-closing valve is obviously applicable, whether the air in the communicating pipe be compressed or rarefied, or whether any fluid other than air, such as water or steam, be employed, for communicating pressure throughout the train for working the brakes.

I do not limit myself to the particular form or construction of valve described, but include herein, as the substantial equivalents thereof, all known forms of valves in which the port or passage-way is opened and closed by a rotary motion of one ported part on another ported part, which latter either remains stationary or rotates in the opposite direction, and in which the axial line of the rotation of the rotary device extends in the same general direction as the axial line of the air ports or passages in or in combination with which it is arranged.

I believe that I am the first to introduce a valve of that class into pipe-couplings in such manner that such valve shall be automatically opened and closed in the act of coupling and uncoupling; nor is it essential that projecting studs or lugs on one valve shall engage those of the other, since the movable part of each valve may be rotated by means of an engagement with some non-rotating part of the opposite half-coupling through the medium of one or more interposed projecting studs or lugs having or acting on an inclined surface or surfaces.

And valves of this class may be combined with couplings having other fastening devices than those described, provided only that such fastenings shall, when the couplings are properly united, prevent the coupling-shells from rotating with reference to each other, and thereby prevent the valves from rotating back to a closed position; and I include herein the use of such valves in lap or splice joint couplings, as well as in "butt" couplings; but separate application will be made covering the use of valves of this class in connection with couplings of the kind referred to in reissued Letters Patent No. 8,291, granted to me June 18, 1878.

I do not claim herein the angular arrangement of the nozzles *N'*, as I am informed that such feature has been previously invented by another.

I am aware that it is not new to arrange two-way cocks in male and female coupling-shells with the axis of rotation of the cocks at right angles to the main through passage-way of the couplings, said cocks and coupling-shells being provided with gear-teeth, whereby it is proposed to open the cocks in the uniting of the couplings, and to close them by separating the couplings, and to such construction, broadly, I make no claim.

I claim herein as my invention—

1. In combination with a half-coupling, a rotary valve having its axis of rotation extending in the same general direction as the axial line of the air ports or passages which it is designed to open or close, in manner substantially as described, whereby in the act of uniting the half-coupling with its counterpart the rotary valve shall necessarily be brought to an open position, and in the separation of the half-couplings it shall be automatically brought to a closed position.

2. In a two-part pipe-coupling, the two halves of which are of like construction, a rotary valve arranged in each half, with their axial lines of rotation extending in the same general direction as the ports or passages which they are designed to open and close, in combination with suitable lugs or projections, whereby each half-coupling on the valve inclosed therein shall act in the operation of coupling to rotate the opposite valve, substantially in the manner set forth.

3. In a two-part pipe-coupling, the two halves of which are of like construction, and are automatically detachable under unusual strain, the combination of valves arranged to open each other by a rotary motion on their axes in the act of uniting the couplings, and springs arranged to rotate the valves back to a closed position when the valves are uncoupled, substantially as set forth.

4. In a rotary coupling-valve, the rotary ported part *F*, of any desired construction, having one or more studs, *H*, and suitable



stops to limit the extent of its rotary motion, in combination with a fixed ported part, G, and spring *g*, substantially as set forth.

5. The pins C and holes *b*, operating as guides in bringing the couplings together, in combination with bevel-ended studs H, attached to the rotary parts of the valves, substantially as set forth.

6. The rigid recessed pins C, in combination with perforated ears B and springs D, substantially as set forth.

In testimony whereof I have hereunto set my hand.

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