

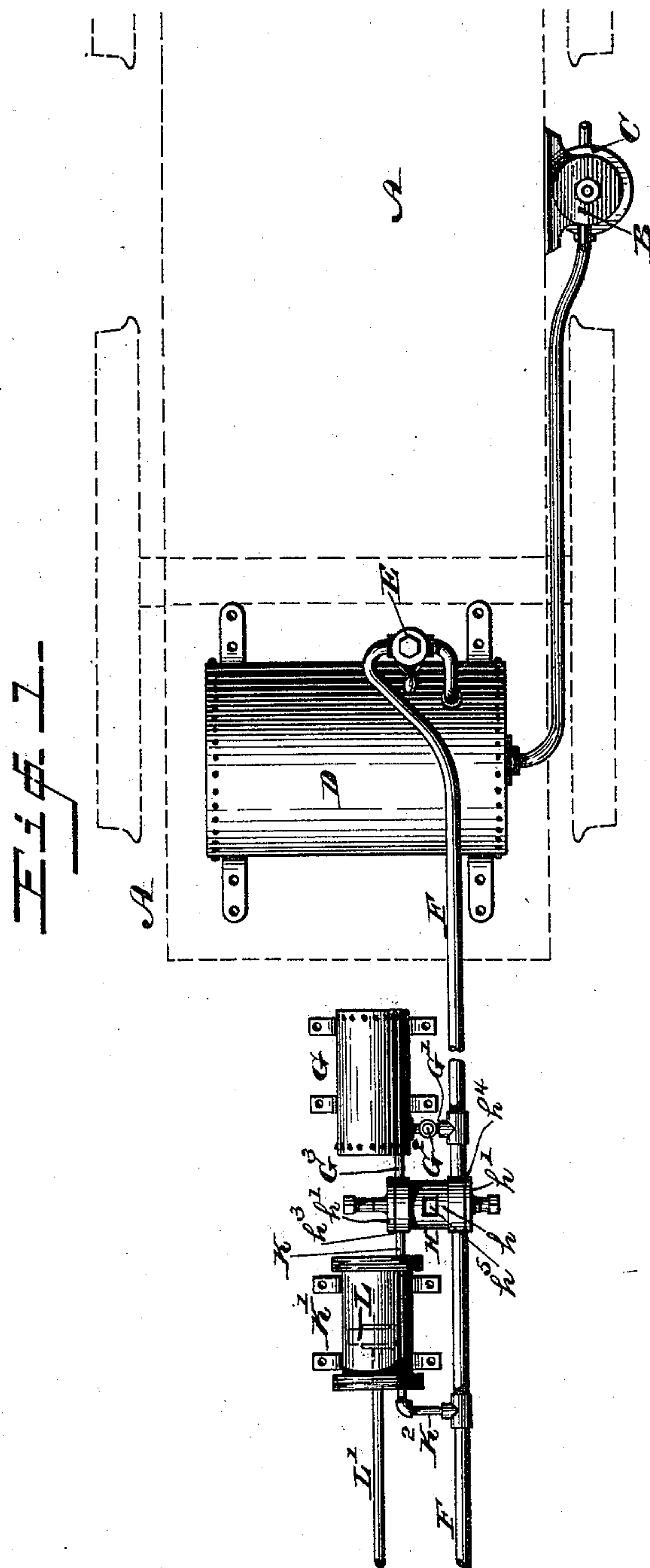
(No Model.)

2 Sheets—Sheet 1.

F. SCHMEMANN.  
AIR OR STEAM BRAKE.

No. 417,448.

Patented Dec. 17, 1889.



Witnesses  
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*Am. M. Co.*

Inventor  
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By his Attorneys  
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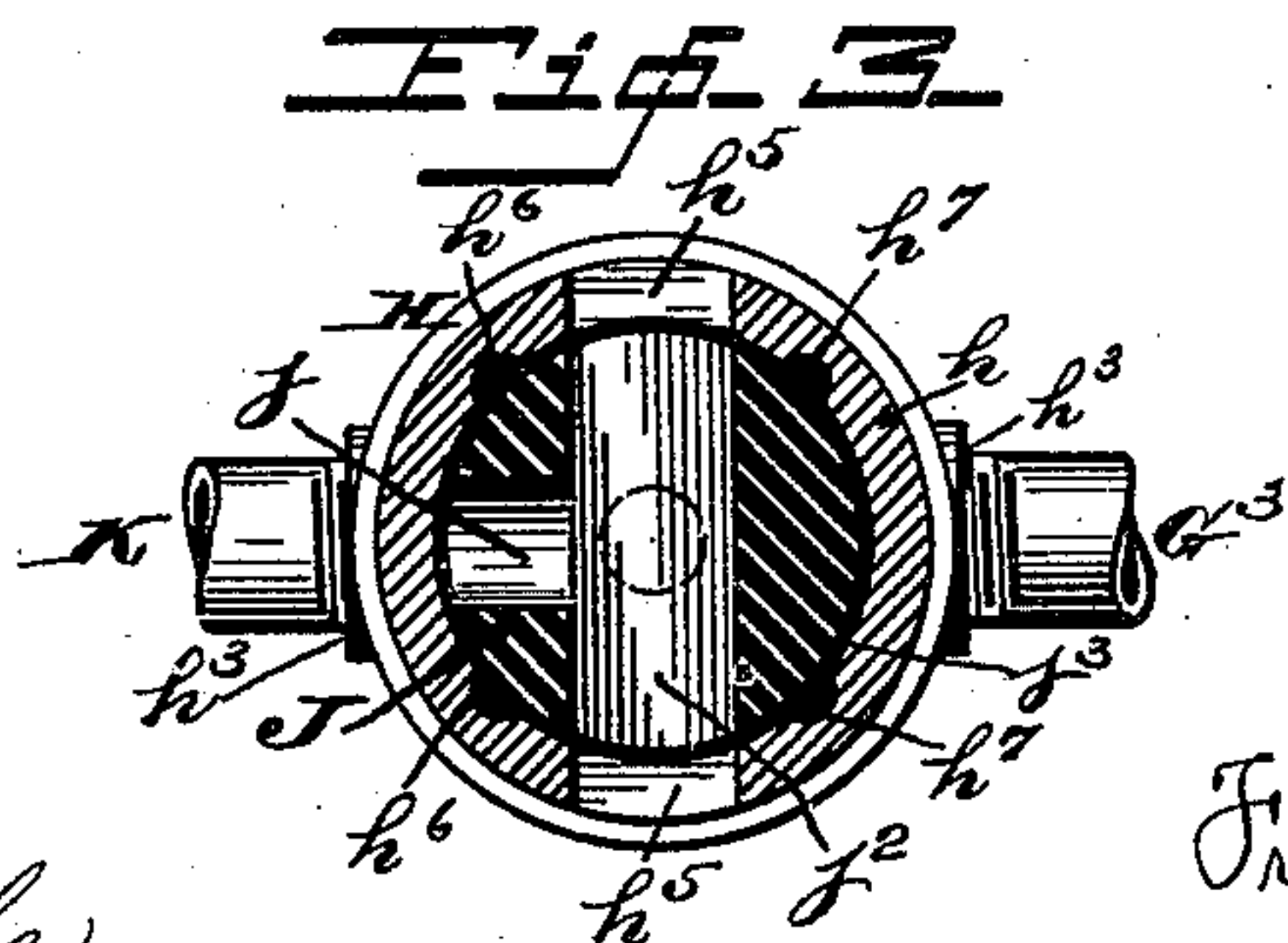
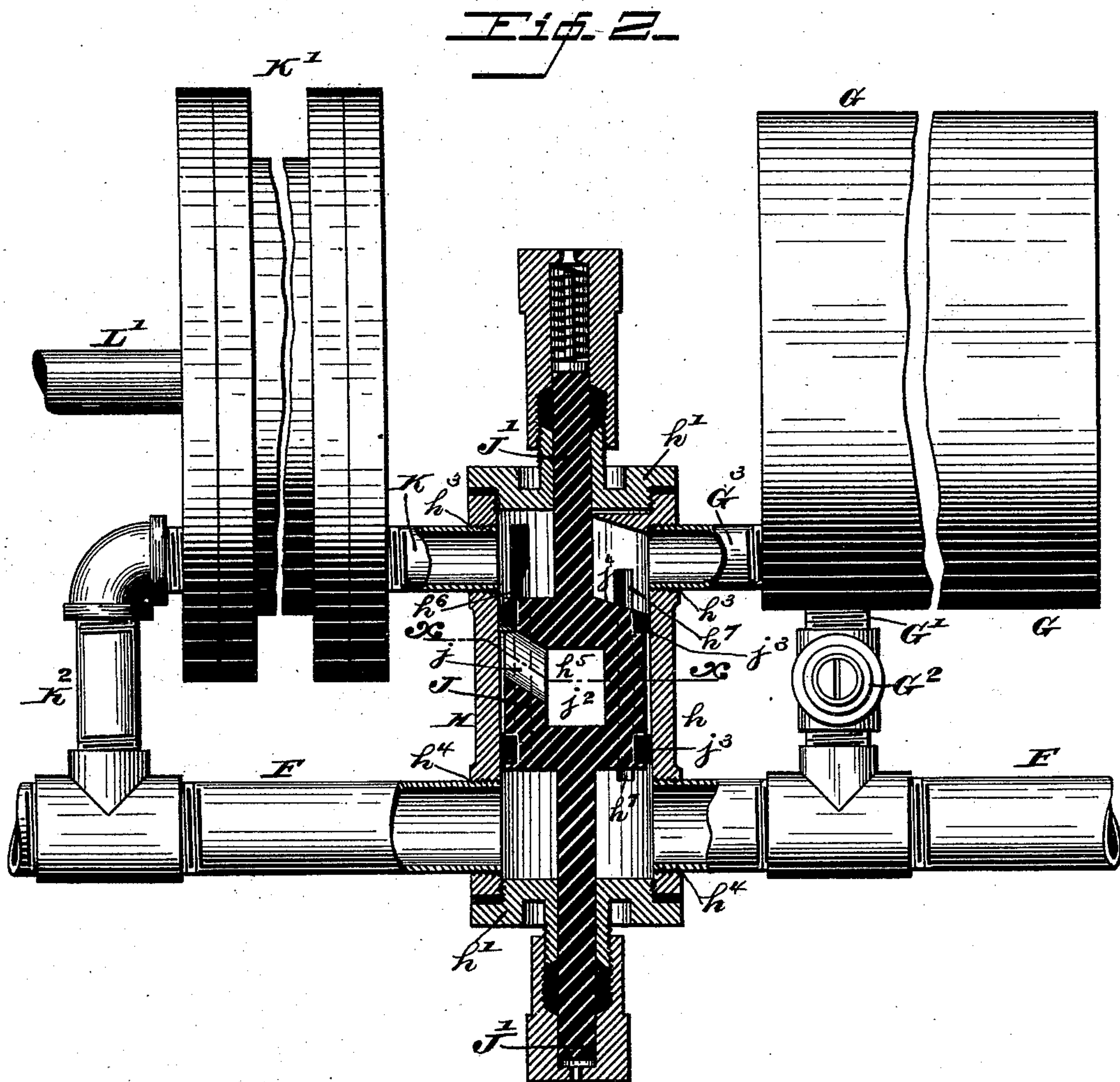
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# UNITED STATES PATENT OFFICE.

FRIEDRICH SCHMEMANN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF  
ONE-HALF TO SAMUEL M. HYNEMAN, OF SAME PLACE.

## AIR OR STEAM BRAKE.

SPECIFICATION forming part of Letters Patent No. 417,448, dated December 17, 1889.

Application filed December 3, 1888. Serial No. 292,575. (No model.)

*To all whom it may concern:*

Be it known that I, FRIEDRICH SCHMEMANN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Air or Steam Brakes, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in air or steam brakes, and the object is to provide a brake which will be positive and effective in its action, and thereby stop the cars immediately.

A further object is to provide an air or steam brake which will in its construction comprise very few working parts, thus avoiding complication and the risk of the brake getting out of order or failing to do its work.

A further object is to provide mechanism which can be readily applied to all cars employing a car-reservoir and brake-cylinder, and also to provide mechanism which can be produced at a very low cost.

To attain the objects mentioned, the invention consists in the combination, with the main pipe, of the car-reservoir and brake-cylinder communicating therewith, and a governing-valve, and the main pipe, also in communication with said car-reservoir and brake-cylinder.

Figure 1 represents a plan view of an air or steam brake embodying my invention. Fig. 2 represents a plan view, partly sectional, of the brake on an enlarged scale. Fig. 3 represents a sectional view on line *xx*, Fig. 2, of a piston-valve for controlling the operation of the brake.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a portion of a locomotive; B, the engine; C, the air or steam pump; D, the main reservoir; E, the engineer's valve; and F designates the main pipe leading from said valve E and controlled by the same.

The mechanism so far described is of well-known construction, on which I base no claim, but in connection with which I employ my improved braking mechanism.

G designates the car-reservoir, which communicates with the main pipe by means of

the branch pipe G', said pipe being provided with a reducing-valve G<sup>2</sup>. The car-reservoir also communicates by means of a pipe G<sup>3</sup> with one of the upper ports of a piston-valve H. The valve H consists of the case or housing *h*, the ends of which are closed by means of caps or covers *h'*, and in said caps or covers are stuffing-boxes. The housing is provided with the upper ports *h*<sup>3</sup>, the lower ports *h*<sup>4</sup>, and the ports *h*<sup>5</sup>, which latter communicate with the open air, and said housing is provided also with the vertical grooves or passages *h*<sup>6</sup> and *h*<sup>7</sup>, the purpose of the said passages being to permit the passage of a portion of the steam behind the piston-body, so as to prevent the striking of the piston-body against the inner face of the cap *h'* of the housing or valve-case and the passages *h*<sup>6</sup> to reduce the movement of the piston to a minimum.

J designates the piston-body, provided with the port *j*, adapted to communicate with the port which leads to front of brake-cylinder, and the port *j*<sup>2</sup>, adapted to communicate with the open air *h*<sup>5</sup>. Around the periphery of the piston-body are packing-rings *j*<sup>3</sup>, and the upper face of the said piston-body is cut out or curved, as at *j*<sup>4</sup>, the purpose of which is to allow the air or steam an easy entrance above the piston-body, and thus cause said air or steam to exert its full pressure at the center. To the piston-body are secured or formed therewith the stems J', and they pass through the caps on the housing and are steam-tight therein by means of the stuffing-boxes in the caps. With the lower ports of the housing communicates the main pipe and with the upper ports communicates the pipe G<sup>3</sup> from the car-reservoir and the pipe K, leading to the front of the brake-cylinder K'. A branch pipe K<sup>2</sup> leads from the main pipe to the rear of the brake-cylinder. In the brake-cylinder K' is a piston L, having the rod L', which passes through the rear end of said cylinder and is connected with the brake.

This being the construction, the consequent operation is as follows: The air or steam is pumped by means of the engine from the pump into the main reservoir, being maintained therein at a pressure of, say, sixty pounds, and from the main reservoir passes



to the engineer's valve. The handle of the valve is operated to allow the air or steam to pass into the main pipe. From thence it passes into the car-reservoir through the branch pipe, this pipe being provided with a reduction-valve which allows the air or steam to be maintained in the car-reservoir at a pressure of fifty pounds. The air or steam passes from the car-reservoir to one of the upper ports of the valve-case and presses on the upper face of the piston-body. To put on the brakes, the handle on the engineer's valve is operated to allow the main pipe to communicate with the open air. This will exhaust the steam in pipes F K<sup>2</sup> and in the end of the cylinder K' adjacent to said pipe K<sup>2</sup>. At the same time the pressure of the steam from the reservoir G in the pipes G<sup>3</sup> and K will be fifty pounds. This pressure will be exerted on the end of the piston-body, driving it toward the port h<sup>4</sup>, a portion of the steam passing through the channel h<sup>7</sup> to the other end of the piston-body, so as to prevent the abrupt or sudden ending of its stroke. The said channel is of such length as to be closed before the end of the stroke. The fifty-pound pressure is also exerted against the head of the piston L, so as to operate the brakes. In order to release the brakes, the pressure in the main pipe is put in communication by the way of the engineer's valve with the main reservoir, and in said main pipe the air or steam is maintained at sixty pounds pressure. Now, as this pressure which is exerted on the lower face of the piston-body is greater than that (fifty pounds) exerted on the upper face of said body, the piston is raised and communication of the open air with the front of the brake-cylinder by means of the passages j and j<sup>2</sup> is effected, forming a partial vacuum in front of the brake-cylinder. Now the steam or air in the branch pipe which leads from the main pipe to the rear of the brake-cylinder exerts a pressure of sixty pounds against the piston therein, forcing the same forward and effecting the release of the brake. The channel h<sup>6</sup> permits the escape or passage of the steam from below the piston-body to the other end thereof, so as to prevent the violent striking of the said piston-body against the cap h' of the casing.

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

1. An air or steam brake having a casing with ports at both ends and air-openings in its sides, and a reciprocating piston-body within said casing having an inner chamber adapted to communicate with said side air-

openings and provided with a passage from said inner chamber adapted to communicate with one of said end ports, said parts being combined substantially as and for the purpose set forth.

2. In an air or steam brake, a casing having inlet or outlet ports at each end and the vertical grooves h<sup>6</sup> and h<sup>7</sup>, as described, in the inner wall thereof, and a reciprocating piston-body within said casing, said parts being combined substantially as described.

3. In an air or steam brake, a casing with inlet and outlet ports at each end, vertical grooves in the inner walls thereof, and side air-openings, a reciprocating piston-body in said casing having an inner opening or chamber, and a passage leading therefrom to one of said end ports, said parts being combined substantially as described.

4. In an air or steam brake, a casing with inlet and outlet ports at each end and vertical grooves in the inner wall thereof, and a reciprocating piston-body having a curved or rounded end portion, said parts being combined substantially as described.

5. A steam or air brake consisting of a main reservoir with a main pipe leading therefrom, a valve in said main pipe, a car-reservoir with branch pipe leading from said main pipe and having a reducing-valve therein, a casing with ports at each end and ports open to the atmosphere, a piston-body within said casing, having ports opening to the air-ports of the casing and to one of the end ports, a brake-piston cylinder, and pipes connecting said casing at one end with said car-reservoir and brake-piston cylinder, the main pipe from the main reservoir communicating with the casing at the other end thereof, said parts being combined substantially as described.

6. A steam or air brake consisting of the main reservoir D, the main pipe F, having engineer's valve E therein, the car-reservoir G, connected to the main pipe by branch pipe G', having reducing-valve G<sup>2</sup>, a casing communicating with the car-reservoir G by pipe G<sup>3</sup> and having the ports h<sup>3</sup>, h<sup>4</sup>, and h<sup>5</sup>, the piston J, with ports j and j<sup>2</sup>, the cylinder K', with piston L, and the pipe K, connecting the said cylinder at one end with the piston-casing, and the pipe K<sup>2</sup>, connecting the said cylinder at the other end with the main pipe F, said parts being combined substantially as and for the purpose set forth.

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Witnesses:

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