

(No Model.)

2 Sheets—Sheet 1.

E. J. COSGROVE.

AUTOMATIC AIR OR STEAM BRAKE.

No. 322,042.

Patented July 14, 1885.

Fig. 1.

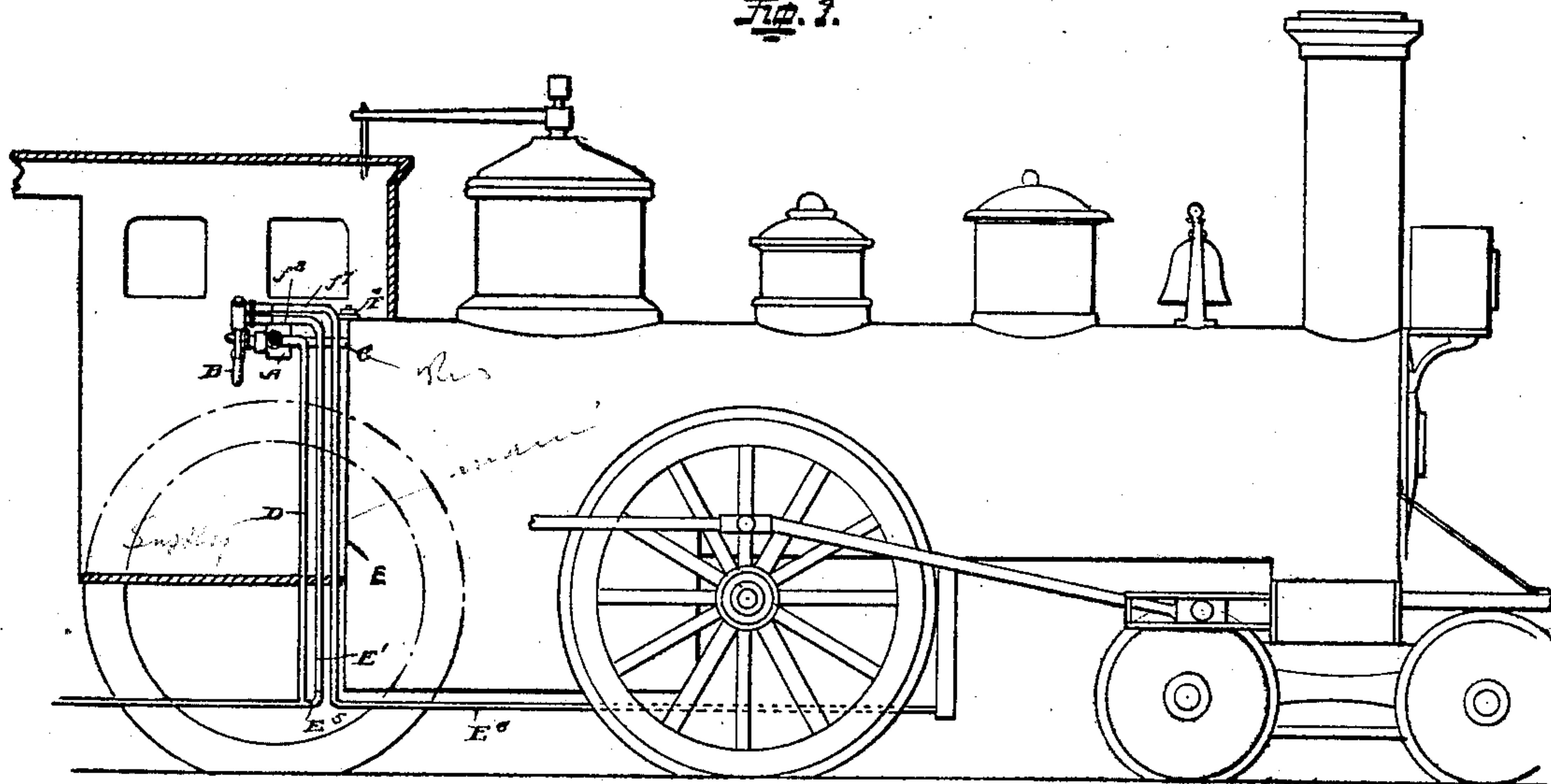
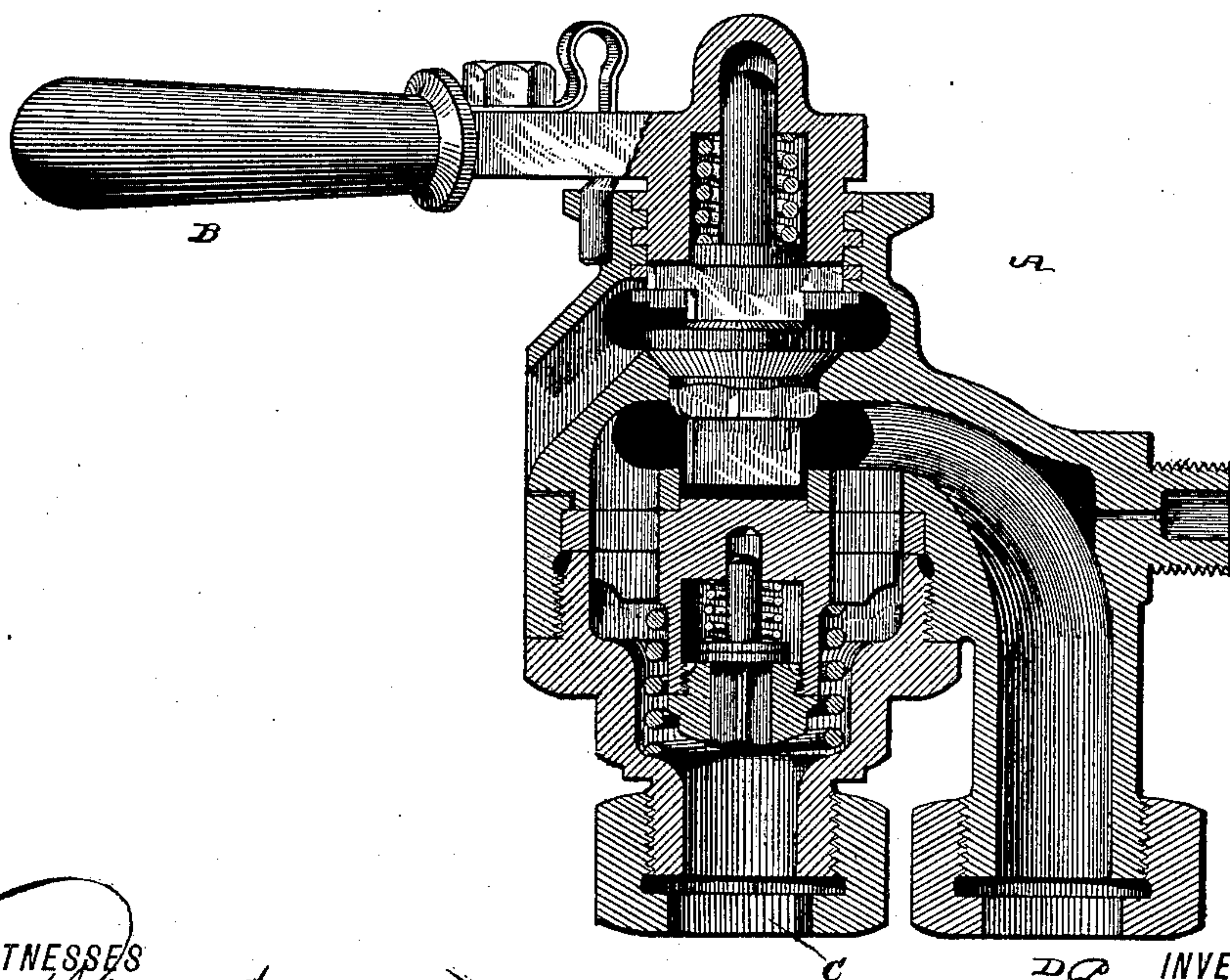


Fig. 2.



WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

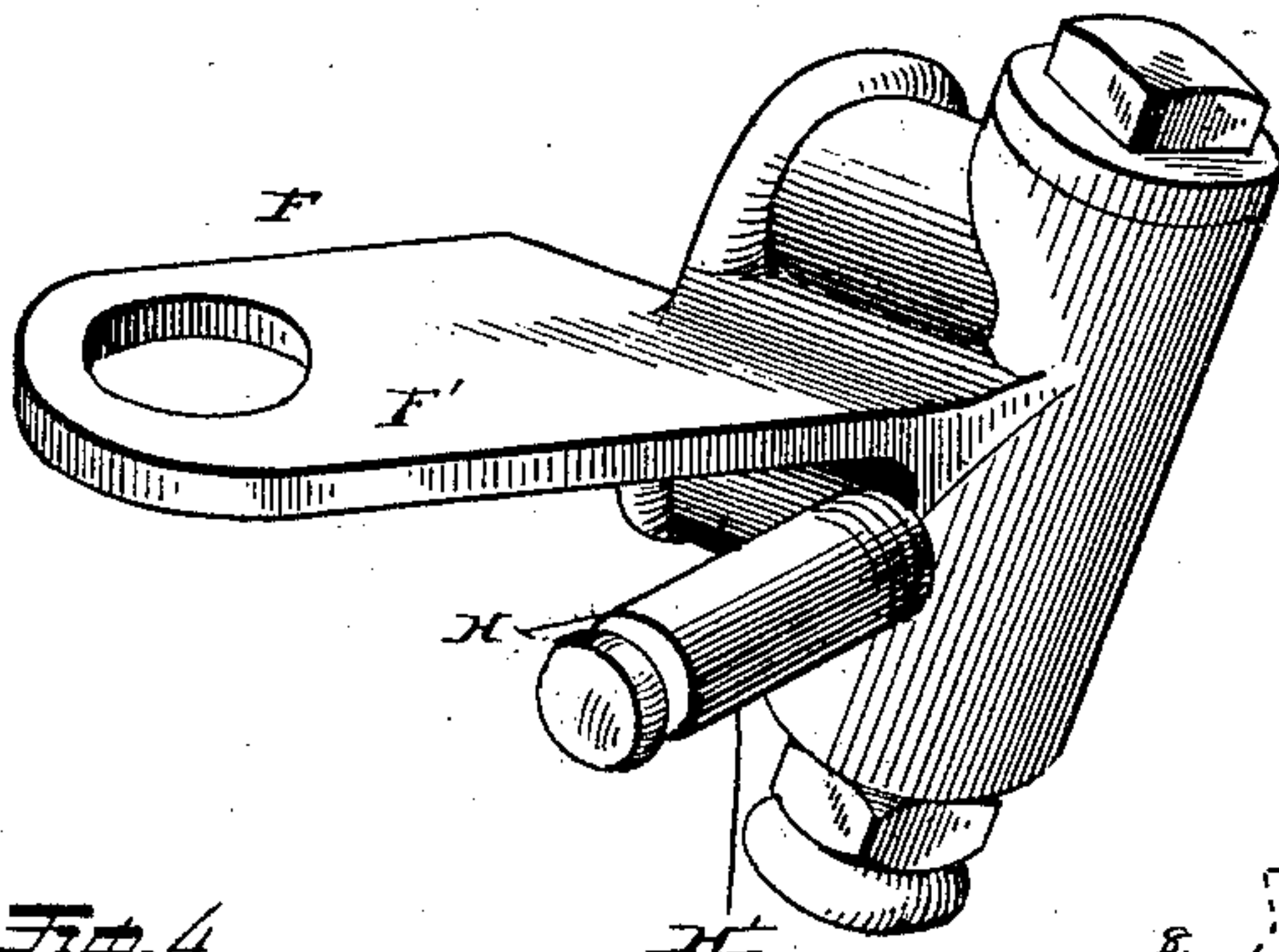
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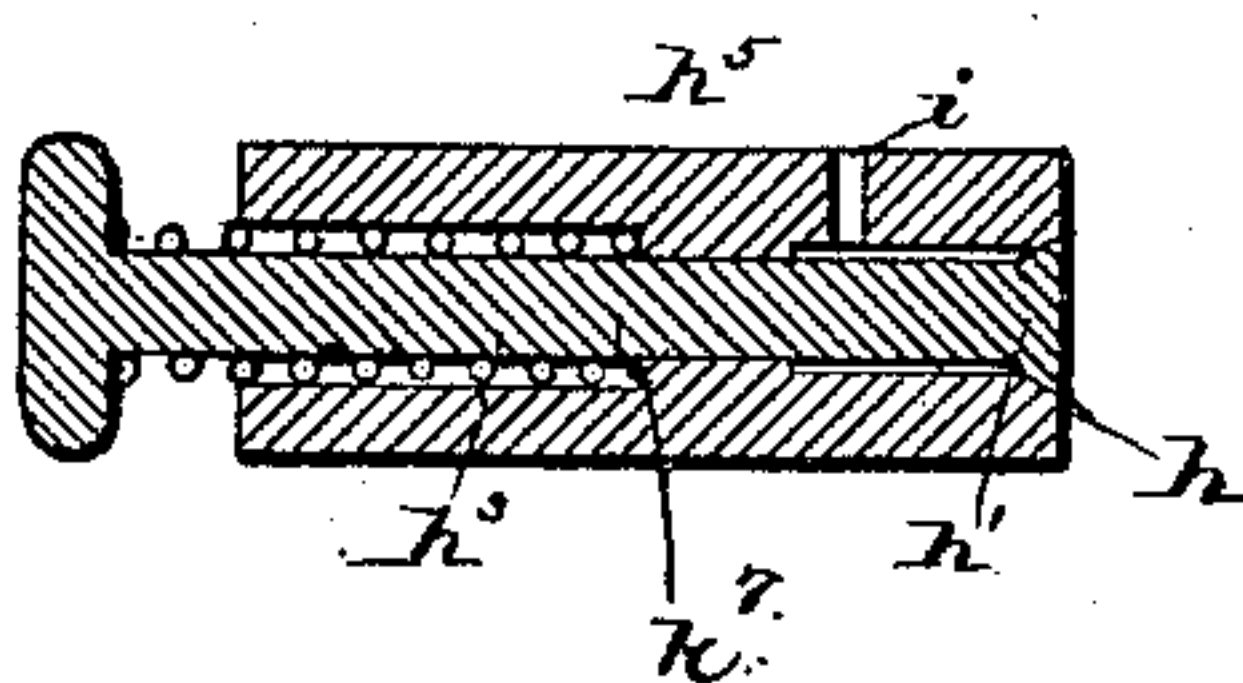


Fig. 5.

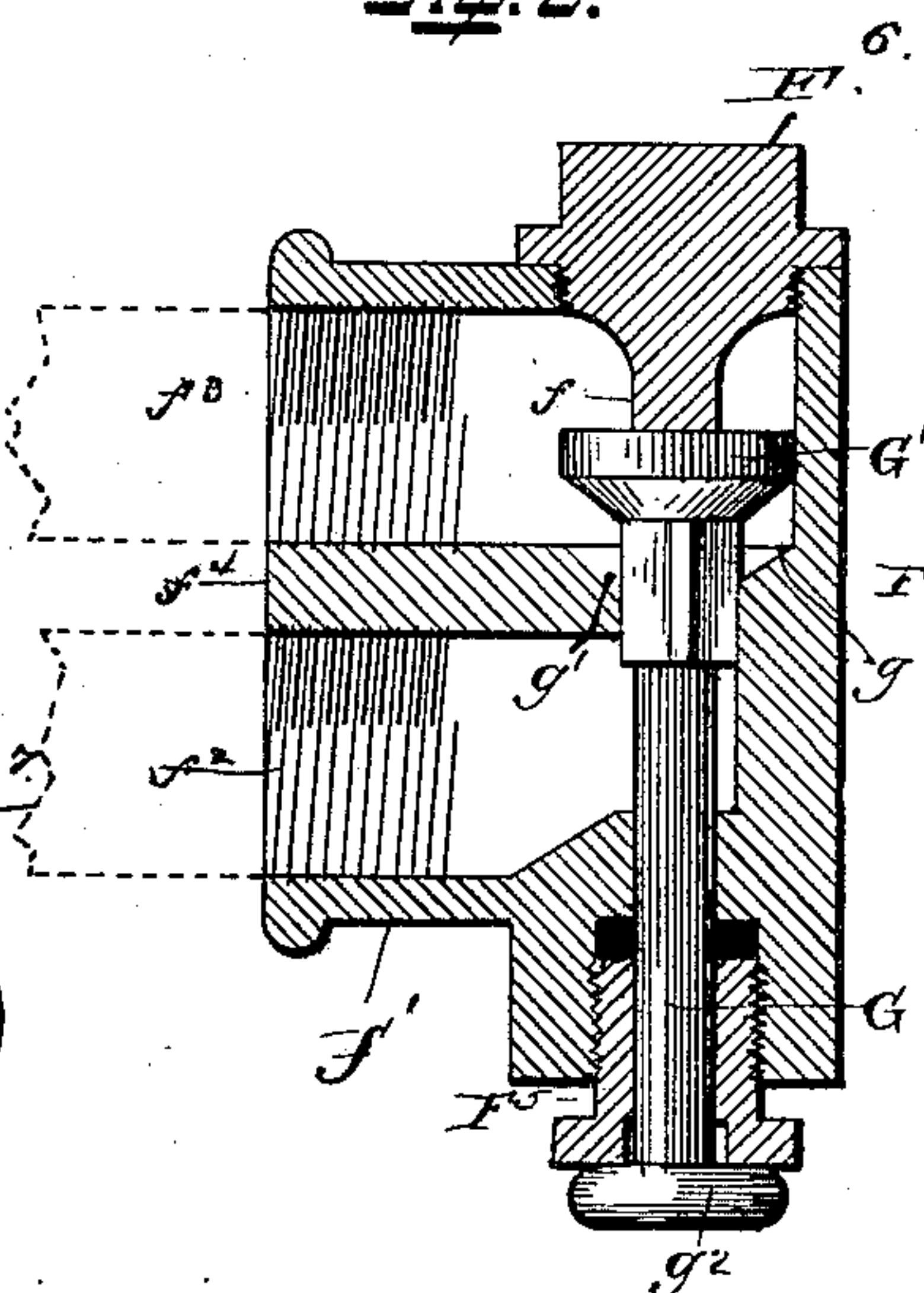
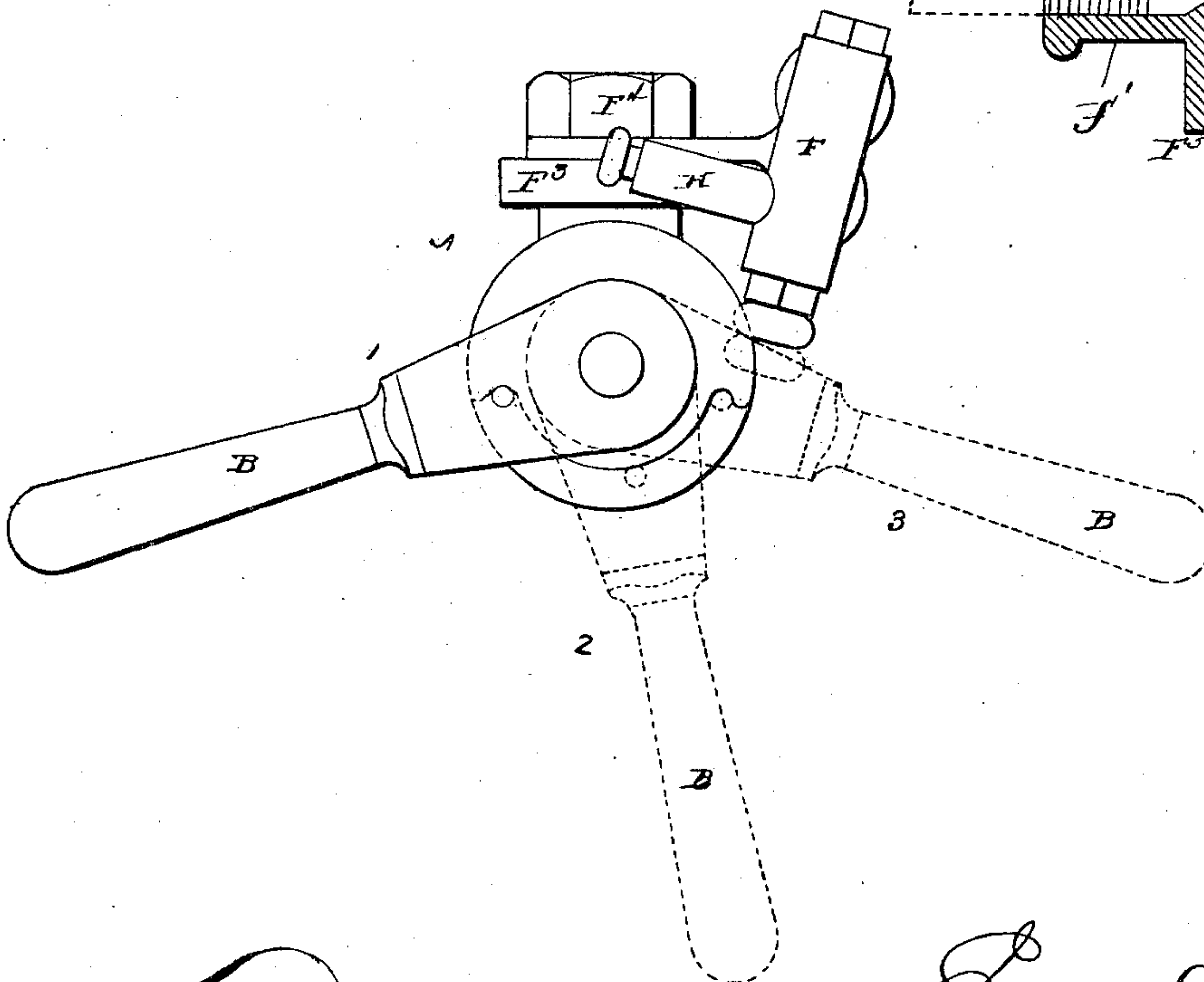


Fig. 6. Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD JAMES COSGROVE, OF AUGUSTA, GEORGIA.

AUTOMATIC AIR OR STEAM BRAKE.

SPECIFICATION forming part of Letters Patent No. 322,042, dated July 14, 1885.

Application filed January 26, 1885. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. COSGROVE, a citizen of the United States, residing at Augusta, in the county of Richmond and State of Georgia, have invented a new and useful Improvement in Automatic Air or Steam Brakes, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a regulator adapted to be used in connection with the "Westinghouse automatic air-brake;" and it has for its object to provide a regulator of such construction and so connected with the supply-pipe that the brakes may be applied to the tender and cars independent of the driving-wheels of the locomotive, and when desired or found necessary applied to the said driving-wheels instantaneously with the application of the brakes to the tender and cars, and cut off from the driving-wheels independent of the other brakes.

A further object of the invention is to provide such a regulator with an escape-opening controlled by a spring-actuated valve, whereby, when the brakes have been cut off from the driving-wheels, the air in the driving-wheel brake-cylinders may be removed or allowed to escape.

The invention consists in so arranging a regulator for the purposes mentioned that it may be controlled by the arm or lever which operates the valve governing the supply of air or steam from the reservoir to the supply pipe or pipes.

The invention further consists in the improved construction and combinations of parts hereinafter fully described, and pointed out in the claims.

In the drawings, Figure 1 is a view in sectional elevation showing the pipe leading from the reservoir to the main engineer's brake-valve, the supply-pipe, and the arrangement of my improvement. Fig. 2 is a longitudinal vertical section of the engineer's valve for controlling the supply of air from the reservoir to the brakes, the arm or lever for controlling the same being shown in full lines. Fig. 3 is a perspective view of my improved regulator detached, and Fig. 4 is a longitudinal vertical section of the exhaust-valve H. Fig. 5 is a

longitudinal vertical section of Fig. 3; and Fig. 6 is a front elevation of the engineer's valve, showing my improvement applied.

In the accompanying drawings, in which like letters of reference indicate corresponding parts in all the figures, A represents the engineer's valve for controlling or governing the supply of air or steam to the supply-pipe from the reservoir. The said engineer's valve is controlled by an arm or lever, B, which, in the position shown in Fig. 6 at 1, closes communication between the pipe leading from the reservoir and the supply-pipe. In Fig. 6 at 2 the valve is opened to apply the brakes to the tender and cars, and at 3, same figure, the arm is shown moved to open my improved regulator and apply the brakes to the driving-wheels.

The main engineer's valve A is of the same form and construction as the valves in ordinary use in air-brake apparatus, and is commonly known as the "Westinghouse engineer's valve."

C represents the pipe leading from the reservoir (not shown) to the valve A, and D represents the pipe which will be referred to as the "supply-pipe," and which leads down under the foot-board of the engine, and is connected with a main pipe, E, having branch pipes communicating with brake-cylinders on the under side of the tender by a flexible connecting-pipe. (Not shown.)

In the apparatus as ordinarily constructed the lower end of the supply-pipe was connected with a continuous pipe having branch pipes leading directly to the cylinders of the driving-wheel brakes, and was also connected by a flexible pipe with a main pipe disposed longitudinally upon the under side of the tender, as before mentioned, said longitudinally-disposed pipe on the under side of the tender being connected with the brake-cylinders of the tender by branch pipes. It will thus be seen that when the arm or lever B was moved to open the valve A to establish communication between the reservoir and supply-pipe, said supply-pipe would allow the passage of air to the driving-wheel brake-cylinders, as well as to those of the tender and cars.

In my improvement the two pipes E⁵ E⁶ are employed. The supply-pipe D connects with

the pipe E^5 , leading to the train-brake cylinders. A pipe, E^6 , also connects my improved valve with the pipe E^3 , and the pipe E^5 , leading to the locomotive brake-cylinders, is also

connected with my improved valve.

F represents my improved regulator, which is formed with an outwardly-extending wing, F^1 , having an opening near its outer end. This wing F^1 is adapted to be connected with a projection or post on the engineer's valve A , said projection having a threaded end. The engineer's valve A is also connected with the boiler (not shown) by a bar, L^3 , which also has an opening to fit said projection and post, and the valve is held in place upon said bar and the wing F^1 upon the post of the valve A by means of a nut, F^4 .

The regulator F is formed at one end with a stuffing-box, F^5 , and at its other or opposite end with a hole or opening, which is threaded and adapted to receive a plug, F^6 , having at its inner end a projection or extension, f , which is adapted to serve as a stop to limit the movement of a valve-stem, as will be more fully described.

The regulator F is formed with an extension, f' , which is divided into two openings or passages, $f^2 f^3$, by a partition-wall, f^4 , said openings being circular in form and threaded. Adapted to be connected with these openings are pipes $F^7 F^8$, the pipe F^7 connecting the opening f^2 with the pipe E^6 , leading to the locomotive brake-cylinders, the pipe F^8 connecting the opening f^3 with the supply-pipe. It will thus be seen that communication between the reservoir and the brake-cylinders of the driving-wheels is established through the supply-pipe, thence through the pipe E^5 , through the pipe F^8 to the valve, and through the valve-opening f^2 to the pipe F^7 , then down to the pipe E^6 to the driving-wheel brake-cylinders. The lower end of the partition-wall f^4 on the side of the same at which the opening f^3 is located is formed with a recess, which, in connection with a recess, g , in the side of the valve-casing, forms a conical seat, g' .

G represents a valve-stem having at one end a head, G' , which is conical in form on its inner side to fit the seat g' , and thus cut off communication between the two openings $f^2 f^3$. The stem of the valve G extends through the stuffing-box F^5 , and is formed with a button or head, g^2 , against which the arm or lever B is adapted to strike, or against which it bears when the brakes are to be applied to the driving-wheels.

It will be seen that, as the opening f^3 is in direct communication with the supply-pipe, the air in passing through said opening will force and hold the head G' in contact with the seat g' , and thus cut off communication between the supply-pipe and the pipe leading to the driving-wheels.

When it is desired to apply the brakes of the tender and cars, the arm B is turned to the position shown at 2, Fig. 6, varying either way

according to train, grade, condition of brakes, &c., requiring more or less air to be released to apply the brakes. The turning of the arm or lever B to the position shown at 2, Fig. 6, establishes communication between the reservoir and the supply-pipe, and through the intermediate pipes to the cylinders of the tender and car brakes, the air or steam also passing, as before described, to the opening f^3 of regulator F , and holding the head G' on its seat. When from any cause whatever it is necessary to make a sudden stop, the arm or lever B is turned to the position shown at 3, Fig. 6, which presses the valve-stem G inwardly, removing the head G' from its seat and establishing direct communication to the brake-cylinders of the driving-wheels and applying the brakes to the same. As long as the lever B is in the position shown at 3, Fig. 6, the driving-wheel brakes are applied; but should the lever B be moved back, the air will force the head G' to its seat and break the communication between the tender and the driving-wheel brake-cylinders. The tender and car brakes will be held applied to the wheels until the lever B is turned to the position shown at 1, Fig. 6, which cuts off communication between the reservoir and the supply-pipe.

Means are provided in the valve A , whereby, when the valve is closed, the port to which the supply-pipe is connected will communicate with an opening for discharging the air remaining in the cylinders of the tender, locomotive, driver, and car brakes. As novelty is claimed in the construction of the valve A or any of its appurtenances, a general allusion to this feature will, it is thought, be all that is necessary.

For withdrawing or releasing the air in the brake-cylinders of the driving-wheels alone without releasing tender-brakes, I have provided a valve, H , which consists of a pipe, H' , attached to a threaded opening of the valve F , adjacent to the lower end of the passage or opening f^2 . The said pipe is provided at its lower end with a conical seat, h , adapted to receive a correspondingly-shaped head, h' , of a stem, h^3 , which extends through the pipe H' , and is provided with a headed end. A spiral spring incloses the upper end of said stem, bearing against the under side of the headed end at one end and against a shoulder, h^2 , in the pipe H' midway between its ends at its other end. It will thus be seen that the head h' will be held in engagement with the seat h . An opening, i , is formed in the side of the pipe H' , near the lower end thereof, so that when the valve-head h' is pressed from engagement with the seat h the air will pass through the pipe H' and out of the opening i .

It will be seen from the above description, taken in connection with the annexed drawings, that by the employment of my improvement the brakes of the driving-wheels are controlled and applied independently of those of the tender and cars, and yet, when desired, com-

munication may readily be established to apply the brakes of the driving-wheels.

The brakes of the tender and cars for an ordinary stop may be applied and released independent of the driving-wheel brakes.

The before-described improvements may be applied to air-brake apparatus now in general use with but a slight change—namely, the disconnecting of the pipe connecting the supply-pipe with the branch pipes leading to the driving-wheel brake-cylinders. Further than this, my improvements are thoroughly effective in their operation, and are cheap and simple.

Slight changes in the details of construction may be resorted to without departing from the spirit or scope of my invention; hence I would have it understood that I reserve to myself the right to make all such slight changes and alterations as may from time to time suggest themselves.

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

1. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe and an engineer's valve for controlling the passage of air or steam to the same, of a regulator arranged in such manner and so constructed that the brakes of the tender and the remainder of the train may be applied independent of those of the locomotive, said brakes of the locomotive being applied by the same arm or lever which opens the valve to apply the brakes of the tender and train, and the brakes of said locomotive being adapted to be removed independent of those of the tender and train, substantially as set forth.

2. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe and an engineer's valve for controlling the passage of air or steam to the same, of a regulator connected with said supply-pipe, and intermediate pipe-connections between said regulator and the locomotive brake-cylinders, said regulator being provided with a secondary or auxiliary valve, whereby the charge of air or steam in the locomotive brake-cylinders may be allowed to escape after the brakes have been removed, as set forth.

3. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe and an engineer's valve for controlling the passage of air or steam to the same, and a lever for operating the engineer's valve, of a regulator connected with the supply-pipe and the locomotive brake-cylinders, and having a stem adapted to be operated by said arm or lever to establish communication between the supply-pipe and the locomotive brake-cylinders, substantially as set forth.

4. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe, an engineer's valve for controlling the passage of air or steam to the same, and an arm or lever for operating said valve, of a regulator connected with said supply-pipe

and the locomotive brake-cylinders, said regulator being provided with a stem adapted to be operated by said lever, said regulator being provided with a valve for releasing the air or steam in the locomotive brake-cylinders, substantially as set forth.

5. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe and an engineer's valve for controlling the passage of air or steam to the same, of a regulator having an inlet and outlet opening, said inlet-opening being connected with the supply-pipe and the outlet-opening with the locomotive brake-cylinders, and a valve-stem in said regulator adapted to cut off communication between the inlet and outlet pipes, substantially as set forth.

6. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe, an engineer's valve for controlling the passage of air or steam to the same, and an arm for operating said valve, of a regulator having an inlet and outlet opening, said inlet-opening being connected with the supply-pipe and the outlet-opening with the locomotive brake-cylinders, and a valve-stem in said regulator adapted to cut off communication between the inlet and outlet pipes and be automatically held in place by the force of the air or steam in said inlet-pipe, and to be removed to establish communication between said pipes to apply the locomotive-driving-wheel brakes by the arm or lever for operating the valve A, substantially as set forth.

7. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe and an engineer's valve for controlling the passage of air or steam to the same, of a regulator having an outwardly-extending wing by which it is attached to valve A, and connected with the supply-pipe and the pipe connecting the regulator with the locomotive brake-cylinders, substantially as set forth.

8. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe and an engineer's valve for controlling the passage of air or steam to the same, of a regulator connected with the supply-pipe and the cylinders of the locomotive-brakes, said valve being divided into two compartments, a seat in said valve, and a valve-stem adapted to fit said seat, as set forth.

9. The combination, with the regulator F, having inlet and outlet openings, of a pipe connected to said regulator adjacent to the inlet-opening, said pipe having a conical seat, a stem having a conical head, and a spring on said stem, as set forth.

10. The combination, with the regulator F, having inlet and outlet openings, and a valve-stem adapted to close communication between the same, of a pipe communicating with said regulator near the inlet-opening, said pipe having a seat, a stem working in said pipe having a head and extended beyond the pipe, and a spiral spring on said stem, as set forth.

11. The combination, with the regulator F,

of a secondary or supplemental valve consisting of a pipe having a seat near its inner end and an opening in its side wall, a stem having a head to fit said seat, the end of said stem
5 extending beyond the pipe, and a spiral spring on said stem, said spring bearing against a shoulder on the inner side of the pipe at one end and against the headed outer end of the stem at its other end, substantially as set forth.

10 12. In an automatic or direct air or steam braking apparatus, the combination, with a supply-pipe, of an engineer's valve and a regulator for supplying air or steam to the locomotive brake-cylinders, said regulator being
15 secured to the valve and adapted to be operated by the arm B of the same, as set forth.

13. In an automatic or direct air or steam braking apparatus, the combination, with a
20 regulator for controlling the passage of air or steam to the locomotive brake-cylinders, of a valve having communication with said regulator for allowing the air or steam remaining in the brake-cylinders of the locomotive after

the brakes have been removed to be released, substantially as set forth. 25

14. The combination, with the engineer's valve A, of the supply-pipes E⁵ E⁶, arranged as described, a regulator, F, communicating with the pipes E⁵ E⁶, and a valve communicating with the regulator for allowing the air or
30 steam remaining in the locomotive brake-cylinders after the brakes have been removed to be released, substantially as set forth.

15. The combination, with the engineer's valve A, of the pipes E⁵ E⁶, a pipe connecting
35 the main valve and pipe E⁵, and pipes communicating with pipes E⁵ E⁶ and with the regulator F, substantially as set forth.

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

EDWARD JAMES COSGROVE.

Witnesses:

S. D. SHAVER Jr.,

HENRY C. GOODRICH.