

No. 626,004.

Patented May 30 1899.

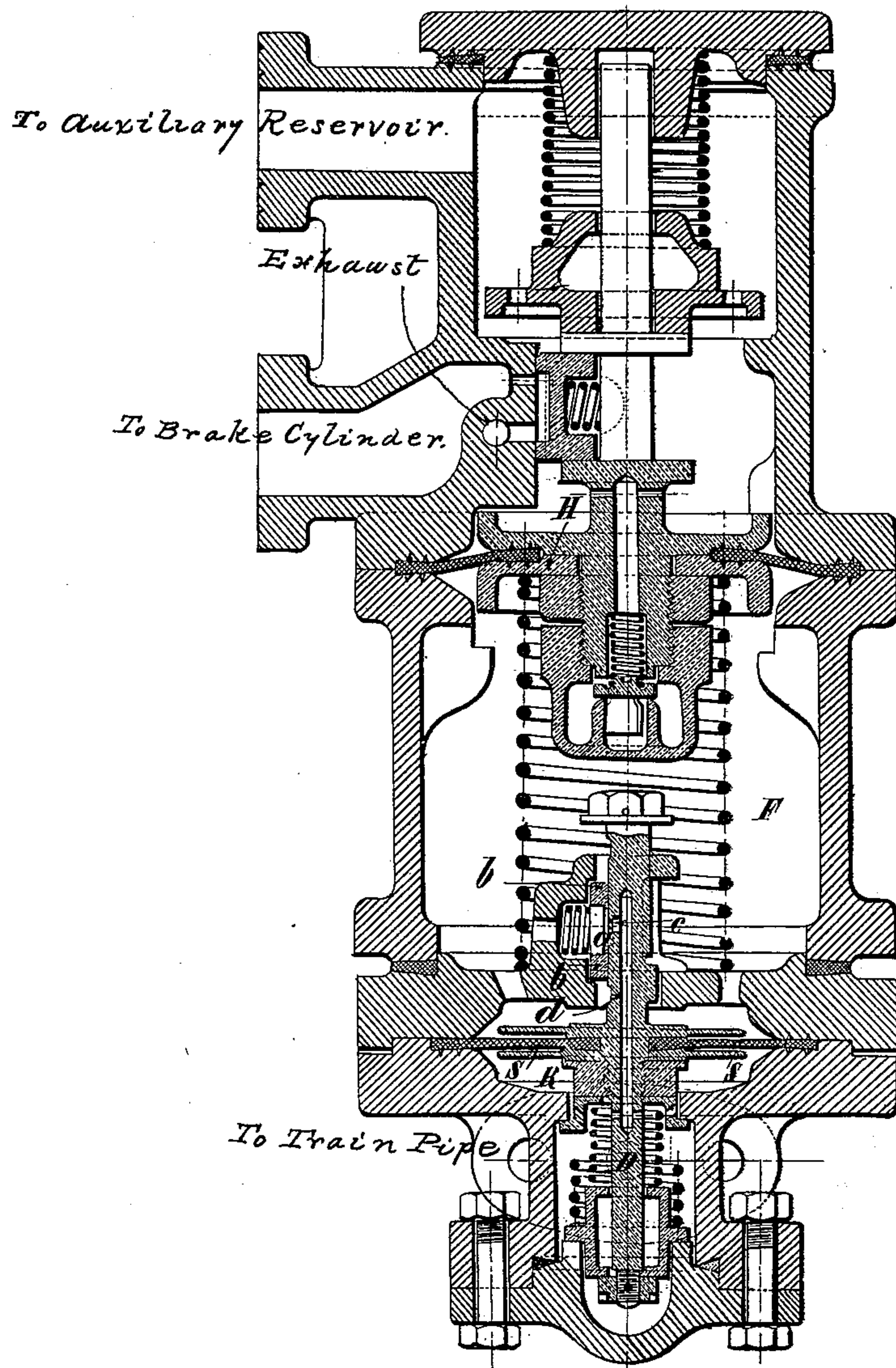
E. M. L. DUVAL.
CONTINUOUS RAILWAY BRAKE.

(No Model.)

(Application filed Jan. 31, 1898.)

2 Sheets—Sheet 1.

FIG. 1



WITNESSES

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FIG. 3.

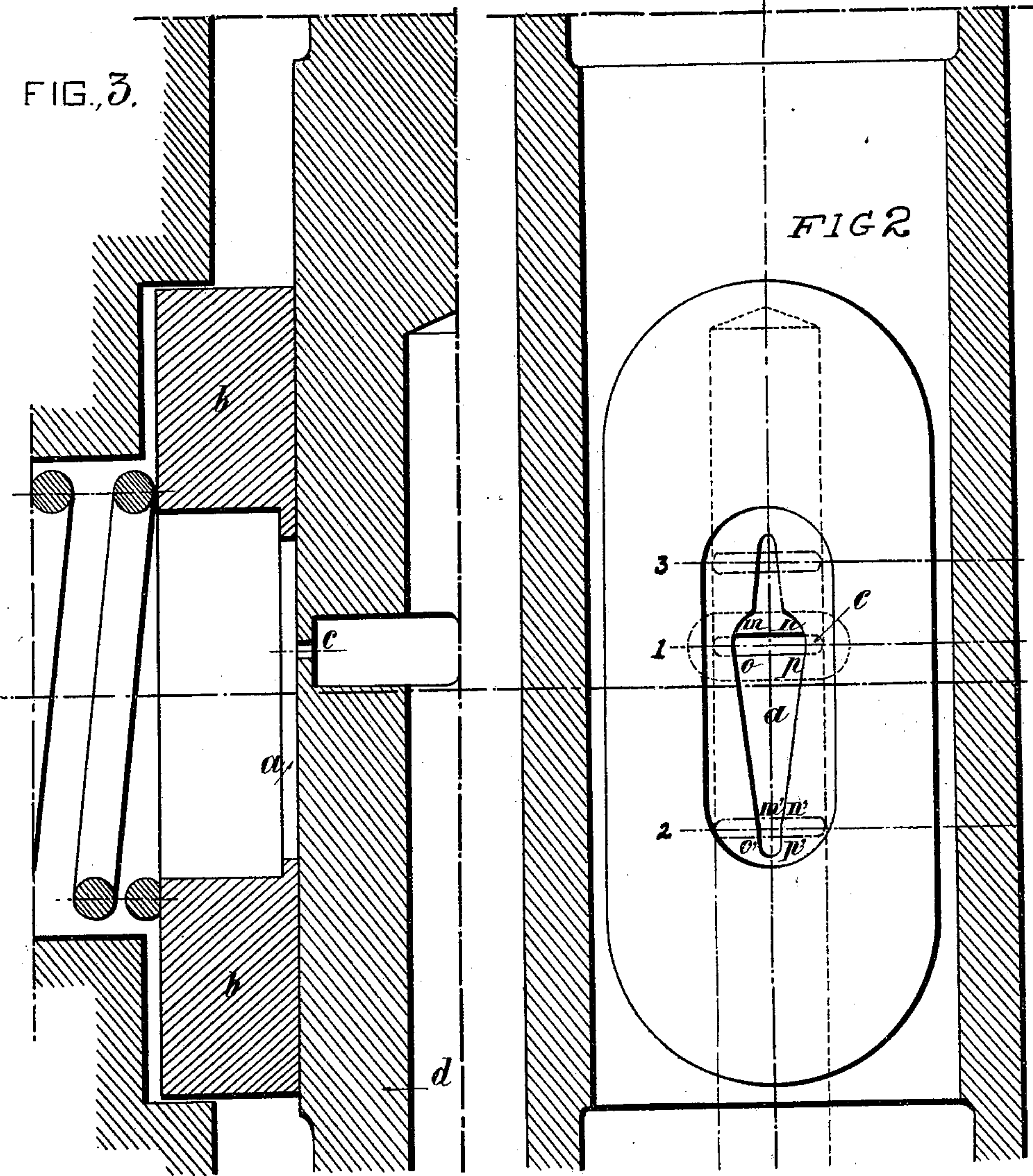


FIG 2

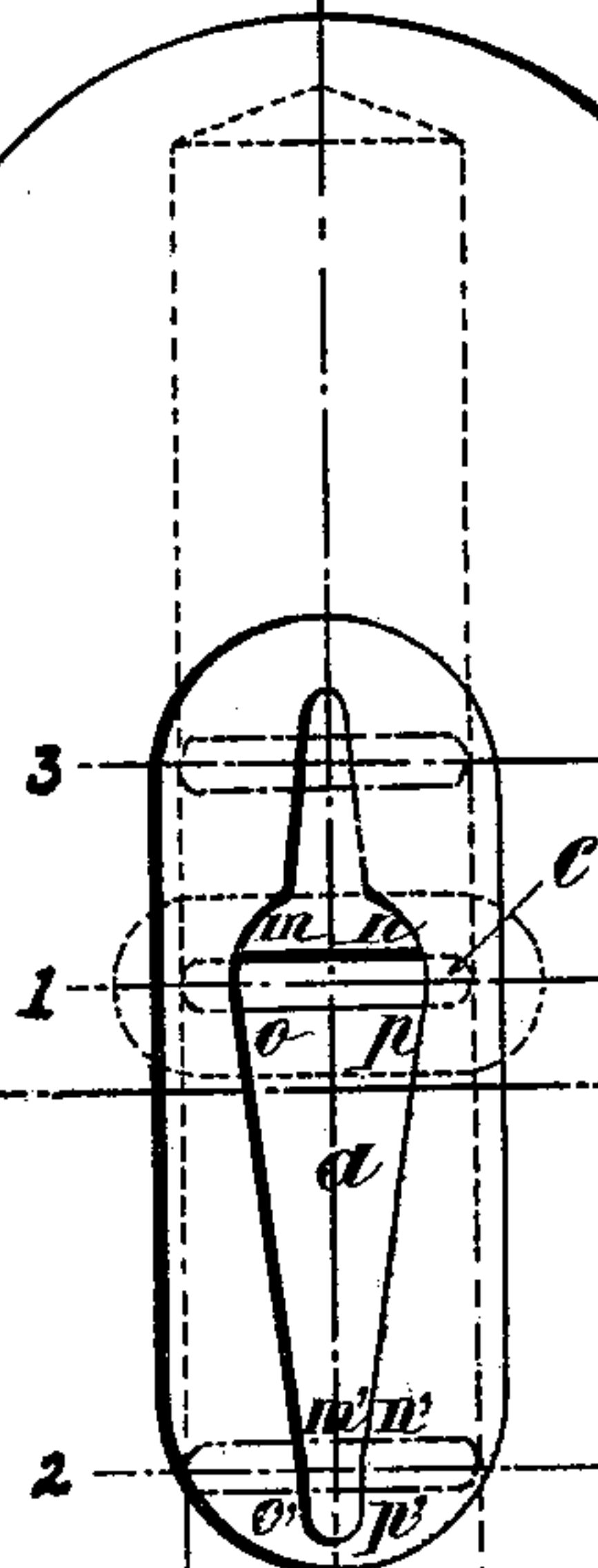
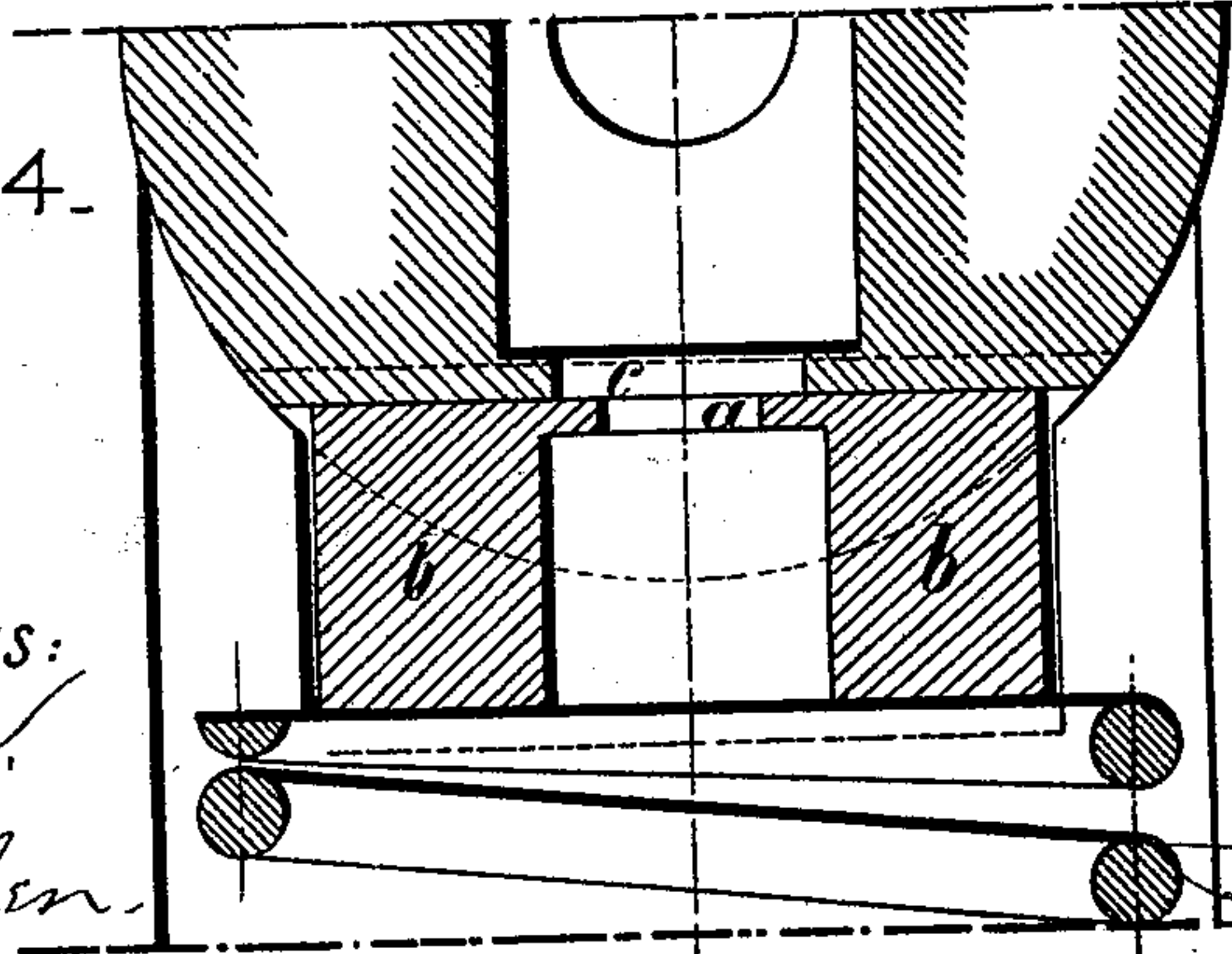


FIG. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDMOND MARTIN LEONARD DUVAL, OF PARIS, FRANCE, ASSIGNOR TO LA
COMPAGNIE DE FIVES LILLE, OF SAME PLACE.

CONTINUOUS RAILWAY-BRAKE.

SPECIFICATION forming part of Letters Patent No. 626,004, dated May 30, 1899.

Application filed January 31, 1898. Serial No. 668,597. (No model.)

To all whom it may concern:

Be it known that I, EDMOND MARTIN LEONARD DUVAL, a resident of Paris, in the Republic of France, have invented new and useful Improvements Relating to Continuous Railway-Brakes, which are fully set forth in the following specification, and for which I have obtained a French patent, No. 268,982, dated July 22, 1897.

In my Patents No. 510,639, of the 12th of December, 1893, and No. 510,870, of the 12th of December, 1893, I have described a form of distributor for railway-brakes having an air-regulator with partial and variable closing devices, the object of which is to obtain in the braking operation simultaneous action in all the vehicles composing a long railway-train.

The object of this invention is to provide a novel device which differs from those described in my earlier patents in the special form of the apparatus of the air-discharge regulator, such form permitting of a more perfect and efficacious graduation of the partial closing of the section through which the air escapes.

In order that the description which follows may be clearly and readily understood, I have represented, by way of example, my discharge-regulator in the accompanying drawings, in which—

Figure 1 is a general view, in vertical section, of a distributor of well-known type provided with my novel form of discharge-regulator. Fig. 2 shows, upon a larger scale, a front elevation of the slide-valve of the regulator and shows more particularly the form of the apertures, one of these, *a*, trapezoidal in shape, being formed upon the fixed portion *b* of the slide-valve, the other, *c*, being rectangular and formed upon the central rod rigidly connected with the diaphragm *S*. Figs. 3 and 4 are vertical and horizontal sections through the slide-valve, respectively.

In the description which follows I will confine myself more especially to the novel arrangement adopted for the slide, as all the other parts of the apparatus are similar to those already described in my earlier patents, which can be referred to.

As above stated, the fixed portion *b* of the slide-valve is formed with a trapezoidal groove *a*, in front of which the rectangular groove *c*, formed in the rod rigidly attached to the diaphragm *S*, is capable of displacement. Owing to the special shapes of these two grooves it will be apparent that according to the position occupied by the rod fixed to the diaphragm the aperture of the passage will vary. It will be at its maximum for the position *m n o p*, Fig. 2, and at its minimum for the extreme positions, such as *m' n' o' p'*. I should also point out that the aperture of the passage will diminish or increase in a progressive and continuous manner without abrupt shocks.

In order to render the description more clear, I will now consider the method of action of the apparatus.

When the train is running at a normal speed, the aperture *c*, formed upon the rod *d*, occupies the position 1, Fig. 2, and the section *m n o p* of the passage establishes permanent communication between the spaces or chambers *F* and *R*, which latter is in communication with the train-pipe *D*, Fig. 1. All these spaces or chambers are, as is known, filled with air at the proper pressure while the train is running. If the driver effects a reduction of pressure in the pipe with the object of applying the brakes, this reduction of pressure takes place rapidly on the front of the train, and the diaphragm *S*, being actively influenced in a downward direction, compresses the counter-springs, the tensions of which are suitably regulated, and takes with it the central rod *d*. As a result of the depression of this central rod *d* the aperture *c* descends along the trapezoidal opening formed upon the fixed portion of the slide-valve and the section of the passage which was originally *m n o p* decreases progressively and in a continuous manner until it becomes *m' n' o' p'*. The section of the passage is then such that in spite of the large reduction of pressure produced in the front portion of the pipe the reduction of pressure in the chamber *F* required to stop the descent of the large diaphragm *H*, and consequently the movement of the admission-slide of the brake-cylinder, is effected in the same time as to—

ward the rear of the train, where the regulator is no longer actuated, the reduction of pressure which takes place at this part of the train-pipe not being sufficient to cause the
5 compression of the spring supporting the diaphragm.

From the front to the rear of the train in the different appliances the aperture of the regulator for the passage of air occupies, as
10 will be understood, all the intermediate positions between the two extremes and gives air-passage sections so much the smaller in proportion as the reduction of pressure in the pipe is more rapid.

15 In order to effect the releasing operation, the diaphragm S ascending much more abruptly in the front vehicles than in those at the rear, the rectangular section c ascends in the first vehicle beyond the position No. 1
20 and occupies the position No. 3, and in these front vehicles the section for the reintroduction of air into the pipe is thus reduced to a minimum. It gradually increases in the other vehicles to the rear end of the train, the section c in each apparatus assuming a position
25 intermediate between the positions 1 and 2 from the rear to the front of the train.

The rectangular aperture might equally well be formed upon the fixed portion of the

slide-valve and the aperture of trapezoidal
30 form upon the central rod.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed,
35 I declare that what I claim is—

In an air-brake, a valve for controlling communication between the train-pipe and the brake apparatus, consisting of a valve-seat having a longitudinal elongated opening therein of decreasing width toward its ends,
40 and a valve-stem having an elongated transverse slot therein crossing the longitudinal opening in the valve-seat, and whereby upon movement of the valve-stem due to fluctuations of pressure in the train-pipe the transverse slot is moved to register with a wider
45 or narrower part of the longitudinal opening, thereby producing a communicating passage of variable area between the train-pipe and the brake apparatus, substantially as described.
50

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EDMOND MARTIN LEONARD DUVAL.

Witnesses:

EDWARD P. MACLEAN,
ANTOINE ROUSSANNES.