

(No Model.)

R. M. DIXON.

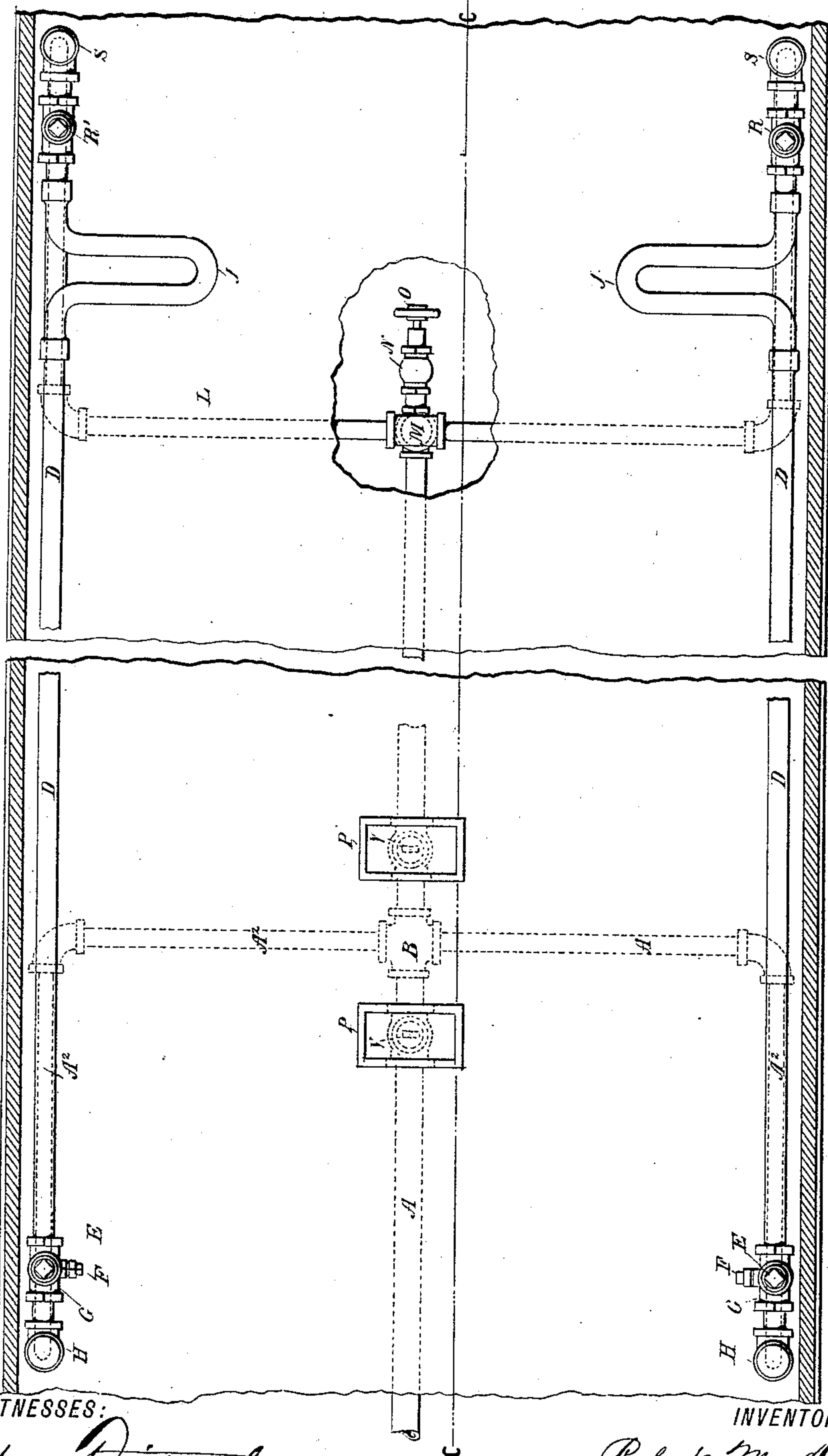
3 Sheets—Sheet 1.

CAR HEATER.

No. 435,484.

Patented Sept. 2, 1890.

Fig. 1.



WITNESSES:

Gustav Dietrich.
William Goebel.

INVENTOR

Robert M. Dixon
BY *Briese Knauth*

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CAR HEATER.

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Fig. 2.

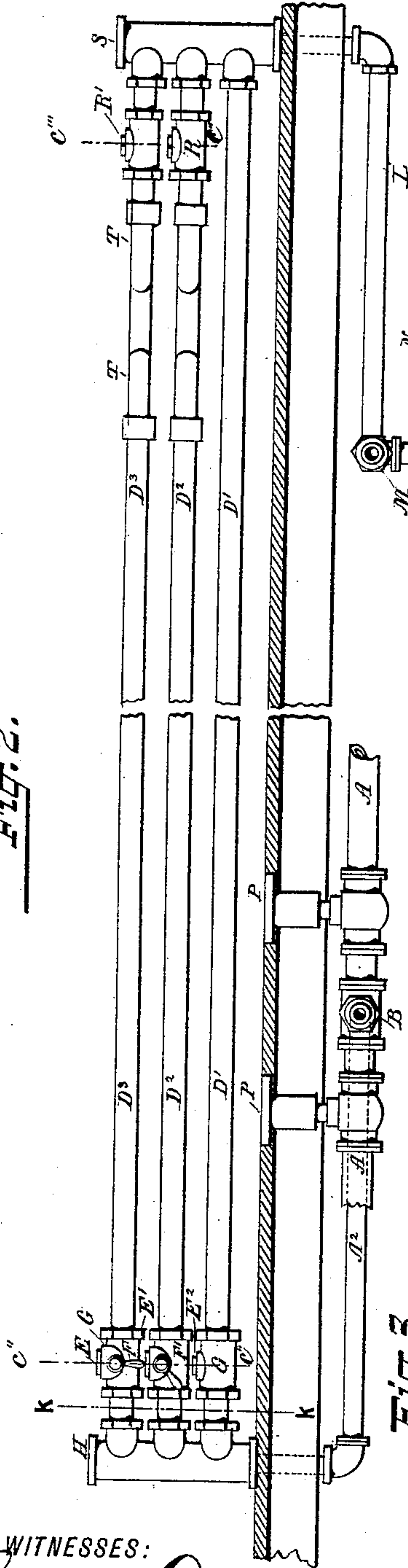


Fig. 4.

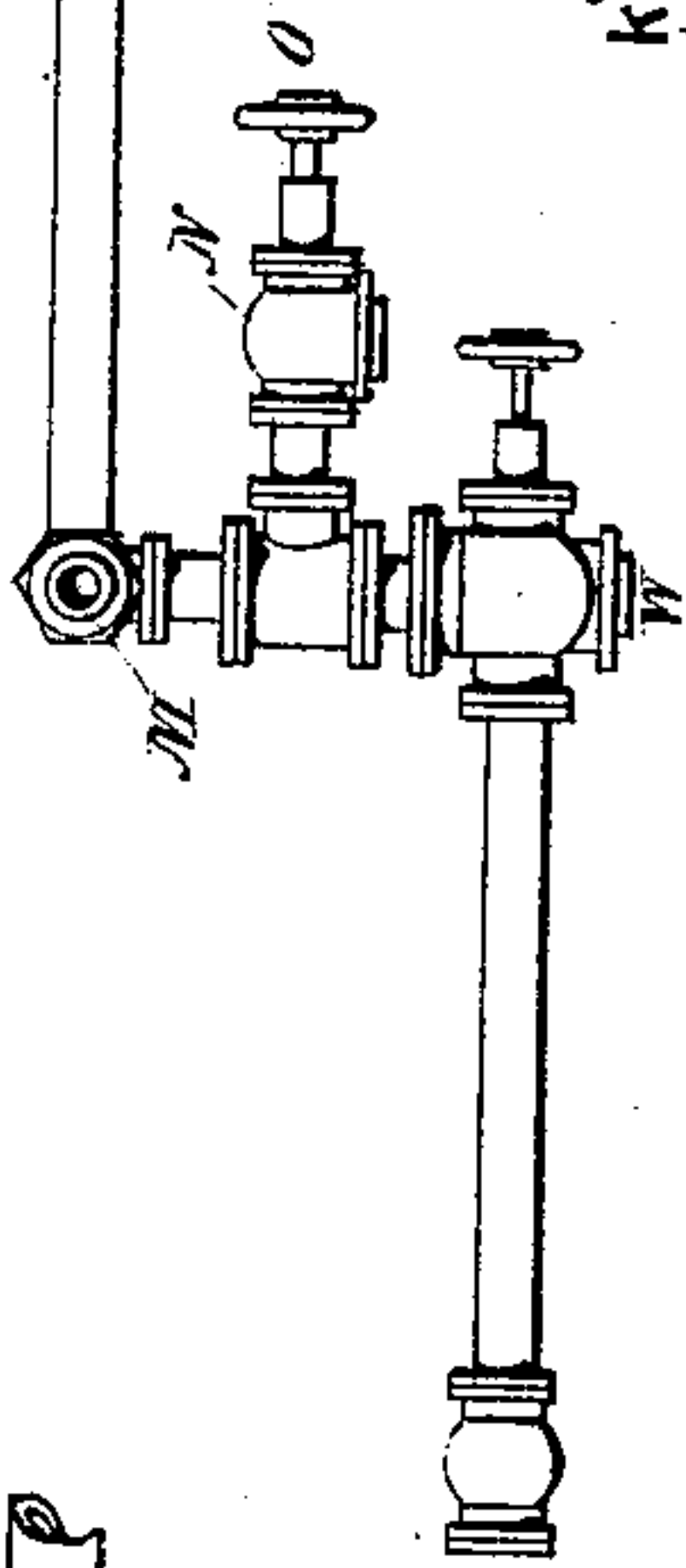


Fig. 5.

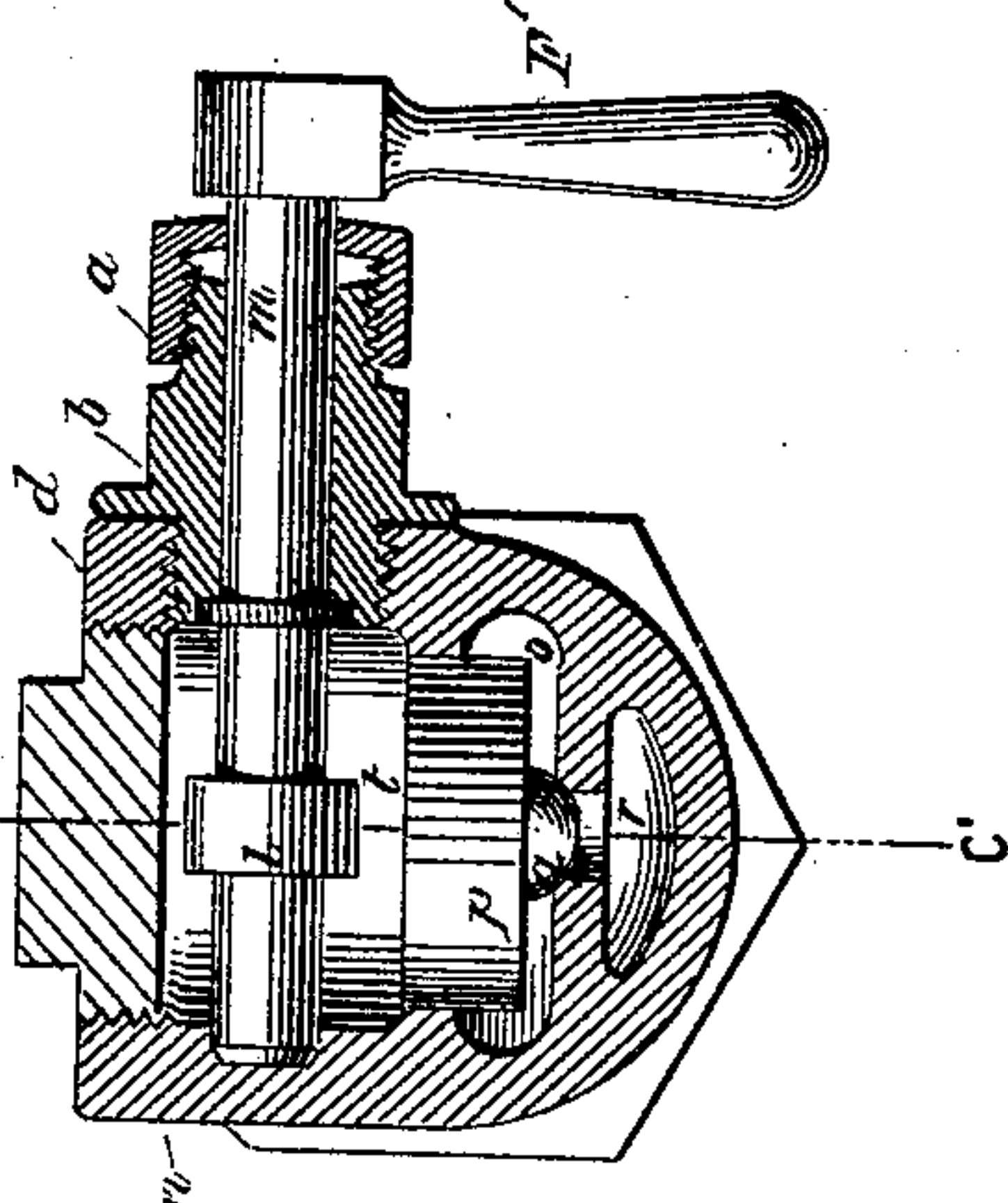


Fig. 3.

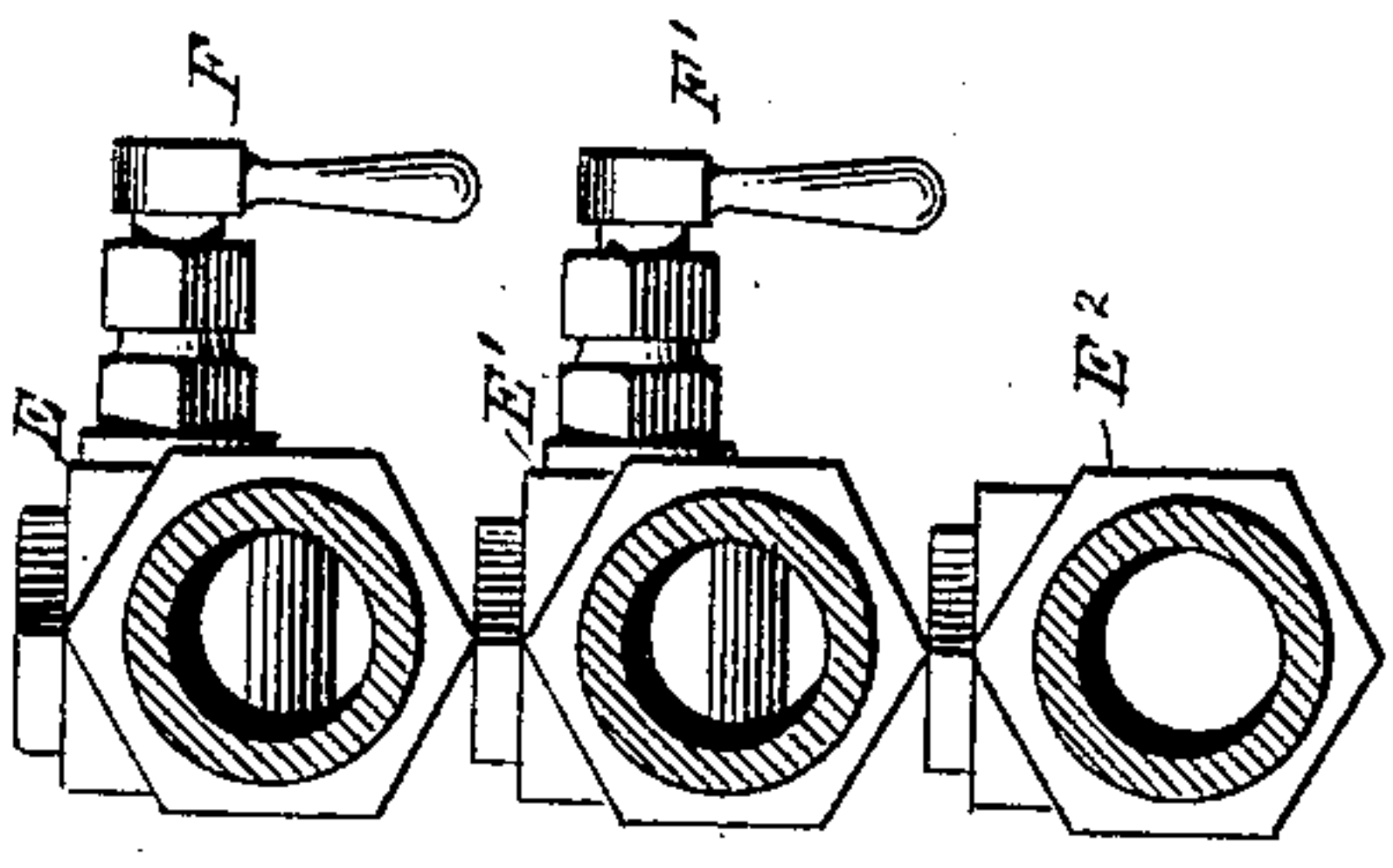
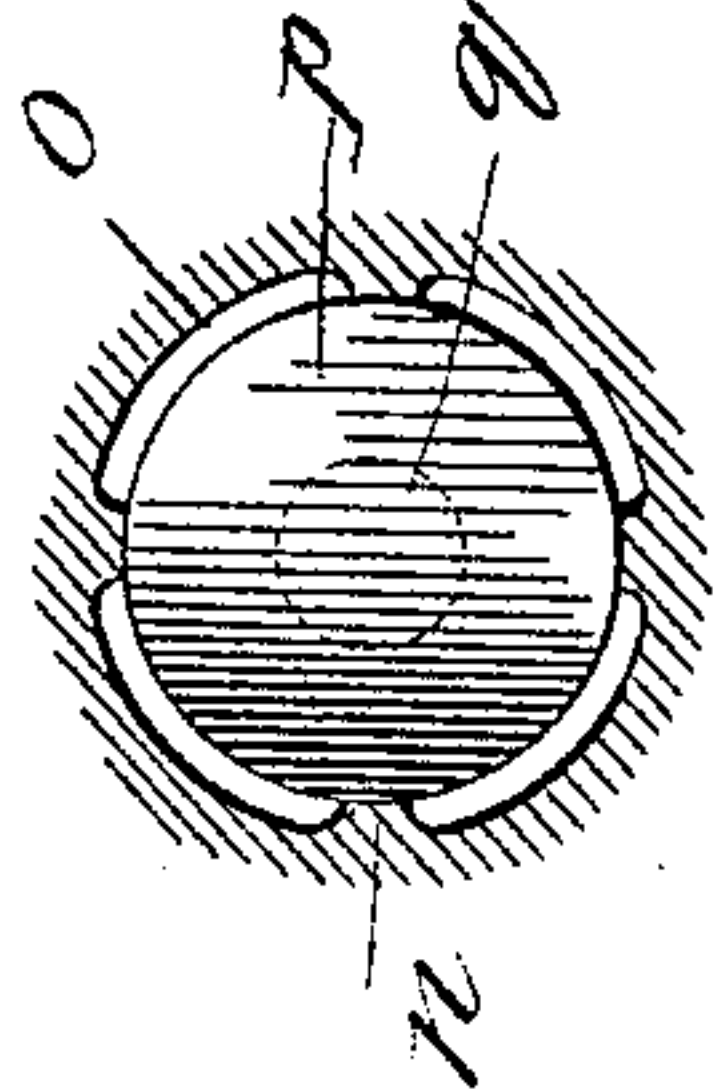


Fig. 6.



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CAR HEATER.

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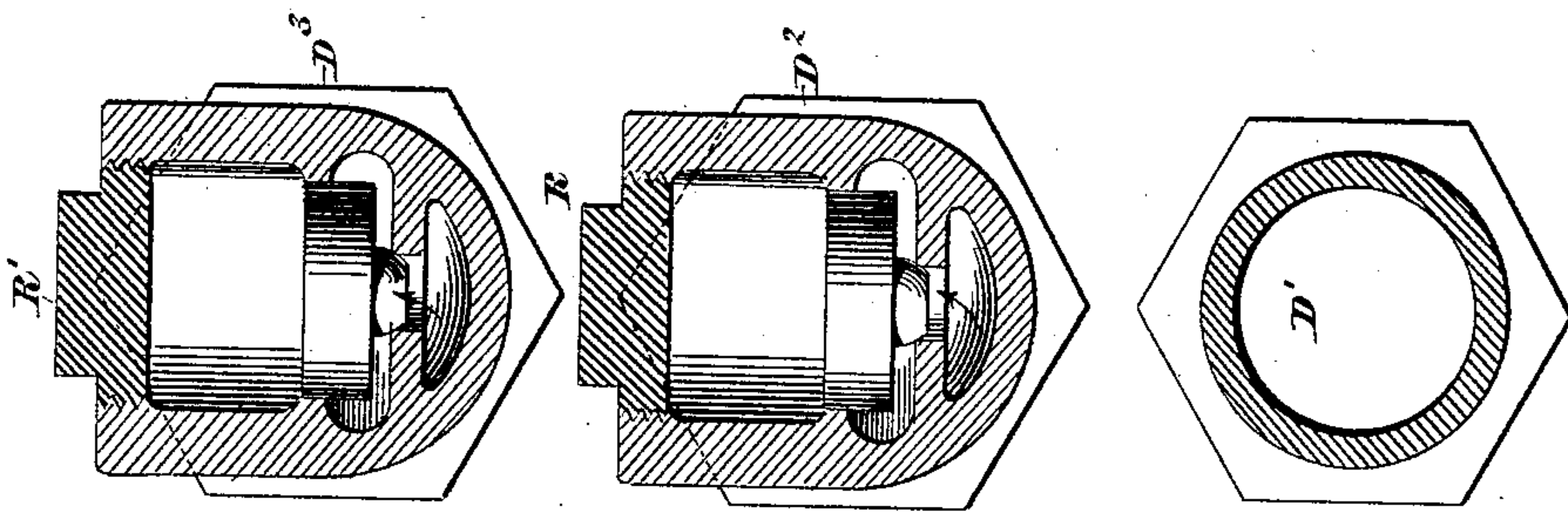


Fig. 8.

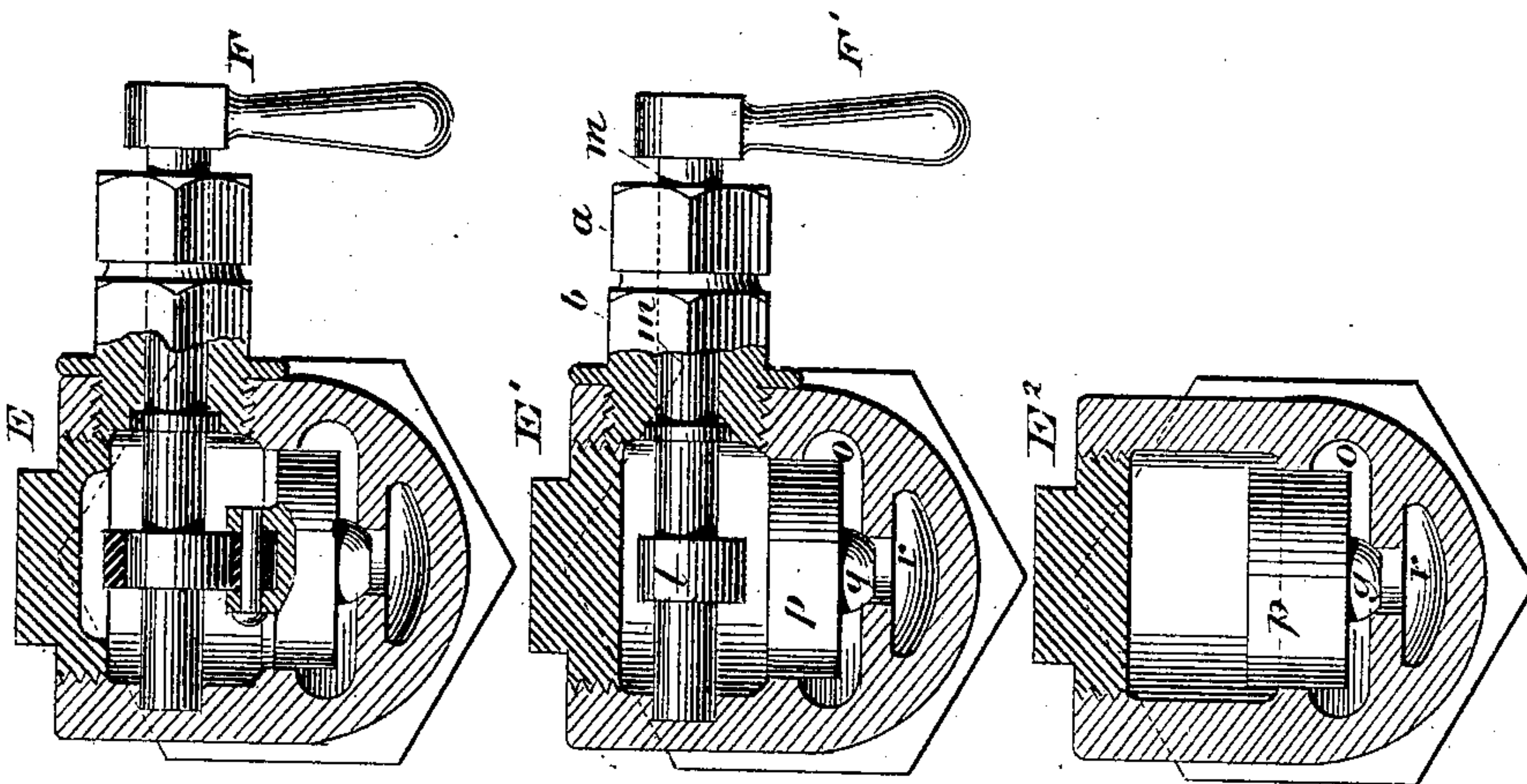


Fig. 7.

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UNITED STATES PATENT OFFICE.

ROBERT M. DIXON, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO THE
SAFETY CAR HEATING AND LIGHTING COMPANY, OF NEW YORK, N. Y.

CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 435,484, dated September 2, 1890.

Application filed December 24, 1889. Serial No. 334,862. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. DIXON, residing at East Orange, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Car-Heaters, of which the following is a specification, reference being had to the accompanying drawings, which form part of the same.

The object of my invention is to warm cars by the use of steam from the locomotive or other source, which passes through suitable radiators, the arrangement of which forms part of my invention.

In the drawings, Figure 1 represents a plan view of a car-body, showing the position of the radiators and of the supply-pipes. Fig. 2 is a side view of the radiator, showing the connection between it and the supply-pipes. Fig. 3 is a cross-section on the line *k k*, Fig. 2, showing the valves through which the steam passes into the radiator-pipes. Fig. 4 is a vertical section through *c' c'*, Fig. 5, showing in detail the valve mechanism of Figs. 2 and 3. Fig. 5 is a section through *k' k'*, Fig. 4. Fig. 6 is a sectional view taken through *k'' k''*, Fig. 4. Fig. 7 is a cross-section on line *c'' c''* of Fig. 2. Fig. 8 is a cross-section on line *c''' c'''* of Fig. 2.

Similar letters throughout the several figures indicate similar parts.

The arrangement of the supply and radiator pipes with regard to the car to be heated is shown in the drawings in Fig. 1, in which—

A represents the supply-pipe, carried for the length of the train either overhead or underneath. From this supply-pipe A the branch pipes A² extend on either side of the car and are connected to the collecting-pieces H H of the radiators. The pipes D' D² D³ forming the radiators are arranged one above the other and extend straight the whole length of the car, or nearly so. The radiator-pipes are provided with expansion-joints J. In the lowermost radiator-pipe, near the inlet collecting-piece H, a reducing-valve E² is placed, (shown in section in Fig. 4,) which reduces the amount of pressure of the steam as it enters the pipe. This reduction-valve is gaged previous to its insertion in the lower radiator-pipe, and the reduction of the pressure is al-

ways constant thereafter. The second radiator-pipe D² is provided near the inlet collecting-piece H with a valve E', (shown in Fig. 5,) which is a reducing-valve, and also capable of being entirely shut, so that if the steam is allowed to enter the valve it will always reduce the pressure, but less than the reducing-valve E² on the lowest radiator-pipe D', and if no steam is desired to pass through the pipe D² the valve may be entirely closed. Between the expansion-joint J on this radiator-pipe D² and the outlet collecting-piece S is placed any suitable check-valve R, (shown in cross-section in Fig. 8,) which allows steam to pass to the outlet collecting-piece S, but prevents the return from the outlet collecting-piece S to the pipe D². The upper radiator-pipe D³ has at its inlet end a valve which does not offer any resistance to the steam when it is opened, but is capable of being tightly closed to prevent entirely the admission of steam. At its outlet end is a check-valve R', similar in construction to the check-valve R of the second radiator-pipe D² and used for a similar purpose.

The valve E' is shown in detail in Figs. 3, 4, and 5, and in its operative connection with the other valves in Fig. 8, and may be described as follows: The shell of the valve contains the weighted valve *p q*, adapted to be opened by the pressure of steam from below. The shell of the valve E' carries a stem *m*, which is provided with an eccentric *l*, which when the stem *m* is turned by means of the lever F' acts upon the valve-body *p q* and holds it down on its seat. Steam enters the valve-chamber from the collecting-piece through the contracted orifice *r*, and when the valve is opened passes to the pipe D² through the contracted orifice *o*. This valve-body *p q* is operated by the lever F', which when turned to, say, a horizontal position shuts the valve and holds it down, but when turned a quarter of a revolution releases the valves. The valve E² is similar in construction to the valve E', but does not have a stem *m*, eccentric *l*, or handle F'. It operates solely to reduce the pressure of steam, and when the steam of required pressure is admitted to the valve E² through the contracted orifice *o*

the valve-body is raised and exercises its weight on the steam as a means of reducing the pressure thereof. The valve E is an ordinary or suitable cut-off valve. (Shown in Fig. 7.)

The check-valves R R' are of usual construction, and need no explanation, but are shown in Fig. 8.

The radiating-pipes on each side of the car are brought into the collecting-piece S, from which the water condensed from the steam escapes by means of a pipe L to a trap W, from which it is made to escape when valves in said trap are opened. An angle-valve N O is placed on the pipe leading to the trap W to allow the discharge of large quantities of water from the pipes when steam is first turned on without disturbing the adjustment of the trap W, and in case the trap W becomes clogged or ineffectual in discharging the waste water this angle-valve N O will take its place.

The operation of my system is as follows: In comparatively warm weather only the lower radiating-pipes are heated and the valves E and E' are kept closed. If the cars are not sufficiently heated by this means, the valve E' is opened. Now if the same pressure of steam is admitted into the second pipe D² as in the first D' the check-valve R will be kept closed, for the reason that the steam from the first pipe enters the collecting-piece S and presses as strongly against one side of the check-valve R as the steam in D² does against the other side; but the heavier reducing-valve E² in the lower radiator-pipe causes a smaller pressure of steam to pass through the pipe D' than the lighter reducing-valve E' allows to pass through the pipe D², and thus enables the steam in D² to open the check-valve R, the steam following the direction of the arrows in Fig. 8. In the same manner the valve E when opened allows the full pressure of steam to enter the upper radiator-pipe D³ and overcomes the resistance of the reduced pressure of the steam in the second radiator-pipe against its check-valve R'. It is merely a matter of ready calculation as to how these reducing-valves are to be regulated, and when once regulated they will need no further care. If four, five, or any number of pipes are to be used, the pressure in the pipes from the lowest to the highest will increase until the full amount is allowed to enter at the uppermost pipes. The amount of steam heat can be regulated, since one, two, three, or more of the radiator-pipes can be heated at the start and afterward the others added, or all the radiator-pipes may be heated at the start, and then

reduced by shutting off the steam from the upper pipes. The heat is evenly distributed throughout the entire length of the car, with the exception that the ends will have the advantage of the collecting-pieces of the radiators. This is what is desired, because the ends of the cars are always cooler than the centers.

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

1. In a system of car-heating, the combination of a pipe A, conveying the steam from the locomotive or other source, with a series of radiator-pipes D' D² D³, with each of which the pipe A communicates, and with reducing cut-off and check valves placed in said pipes D', D², and D³, respectively, as described, for establishing and shutting off the connection of the pipe A with any one or more of said pipes D' D² D³, and for admitting steam there- to under varying degrees of pressure, substantially as described.

2. In a car-heating system, a series of radiating-pipes in the same radiator, the lower pipes of said series being combined with reducing-valves p q, of varying adjustment, at one end, and check-valves at the other end, the upper pipes of the series being combined with cut-off valves at one end and check-valves at the other end, substantially as described.

3. In a car-heating system, a series of radiating-pipes in the same radiator, combined with collecting-pieces H S at each end, the lower pipes of the series being combined with reducing-valves p q, of varying adjustment, at the inlet and with check-valves at the outlet, the upper pipes of the series being combined with cut-off valves at the inlet and check-valves at the outlet, substantially as and for the purposes set forth.

4. A radiator for car-heating, consisting of radiator-pipes provided with collecting-pieces at each end, the lowermost radiator-pipe having a reducing-valve at its inlet end, the uppermost pipe having a cut-off valve at its inlet end and a check-valve at its outlet end, the intermediate pipes in the series being provided with reducing and cut-off valves at the inlet ends and check-valves at the outlet ends, whereby the number of pipes of the radiator desired to radiate the heat may be diminished or increased, substantially as described.

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Witnesses:

HARRY M. TURK,
HENRY E. EVERDING.