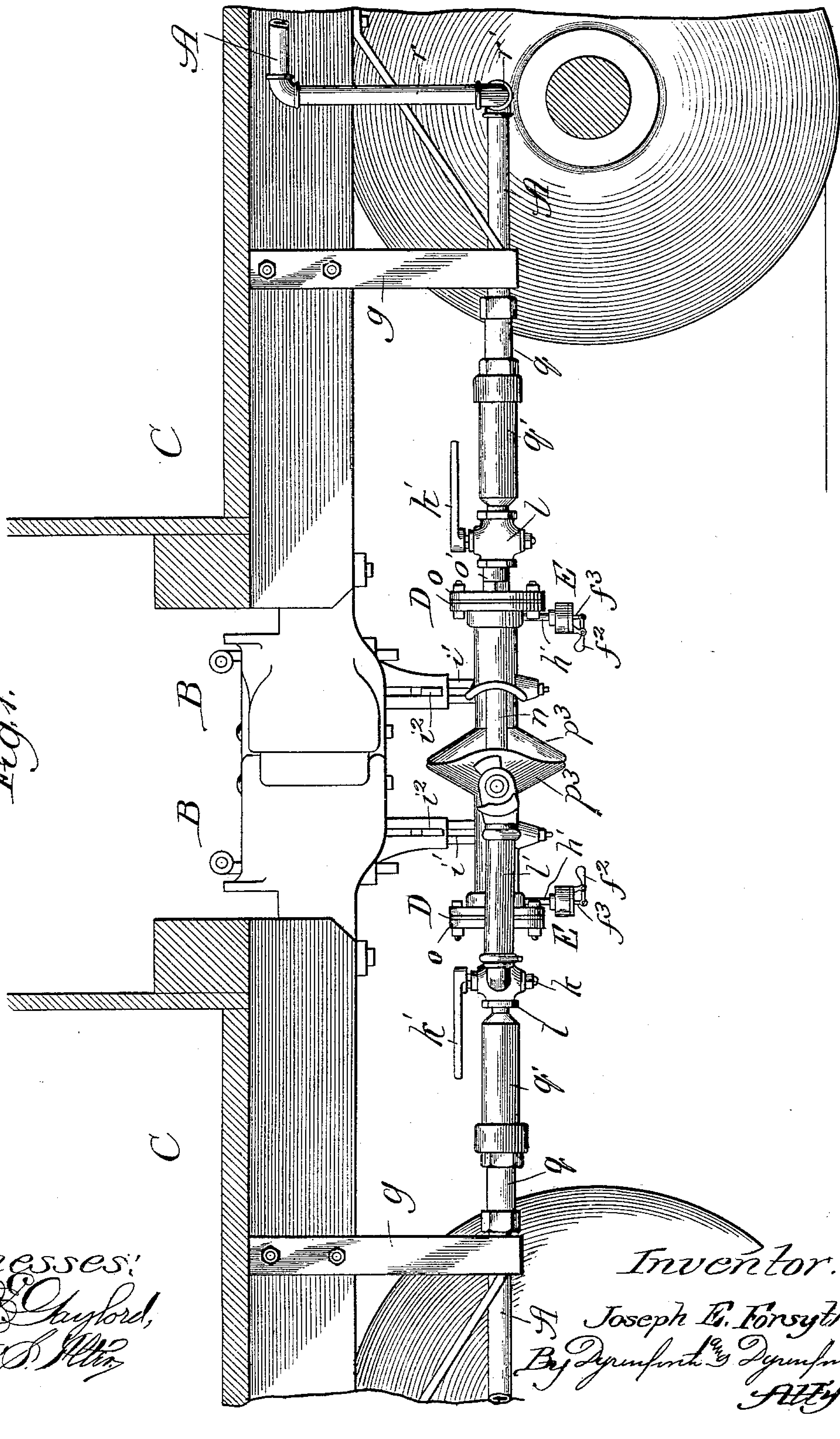
No. 618,081. Patented Jan. 24, 1899.

J. E. FORSYTH.

AUTOMATIC TRAIN PIPE COUPLING.

(Application filed May 27, 1898.)

(No Model.) 5 Sheets—Sheet 1.



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Lute S. Alter.

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By Dyrenforth & Dyrenforth,
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 5 Sheets—Sheet 2.

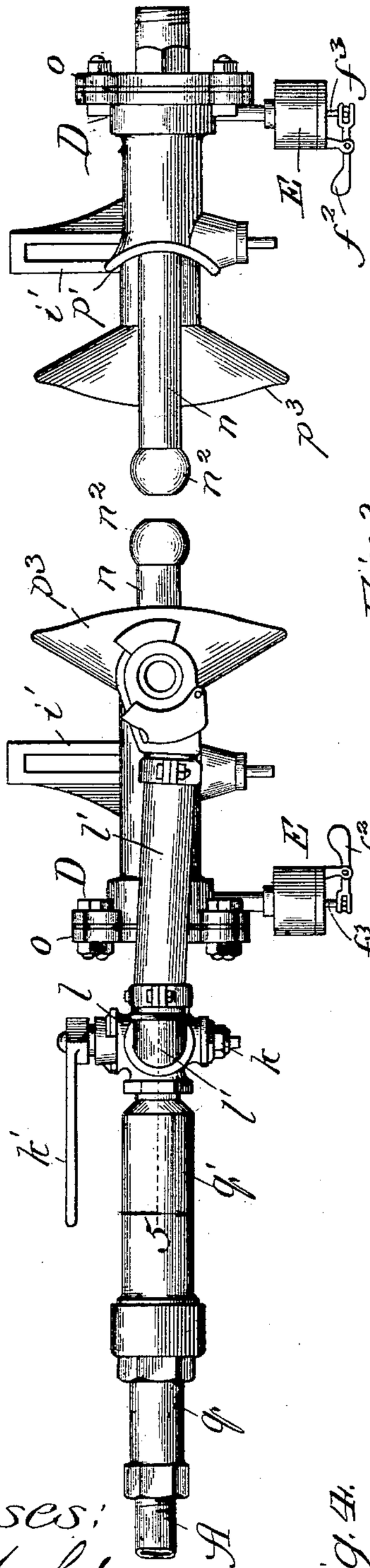

Fig. 2.

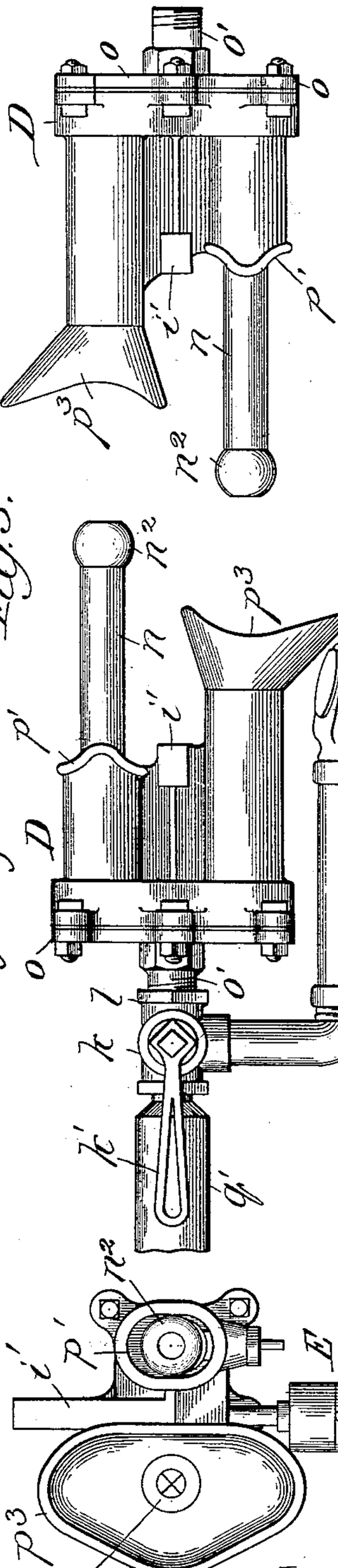

Fig. 3.

Fig. 4.

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(No Model.) 5 Sheets—Sheet 3.

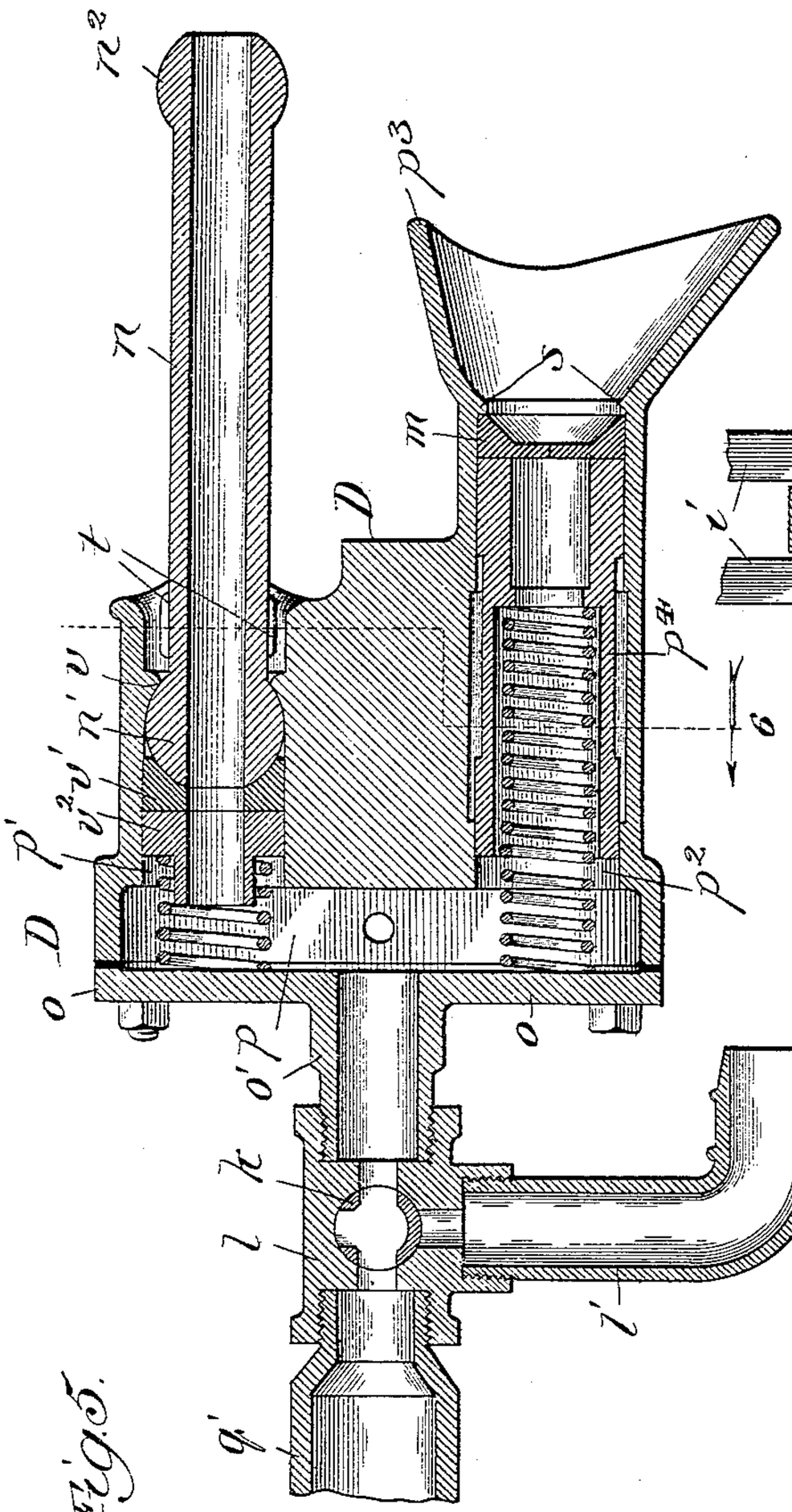

Fig. 5.

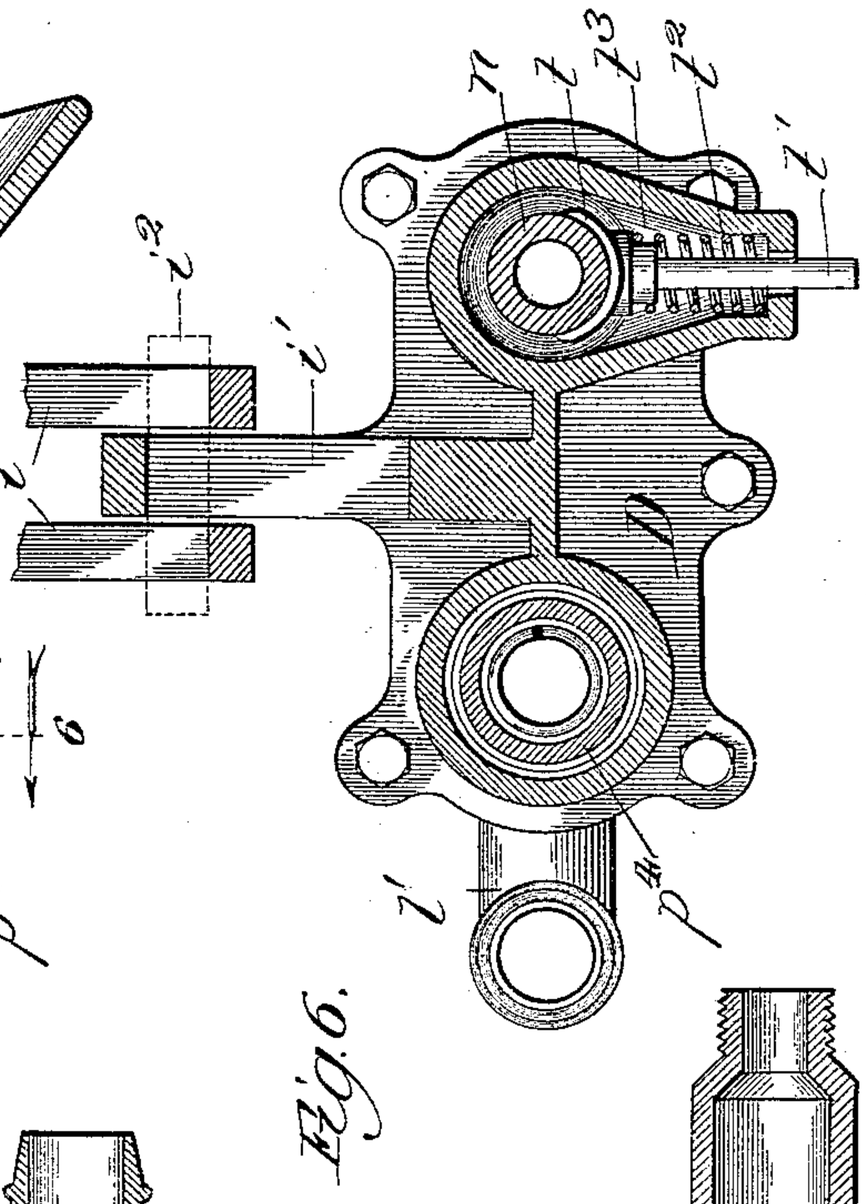

Fig. 6.

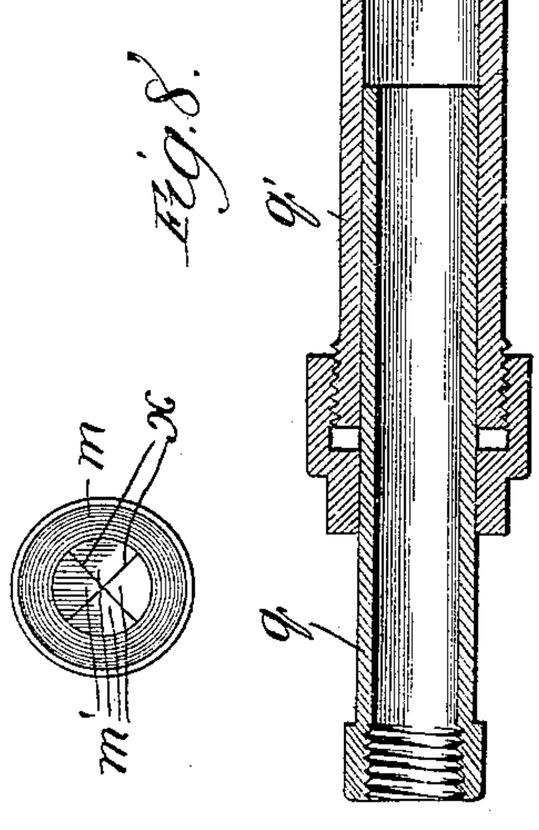

Fig. 8.

Fig. 7.

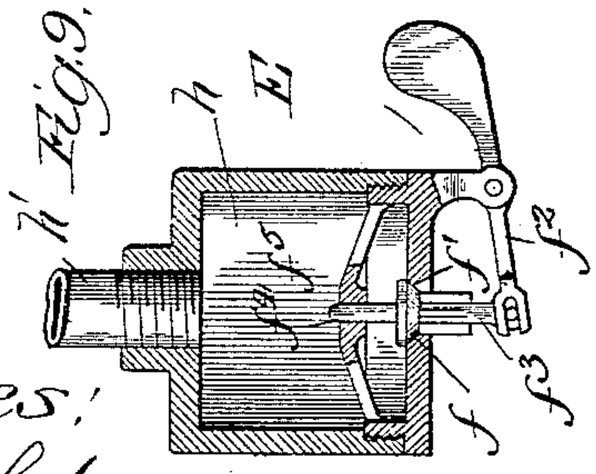

Fig. 9.

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Fig. 10.

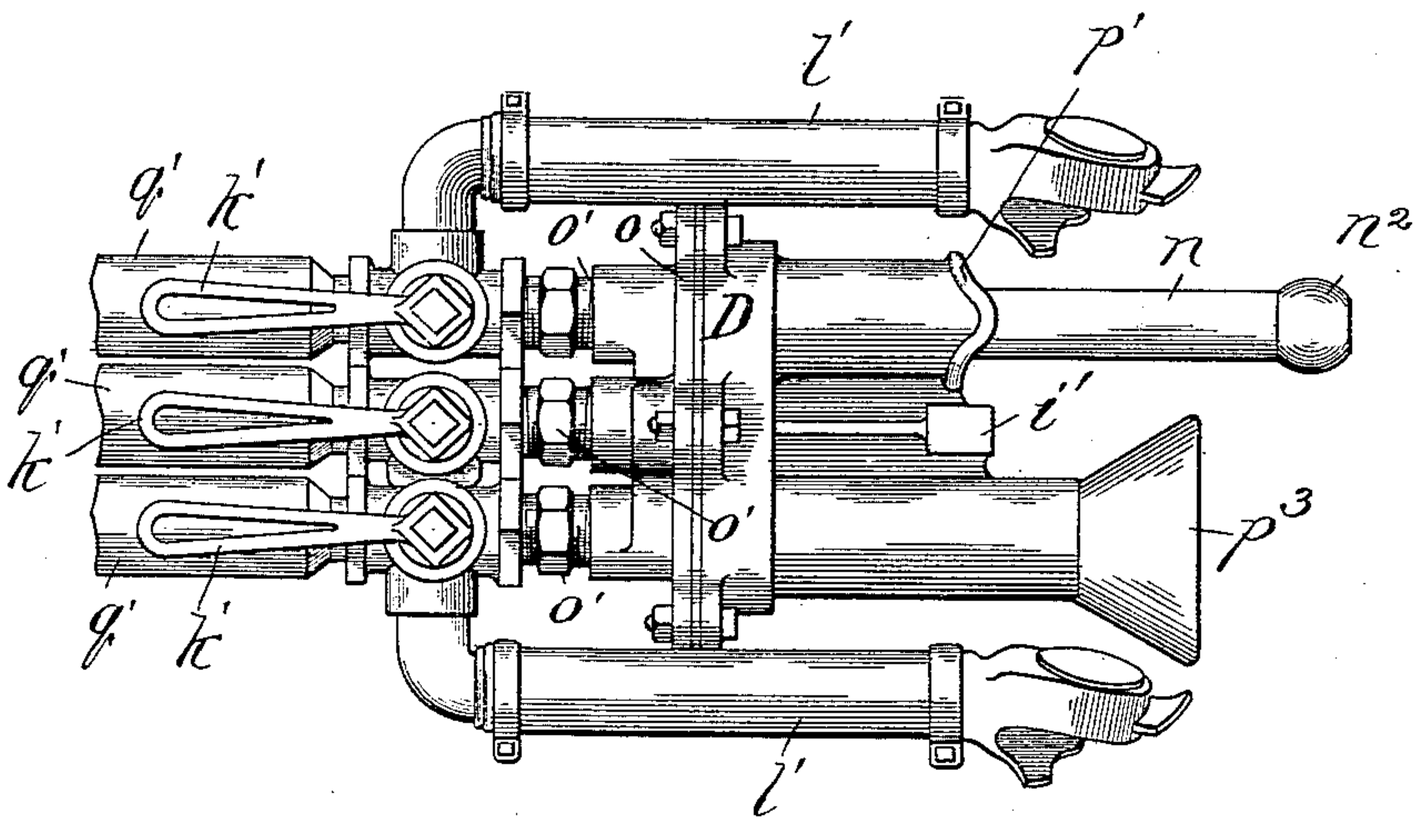
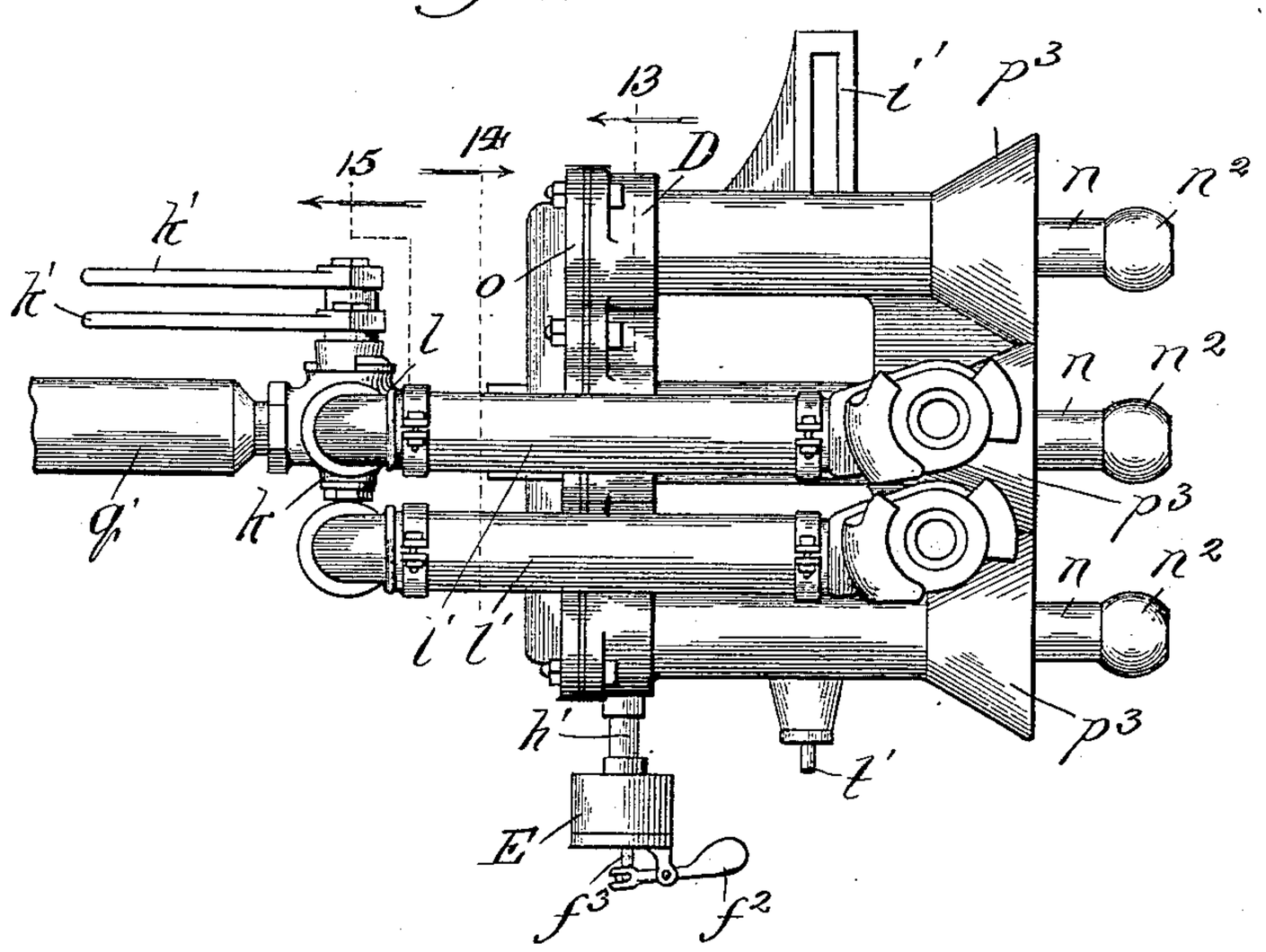


Fig. 11.



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No. 618,081. Patented Jan. 24, 1899.

J. E. FORSYTH.

AUTOMATIC TRAIN PIPE COUPLING.

(Application filed May 27, 1898.)

(No Model.) 5 Sheets—Sheet 5.

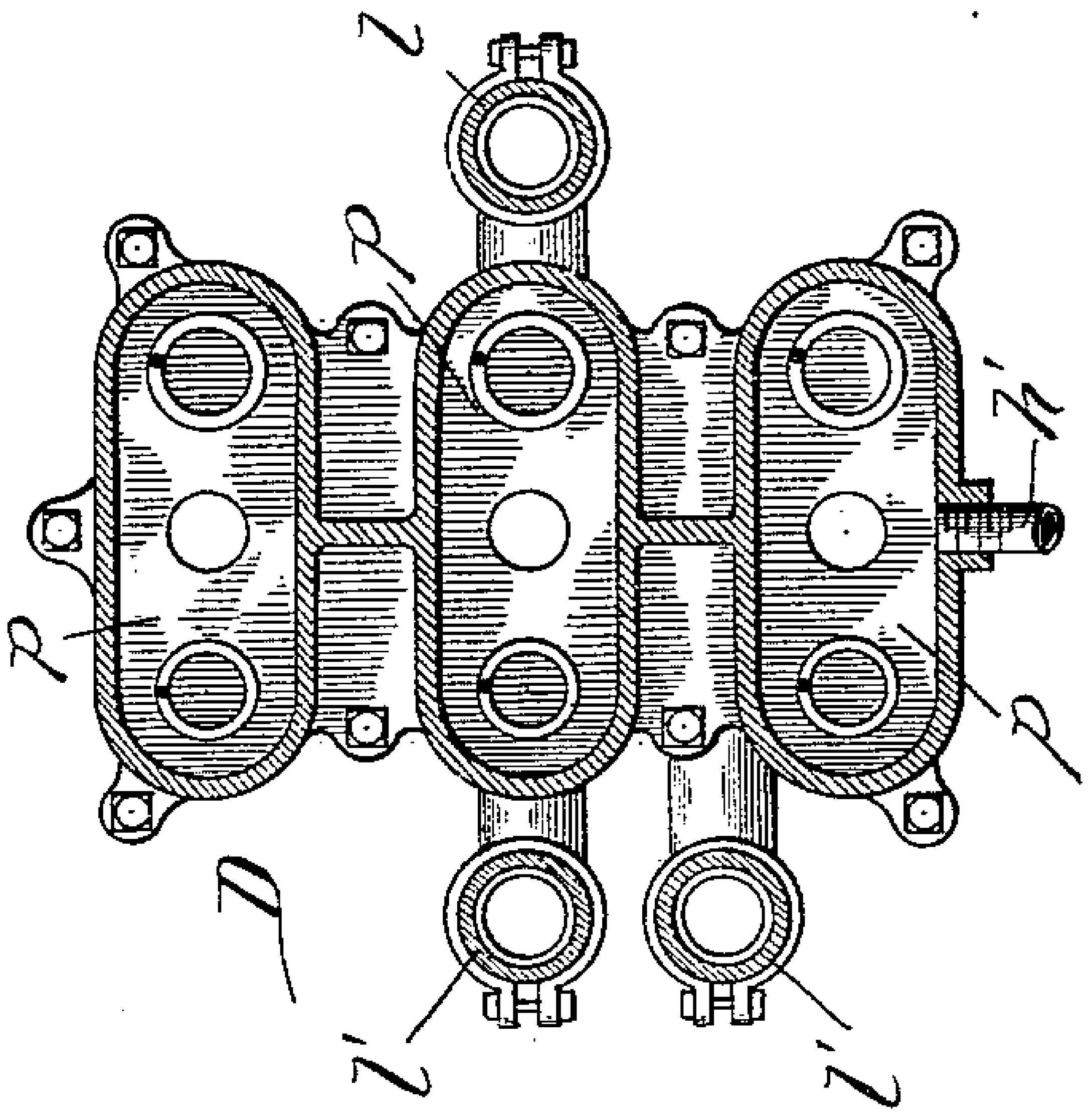

Fig. 13.

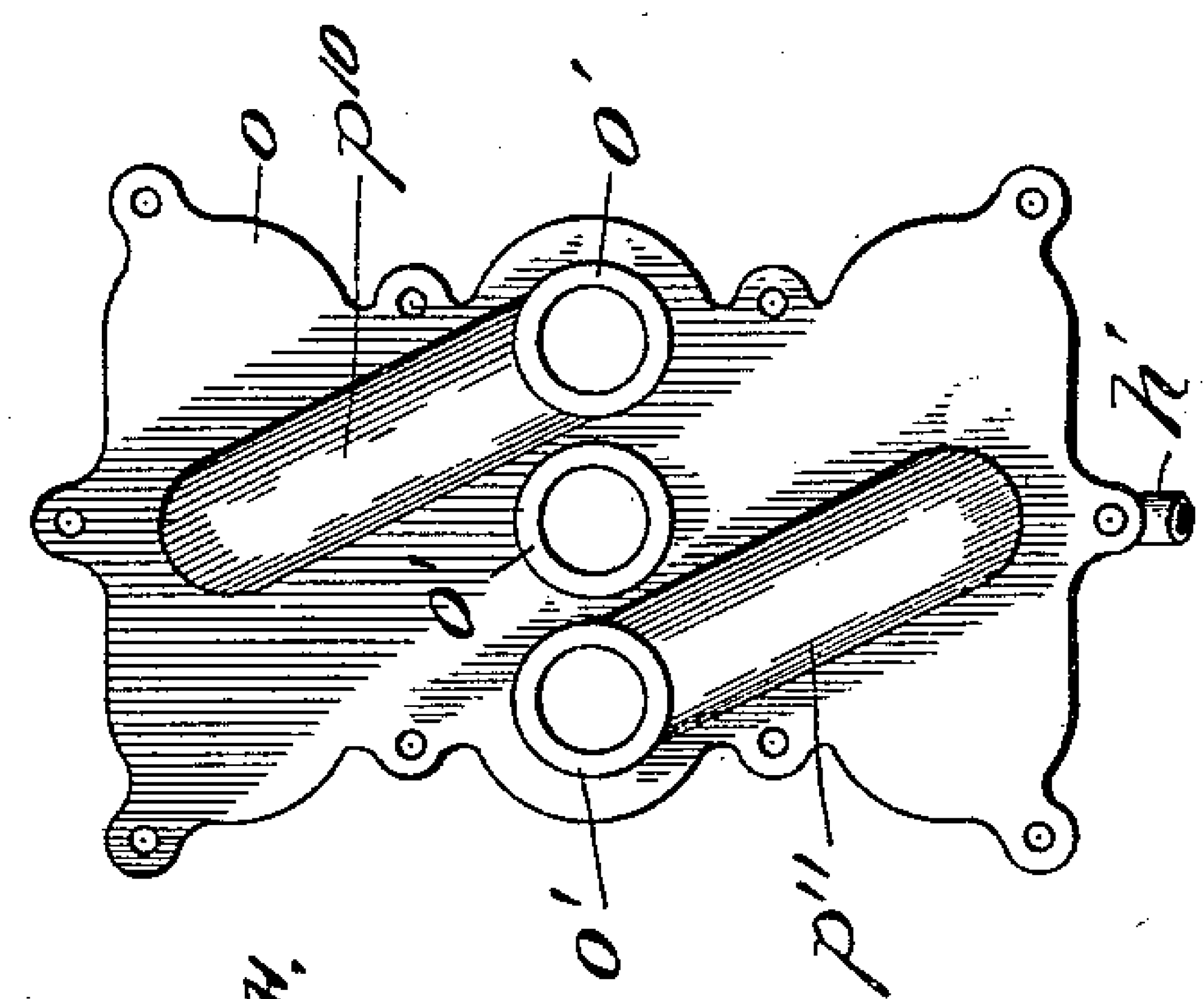

Fig. 14.

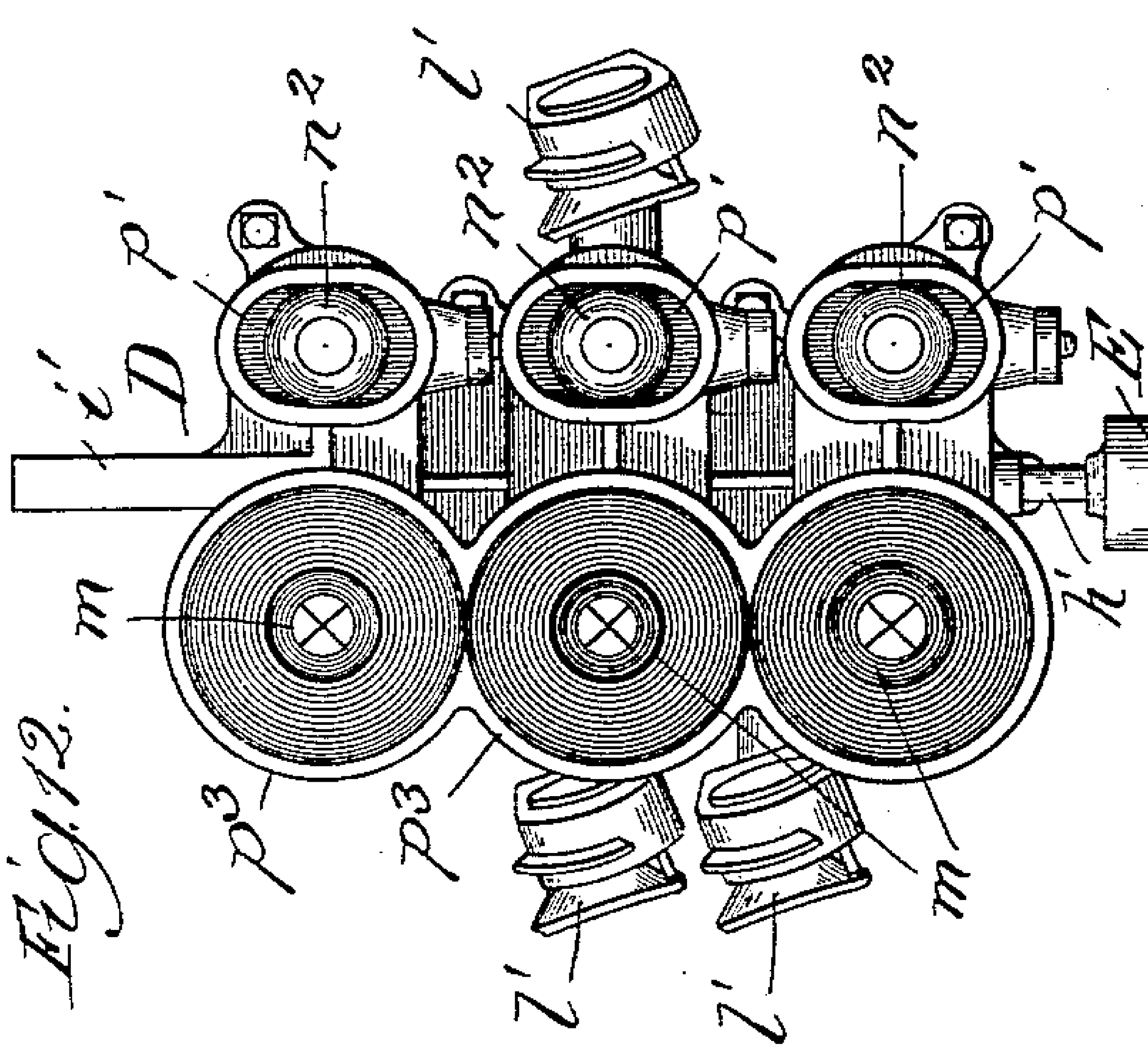

Fig. 12.

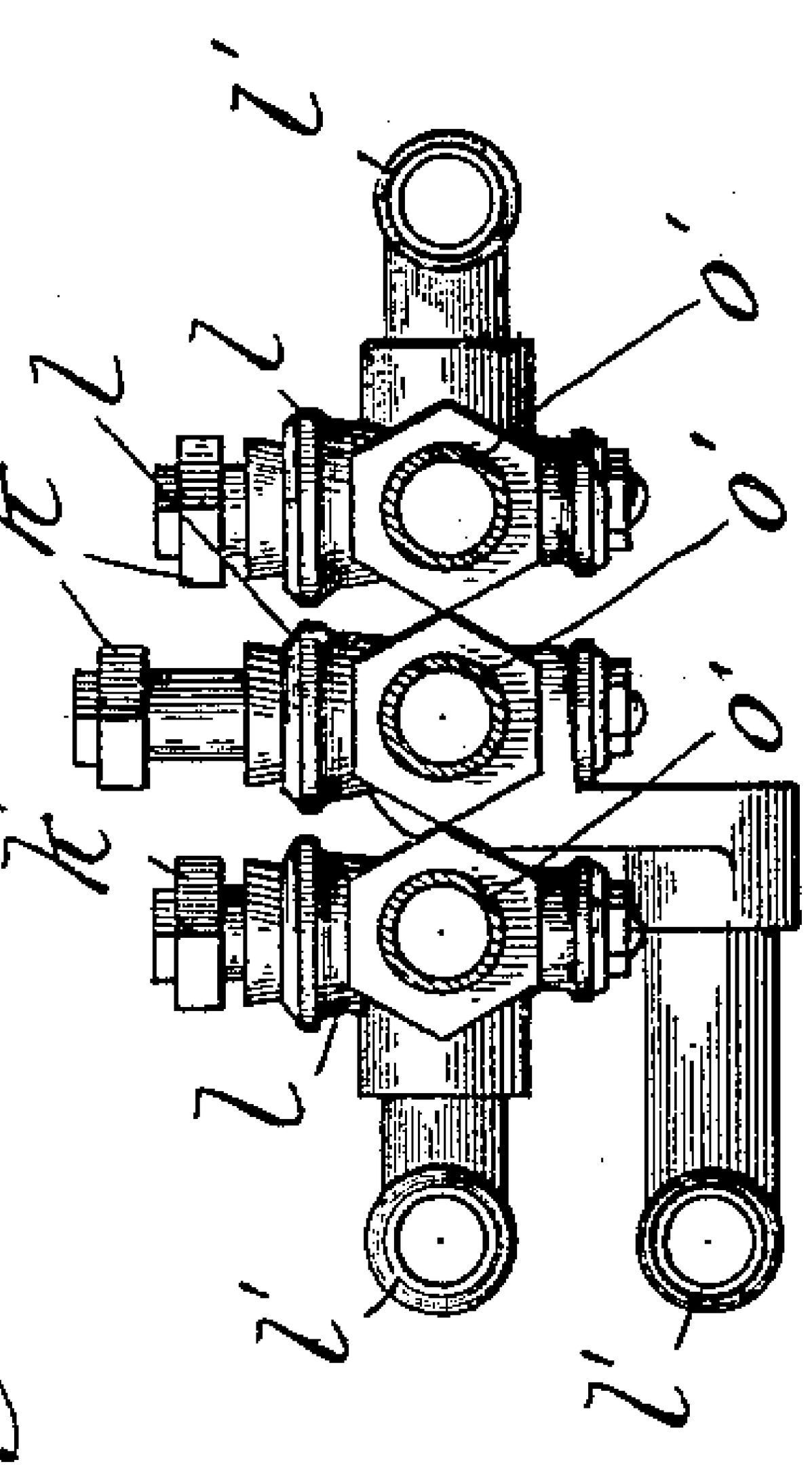

Fig. 15.

Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH E. FORSYTH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE J. E. FORSYTH COMPANY, OF SAME PLACE.

AUTOMATIC TRAIN-PIPE COUPLING.

SPECIFICATION forming part of Letters Patent No. 618,081, dated January 24, 1899.

Application filed May 27, 1898. Serial No. 681,883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Automatic Train-Pipe Couplings, of which the following is a specification.

My invention relates to an improvement in the class of couplings employed between cars for automatically coupling the train-pipe, whether air-brake pipe, signal-pipe, or steam-pipe, or any two or all of them.

More particularly my device is of the order of the automatic train-pipe coupling set forth in Letters Patent No. 574,695, granted January 5, 1897, to William F. White; and it is especially designed to afford an improvement on the same in the matters of simplification of construction and effectiveness of operation.

Referring to the accompanying drawings, Figure 1 shows by a broken view the end portion in sectional side elevation of each of two freight-cars equipped with my improved automatic coupling for the air-brake train-pipe. Fig. 2 shows the same couplings in side elevation detached from the cars and separated. Fig. 3 is a plan view of the same; Fig. 4, a view of the coupling in front elevation; Fig. 5, a section taken at the line 5 on Fig. 2, viewed in the direction of the arrow and enlarged; Fig. 6, a section taken at the line 6 on Fig. 5 and viewed in the direction of the arrow; Fig. 7, a view in elevation of a cross-slitted dust-excluding rubber-washer detail; Fig. 8, a longitudinal sectional view of a telescoping joint in the train-pipe; Fig. 9, a view in sectional elevation of a drip detail; Fig. 10, a plan view of my improved coupling as adapted for coupling the air-brake, signal, and steam pipes on a passenger-train; Fig. 11, a view of the same in side elevation; Fig. 12, a view of the same in front elevation; Fig. 13, a section taken at the line 13 on Fig. 11 and viewed in the direction of the arrow; Fig. 14, an elevation taken at the line 14 on Fig. 11 and viewed in the direction of the arrow, and Fig. 15 a section taken at the line 15 on Fig. 11 and viewed in the direction of the arrow.

A is a train-pipe which usually extends lengthwise along the bottom of the car to one side of its center. For my purpose, which involves locating my improved coupling beneath the car-coupling B, a vertical bend r is formed in the train-pipe at a suitable distance back from each end of the car C, this bend reaching below the plane of the car-coupler, and from the bend r another bend r' extends transversely of the bottom of the car about to its center and has connected with it the continuation of the pipe A, preferably carrying at its outer end the two telescoping pipe-sections q and q' for the same purpose as the corresponding telescopic tube-sections of the aforesaid patent—namely, to afford play like that afforded to the car-coupler B by its draw-bar spring, whereby the car-coupler and pipe-coupler may move correspondingly.

My improved coupling involves the following-described construction:

D is a metal head, preferably cast, and containing a rear chamber p, covered by a cap o, from the center of which extends a tubular nipple o'. From one side of the chamber p there extends forward a tubular chamber p', containing near its outer end a restricted and rounded seat v, and a similar chamber p^2 extends forward from the opposite side of the chamber p and has a bell-mouth termination p^3. A tube n, having rounded heads n' and n^2, respectively, at its opposite ends, is held loosely at one of its heads in the chamber p' to project beyond it and fits against the seat v therein, being confined by a rubber washer v', fitting the rear portion of the tube-head and yieldingly held against it by a spring-pressed tubular bearing v^2. To tend to sustain the tube n in proper horizontal alinement, it is supported by a prop t, Fig. 6, on a vertically-reciprocable stem t', surrounded by a spring t^2, confined against the prop in a housing t^3 below the tube and opening into the chamber p'.

Within the chamber p^2 is confined between an annular shoulder s at the inner end of the

bell-mouth p^3 and a spring-pressed tube p^4, equipped with means for guiding it in its reciprocating movements, a rubber washer m, dished in its outer face and having its central portion cross-slitted, as indicated at x in Fig. 7, to form the flaps m'.

To the nipple o' is attached a coupling l, shown as a T-coupling and containing a three-way valve k, provided with an operating-handle k'. From one side of the coupling l there extends an elbow-tube l', upon which to connect a coupling-hose (not shown) in the event of the requirement for coupling a car equipped with my improved automatic coupler with one not so equipped, but having instead the old form of hose-coupling.

My improved device is connected with the train-pipe A at its telescoping section q' and extends parallel with and underneath the car-coupling B, from which there depends for supporting the air-coupling a bifurcated hanger i to receive a slotted bar i', rising from the head D, and at which the suspending connection is made by a pin i^2, passed through the slot in the bar and through perforations in the hanger. The device is further supported at the forward extension of the train-pipe A by a hanger g, depending from the bottom of the car C near its forward end.

When two cars, each equipped with my improvement, come together for coupling, their train-pipes are automatically coupled between cars by the outer end of the tube n of each coupling entering the bell-mouth p^3 of the other to be received in the dished face of the washer m, and the spring-pressed condition of the washers and tubes enables the coupling action to be performed without strain and effects and maintains a close junction between the connecting members of the two couplings.

With the valve k in the position in which it is shown in Fig. 5 the air enters the coupling-chamber p through the nipple o', which should be of about the same diameter as the train-pipe, and from the chamber p the body of air is divided to pass through the tubes n and p^2, the combined diameters of which should about equal or somewhat exceed the diameter of the train-pipe. As will be understood, by properly adjusting the valve k the air may be directed from the train-pipe through the elbow-pipe l', and thus past my improved coupling device when the old hose connection is employed. The air readily passes the yielding flaps m' of the washer m, which tend normally to close and seal the device in its uncoupled condition against the ingress of dust.

The foregoing describes my improvement in its simplest form as a means of coupling a train-pipe, whether air or steam be passed through it, though air alone has been hereinbefore referred to as the fluid. It may be steam, however, and in that case I provide an especially-desirable form of drip device E, Fig. 9, depending from the chamber p in the head D. It comprises a chamber h, connected by a pipe-section h' with the bottom of the chamber p and containing a valve f, seating in a discharge-opening f' in its bottom. A tendency is given to the valve to open by rising through the medium of a lever f^2, fulcrumed between its ends on the casing of the chamber h, weighted at its outer end and connected at its opposite end with the valve-stem f^3. The valve has an upper guide-stem f^4 in a spider-bearing f^5 in the chamber h.

The pressure of steam in the chamber p when the coupling is in use overcomes the resistance of the weighted end of the lever f^2 and holds the valve f closed or against its seat; but when the device is uncoupled and the steam-pressure is accordingly removed the weighted lever opens the valve to permit the water of condensation to discharge through the opening f'.

To adapt my improved device for automatically and simultaneously coupling the air-brake pipe, signal-pipe, and steam-pipe of a train, the several parts in the head D are provided in triplicate. Thus on the back of the cast head D are formed three chambers p, one above the other, and from the center of the cover o there extend the three nipples o', Fig. 14, in horizontal alinement with each other for coupling therewith, respectively, the air-brake pipe, the air-signal pipe, and the steam-pipe, which three pipes are parallel on the same horizontal plane along the bottom of the car. The air-brake pipe being in alinement with the nipple o' of the central chamber is directly connected therewith and the air which enters that chamber goes out through the chambers p' and p^2, respectively, at its opposite sides, the former of which contains a headed tube n, confined therein between a seat v and a washer v' under control of a spring-pressed bearing v^2, and the latter of which has a bell-mouth termination and contains a washer m under control of a spring-pressed tube p^4. The air-signal pipe connects with the nipple to one side of the brake-pipe nipple. This signal-pipe nipple does not communicate with the central chamber p, but with the upper chamber p through a cored passage (represented at p^{10}) in the cover o. The steam-pipe connects with the nipple at the opposite side of the central nipple, this steam-pipe nipple having also no communication with the central chamber p, but communicating through a cored passage (represented at p^{11}) with the lowermost chamber p, from which depends the drip device E.

As will be understood, from the upper chamber p, as well as from the lower chamber, there extend the tubular chambers p' and p^2, equipped with the same parts as those described in connection with the middle chamber, including a washer m in each chamber p^2, which is really a species of check-valve. Each pipe is provided with its own three-way valve k and elbow-tube l', leading therefrom, for

the hose-coupling connection hereinbefore referred to.

Although the term "train-pipe" is more commonly employed in the art to signify the air-brake pipe, I intend herein to signify thereby either the air-brake pipe, the air-signal pipe, or the steam-pipe.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic train-pipe coupling, the combination of a head provided with a rear chamber at which to connect the pipe, tubular chambers leading from and communicating with each other through said rear chamber, and a tube confined in and projecting beyond one of said tubular chambers, substantially as described.

2. In an automatic train-pipe coupling, the combination of a head provided with a rear chamber at which to connect the pipe, tubular chambers leading from and communicating with each other only through said rear chamber, a tube headed at its opposite ends and confined at one head in a spring-pressed bearing in one of said tubular chambers, the other tubular chamber terminating in a bell-mouth and containing a spring-pressed valve, substantially as described.

3. In an automatic train-pipe coupling, the combination of a head provided with a rear chamber at which to connect the pipe, tubular chambers leading from and communicating with each other through said rear chamber, and a tube confined in and projecting beyond one of said tubular chambers, the other tubular chamber terminating in a bell-mouth and containing a dish-faced spring-pressed slitted rubber washer m, substantially as described.

4. In an automatic train-pipe coupling, the combination of a head provided with a rear chamber at which to connect the pipe, tubular chambers leading from and communicating with each other through said rear chamber, a tube headed at its opposite ends and confined at one head against a bearing in one of said tubular chambers containing a washer v' controlled by a spring-pressed tubular bearing v^2, the other tubular chamber terminating in a bell-mouth and containing a slitted washer m controlled by a spring-pressed tube p^4, substantially as described.

5. In an automatic train-pipe coupling, the combination of a head provided with a rear chamber, a connection between said chamber and pipe containing a three-way valve, an elbow-tube extending from said connection for a hose-coupling, tubular chambers leading from and communicating with each other through said rear chamber, and a tube confined in and projecting beyond one of said tubular chambers, substantially as described.

6. In combination with the chamber of a train steam-pipe automatic coupling, a drip device comprising a chamber h containing a bearing f^5 and provided with a discharge-opening in its bottom, a valve f seated in said opening and having a protruding stem f^3 and a guide-stem f^4 in said bearing, and a lever f^2 fulcrumed between its ends, weighted at one end and connected at its opposite end with said valve-stem, substantially as described.

7. In an automatic train-pipe coupling, the combination of a head provided with rear chambers respectively connecting with the air-brake pipe, the air-signal pipe and the steam-pipe, a pair of tubular chambers p' and p^2 leading from and communicating with each other through each of said rear chambers, and a tube n confined in and projecting beyond each chamber p', substantially as described.

8. In an automatic train-pipe coupling, the combination of a head D provided with rear chambers having a cover equipped with nipples each communicating with one of said chambers for connection thereof respectively with the air-brake pipe, signal-pipe and steam-pipe, chambers p' leading from said rear chambers and each having loosely confined in it a tube n, and chambers p^2 leading from said rear chambers and each terminating in a bell-mouth p^3 and containing a spring-pressed valve m, substantially as described.

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In presence of—
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DAN W. LEE.