

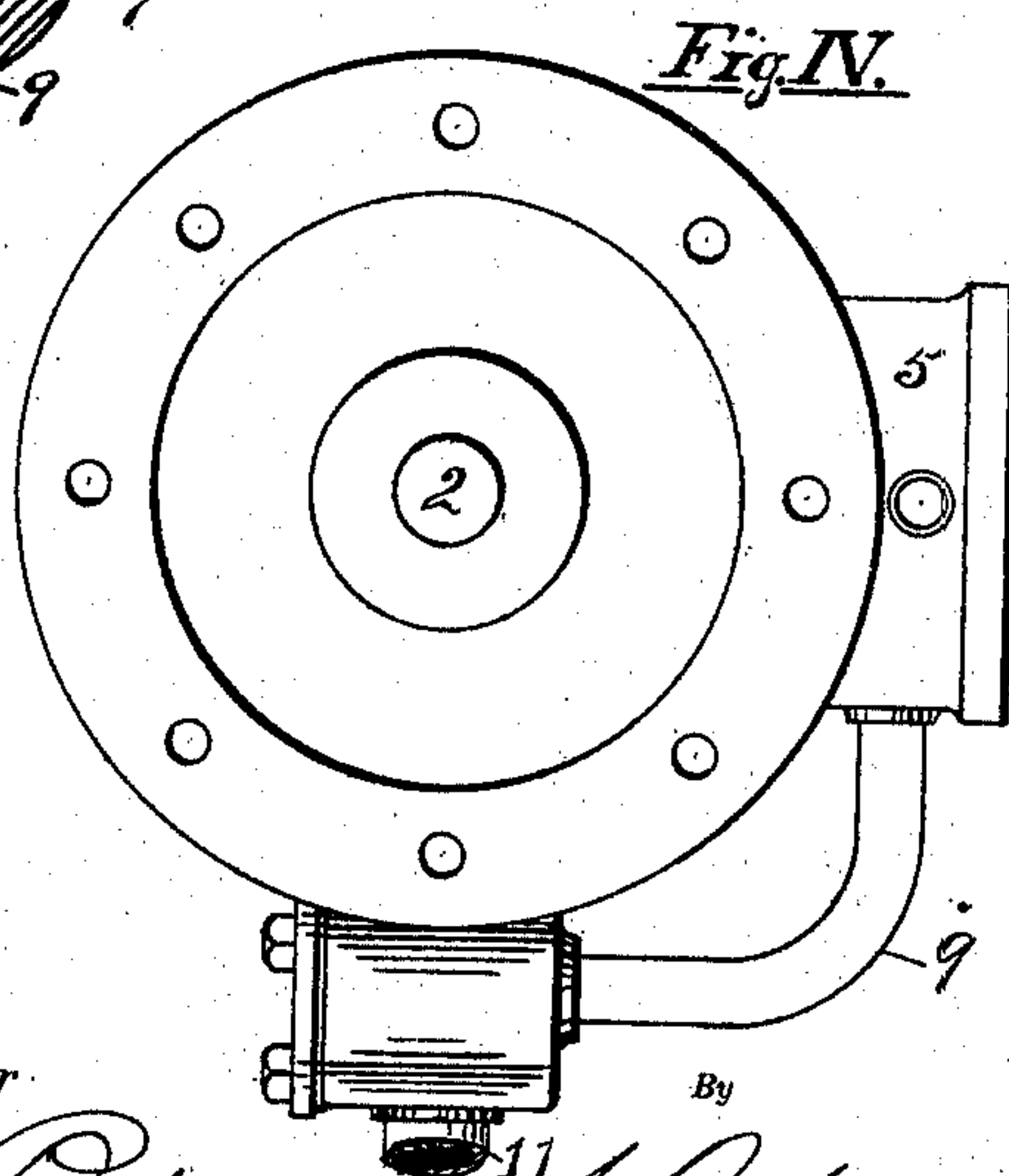
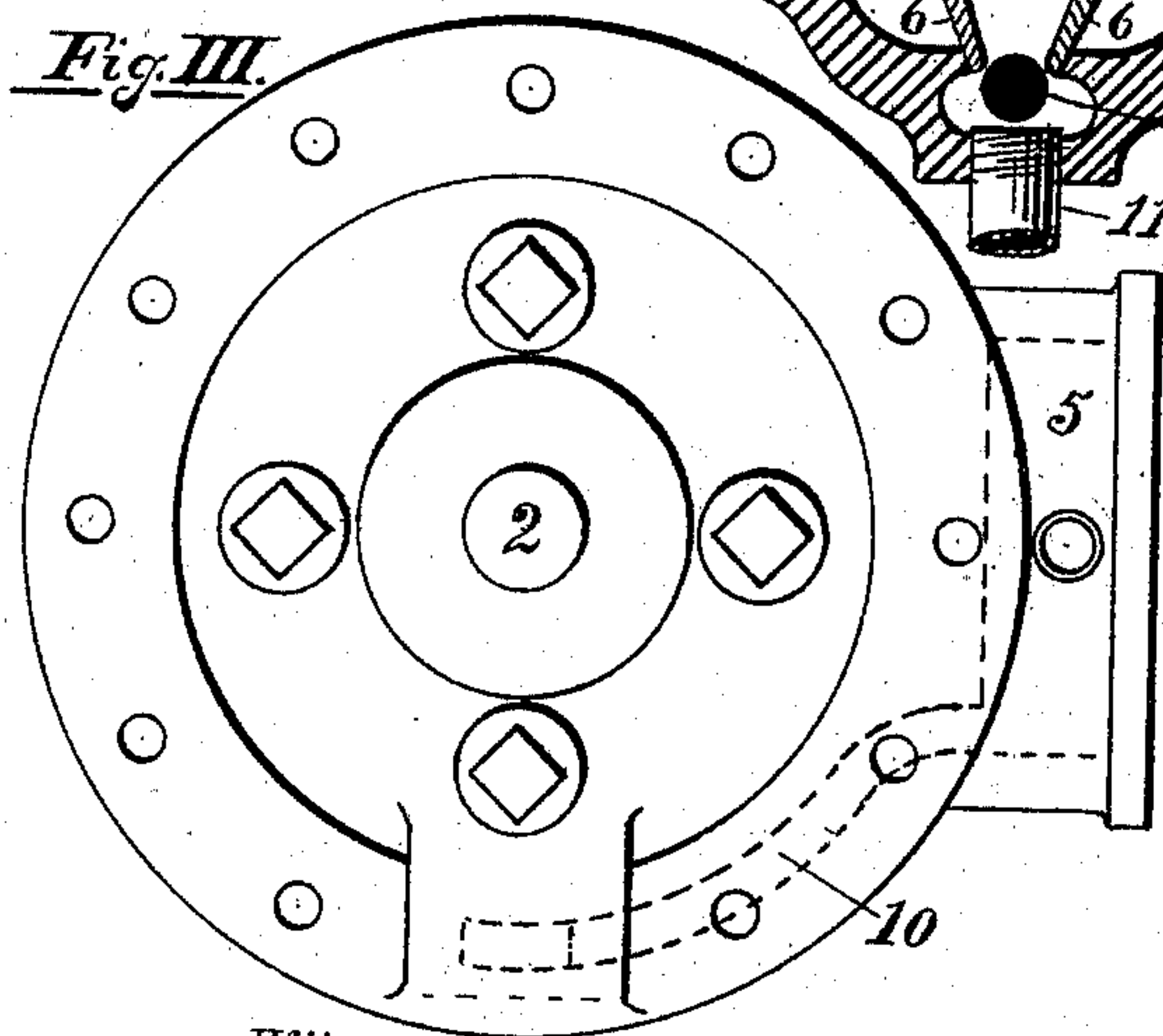
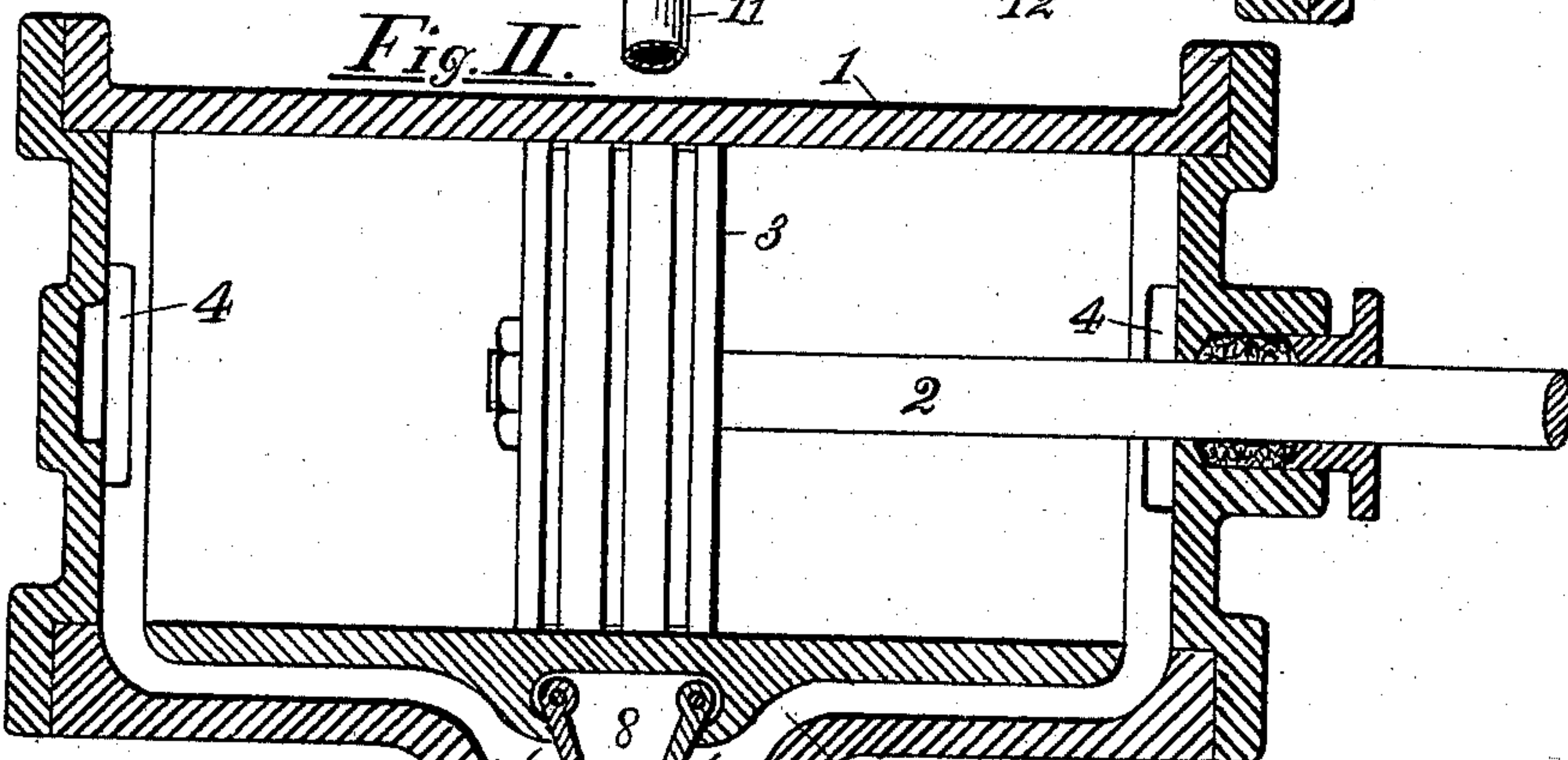
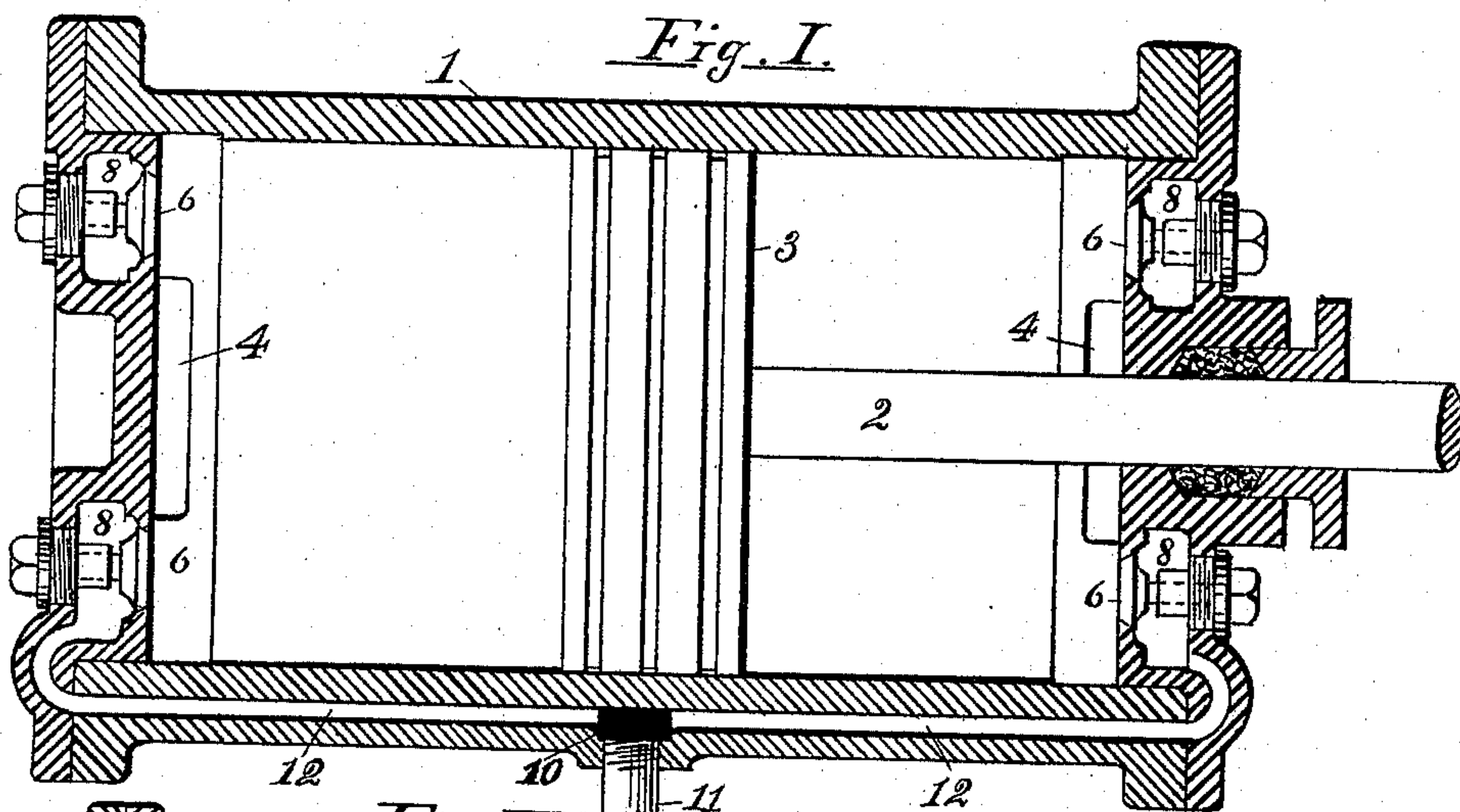
No. 608,217.

Patented Aug. 2, 1898.

J. C. PARKER.
RELIEF VALVE.

(Application filed June 10, 1897.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN C. PARKER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
PARKER ENGINE COMPANY, OF SAME PLACE.

RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 608,217, dated August 2, 1898.

Application filed June 10, 1897. Serial No. 640,137. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. PARKER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Relief-Valves for Steam-Engines; and I hereby declare the following specification and drawings therewith to be a full and complete description of my invention and the manner of applying the same in practice.

My invention relates to what are technically called "relief-valves" and a means for expelling water entrapped in steam-engine cylinders.

My improvements consist in providing for each end of a steam-engine cylinder, or for one end if both ends are not exposed to entrapped water, an escape valve or valves connecting with an exterior chamber under pressure and so mounted as to open automatically by a superior pressure within the cylinder and be held shut when not in action by counteracting pressure applied on the other or outer side of the valves, these remaining closed under normal working pressure in the steam-cylinder and opening whenever from any cause the pressure within the steam-cylinder rises above that of the static pressure in the outer chamber, into which the valves open or with which they communicate.

The object of my invention is to avoid water obstruction in steam-cylinders by permitting its free escape through valves of sufficient area into an inclosed chamber as soon as the pressure thereon exceeds that of the steam in the boiler or other source of static pressure that holds the relief-valves closed, and thus without loss of steam guard against accidents due to entrapped water or its escape into the air.

Referring to the drawings, Figure I is a central longitudinal section through a steam-engine cylinder provided with relief-valves opening into steam-jacket chambers in the cylinder-heads. Fig. II is also a central longitudinal section through a steam-engine cylinder having the relief-valves placed beneath

the cylinder. Fig. III is an end view of Fig. I. Fig. IV is an end view of Fig. II.

Similar numerals of reference indicate corresponding parts throughout.

In that class of steam-engines provided with piston or other positive-closing valves, now comprising a large share of the whole, safety demands provision for the sudden escape of entrapped water. Such escape should be as free as possible, both as to volume and resistance, require no care or adjustment, and be reliable in action; also should be into a closed vessel or chamber to avoid loss of steam and to avoid danger. To these ends I construct devices as shown in the drawings, 1 being the steam-cylinders, 3 the pistons, and 2 the piston-rods, of engines provided with my improvements. Steam-ports 4 communicate to each end of the steam-cylinder from the valve-boxes 5 in the usual manner, and 6 are relief-valves communicating with each end of the steam-cylinder and to the chambers 8, in Fig. I directly and in Fig. II by means of the ports 7. The chambers 8 are in communication with the valve-box 5 by means of a pipe 9, as seen in Fig. IV, or a port 10, that extends around the cylinder 1 and connects to the valve-box 5, as indicated by dotted lines in Fig. III. The chambers 8 may also communicate by means of pipes 11 direct to a steam-boiler or any vessel under pressure equal to the working pressure in the steam-cylinders 1.

The valves 6 can be of the disk form, as shown in Fig. I, opening directly from the interior of the cylinder 1, or of the hinged kind, as seen in Fig. II, placed in the conduits or ports 7, the construction being immaterial so long as the opening-and-closing movement is free.

The horizontally-moving valves and other features of construction, as shown in Fig. I, are especially adapted for engines of high speed, and so a large amount of suddenly-entrapped water can be discharged into the chambers 8 and ports 12 or into a steam-jacket space around the cylinder when the cylinders are so provided.

The chambers 8, being, when properly drained, partially filled with steam, provide an elastic resistance to water suddenly discharged therein; also permit relief of over-
5 pressure in the steam-cylinder from entrapped steam or other cause, thus acting as safety-valves.

The operation is as follows: If water becomes entrapped in the cylinder 1, it is forced
10 out by the piston 2 through the valves 6 into the chambers 8 and from there through the pipe 9 or the passage 10 into the valve-boxes 5 or may be expelled through the pipes 11, leading to the steam-boiler or any closed
15 chamber containing a static pressure equal to that of the working pressure in the steam-cylinder 1. As soon as the entrapped water is expelled and the equilibrium of pressure on the outer and inner sides of the valves 6
20 ceases these close by pressure in the chambers 8. It will be seen that by the valves 6 being in a closed circuit and not opening to the air no steam, water, or heat can escape or be lost and that leakage does not cause
25 any waste worth considering. It will be seen also that no adjustment or attention is required, and that the action of the valves 6 will be reliable under all circumstances.

I do not claim a relief-valve operated by a piston under differential pressure or requiring auxiliary springs. 30

Having thus described the nature and objects of my invention and a suitable manner of constructing and applying the same, what I claim as new, and desire to secure by Letters 35 Patent, is—

In a steam-engine, a relief valve or valves opening outward from the steam-cylinder or a passage therefrom and operated solely by fluid-pressure therein, in combination with a 40 chamber in the rear of said valve, and a downwardly-extending passage communicating directly with the valve-box, steam-boiler or other source of initial pressure, whereby water entrapped in the cylinder will be re- 45 turned to the steam-boiler or other vessel in communication therewith by superior pressure in said cylinder, substantially as specified.

In testimony whereof I have hereunto af- 50 fixed my signature in the presence of two witnesses.

JOHN C. PARKER.

Witnesses:

K. LOCKWOOD-NEVINS,
H. SANDERSON.