

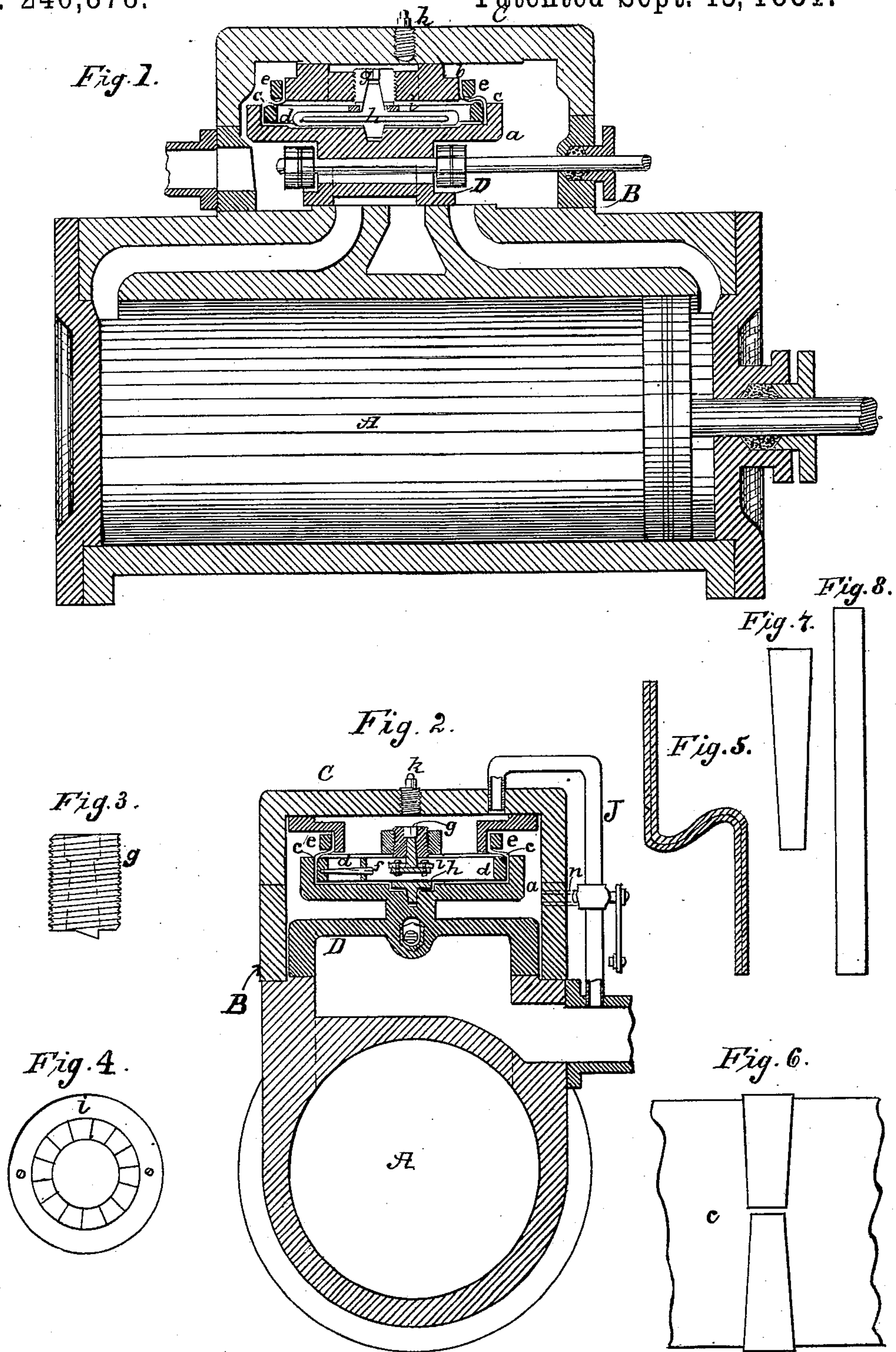
(Model.)

2 Sheets—Sheet 1.

W. R. GLUYAS.
BALANCED VALVE.

No. 246,878.

Patented Sept. 13, 1881.



Witnesses:

John A. Grabowsky
James F. Hoffman

Inventor.

Walter R. Glynas

(Model.)

2 Sheets—Sheet 2.

W. R. GLUYAS,
BALANCED VALVE.

No. 246,878.

Patented Sept. 13, 1881.

Fig. 9.

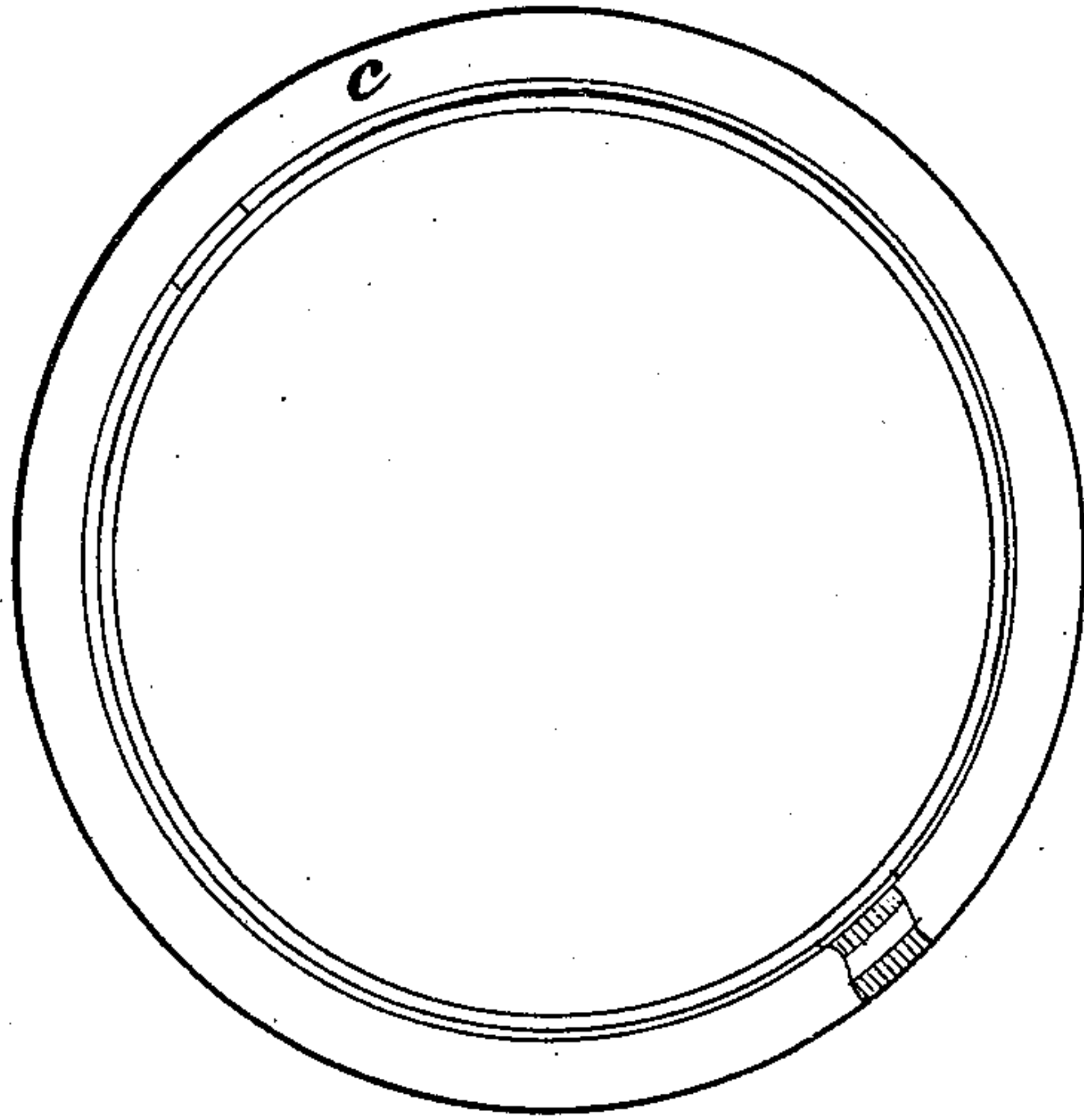


Fig. 10.

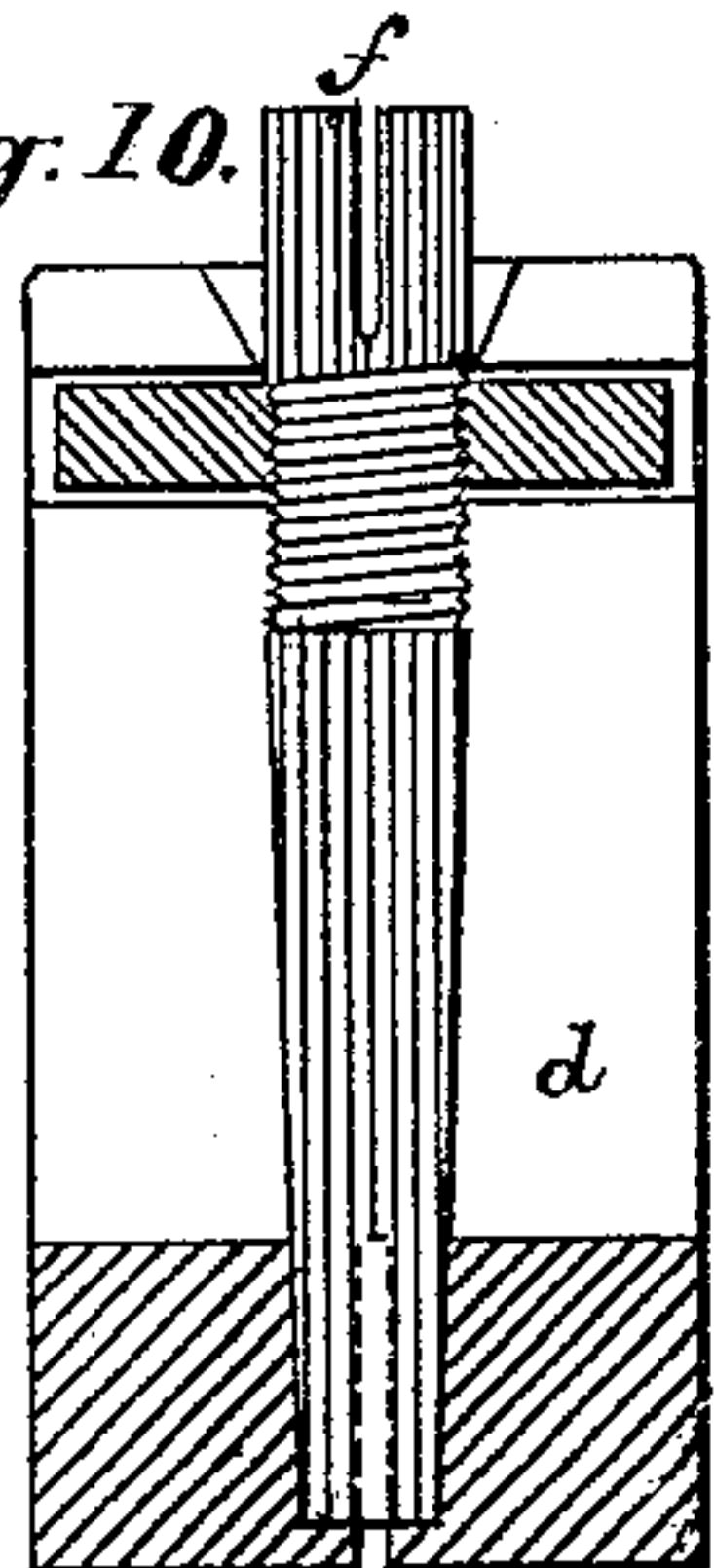


Fig. 14.

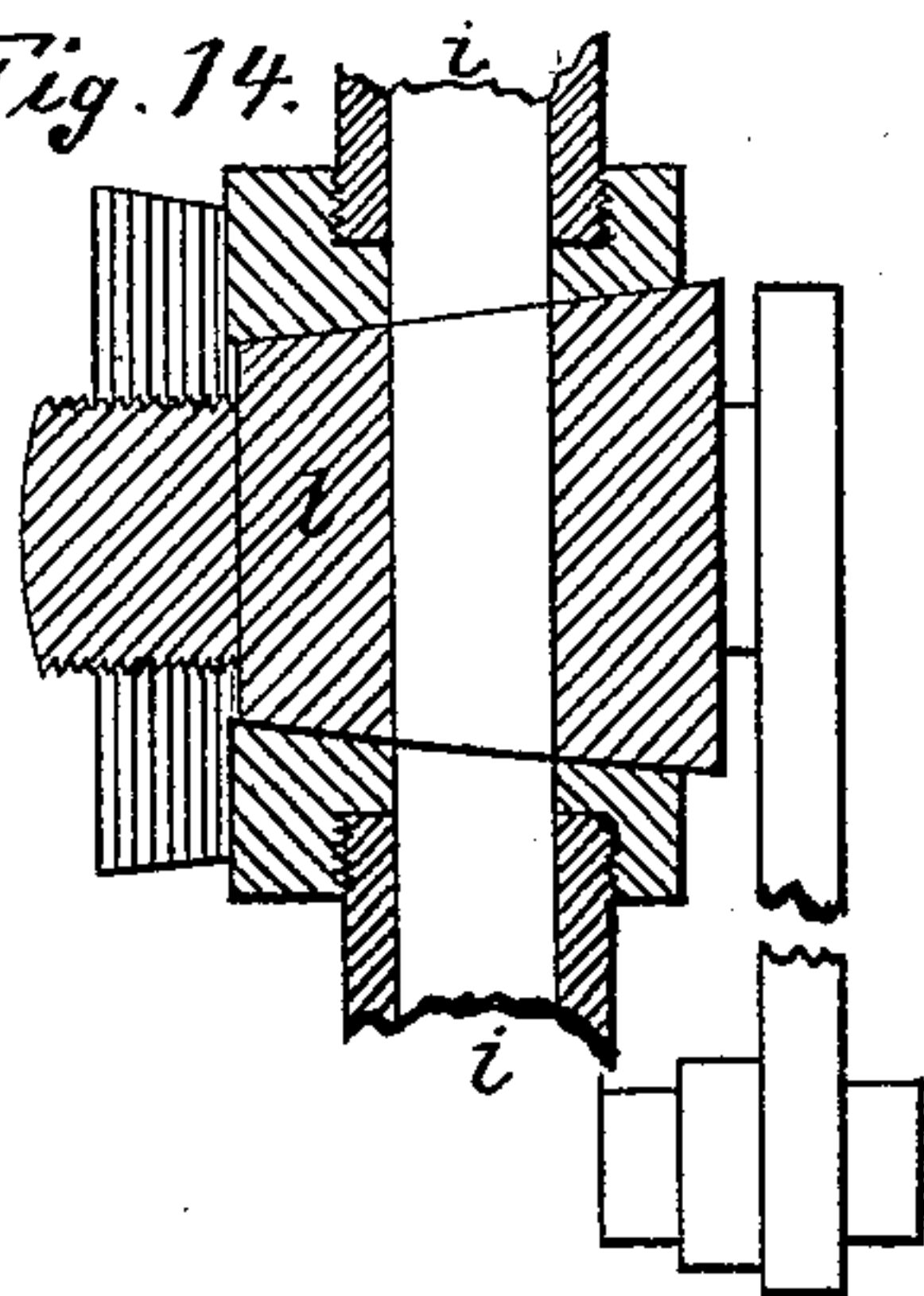


Fig. 11.

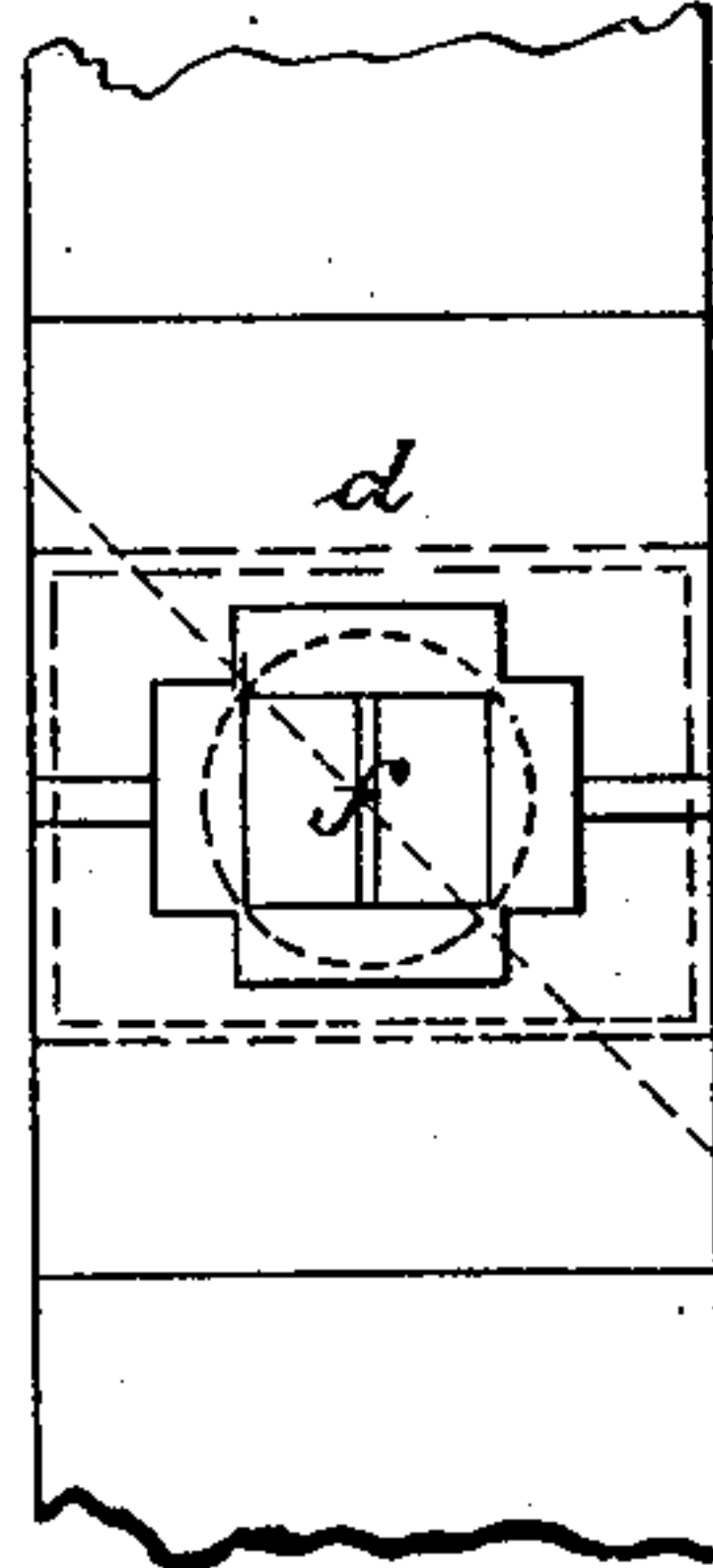


Fig. 12.

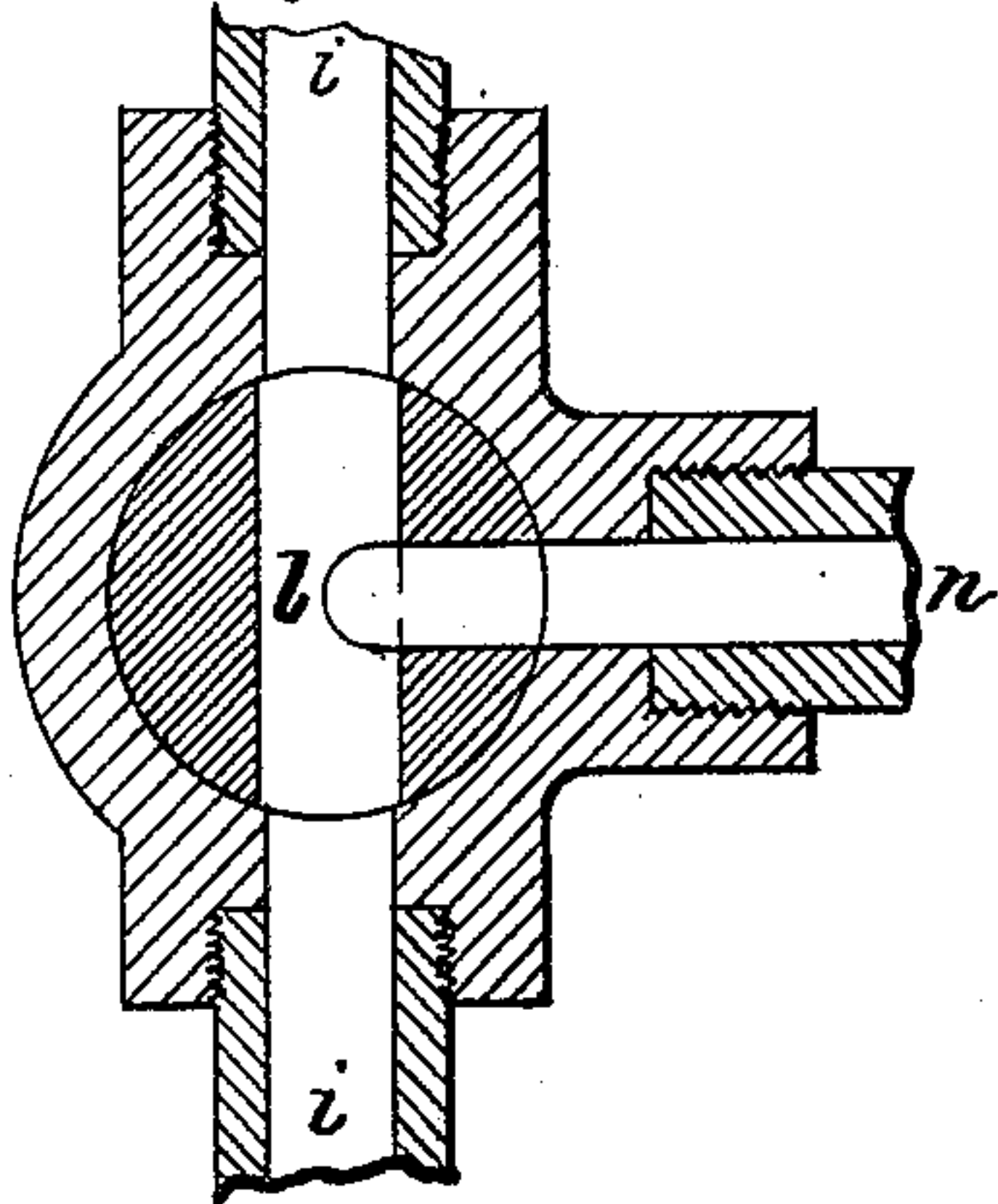
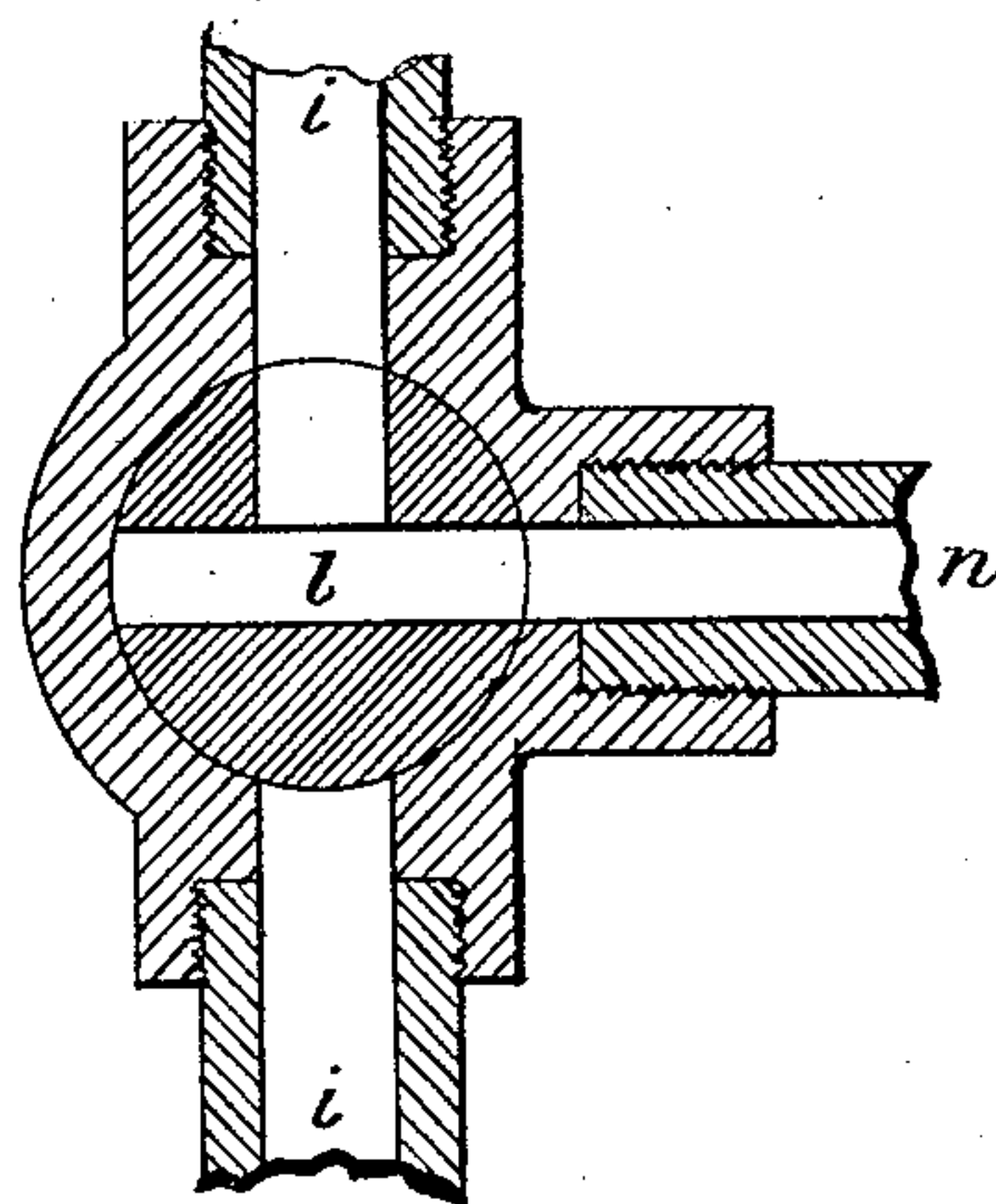


Fig. 13.



Witnesses:

John A. Grabowsky
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Inventor.

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UNITED STATES PATENT OFFICE.

WALTER R. GLUYAS, OF COLUMBUS, OHIO.

BALANCED VALVE.

SPECIFICATION forming part of Letters Patent No. 246,878, dated September 13, 1881.

Application filed February 21, 1881. (Model.)

To all whom it may concern:

Be it known that I, WALTER R. GLUYAS, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful
5 Improvements in Balanced Valves for Steam-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it,
10 reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in balanced slide-valves for steam-engines.

Heretofore in balanced valves (referring to
15 my Patents No. 205,541, July 2, 1878, and No. 230,769, August 3, 1880, wherein the main parts have been connected together by a sheet-metal hoop secured by rings and coupled together and kept to their seats by a spring) the
20 hoop has been rigidly secured to the parts of the valve, the fold in the middle portion being depended on entirely for the adjustment of the parts of the valves to their seats, and the spring has been secured and adjusted by a set-
25 screw having a shoulder and parallel sides. These valves have been found to be objectionable on account of the fold in the hoop not allowing the valves to readily adjust themselves to their seats and on account of the set-
30 screw working loose.

The object of my invention is to provide a balanced valve for steam-engines of such construction that the balancing device may be readily attached to any common slide-valve
35 now in use, and be so connected together that it will always remain steam-tight and the parts readily adjust themselves to their seats, and so that none of the parts can work loose while the valve is in operation, and also be so ar-
40 ranged that the valve may be operated as a balanced valve or as an ordinary slide-valve.

My invention consists of a balanced valve having the combination, with an ordinary slide-valve, of a hoop each side of which is made of
45 different sizes and fitting to the parts of the valve, so as to leave the middle portion flexible in a direction perpendicular to the valve-faces, it being secured by adjustable rings to the parts of the valve; also, in a spring of such con-
50 struction that the wear of the parts will not affect its fit to the parts of the valve, and a

set-screw for its adjustment of such construction that it cannot work loose while the valve is in operation; also, in means for throwing on or taking off the steam-pressure from the
55 back of the main valve.

In the drawings, A represents an engine-cylinder, having the usual ports and passages with exhaust-pipe attached.

B represents the valve-chest with the usual
60 steam-pipe and cover, C. There are two valve-seats, one on the body of the cylinder and the other on the cap of the chest C, which is made of such form as to give room for the valve.

D is an ordinary slide-valve, having a pro-
65 jecting portion, *a*, which has an opening of any suitable shape, but preferably of circular form, to receive the hoop *c*.

b is the relief-plate, having a face similar to the valve and a projecting portion of a differ-
70 ent size from the opening in projection *a*. A portion of hoop *c* is made to fit in the opening in projection *a*, and the opposite portion is made to fit over the projection on relief-plate *b*, and the middle portion is made of such shape as to
75 be flexible in a direction perpendicular to the valve-faces, preferably S-shaped. It consists of a number of split rings of sheet metal so placed together as to break joint and allow it to adjust itself to the parts of the valve, and taper-
80 ing or other shaped pieces of sheet metal, *o*, fitted between the opposite ends and secured by soldering or bending the pieces, so as to make it steam-tight between the adjacent parts of the valve. The portion of this hoop which fits
85 over the projection on relief-plate *b* is secured by a solid ring, *e*, shrunk on, and the portion which fits into the opening in projection *a* is adjustably secured by a split ring, *d*, preferably split diagonally across its outer surface, so
90 as to bear against all points of the hoop and keep it against the inner surface of the opening. Ring *d* is made slightly larger than the hoop and sprung in, and is further secured by a tapering screw-bolt, *f*, acting as a wedge
95 placed in the dividing-point, lugs being cast on the inside of said ring at this point. Screw-bolt *f* is threaded to screw into a nut (fitted into a recess so as not to turn.) One end is made square to receive a wrench, and the opposite
100 end is split, so that its sides may be sprung into recesses formed in the ring to prevent its turn-

ing after it has been screwed in as far as necessary. The hoop being adjustably secured, it does not depend on the flexible portion through a very wide range of movement. The sides of the rings *d e* are made to conform in shape with the middle portion of the hoop *c*, and are sufficiently close together to prevent its injury by the movements of the valve.

A spring, *h*, is placed between the two main parts of the valve, which may be made of any metal which possesses sufficient elasticity, either cast or wrought, and is made of sufficient strength to carry relief-plate *b*, and also to keep the parts of the valve to their seats. Tapering projections are formed on the opposite portions of this spring, which are fitted into the parts of the valve. It is adjusted by a set-screw, *g*, which is screwed into a hole drilled and tapped for that purpose in the center of a cross-piece on relief-plate *b*, and is bored out to receive one of the tapering projections, and has a projecting tooth engaging with a notched plate, *i*, which is secured to the spring to prevent its turning out after it has been screwed in sufficiently. It is made so as to be turned by a wrench, a screw-plug, *k*, being placed in the chest-cap for convenience of access to it.

The recess between the valve and relief-plate communicates with the main exhaust by pipe *J*, which has a branch pipe, *n*, communicating with the live steam in the chest. A three-way valve, *l*, regulates the flow of steam through these pipes, and it is apparent that if it be placed in the position shown in Figures 1, 2 the valve will be relieved from pressure, and if placed in position shown in Figs. 1, 3 it will operate as an ordinary slide-valve. There is sufficient difference between the area of the face of valve *D* and the opening in the projection *a* and between the face of relief-plate *b* and its projection that the steam-pressure will keep the parts to their seats. The pressure of the springs is constant and is sufficient to keep the parts of the valve to their seats without reference to steam-pressure. Steam is admitted to the chest and exhausted as usual. The valve is moved by an eccentric in the usual way, and as it is relieved from pressure but little power is required to move it. The parts are so secured that they cannot work loose while the valve is in operation, and the valve is so arranged that it may be operated as a balanced valve or as an ordinary slide-valve.

It is evident that by slight changes in construction steam may be admitted into the interior of the valve through the chest-cap and exhaust into the chest instead of as herein described; also, the hoop may be secured by two

solid rings or two split rings instead of as herein described, and similar results obtained.

It is also evident that the pipe which communicates with the interior of the valve and the main exhaust may be in communication with the atmosphere with the same result; also, the passages may be made through the chest instead of the pipes. I do not limit myself to the particular form of hoop or rings for securing it herein shown and described; nor to the particular form and construction of spring and set-screw herein described; neither to any particular arrangement or construction of pipes or valve for regulating the pressure of steam on the main valve, or any particular means of operating the same.

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

1. In a balance-valve, the combination, with an ordinary slide-valve having a relief-plate, of a hoop adjustably secured in an opening in the back of the main valve by a split ring and tapering screw-bolt and rigidly secured to a projection on relief-plate by a solid ring shrunk thereon, substantially as set forth.

2. The combination, with a balance-valve having a slide-valve and a relief-plate and rings, of a hoop the opposite sides of which are made of different sizes, and the middle portion is formed of such a shape as to be flexible perpendicularly and made of a number of split rings of sheet metal so arranged as to break joint, with pieces fitted between the opposite ends, substantially as set forth.

3. The combination, in a balance-valve having a slide-valve and relief-plate, of a spring with tapering projections on its opposite portions, with a set-screw having a projecting tooth engaging with a notched plate, all arranged and operating substantially as set forth.

4. In a balance-valve having a slide-valve and relief-plate, and provided with a passage leading from the interior of the valve to the main exhaust-passage, and a steam-passage leading from the steam-chest to the passage connecting with the main exhaust-passage, said steam-passages being controlled by a valve or valves in such a manner as to allow the pressure of steam on the back of the main valve or relieve it therefrom, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of January, 1880.

WALTER R. GLUYAS.

Witnesses:

J. M. THOMAS,
T. J. THOMAS.