

(No Model.)

2 Sheets—Sheet 1.

N. TVERSKOY.
COUPLING.

No. 547,650.

Patented Oct. 8, 1895.

FIG. 4.

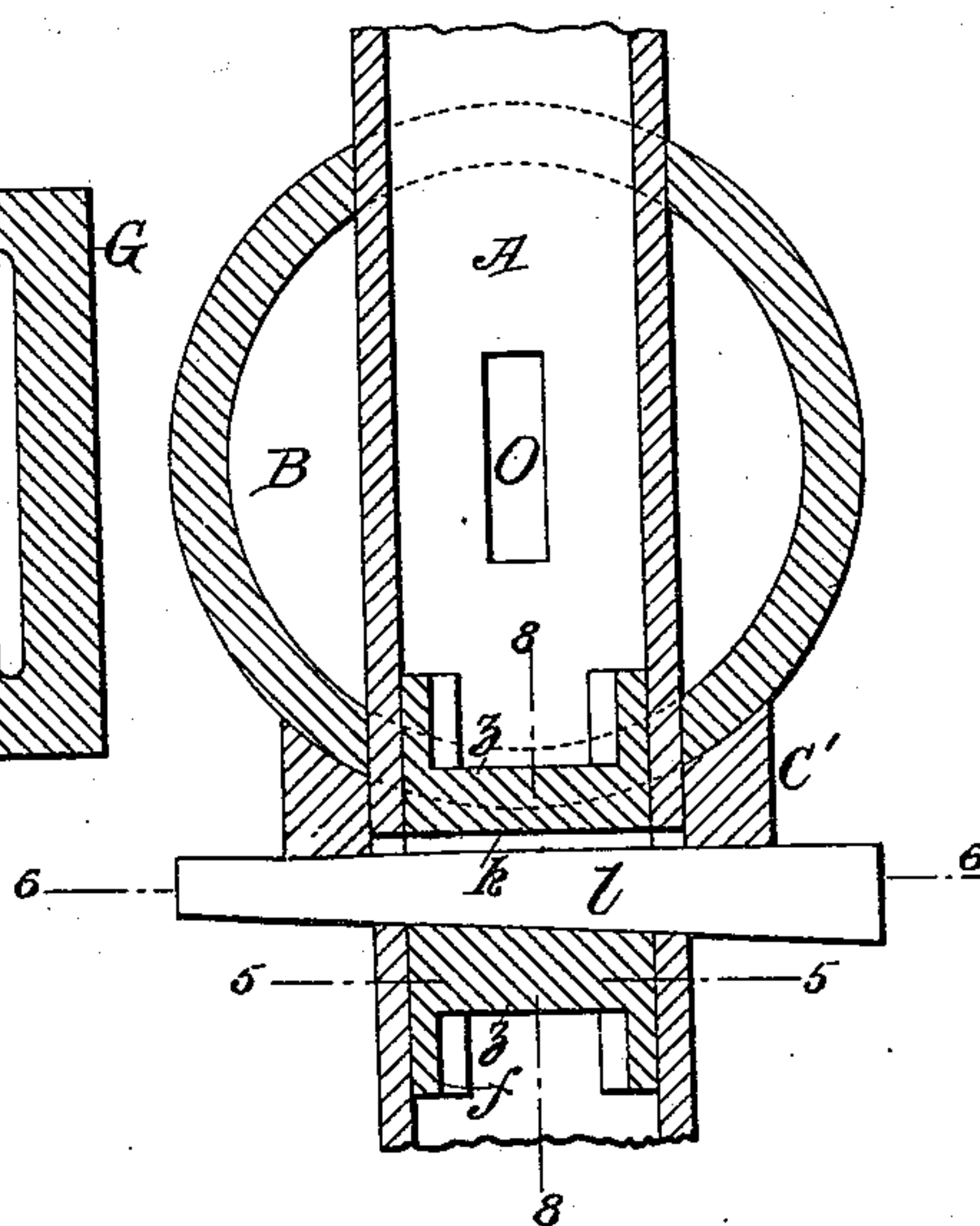
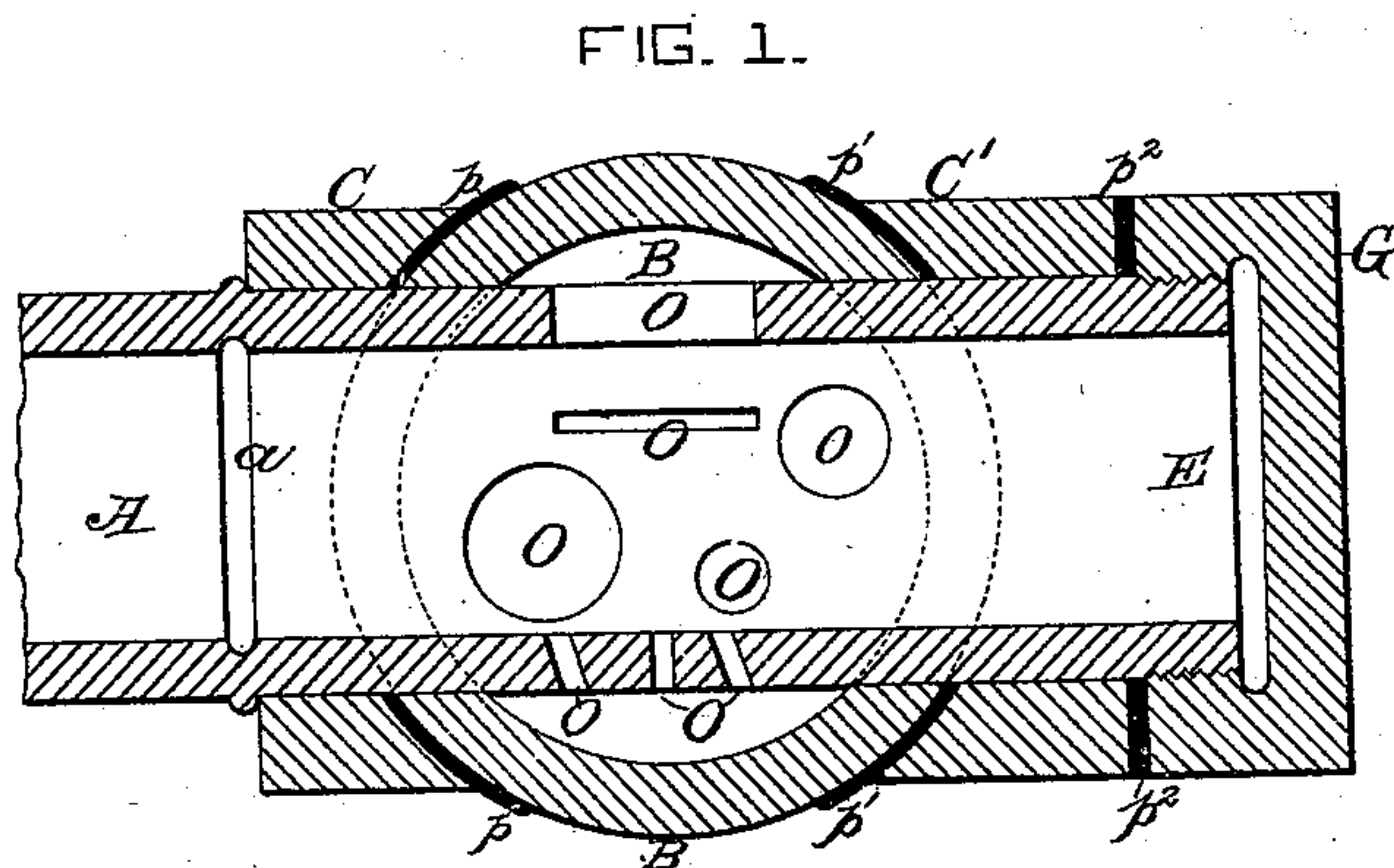


FIG. 2.

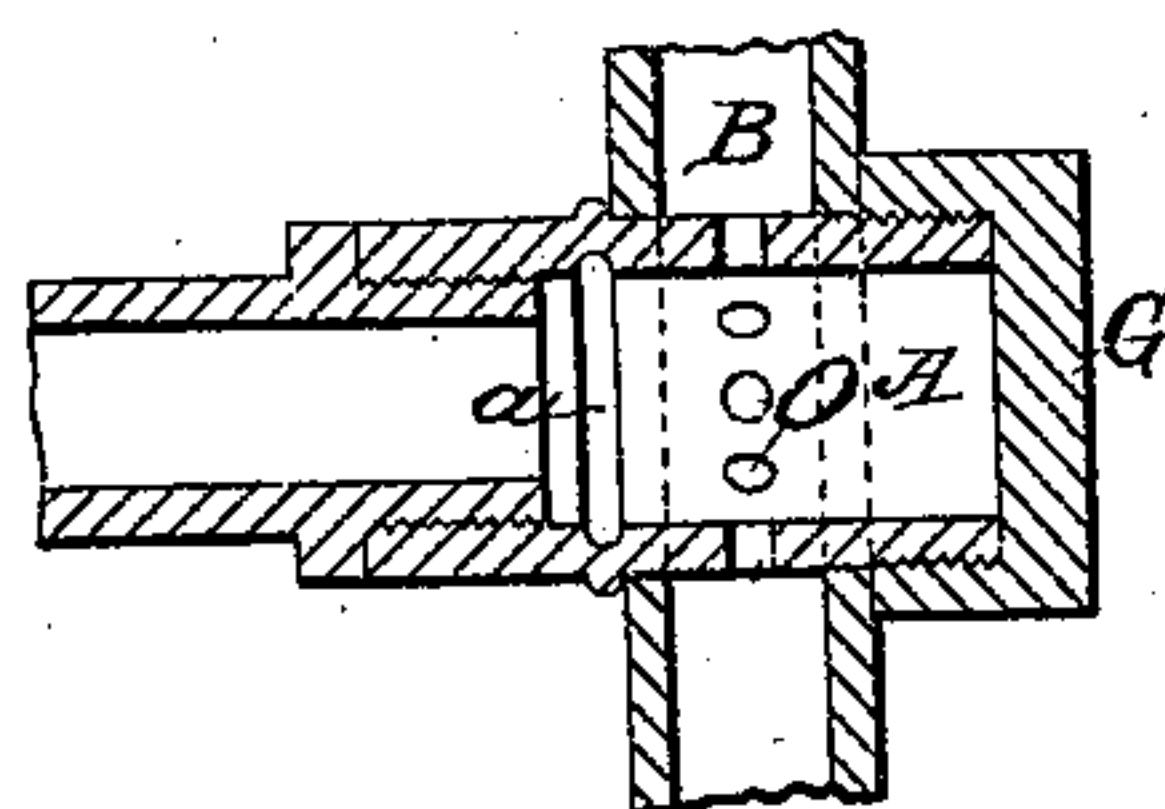


FIG. 3.

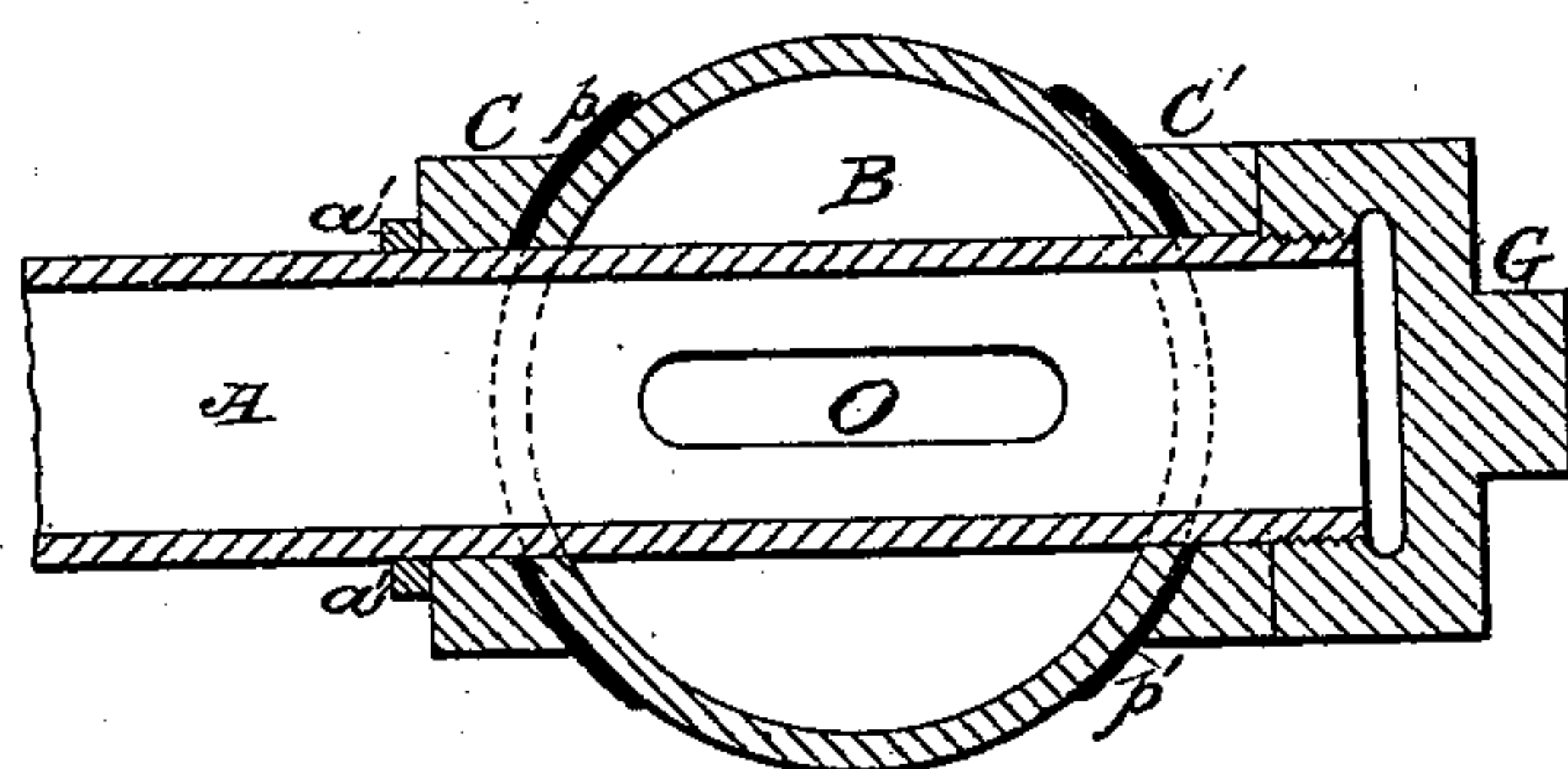


FIG. 7-

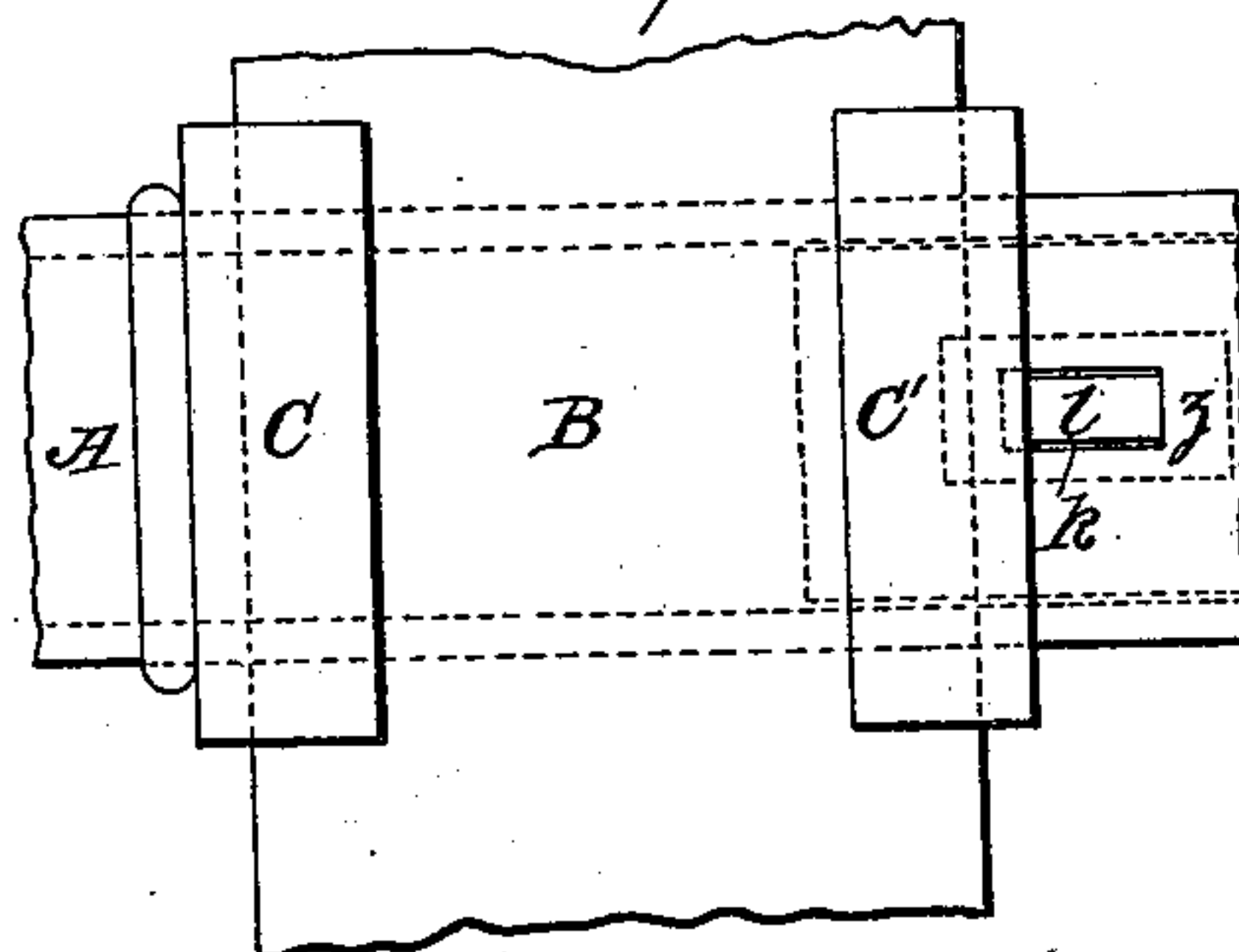


FIG. 5.

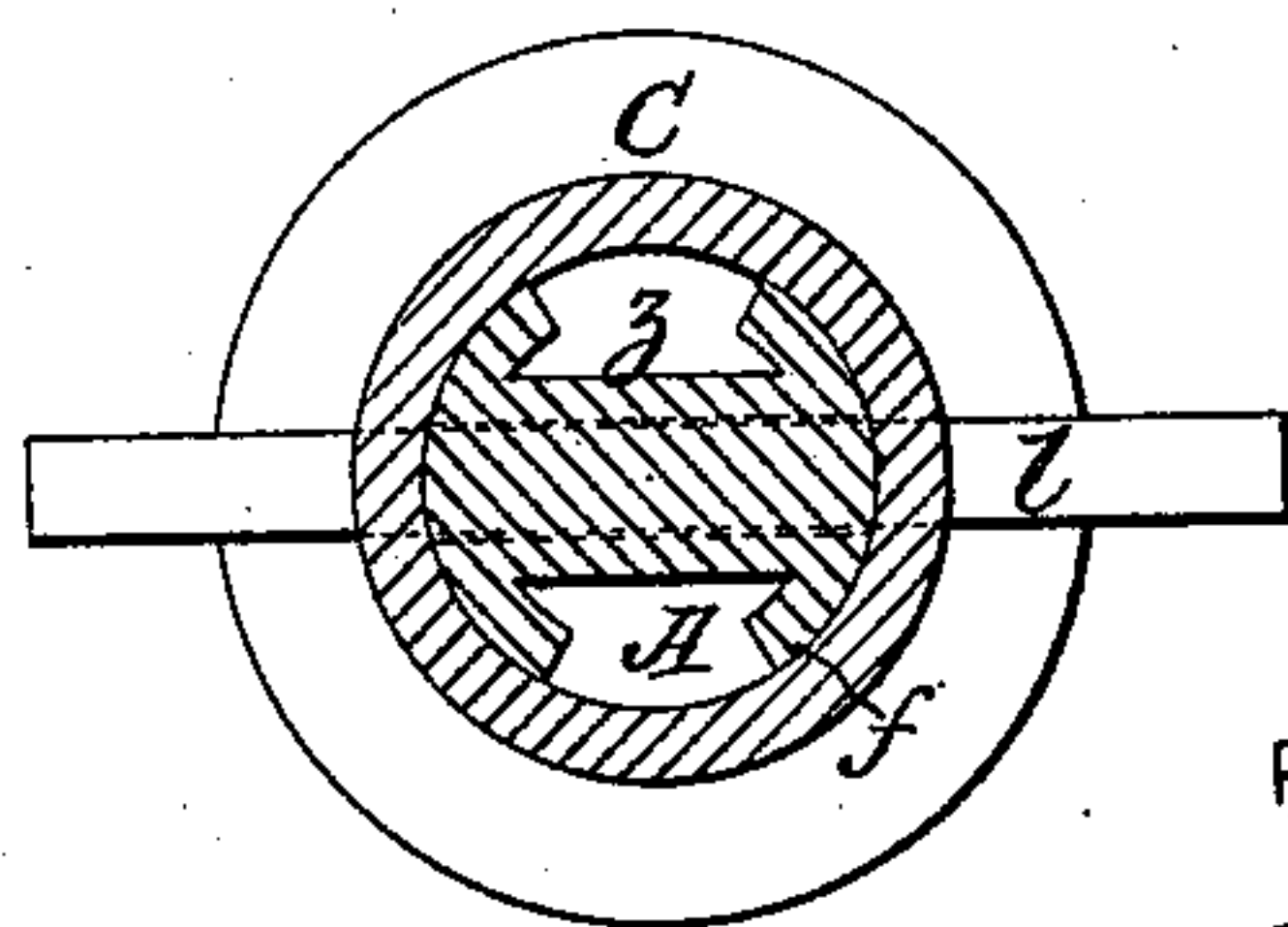


FIG. 5.

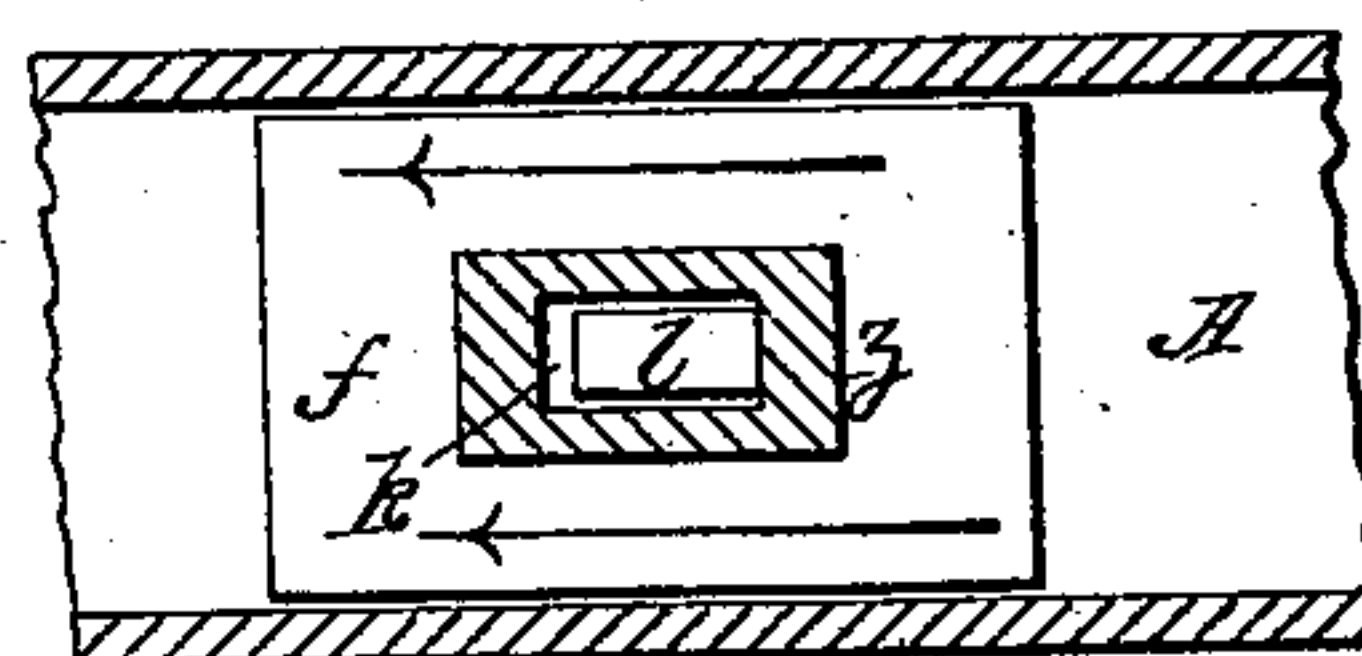
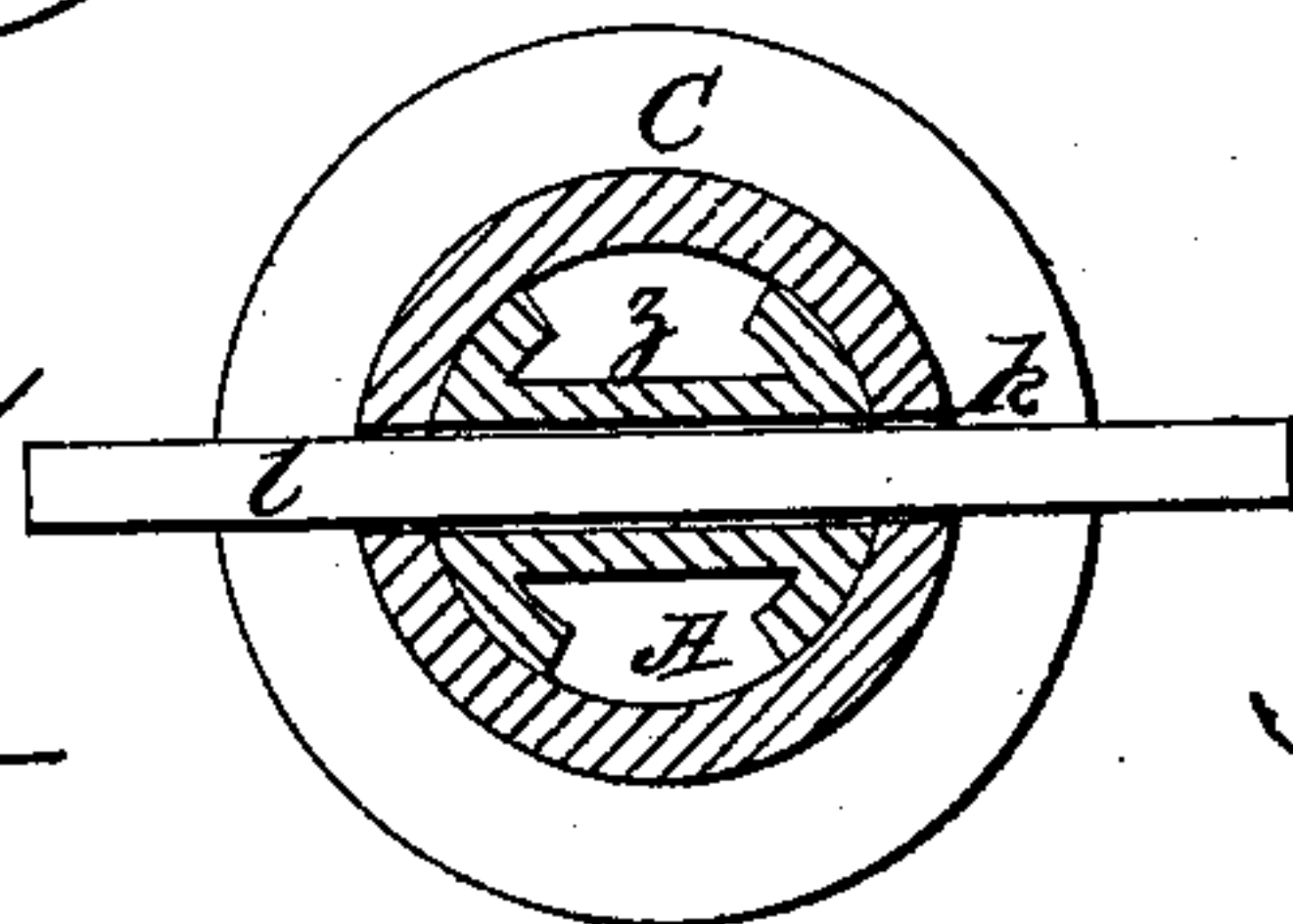


FIG. 6.



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FIG. 9.

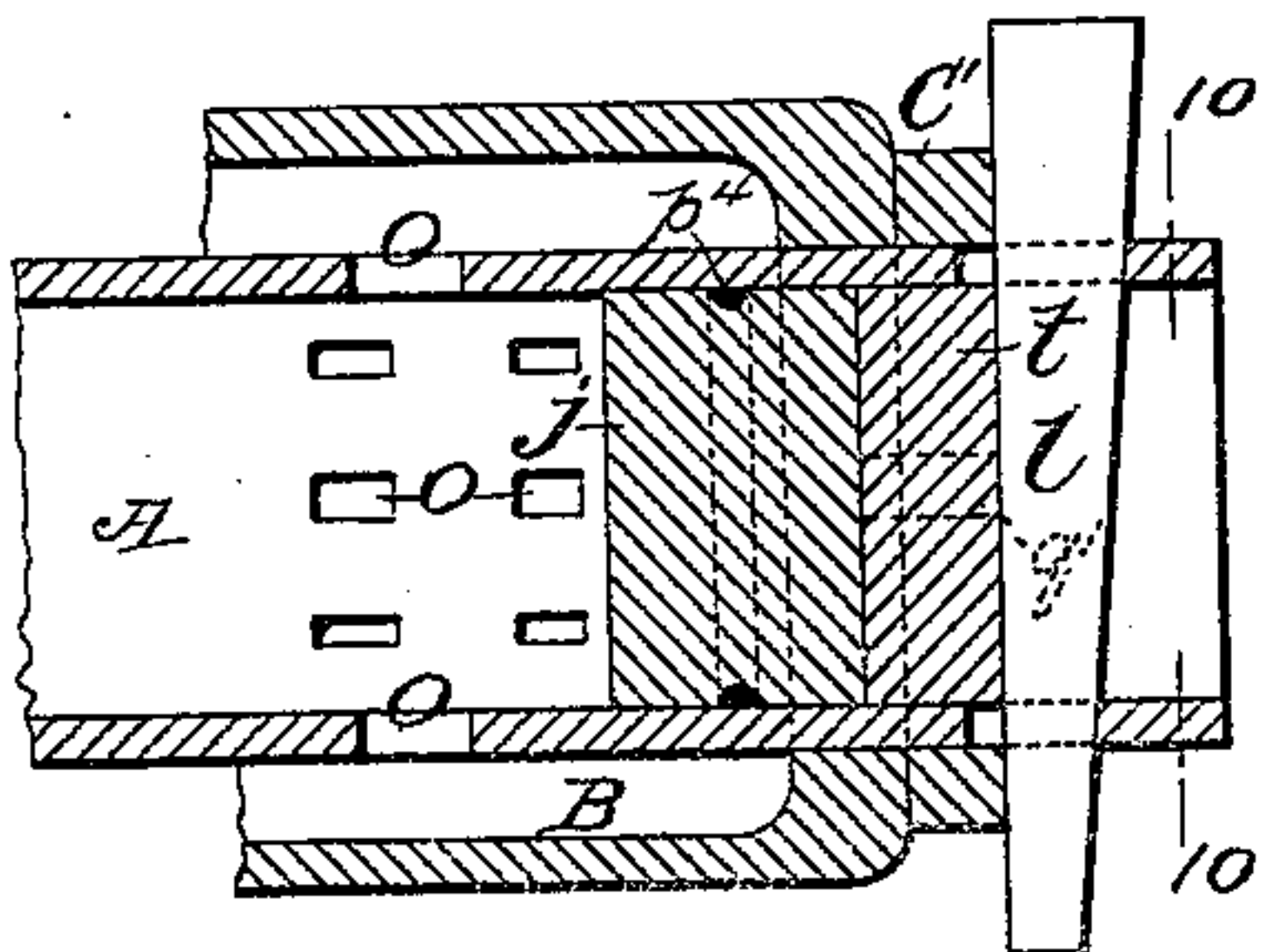


FIG. 10.

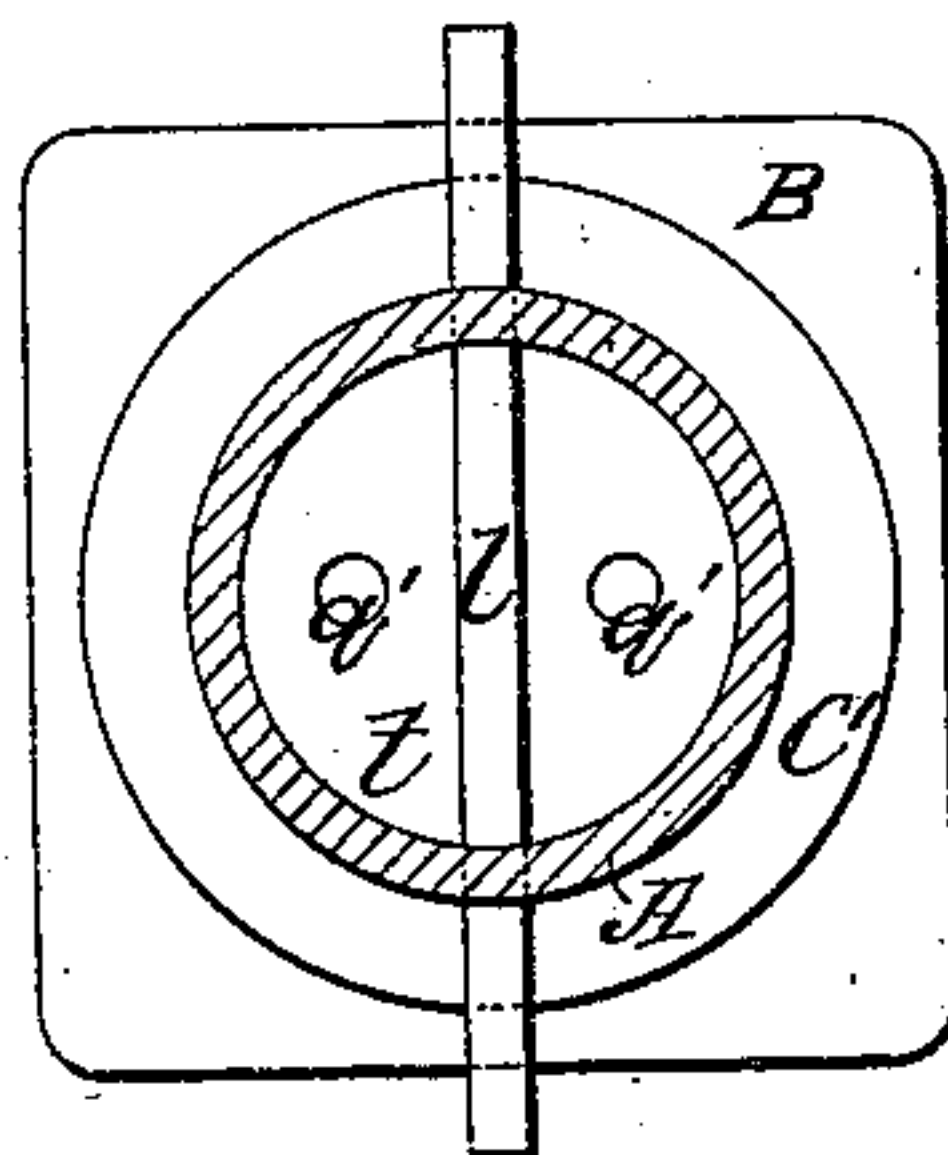


FIG. 15.

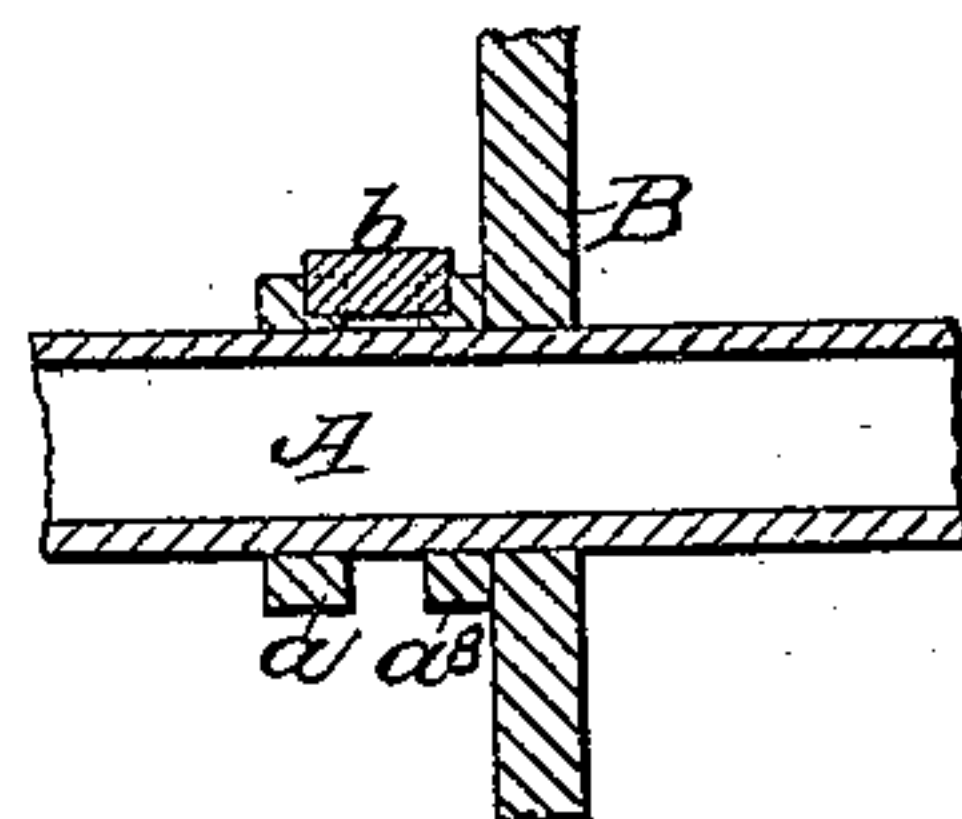


FIG. 11.

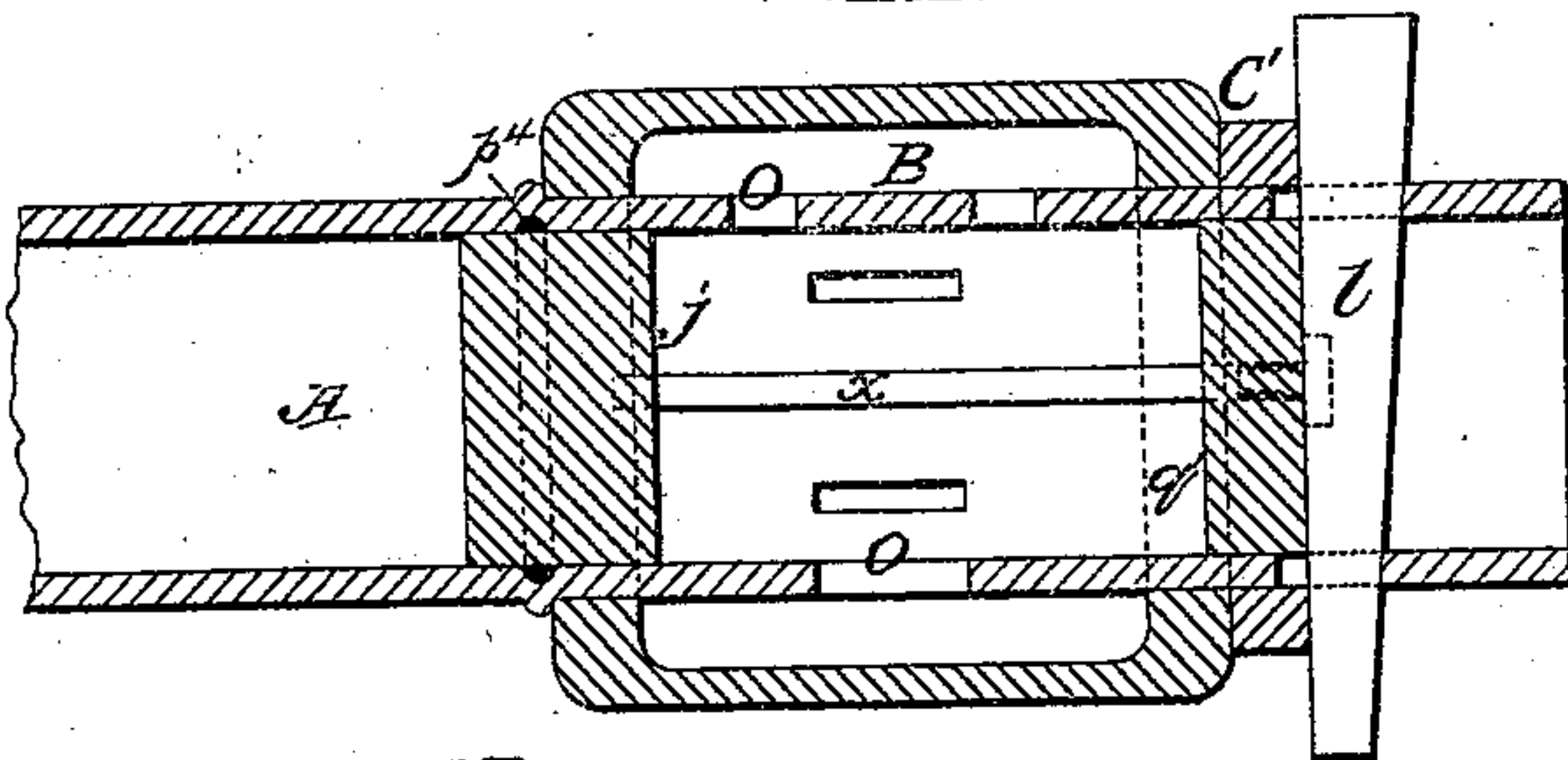


FIG. 16.

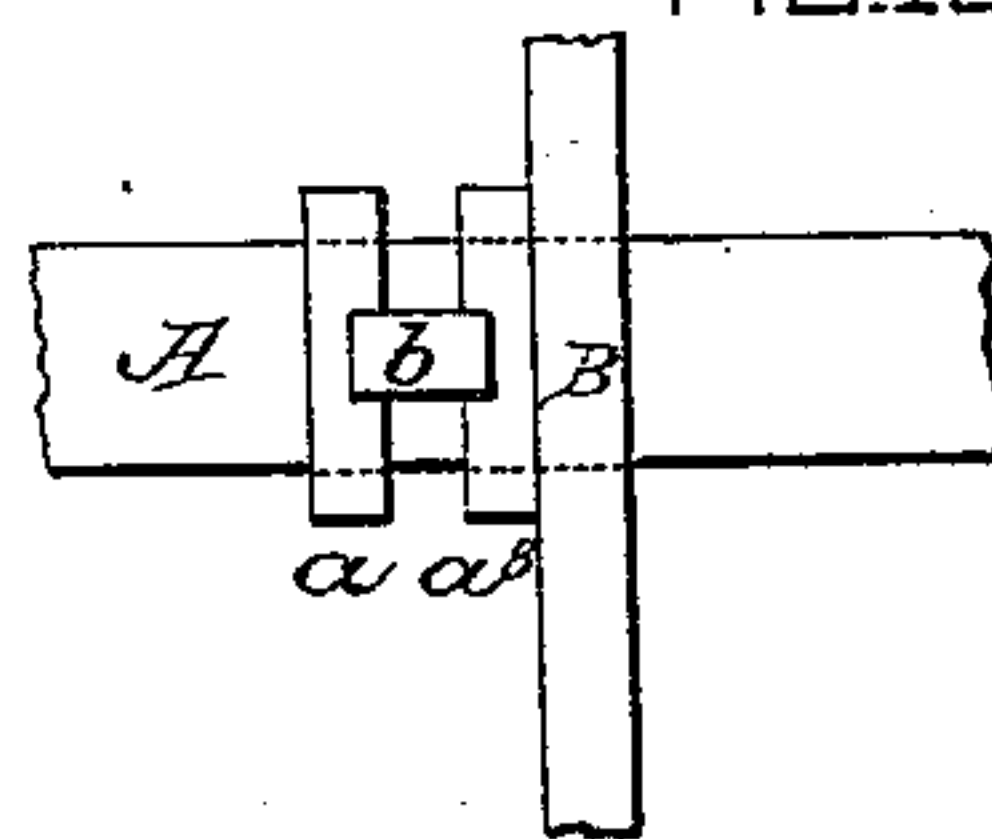


FIG. 13.

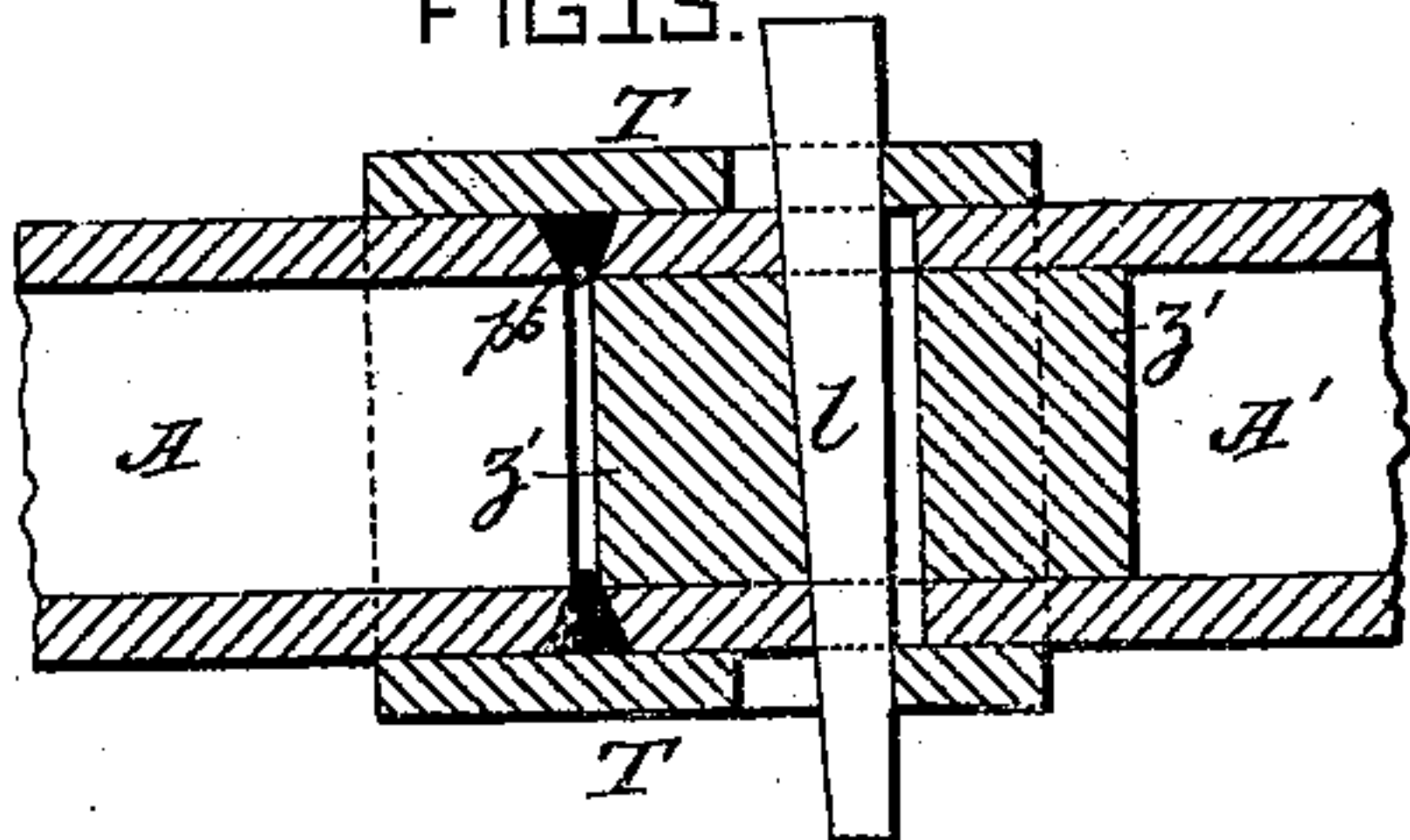


FIG. 12.

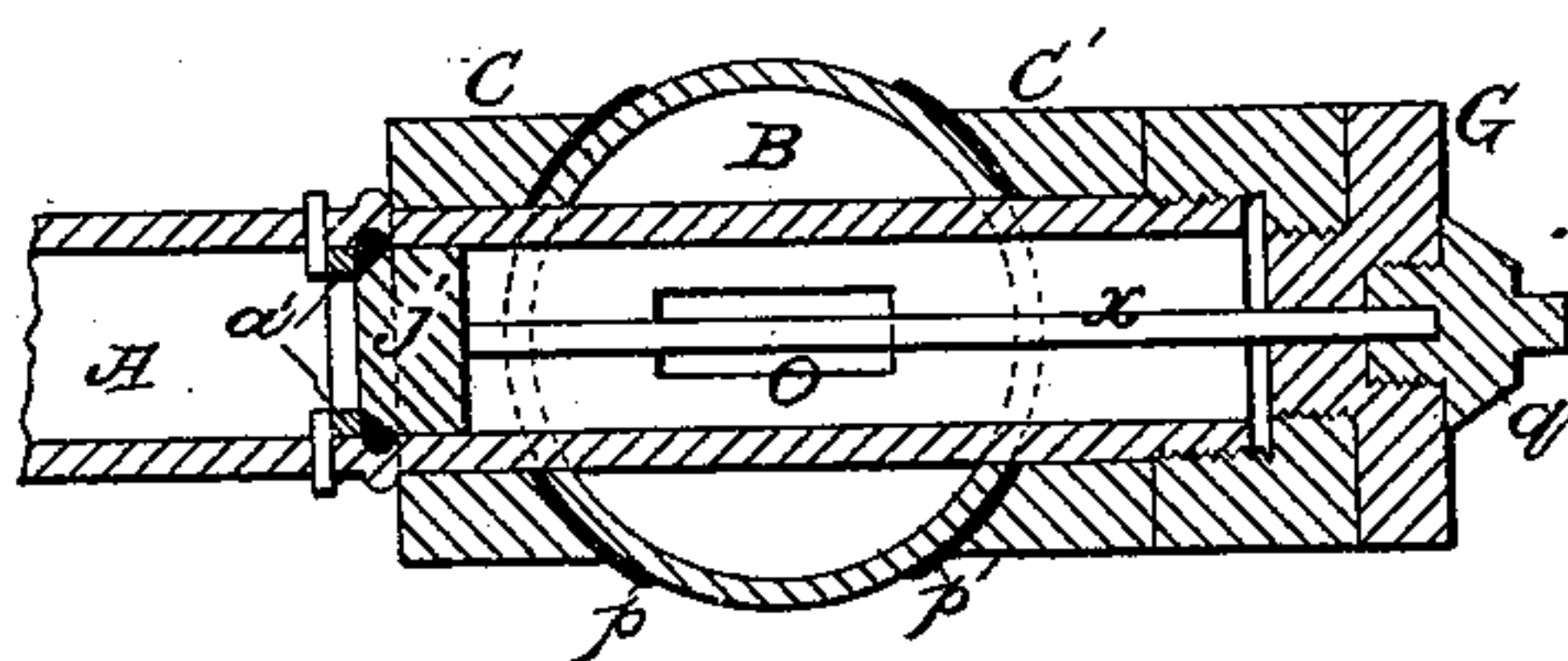


FIG. 14.

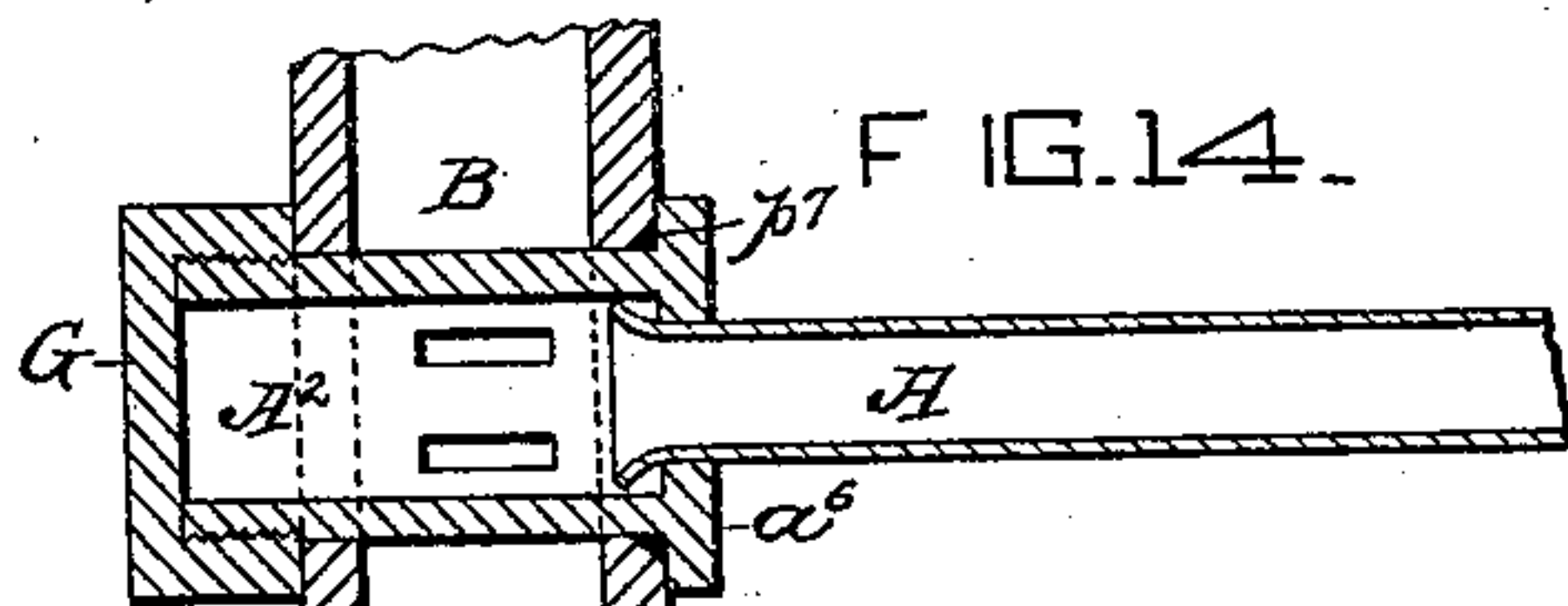
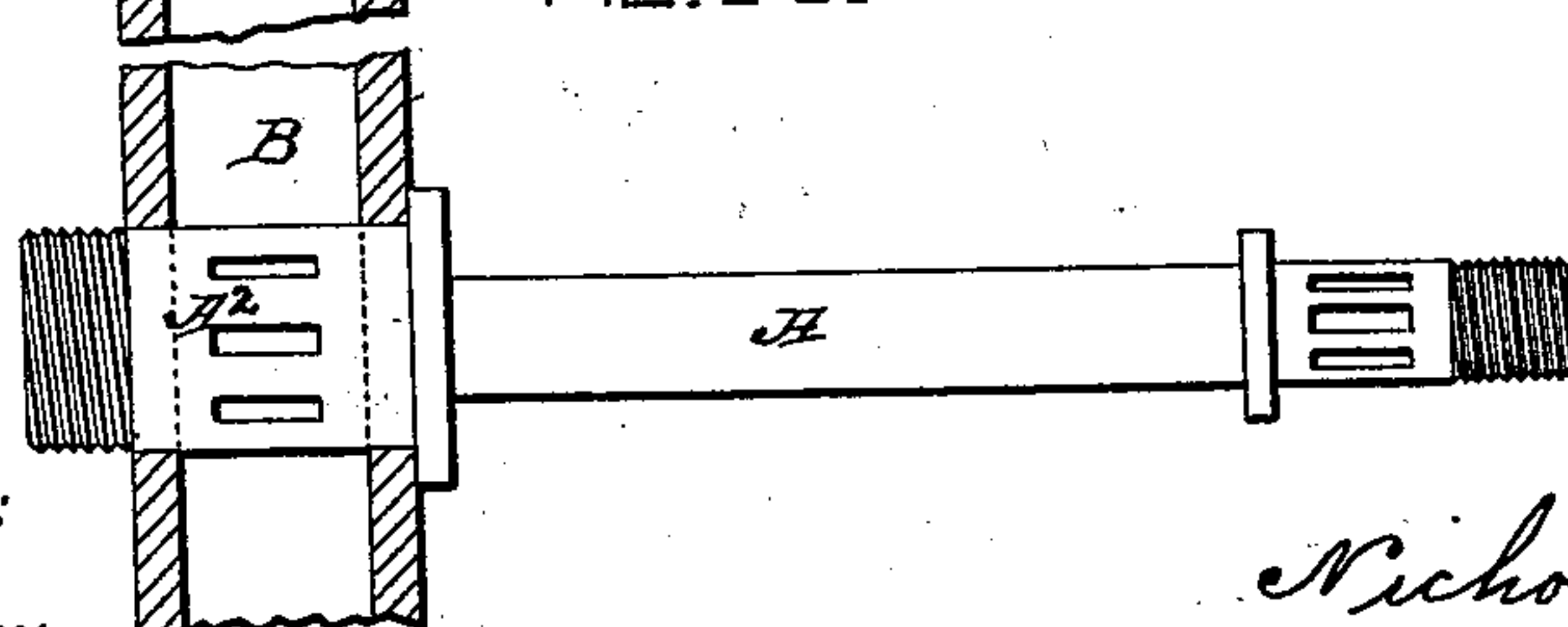


FIG. 14.^a



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UNITED STATES PATENT OFFICE.

NICHOLAS TVERSKOY, OF ST. PETERSBURG, RUSSIA.

COUPLING.

SPECIFICATION forming part of Letters Patent No. 547,650, dated October 8, 1895.

Application filed May 9, 1892. Renewed August 13, 1896. Serial No. 559,143. (No model.) Patented in Germany March 5, 1892, No. 69,935.

To all whom it may concern:

Be it known that I, NICHOLAS TVERSKOY, a subject of the Emperor of Russia, and a resident of St. Petersburg, Russia, have invented certain new and useful improvements in the method of fixing and coupling tubes, cocks, &c., to other tubes, receptacles, or reservoirs of any sort, (for which I have obtained Letters Patent in Germany, No. 69,935, dated March 5, 1892,) of which the following is a specification.

My present invention is for a method of coupling tubes or attaching them to boilers, steam-chests, reservoirs, &c.; and the object of my invention is to permit of coupling or attaching the tubes or pipes quickly, yet in a durable manner.

According to my method the tube or fitting is passed through the opposite sides of a tube, boiler, reservoir, or the like to which it is to be coupled and then fixed in place by means of nuts, pins, or wedges, &c. By this method the pipes or tubes serve as stays. Another advantage is that the pipe or tube can be easily and quickly removed or isolated.

In the accompanying drawings, Figure 1 is a sectional view showing the end of one pipe A coupled to another pipe B according to my invention. Figs. 2 and 3 are views similar to Fig. 1, showing different ways of fixing the pipe when in place. Fig. 4 is a sectional view representing two pipes A B coupled together by means allowing of free circulation through both pipes. Figs. 5 and 6 are views at right angles to Fig. 4, taken on lines 5 5 and 6 6, respectively, of Fig. 4. Fig. 7 is an outside view of Fig. 4 at right angles thereto, and Fig. 8 is a sectional view taken on line 8 8 of Fig. 4. Figs. 9, 10, 11, and 12 are views illustrating different ways of isolating the pipe in case of accident or when required, Figs. 9, 11, and 12 being sections taken through the longitudinal axis of the pipe A and Fig. 10 being a cross-section of the pipe A and taken on the line 10 10 of Fig. 9. Fig. 13 is a longitudinal section illustrating the means for coupling the ends of two pipes together. Figs. 14 and 14^a represent a modification of the means for coupling the end of one pipe to another pipe, Fig. 14 being a section through the pipe A

and its fitting and Fig. 14^a an outside view thereof. Fig. 15 is a sectional view, and Fig. 16 an outside view, illustrating means for making a good connection in certain cases hereinafter referred to.

Referring to Fig. 1, the pipe A is provided at a suitable distance from its end E with an enlargement or an exterior projection *a*. The conduit B is pierced on opposite sides with orifices sufficiently large for the pipe A, but not for the enlargement *a*, to pass through. A washer C, hollowed out to correspond to the curve of the conduit B, is slid onto the end of the pipe A until it bears against the enlargement *a*, and, if required, a washer *p*, of leather, asbestos, gutta-percha, or iron wires, &c., of suitable form and dimension, is slid onto the pipe A up against the washer C, and then the end E of the pipe A is passed through the orifices in the conduit B. Washers *p'* and C', similar to *p* and C, respectively, are then slipped onto the end of the pipe A, projecting through the conduit B, and also another washer *p''*, similar to the washers *p* and *p'*, and finally a nut G is screwed onto the end of the pipe A, which is screw-threaded for the purpose. The screwing up of the nut or cap G compresses the washers between the enlargement *a* and the conduit B and between the conduit B and the said nut, thus making a tight joint between the pipes A and B.

The part of the pipe A passing through the conduit B is provided with orifices O, of suitable form and dimensions, through which the vapor, gases, or liquids can pass from the conduit B into the pipe A, or vice versa. By modifying the form, direction, and arrangement of these orifices O the liquids may be directed in any desired way. If the walls of the conduit B are flat, or if the pipe A is to be connected with a chamber or rectangular box, a boiler, or in general with a reservoir of any sort with flat walls, the employment of washers C C' becomes superfluous, and the stops or projections *a*, as well as the nuts G, may bear directly against the walls of the reservoir B, as shown in Fig. 2. The projection *a* may itself have a curved form corresponding to that of the walls of the reservoir or conduit B, and in this case, also, it may be

applied directly against the curved wall of the reservoir or of the pipe B without the intervention of washers C C'. The stop a may be formed as an enlargement of the wall of the pipe A or as a metallic ring a' , Fig. 3, soldered upon the pipe or fixed upon this last in the required place by the aid of a screw or rivet or by the aid of rings drawn on when hot. The abutting surface of the ring may be plain or may present a curve corresponding to that of the pipe B. The purpose of these enlargements or rings is to prevent (whatever may be the pressure exerted by the nut or the pin driven in the entrance of the extremity E of the pipe A, as hereinafter explained) the pipe A from entering into the orifice of the conduit or reservoir B beyond the prearranged limit, at the same time insuring a perfectly solid and easy connection of the pipes or of the pipe with a reservoir by means of a nut or of a wedge. The dimensions of the stop or projection a should be such that the stop cannot embed itself like a cone or wedge in the orifice of the conduit B, but so that it presses upon as large a surface as possible of the metal or of the conduit or reservoir B or of the washer C.

The form and the material employed for the manufacture of the nuts or covers G may be varied indefinitely. The nuts or covers may be closed, Figs. 1 and 2, or pierced with one or more orifices, which may be closed by means of a plug, Fig. 12. In general the form and dimensions of the nuts, plugs, and orifices, as well as the number of these latter, may vary, according to need and according as it is proposed to close the pipe completely or to facilitate its cleaning and inspection, or to fix upon the cover a tap or pressure-gage or the like, or, if necessary, to introduce a rod to close the channel of a burst pipe or to leave the passage for the introduction of a rod to actuate stop-cocks or the like, or, if necessary, to introduce a tie of some sort.

The connection of the pipes with the conduit or reservoirs can be made not only by the aid of nuts or threaded covers, but also by means of pins or wedges L, Figs. 4 to 13, which are driven through suitable slits in the end of the pipe A. In this case the pipe is closed by plugs or metallic disks t , Fig. 9, arranged in front of the pin or wedge. If an exit for the gases or liquids has to be left, or if an opening is required for the cleaning or inspection of the tube A, the pins or wedges are pierced with holes, which are closed by means of plugs q' , Figs. 9, 10, and 11, or a plug z is used, as shown in Figs. 4 to 8. The flanges f of the plug z rest exactly against the interior surface of the pipe A, and it is evident that the exterior surface of the flanges f should have the same contour as that of the interior surface of the conduit or reservoir to which the flanges are to be adapted. The plug is provided with a slit k for the passage of the pin l . To render the joint perfectly

tight—that is to say, to avoid leakage of gases or liquids between the flanges of the plug z and the interior surface of the pipe A into the passage k , from whence it could escape to the outside and consequently be lost—the corresponding surfaces of the flanges f and of the pipe A can be recessed for packing or soldered together or closed or cemented by a layer of suitable cement or mastic.

The plug z , as well as the metallic disks t , are fixed to the pipe A by means of bolts or rivets, or they are soldered or brazed to it. They may also be screwed and driven directly into the passage of the pipe A by blows of a hammer, or they are fixed to the interior metal of the pipe in any manner whatever; but whatever be the way in which the disks or the plugs are fixed it is essential that their connection with the walls of the pipe should be sufficiently solid to prevent their displacement under the influence of the pressure of the pin driven in. One of the faces of the pin rests against the washer C' or directly upon the wall of the conduit or reservoir B, while the other face is applied against the metal of the pipe A or against the plug or metallic disk.

When using the plug z , which, as the arrows in Fig. 8 indicate, allows the contents of the pipe to freely circulate, the pipe A is closed by means of a nut or cap. This form of joint may be arranged on the two sides of the conduit or reservoir B, in which case the pipe A need not be furnished with stops or enlargements, for the pins ll do not permit it to pass into the conduit B. The washers C C' may be formed as complete rings surrounding the pipe, or they may be composed of two halves connected together. The edges of the frames, washers, and nuts may be beveled to render more complete the compression of the packing interposed between the different parts of the assemblage, so as to avoid loss of vapor, gases, or liquids.

Figs. 9, 10, 11, and 12 represent the employment of plugs j , introduced into the passage of the pipe or into the cap G for the purpose of isolating a burst pipe. The plugs j are formed of a single piece provided with a packing of any sort p^4 . Referring to Figs. 9, 10, and 11, to isolate the pipe A the screw-plugs $q' q'$ are removed from the disk t , and there is introduced into the pipe a stem x , Fig. 11, the cylindrical head of which exactly fills the orifices or channels of the plugs $q' q'$. A part of these orifices or channels is left for this purpose cylindrical and is not threaded. By means of the stem x the plug j is pushed along the channel of the pipe A until it covers or gets beyond the openings in the pipe A. Leaving the stem within the channel of the pipe, the plug q is again fixed in its place. The plug q' presses against the stem x and by means of the stem upon the plug j . Steam gases and liquids contained in the pipe press on their side upon the plug j , and under the

influence of this double pressure all leakage of gases or liquids between the plug and the wall of the tube thus becomes impossible and the pipe A is completely isolated from the conduit or reservoir.

Fig. 12 represents a pipe A, provided with an internal flange a' , against which the plug j is driven. In this case the stem x is put through the hole for the plug q in a cap G.

Fig. 13 represents the connection of two pipes by the aid of a pin in a frame z' . In this case the pipe A is furnished with sleeves T. The frame z' for the pin l is fixed to the pipe A'. This pin being in the form of a wedge, by bearing against the walls of the frame, brings together the pipes A and A'. A layer of asbestos or a packing of any sort p^6 , arranged between the beveled edges of the pipes A and A', which presses it against the sleeve T, renders the joint perfectly tight.

Fig. 14 represents in longitudinal section a modification of the processes above described for the assemblage of tubes A and reservoir B. In this case the tube A is not fixed to the reservoir B directly, but by the intervention of a socket A², the extremity of the pipe A being inclosed in the cavity of the appliance A², as is the case with fire-tubes of locomotives. To this end upon the extremity of the tube A there is placed, so as to fit tightly, the socket A², and then, by the aid of a suitable instrument, the extremity of the tube A is pressed and swelled in the interior of the appliance A², so as to unite them into a single piece. (Represented in exterior view at Fig. 14^a.) Finally this tube is connected to the reservoir B by means of the nut G, Fig. 14, or by a pin. The flange a^6 of the socket A² presses against the side of B, and a packing p^7 makes a tight joint.

Fig. 15 represents in longitudinal section, and Fig. 16 in exterior view, the connection of the tube A to the reservoir B in the case where the ring or the projection a cannot be brought close up to the reservoir. In this case I employ a movable ring a^8 , pressed against the reservoir B by a plug or metallic wedge b , which I insert between the rings a and a^8 in corresponding grooves. It is evident that the number of wedges b may be varied and that they are intended to strongly press the packing against the movable ring a^8 and the wall of the reservoir B.

I claim as my invention—

1. The combination of a pipe provided with an enlargement at a suitable distance from one end, and orifices in its sides between the enlargement and the end, with a receptacle having openings in its opposite sides of a size sufficient to admit the end of the pipe but not

the enlargement, the end of the said pipe being passed through the opposite sides of the receptacle as far as the enlargement will allow, the orifices being within the said receptacle, and means for securing the protruding end of said pipe and tightening the enlargement up against the outside of the receptacle.

2. The combination of a pipe provided with an enlargement at a suitable distance from one end, and orifices in the sides of the pipe between the enlargements and the end, with a receptacle provided with openings in its opposite sides through which the said pipe is passed as far as the enlargement, a closure for the end of the pipe protruding through the receptacle the closure being provided with an opening for the purposes described and a plug adapted to be inserted in the opening in the closure, all substantially as set forth.

3. The combination of a pipe provided with an enlargement at a suitable distance from one end, orifices between the enlargement and the end, and slits on opposite sides near the end, with a receptacle provided with openings in its opposite sides through which openings the end of the pipe is passed and a wedge adapted to be passed through the said slits to hold the pipe in position, all substantially as set forth.

4. The combination of a pipe provided with an enlargement at a suitable distance from one end, orifices between the enlargement and the end, slits on opposite sides near the end, with a receptacle provided with openings in its opposite sides through which openings the end of the pipe is passed, a plug provided with longitudinal channels and a cross slit, the said plug adapted to fit in the end of the pipe and a wedge adapted to pass through the slits in the pipe and the plug, all substantially as and for the purposes set forth.

5. The combination of a pipe provided with orifices near one end, with a receptacle having openings in its opposite sides through which openings the end of the pipe is passed, means for securing the pipe in this position with the orifices within the receptacle, a device for closing the end of the pipe provided with an opening, a plug adapted to fit in this opening, a plug j adapted to fit in the pipe, and a stem x adapted to pass in through the opening in the closing device, all substantially as and for the purposes set forth.

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

NICHOLAS TVERSKOY.

Witnesses:

N. TSCHOKALOFFELL,
T. BEAN.