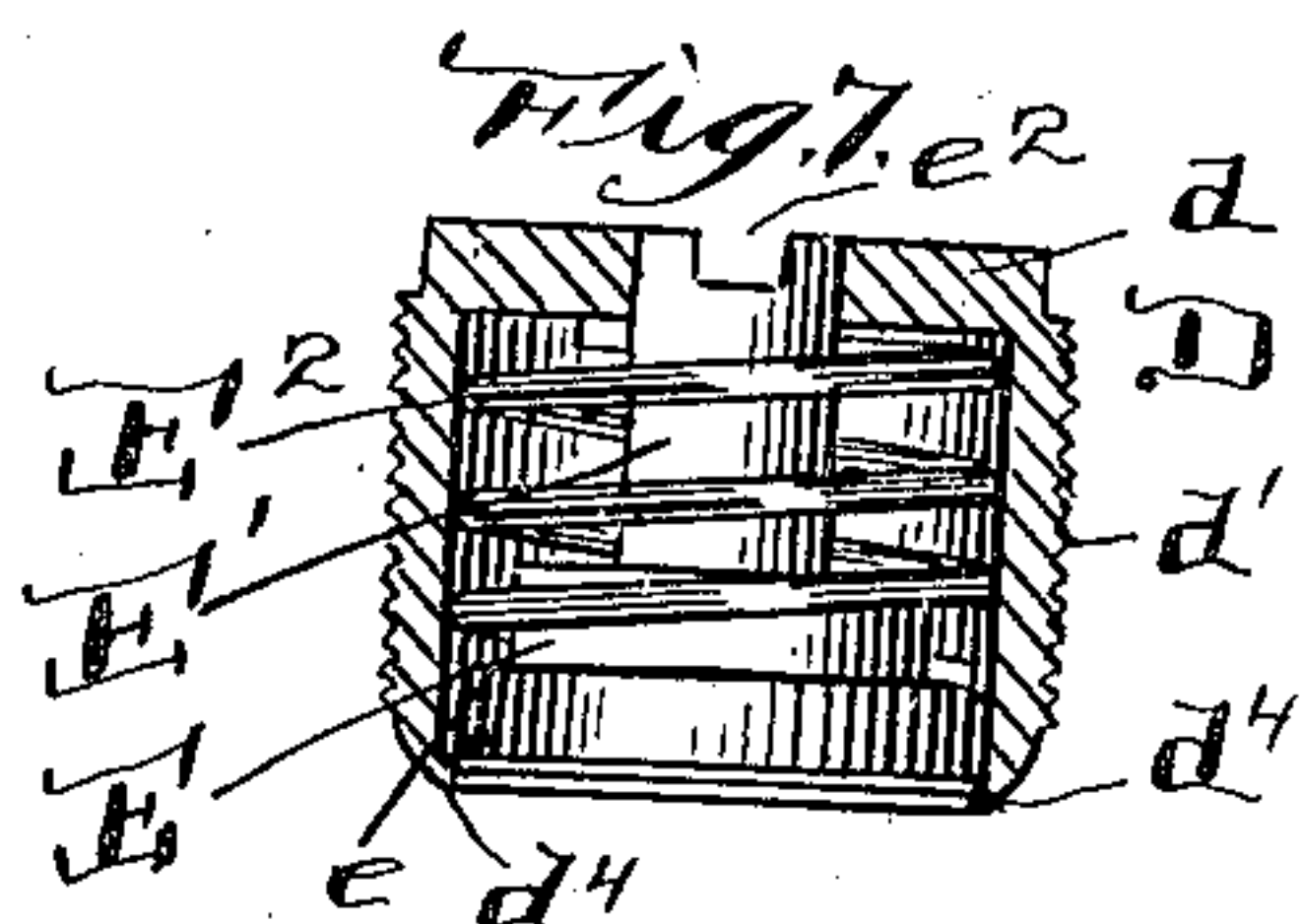
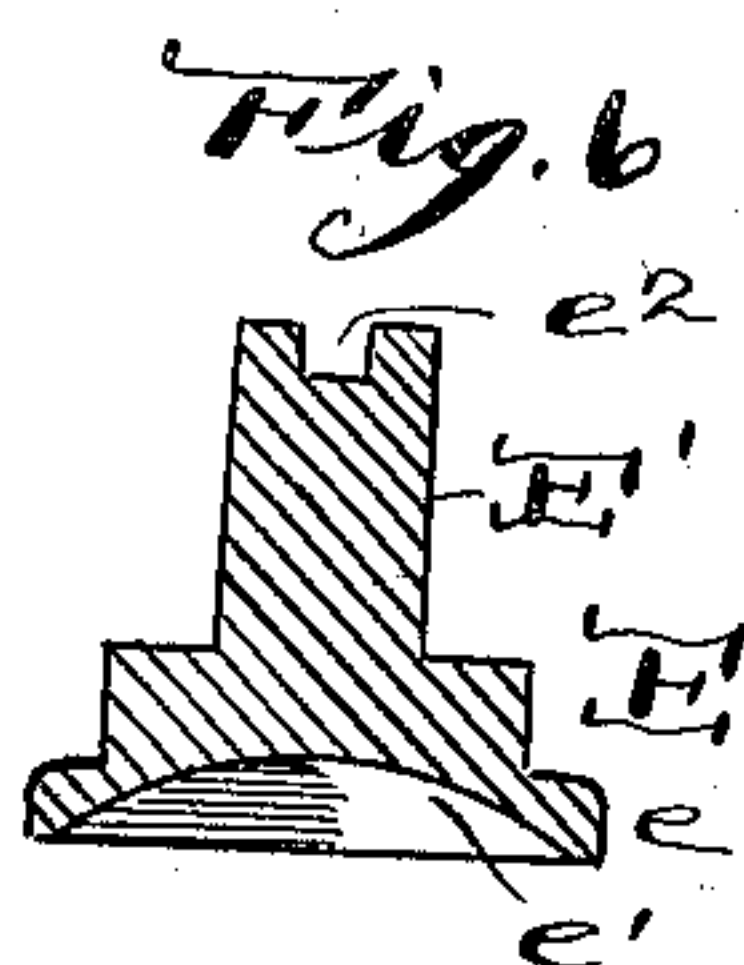
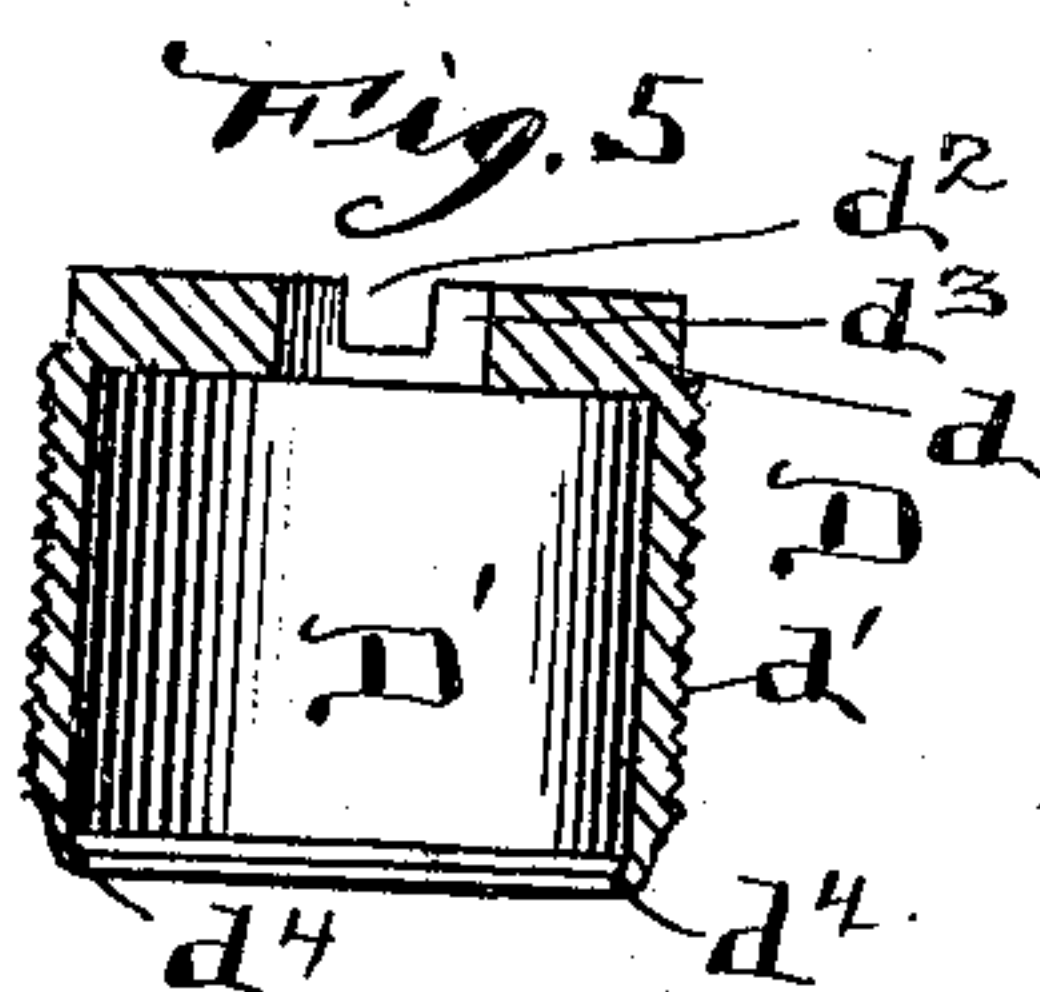
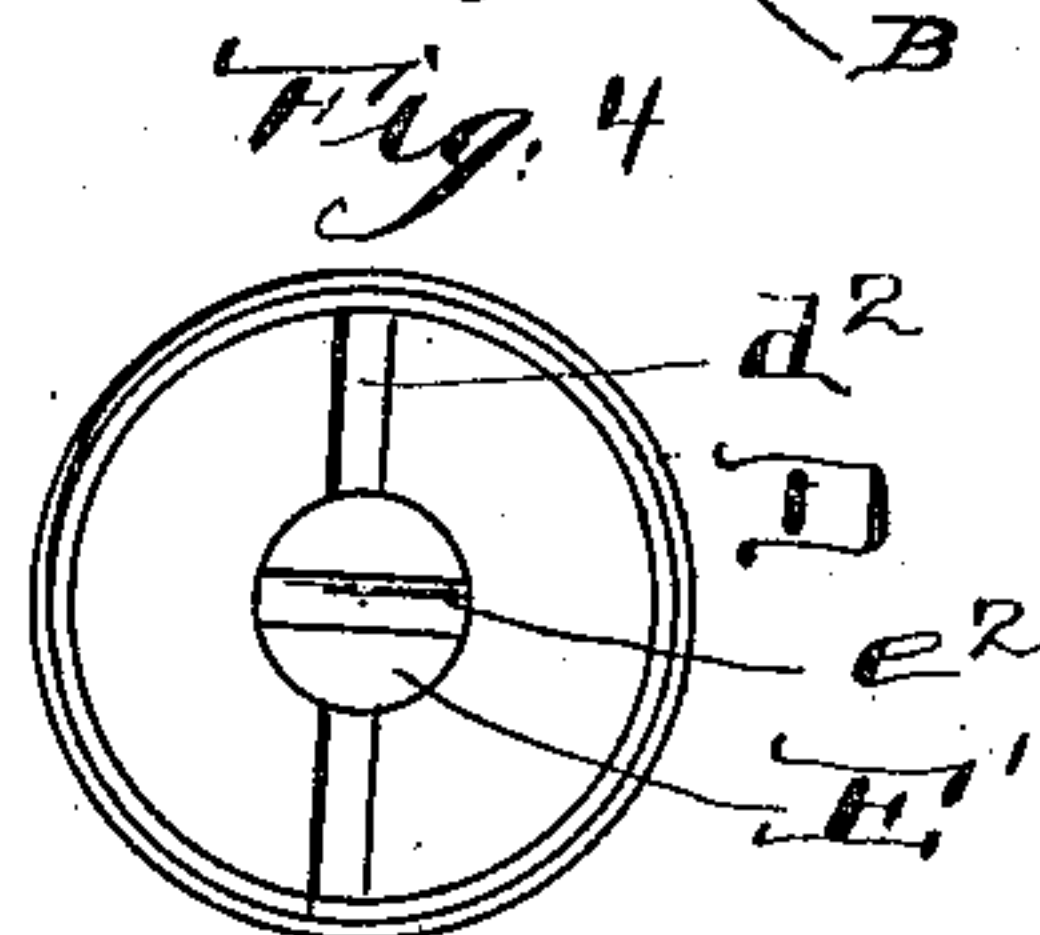
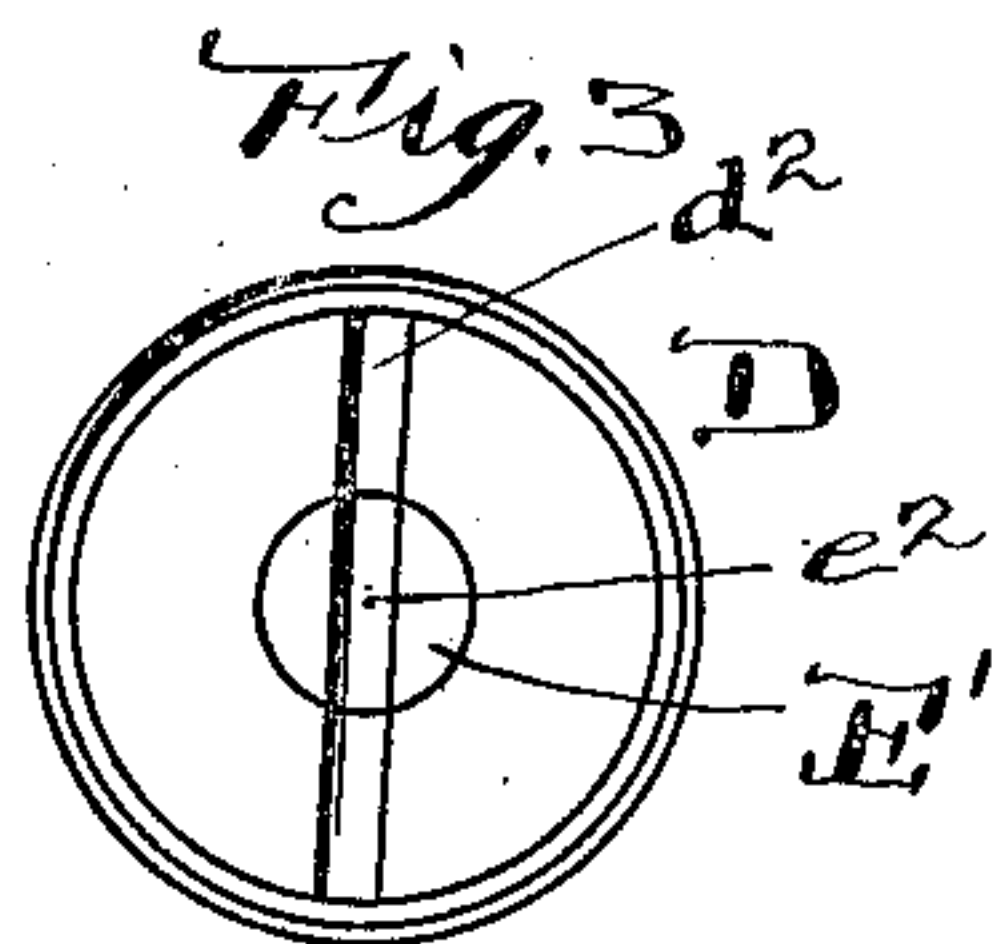
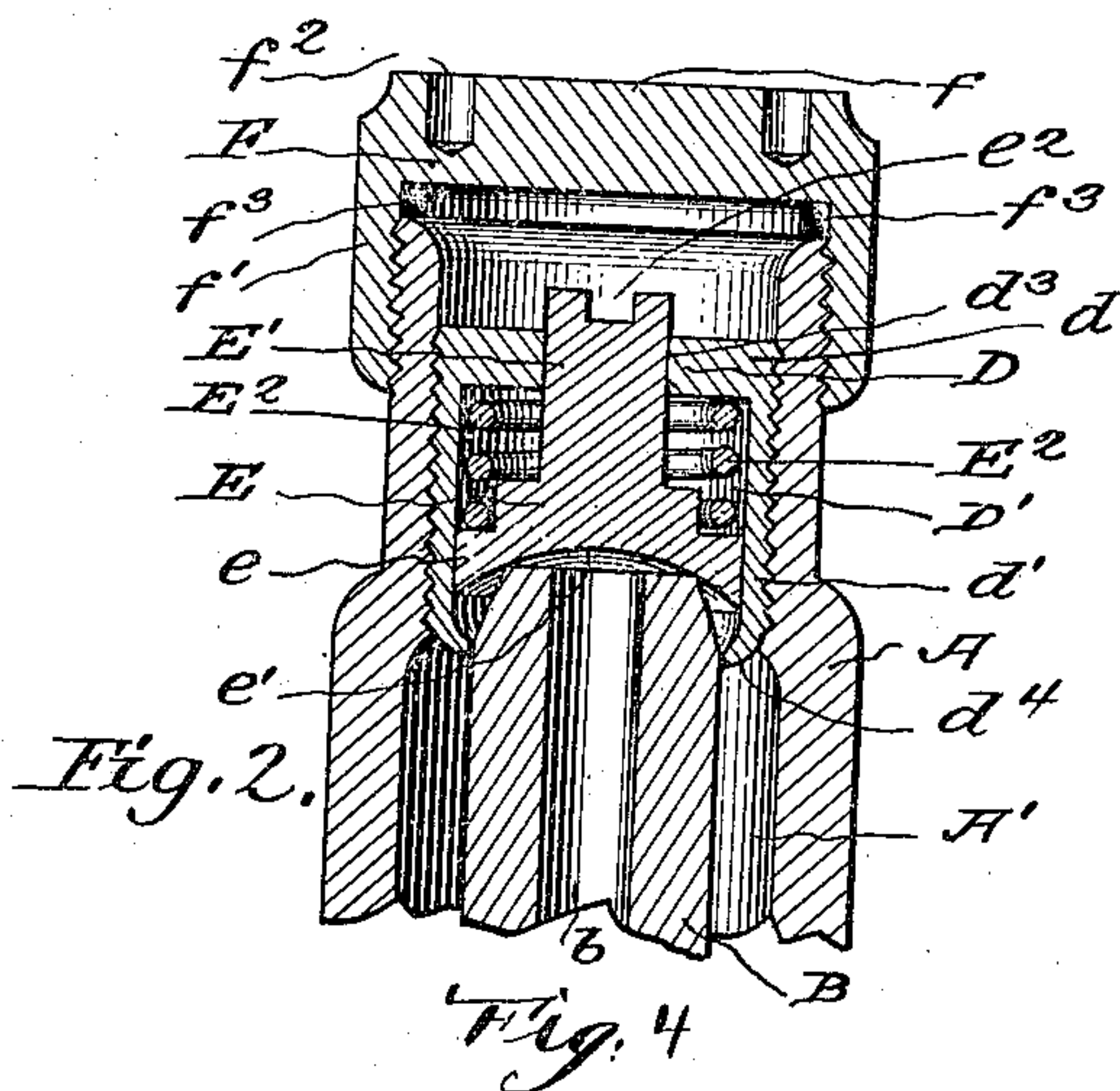
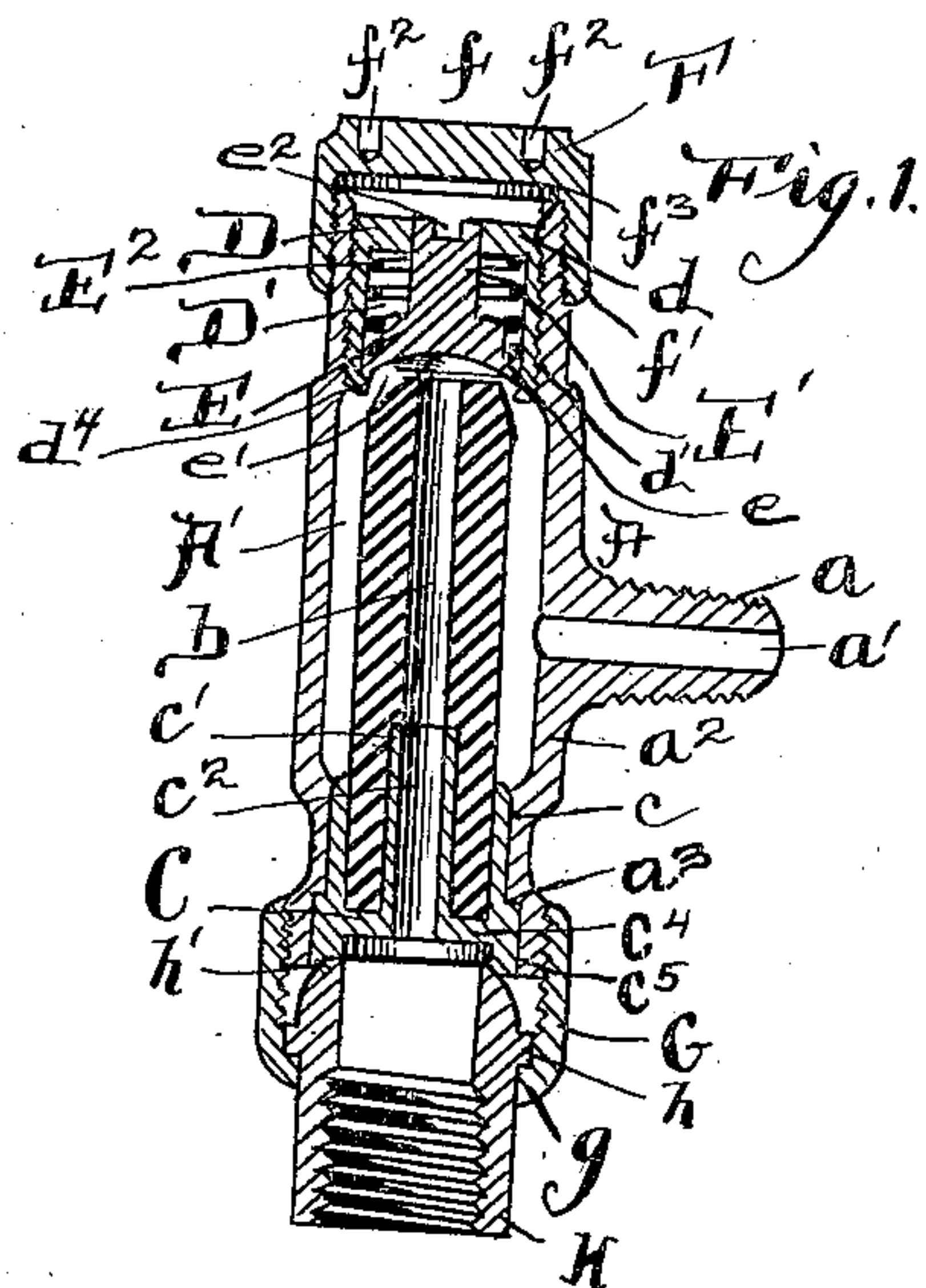


F. W. LEUTHESSER.
AIR VALVE FOR RADIATORS.
APPLICATION FILED JULY 20, 1905.

944,338.

Patented Dec. 28, 1909.



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UNITED STATES PATENT OFFICE.

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AIR-VALVE FOR RADIATORS.

Specification of Letters Patent.

Patented Dec. 28, 1909.

944,338.

Application filed July 20, 1905. Serial No. 270,518.

To all whom it may concern:

Be it known that I, FRED W. LEUTHESSER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Air-Valves for Radiators, of which the following is a specification.

This invention relates more particularly to that type of air valves for radiators in which an expansible member or stem is located within the chamber of a shell or casing, the expansible member having an axial longitudinal hole for the passage of air, steam and the water of condensation, and having its nonacting end fixedly secured in place and its acting end cooperating with an adjustable seat. It is a delicate and somewhat difficult matter to properly locate the seat in correct relation to the acting end of the stem, and even when adjusted it often occurs that the operator considers the seat not properly adjusted and thereupon changes its relation to the acting end of the expansible member or stem, with the result that, as the expansible member or stem is lengthened under the effects of heat, its acting end will engage the adjustable seat with sufficient force to buckle or even break the expansible member or stem, thereby destroying the utility of the valve.

The objects of the present invention are to furnish an adjustable seat for the expansible member or stem having a yielding or cushioning action by which danger and liability of buckling or breaking the expansible member or stem is avoided; to enable the party who adjusts the valve to know positively just when the correct adjustment is obtained; and to prevent any overpressure from the lengthening of the expansible member or stem from affecting the working of the valve.

The invention consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings Figure 1 is a sectional elevation of the air valve of the invention, with the adjustable seat and its cushion or yieldable cap, with the parts in normal position; Fig. 2 a detail in section showing the end of the expansible member or stem, the adjustable seat and its cushion or yieldable bearing; Fig. 3 a top or plan view of the adjustable plug and the slidable stem of the cushion in normal or properly adjusted position;

Fig. 4 a top or plan view, showing the adjustable plug advanced inwardly so as to project the stem of the cushion or yieldable support above the end plate or top of the plug throwing the grooves in the stem and plug out of alignment, thereby preventing further advance of the plug; Fig. 5 a sectional elevation of the adjustable seating plug; Fig. 6, a sectional elevation of the cushion or yieldable bearing for the expansible member or stem; and Fig. 7 a sectional elevation of the adjustable seating plug, and a full elevation of the cushion or yieldable bearing and the controlling spring.

The valve shown has an outer shell or casing A with an interior chamber A'; and on one side of the outer shell or casing is a nipple a for attachment of the valve to the radiator, and having a passage a' leading into the chamber A' between the top and bottom of such chamber. The expansible member or stem B is located in the chamber A', with its acting end in line, or nearly so, with the top of the chamber, when the member or stem is normal; and this expansible member or stem has an axial longitudinal passage b for escaping air as usual. The lower end of the main shell or casing A has a neck a² with an interior shoulder a³, in the construction shown. A thimble or socket C is entered into the neck a² and this thimble or socket C has an outer wall c and an inner tube c' with an axial passage coinciding with the axial passage in the expansible member or stem, with a space between the outer wall and the inner tube in which is securely entered the lower end of the expansible member or stem. The bottom wall c⁴ of the thimble or socket has a depending rim c⁵, against which the end of the coupling impinges tightly, when the parts are assembled.

The upper end of the main shell or casing A has an exterior screw thread and an interior screw thread, in the arrangement shown; and the interior screw thread engages an exterior screw thread on the body or wall of the adjustable seating plug D, which plug has an interior chamber D', located below its top wall d, and its body or side wall d', in which chamber is located the cushion for furnishing a seat for the acting end of the expansible member or stem and constituting an essential feature of the present invention.

ent invention. The cushion for seating against the acting end of the expansible member or stem is in the form of a head or disk E having a peripheral rim or flange e at its lower or under side with a concave face e' to receive the acting end of the expansible member or stem. A stem E' projects from the center of the plate or disk E and passes into a hole d^3 formed therefor in the top plate or wall of the adjustable hollow plug through which hole the stem E' is free to slide. A coil spring E^2 encircles the stem E' and the body of the plate or disk E with its lower or under end resting on the rim or flange e and its upper or top end abutting against the top wall or plate d of the hollow adjustable seating plug, and this spring is of the proper tension to maintain the under face e' of the cushion in engagement with the inwardly turned edge d^4 of the wall d' so as to be engaged by the acting end of the expansible member or stem when lengthened, the expansible member or stem, when the parts are normal, being out of contact with the cushion, as shown in Fig. 1. The top wall or plate d of the adjustable hollow seating plug has a cross groove d^2 for the end of a screw driver, or other suitable instrument, by means of which the plug can be entered into place and adjusted as required, and the end of the stem e' has a cross groove e^2 which, when the parts are in normal relation, is in alinement with the cross groove d^2 , so that the screw driver, in turning the hollow seating plug to its adjusted position, carries with it the stem and the cushion, which may thus be located and in proper relation to the acting end of the expansible member or stem.

A closing cap F is entered onto the exterior thread of the main shell or casing; and as shown, this cap has a top plate or wall f and a body or side wall f' with an interior screw thread for entering the cap onto the end of the shell or casing, and the top wall has therein two holes f^2 for the reception of a turnkey by means of which the closing cap can be entered into place. A packing f^3 of any suitable material is located between the under face of the top wall or plate of the closing cap and the end face of the shell or casing, so that when the closing cap is fully entered a tight joint will be formed for the upper end of the shell or casing. The lower end of the shell or casing has an exterior screw thread which receives a coupling nut G, having a shoulder or inturned portion g ; and this nut has entered therein a coupling collar H with an annular exterior rim h engaging the shoulder or inturned end g of the coupling nut, and as shown, the inner end of the coupling collar is rounded so as to furnish a seating face h' to impinge against the edge of the

rim or flange e^5 and tightly close and seal the lower end of the shell, the same as the cap F closes the upper end.

The manner of assembling is as follows: The expansible member or stem is entered into the thimble or socket C and the socket entered tightly into the neck a^2 . The coupling collar H is entered into the coupling nut G and the nut threaded onto the lower end of the shell or casing, for the contact face h' to impinge against the edge of the rim e^5 , making a close tight fit. The adjustable hollow plug, with the cushion cap E and the spring E^2 entered into the chamber D' with the stem E' projecting into the hole d^3 , is threaded into the upper end of the shell or casing and is advanced by means of a screw driver until the yieldable cap or cushion abuts against the acting end of the expansible member or stem. Such contact is indicated on further movement of the plug by the guide stem or stud E' projecting above the plane of the outer face of the top plate or wall of the adjustable hollow plug, in which position the two grooves d^2 and e^2 are thrown out of alinement. When this condition is reached further advancement of the plug by the screw driver is impossible and the operator knows at once that the bearing cap or yieldable contact has engaged the acting end of the expansible member or stem. When this condition is reached a sufficient backward turn of the adjustable hollow plug carries the seating cap or bearing E away from the end of the seating plug a sufficient distance to leave, when the parts are normal, the required space for the air to escape through the axial passage of the expansible member or stem. The lengthening of the expansible member or stem from heat causes its acting end to engage with the seating cap or bearing, closing the inlet into the passage b of the expansible member or stem, and the lengthening of the expansible member or stem will not buckle or break the stem, as the bearing or yieldable contact will recede against the pressure of the spring without affecting the condition of the expansible member or stem as regards buckling or breaking.

The seat for the expansible member or stem is furnished by the cap or bearing plate E, which is under spring control; and the point at which the seating cap is adjusted is regulated by advancing or receding the adjustable plug, and inasmuch as the plug and the stem of the cap move in unison the party adjusting knows at the instant the guide stem of the cap projects beyond the plane of the top plate or wall of the adjustable plug that the seating plate or bearing is in engagement with the acting end of the expansible member or stem, and that when so engaged the inlet to the passage of the expansible member or stem is

closed, requiring a sufficient recession of the adjustable hollow plug in order to obtain the proper seating relation. It will also be seen that it is impossible for anyone to so advance the adjustable seating plug a sufficient distance to produce injurious effects, as when this plug is advanced to a point where the notch of the guide stem is above the plane of the top wall of the plug, the inserting instrument is at once disengaged from the notch of the plug thereby preventing further advance of the plug.

While the special feature of the present invention, namely, the adjustable hollow plug and the yieldable seating cap, are shown in connection with an expansible member or stem having a longitudinal passage, it is evident that these parts or elements could be used in connection with an expansible member or stem having a solid body. It is also to be understood that the adjustable hollow plug with the yieldable cap can be used in connection with other types of air valves in which there is a longitudinal movement of the part controlling the outlet for the air, steam or water of condensation.

What I claim is:

1. In an air valve for radiators, the combination of an expansible member or stem, an adjustable hollow plug, a yieldable seating cap within the chamber of the hollow plug, a stem for the seating cap slidable through the top wall of the hollow plug, and a spring controlling the yield of the seating cap, substantially as described.

2. In an air valve for radiators, the combination of an expansible member or stem, an adjustable hollow plug, a seating cap within the chamber of the hollow plug, a stem for the seating cap slidable through the top wall of the hollow plug, and a coil spring within the chamber of the hollow plug and abutting at its ends against the seating cap and the top wall of the plug and controlling the yield of the seating cap, substantially as described.

3. In an air valve for radiators, the combination of an expansible member or stem, an adjustable hollow plug having a cross groove in its top plate, a yieldable seating cap within the chamber of the hollow plug, and a stem for the seating cap slidable through the wall of the hollow plug and having in its outer end a cross groove to cooperate with the cross groove in the top wall of the plug, substantially as described.

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