

No. 780,424.

PATENTED JAN. 17, 1905.

T. HERYNG.

INHALER.

APPLICATION FILED NOV. 10, 1903.

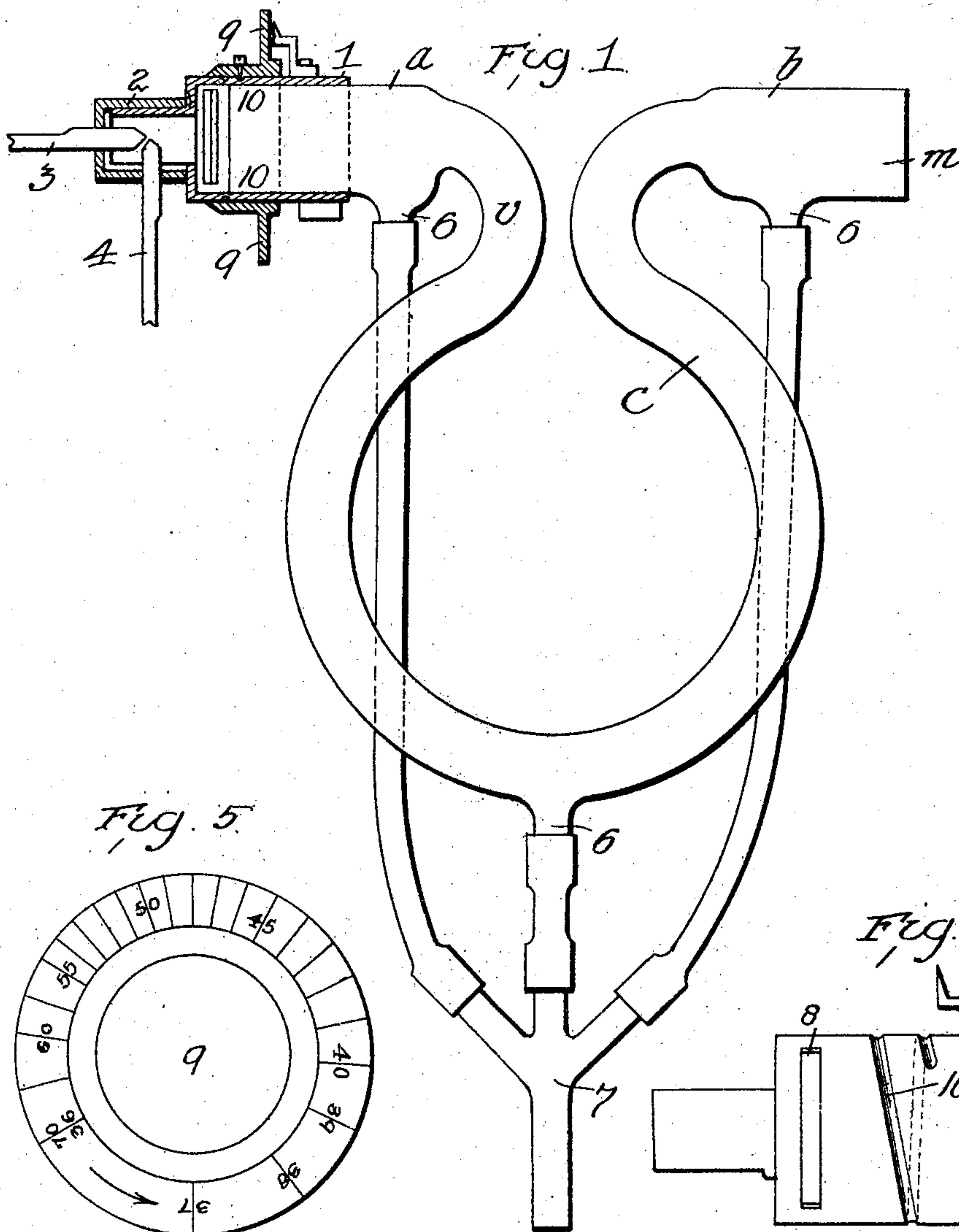


Fig. 5.

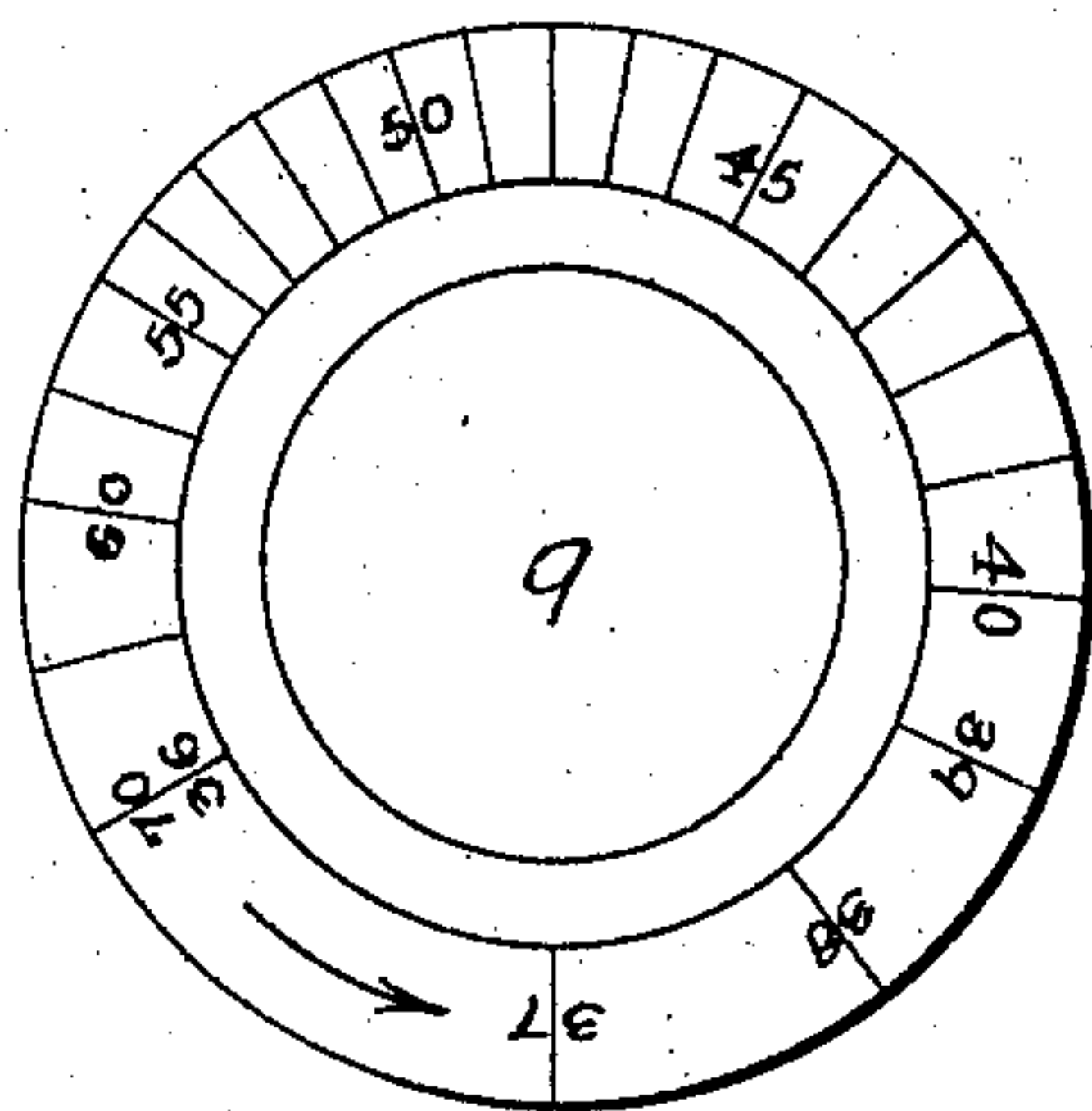


Fig. 6.

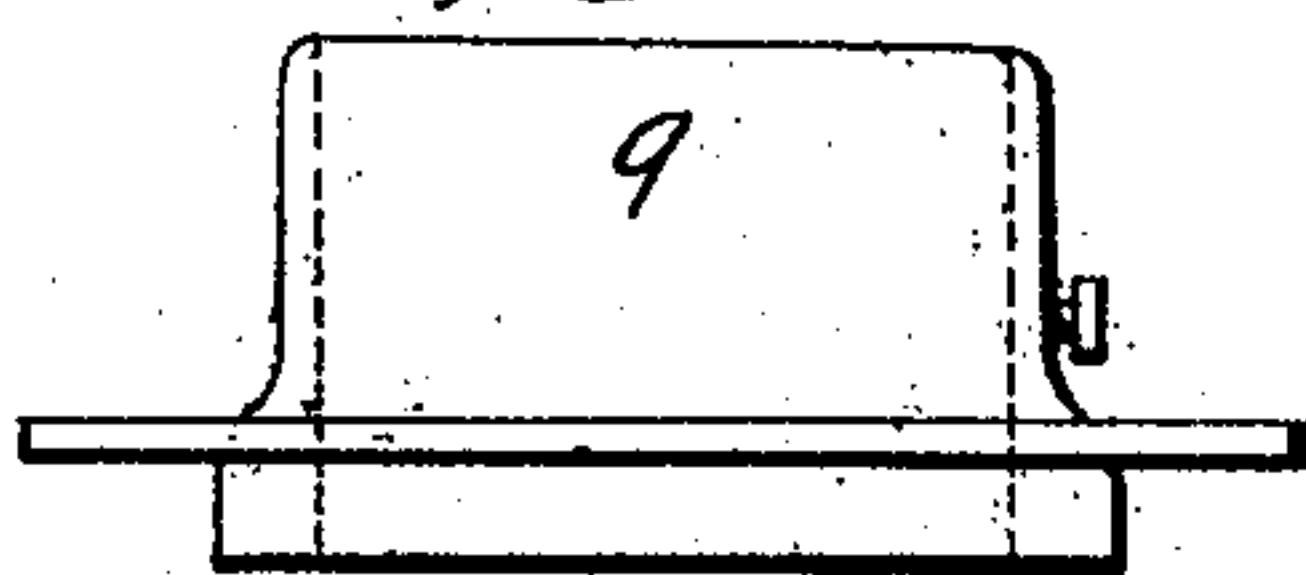


Fig. 3.

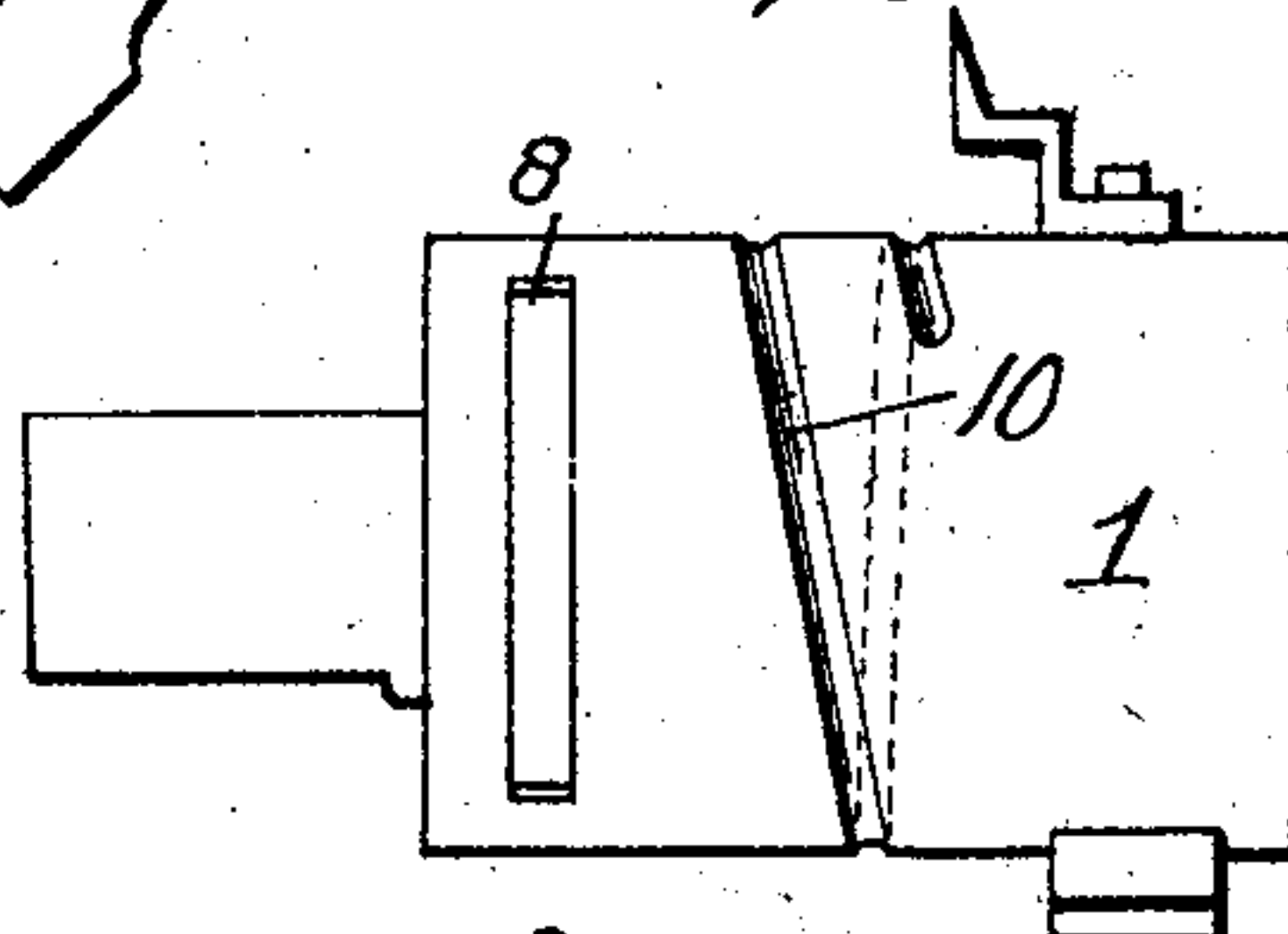


Fig. 4.

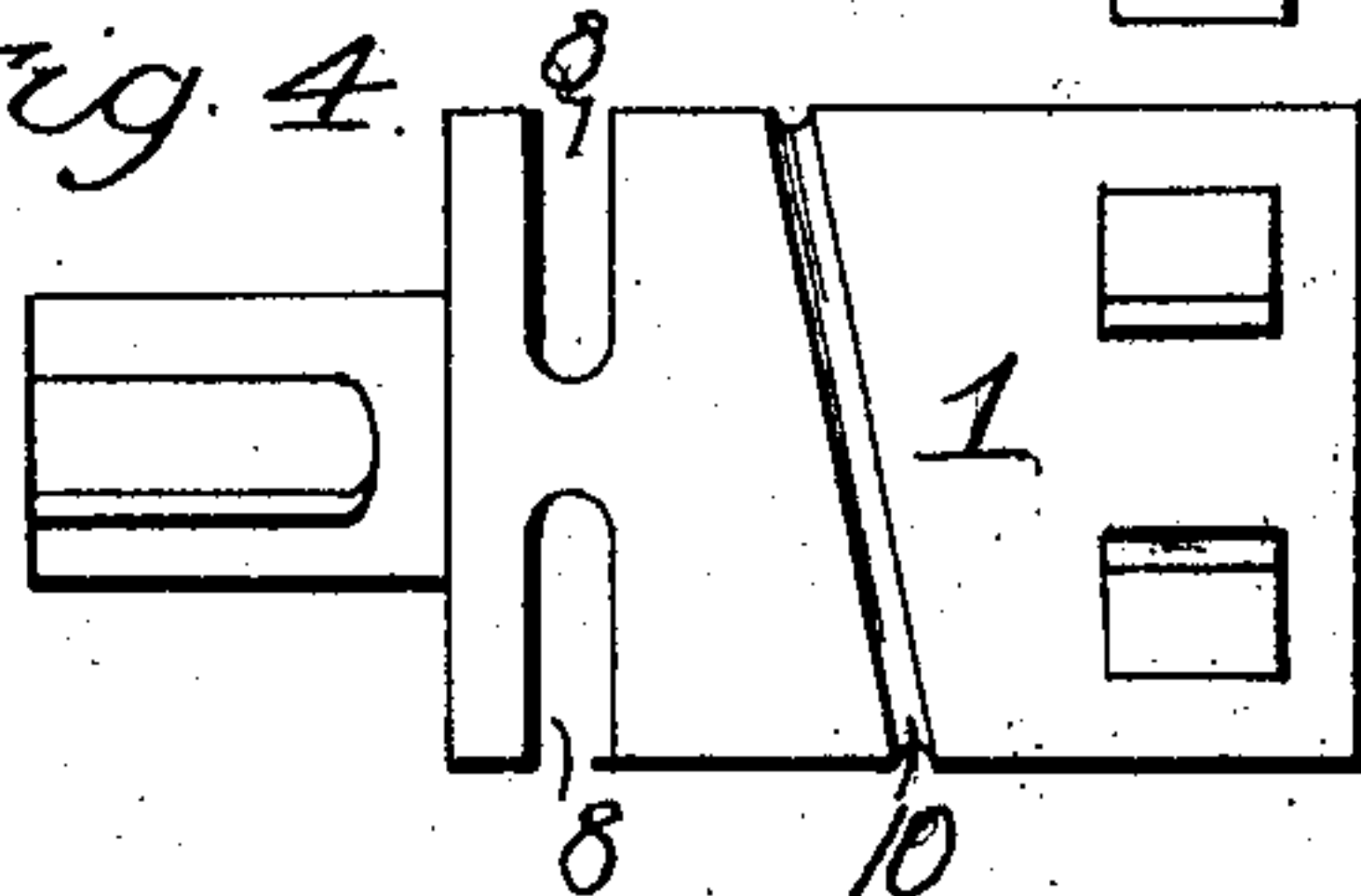
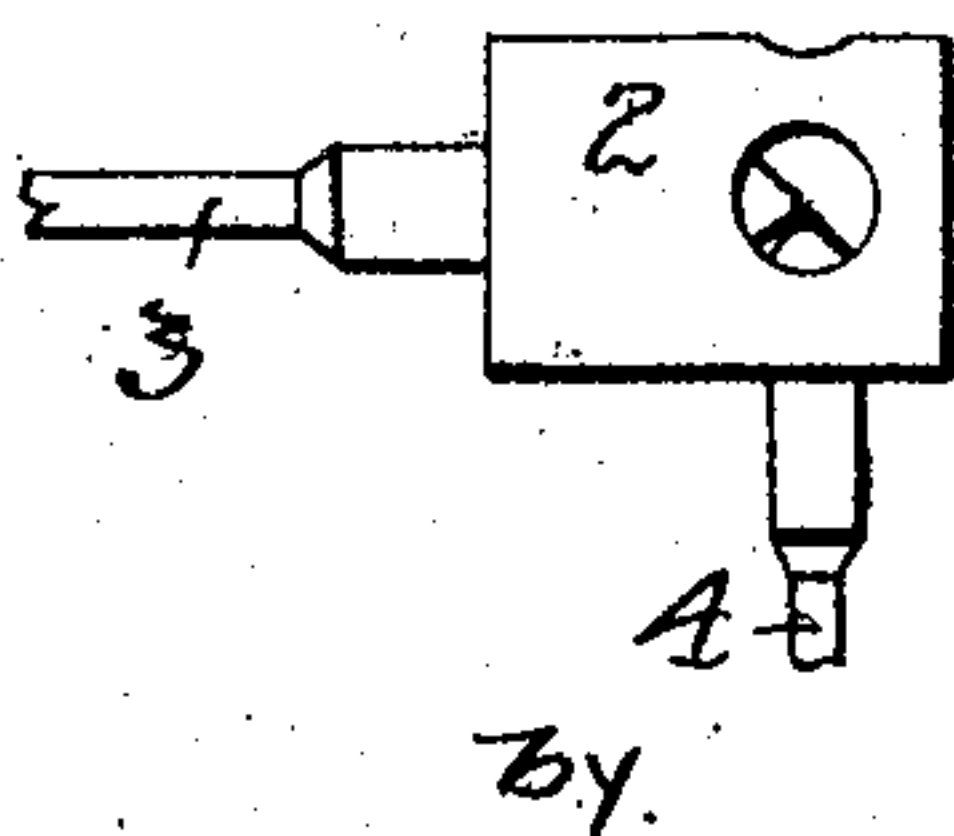


Fig. 2.



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THEODOR HERYNG, OF WARSAW, RUSSIA.

INHALER.

SPECIFICATION forming part of Letters Patent No. 780,421, dated January 17, 1905.

Application filed November 10, 1903. Serial No. 180,538.

To all whom it may concern:

Be it known that I, THEODOR HERYNG, a subject of the Emperor of Russia, and a resident of Warsaw, Russia, have invented new and useful Improvements in Inhalers, of which the following is a specification.

This invention relates to an apparatus for inhalation the construction of which is improved in such a manner that liquid medical compounds are evaporated by first spraying the same and then conducting the sprayed liquid, together with a steam-jet, through a glass tube of smaller diameter, in which the sprayed liquid is evaporated by means of the increasing temperature of the steam, while the steam is simultaneously condensed. The evaporation of medicaments to be inhaled is necessary, as gases can penetrate into any part of the lungs, while this is only partially possible for sprayed liquids.

The construction of the apparatus is based on the theorem that sprayed liquids evaporate much easier and quicker than liquids in ordinary condition.

In the accompanying drawings the apparatus is shown in Figure 1 in a front view, partly in section. Fig. 2 is a side view of the metal cap and of the spraying-pipes. Fig. 3 is a side view of the metal cylinder, which is shown in Fig. 4 in a view from the bottom. Fig. 5 shows the regulating device for the temperature, which is shown in Fig. 6 in a side view.

The improved inhaler consists of a lyre-shaped glass tube *c*, which has at the upper ends two horizontal arms *a b* of larger diameter than the lyre-shaped glass tube *c*. Over the end of one of the horizontal arms *a* a metal cylinder 1 is placed, in which terminate two spraying-pipes 3 4, one for the liquid and the other for the steam, which are arranged in the well-known manner so that their orifices stand at right angles, one above the other. A metal cap 2 is placed over the open end of the cylinder 1.

At the bottom of the lyre-shaped glass tube *c*, as well as at the bottom of the horizontal upper arms *a b* of said tube, short nozzles 6 are provided, which are connected, by means of india-rubber hose, with a three-branched pipe 7 for the outflow of the condensed liquid.

In the walls of the metal cylinder 1 longitudinal slots 8 are provided, one at each side, the width of which can be adjusted in any suitable manner, so as to regulate the quantity of air admitted into the apparatus. The adjusting device for said slots shown in the drawings consists of a ring 9, which is provided with a scale to allow a very close regulation of the quantity of air, and during the rotary movement of ring 9 on tube 1 said ring is shifted by means of a small screw in the flange thereof catching into groove 10 in the cylinder 1, and it opens or closes thereby the slots 8 in part 1, a fact which becomes at once evident and clear from Fig. 1. Said regulating-ring stands vertically on the cylinder.

The apparatus operates as follows: The jet of liquid medicaments flows into the metal cylinder through the horizontal pipe 3 and the liquid is sprayed by the jet of steam, which strikes it at right angles coming out of the vertical pipe 4. The mixture of sprayed liquid and steam now passes through the metal cylinder 1, where it is mixed with air entering through the slots 8 into branch *a* of the lyre-shaped glass tube *c*, where the sprayed liquid is evaporated as the temperature of the steam increases, the steam being compressed in consequence of the smaller diameter *v* of the lyre-shaped glass tube *c*. The temperature of the steam increases from 10° to 30° centigrade, so that during the passage of the mixture of steam and sprayed liquid through the lyre-shaped glass tube *c* the liquid is completely evaporated, the lyre-shaped glass tube acting as thermo-accumulator. The smaller the diameter of the lyre-shaped glass tube is chosen the greater is the increase in temperature. The evaporated medicament is inhaled from the end *m* of the other arm, *b*, of the lyre-shaped glass tube *c*. The water of condensation flows off through the three nozzles 6 at the bottom of the horizontal arms *a b* and at the bottom of the lyre-shaped glass tube *c* into pipe 7.

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

An improved inhaler comprising in combination a lyre-shaped glass tube, two horizon-

tal arms at the upper end of the lyre-shaped glass tube of larger diameter than the same, studs at the bottom of the horizontal arms and of the lyre-shaped glass tubes, a three-
5 branched pipe for the outflow of the condensed water, india-rubber hose connecting the studs with said three-branched pipe, a metal cylinder at the end of one of the horizontal arms, a metal cap closing the open end of said cyl-
10 nder, a horizontal pipe for the supply of liquid and a vertical pipe for the supply of a steam-jet terminating in said metal cap, longitudinal slots in the metal cylinder, a verti-

cal ring with a scale on its surface screwed with a flange on the metal cylinder so as to 15 more or less cover the longitudinal slots, substantially as described and shown and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing wit- 20 nesses.

THEODOR HERYNG.

Witnesses:

BENJAMIN ELLENBAND,
M. B. OLSSEWSKI.