No. 619,282.

Patented Feb. 14, 1899.

J. CRAIG, JR.

CHARGING NOZZLE.

(Application filed Oct. 4, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig 2

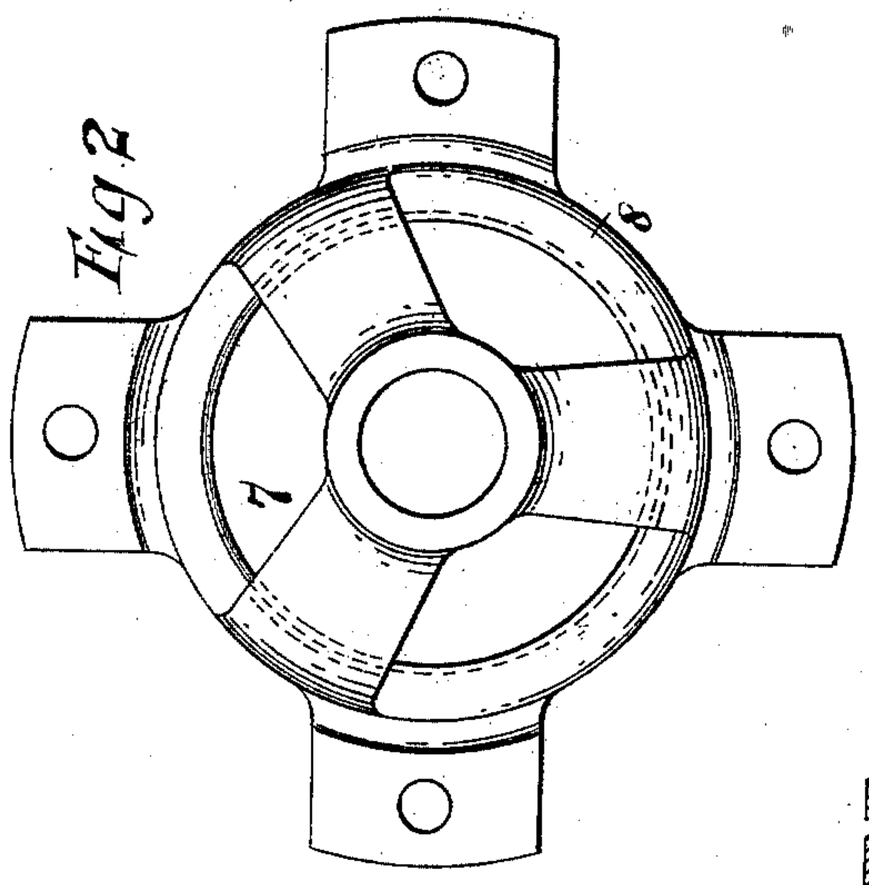

Fig 3

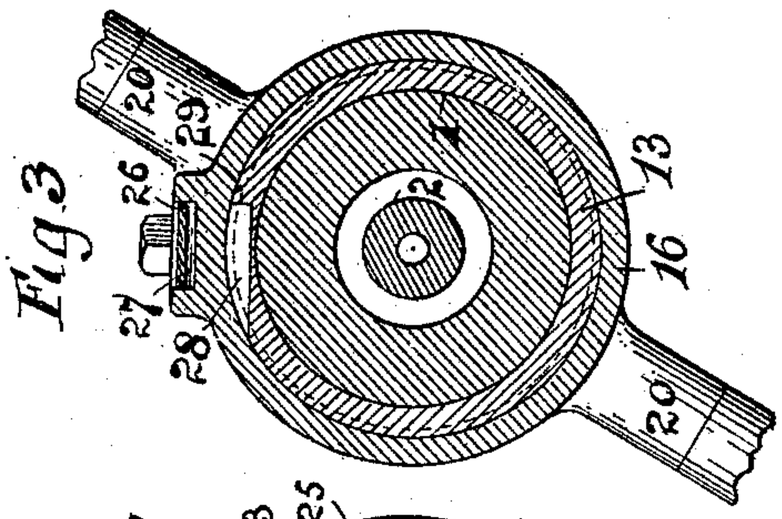

Fig 4

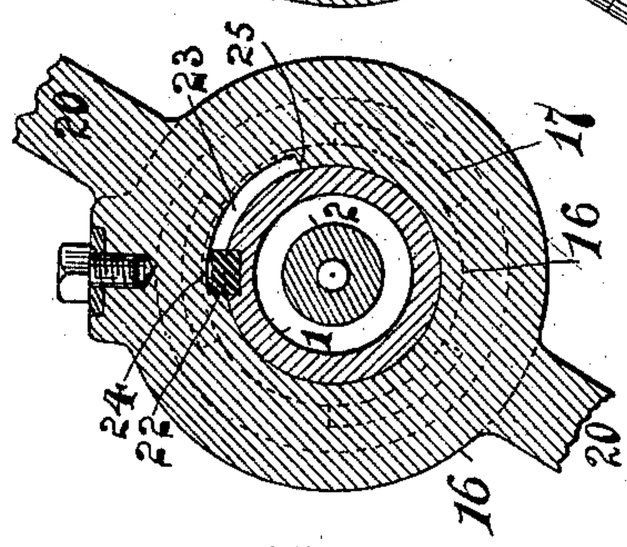

Fig 5

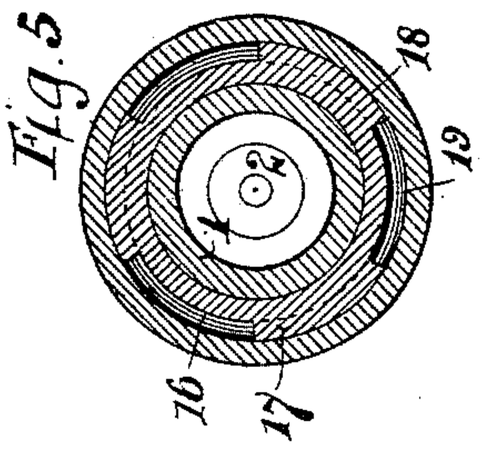

Fig 1

Witnesses
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Fig. 6.

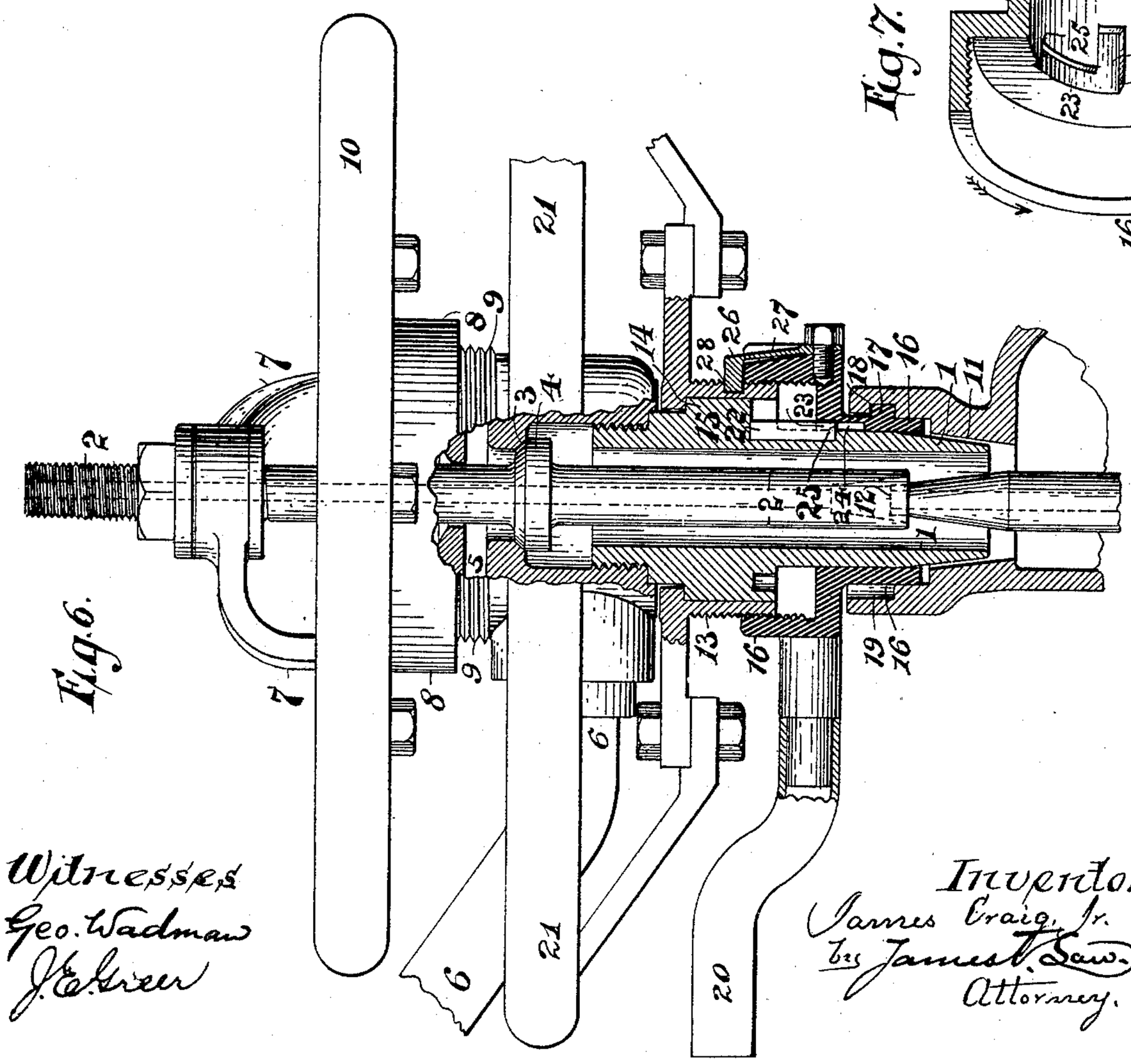

Fig. 7.

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UNITED STATES PATENT OFFICE.

JAMES CRAIG, JR., OF NEW YORK, N. Y.

CHARGING-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 619,282, dated February 14, 1899.

Application filed October 4, 1897. Serial No. 653,916. (No model.)

To all whom it may concern:

Be it known that I, JAMES CRAIG, Jr., a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Charging-Nozzles, of which the following is a specification.

This improvement relates to nozzles for charging or filling vessels under pressure and refers especially to charging-nozzles for charging or filling the heating-cylinders used in connection with compressed-air motors where the cylinder is to be filled with steam or hot water under pressure and where an outlet is required for the escape of the air or water with which the cylinder is already filled.

This invention consists in the combinations and constructions recited in the claims.

The particular construction of the charging-nozzle herein shown is more especially designed for use in charging or filling the heating-cylinders on compressed-air cars or vehicles.

In the accompanying drawings, illustrating this invention, Figure 1 is a horizontal section of the charging-nozzle, taken centrally through the same, attached to the heater-orifice. Fig. 2 is an end elevation of the yoke on the outer end of the charging-nozzle. Fig. 3 is a transverse sectional view of the nozzle through the line $x\ x$, Fig. 1. Fig. 4 is a transverse sectional view through the line $y\ y$, and Fig. 5 a similar view through the line $z\ z$. Fig. 6 is a horizontal view, partly in section, of the charging-nozzle, showing certain parts in an unlocked position; and Fig. 7 is a detail.

My improved charging-nozzle consists of two tubes, one preferably within the other, the outer one of which is connected with the inlet-orifice through which the steam or water enters the heater and the inner one with the discharge-orifice from the latter. 1 is the inlet or charging tube, and 2 the outlet or discharging tube situated within the tube 1. In the tube 1 is the valve-seat 3, with which engages the valve 4, mounted on the outside of the tube 2, by means of which the passage of the steam through the charging-tube is controlled. Communicating with the ports 5 in the tube 1 back of the valve is the supply-pipe 6, through which the steam or hot water enters the nozzle. The inner outlet tube 2 is supported and moved within the tube 1 by the yoke 7, attached to the part 8, which screws onto the outer end of the apparatus at 9. As shown in the drawings, the tube 2 screws into the yoke 7, by which means the position of the tube is regulated and the valve 4 adjusted on its valve-seat. Attached to the part 8 is the wheel 10, by which it is turned. As will be evident, when the part 8, with the yoke 7, is screwed onto the end of the nozzle the tube 2 is moved along within the tube 1 and the valve 4 slid away from its valve-seat or unseated, and as the part 8 is unscrewed the tube is moved back and the valve brought against its valve-seat and closed. The valve in the charging-tube 1 is thus opened and closed by the movement of the discharge-tube 2, and at the same time the latter tube is connected with or withdrawn from the discharge-orifice on the heater, as described farther on.

The end of the tube 1 is beveled on the outside, as shown in the drawings, in order to slide and fit into the charging-orifice 11, connected with the heater, and the tube 2 is correspondingly beveled on the inside to slide over and inclose the end of the discharge-orifice 12. The tube 1 is made to slide into the orifice 11 by the encircling screw-ring 13, the inner surface of which is provided with a shoulder 14, which bears against or engages with a similar shoulder 15 on the outside of the tube 1, and which ring screws into the attaching or locking ring 16 of the nozzle. This attaching-ring 16 consists of an annular ring screwing over the ring 13 and adapted to be attached and secured to the heater-orifice. On the end of the ring 16 are segmental projections 17, which fit into corresponding recesses 18 within the orifice 11 and hold the nozzle in position on the latter.

When the charging-nozzle is to be attached, the part 8 is unscrewed from the end of the nozzle until the tube 2 is drawn back far enough to seat the valve 4 on its seat, and thus close the valve in the tube 1, and the ring 13 is partially unscrewed from the attaching part 16, as is shown in Fig. 6. The end of part 16 is then inserted in the orifice 11, the projections 17 sliding in the grooves 19 until opposite the recesses 18. The attaching-ring 16 is then turned by the handle

20 and the projections 17 slid into their several recesses 18 in the orifice 11, when the part 16, and hence the charging-nozzle, will be attached to the heater-orifice and securely held in the latter. The ring 13 is then turned by means of the wheel 21 and screwed into the fixed attaching part 16. The part 16 being held from turning by its connection with the heater-orifice as the ring 13 screws into it the shoulder 14 on the ring presses against the shoulder 15 on the outside of the tube 1 and causes the tube to move forward with the ring, and thus slides the tube into the orifice, as shown in Fig. 1. The charging-tube is then in place in the charging-orifice on the heater and ready for the admission of steam or hot water. The part 8 is then screwed by means of the wheel 10 onto the outer end of the apparatus, which causes the tube 2 attached to it to move forward and its end to slide over and inclose the end of the discharge-orifice 12. At the same time the valve 4 on the tube 2 is slid away from its seat and the valve in the charging-tube opened, allowing the steam to pass through the charging-tube into the heater, as shown in Fig. 1. As the valve 4 in the charging-tube is opened and as the connection is made between the discharge-tube and discharge-orifice the valve or stop-cock on the heater connected with the discharge-pipe is opened and the air or water allowed to escape through the discharge-orifice and the discharge-tube in the nozzle at the same time as the steam or hot water enters through the charging tube and orifice and passes into the heater. As is thus seen, with my improved charging-nozzle the connection is made with both the charging and discharging orifices and the valve in the charging-tube opened at the same time and by one operation, and when an automatic discharge-valve is used on the cylinder, which opens by the pressure of the steam entering the cylinder, the whole operation of charging the heater-cylinder and allowing the escape of the air or water is effected at one operation and by the same operator.

It sometimes occurs that the charging-nozzle is disconnected from the heater-orifice while the charging is progressing or before the tubes are withdrawn from the orifices, causing the nozzle to be blown violently out and resulting in injury to the operator or apparatus. To prevent such an occurrence, I employ the locking device shown in the drawings. This consists of a key or feather on the outer surface of the tube 1, which fits into a recess in the inner surface of the locking-ring 16 and prevents the latter ring being turned so as to remove the projections 17 from the recesses in the orifices or so as to disconnect the nozzle from the orifice until the tube has been withdrawn from the charging-orifice.

On the outside of tube 1 is a feather or key 22, which fits and moves in a recess 24 (shown more clearly in Fig. 7) in the inner surface of the attaching-ring 16. Communicating with this recess is a segmental groove 23, in which the key slides as the ring 16 is turned to bring the projections 17 into the recesses 18 when attaching the nozzle to the orifice. The position of the recess 24 and groove 23 with respect to the key 22 and to the projections 17 is such that when the nozzle is detached and the tube 1 drawn back the key will rest in the outer corner 25 of the groove, and the projections 17 will be in position to slide in the grooves 19 in the edge of the heater-orifice. In attaching the nozzle to the orifice as the ring 16 is turned to bring the projections 17 into the recesses 18 in the orifice the key 22 slides in the groove 23 in front of the recess 24 and in position to enter the latter. As the tube 1 is then slid forward to form a connection with the charging-orifice the key enters the recess and moves to the back of the same. The nozzle is now attached to the orifice by the projections 17 and is securely locked by the key 22 in the recess 24, as so long as the key remains in the recess the ring 16 cannot be turned to move the projections 17 out from the recesses in the orifice and detach the nozzle, and hence the nozzle cannot be detached until the tube 1 is withdrawn far enough to slide the key out from the recess and in position to slide in the groove 23. In this position, as shown in Fig. 6, there is sufficient space between the tube and the orifice to allow any steam that may be confined in the orifice to pass gradually out without blowing out the nozzle, and if by accident the operator should withdraw the tube before closing the valve in the latter the escape of the steam around the tube would warn him of his mistake and enable him to close the valve before any injury resulted.

To prevent the ring 13 being unscrewed so far as to be detached from the ring 16, I employ a detent or stopper 26, mounted on the ring 16 by a spring 27, which enters a groove 28 in the ring 13 at the moment the key 22 moves out of the recess and is in position to slide in the groove 23. One side of this groove 28 has a shoulder 29, Fig. 3, against which the detent strikes and stops the further turning of the ring 13. As the ring is turned in sliding the tube 1 forward the detent moves out from the groove and remains on the surface of the tube, as shown in Fig. 1.

My improved charging-nozzle may be used equally well to charge the reservoir with compressed air and for all purposes where a charging apparatus is required and with any construction of orifice on the cylinder or vessel charged having the discharge-pipe and inlet pipe or orifices arranged to connect with the respective tubes of the nozzle.

While I prefer the construction here shown, it may be varied in important particulars without departing from the invention, as the charging-tube may be situated within the outlet-tube or the tubes may be otherwise placed and the details may be altered from those here shown and described.

What I claim is--

1. In a charging-nozzle, in combination, a charging-tube, and a discharging-tube adapted to move back and forth in the nozzle to form a connection with the discharge-orifice, substantially as described.

2. In a charging-nozzle, in combination, a charging-tube; an outlet-tube, situated within the charging-tube and capable of moving back and forth in the same; and a valve mounted on the outlet-tube, and adapted to control the passage of the charge in the charging-tube, substantially as described.

3. In a charging-nozzle, in combination, a charging-tube; an outlet-tube situated within the charging-tube; a valve mounted on the outlet-tube, and adapted to control the passage of the charge through the charging-tube; means whereby the charging-tube is moved to engage and disengage with the charging-orifice; and other means whereby the outlet-tube is moved to open and close the valve in the charging-tube, and engage and disengage with the outlet-orifice, substantially as described.

4. In a charging-nozzle having a charging-tube situated within the nozzle and adapted to engage with the charging-orifice of the vessel charged, a locking device adapted to prevent the nozzle from being detached from the vessel until the charging-tube is disengaged from its orifice, substantially as described.

5. In a charging-nozzle, in combination, a charging-tube, situated within the nozzle and adapted to engage with the charging-orifice of the vessel charged; and a locking device on the nozzle, adapted to prevent the latter from being detached from the vessel until the charging-tube is disengaged from its orifice, substantially as described.

6. In a charging-nozzle, in combination, a charging-tube; an outlet-tube, situated within the charging-tube; a valve on the outlet-tube adapted to control the passage of the charge in the charging-tube; and a locking device on the nozzle whereby the nozzle is secured to the charging-orifice until the charging-tube is disengaged therefrom, substantially as described.

7. In a charging-nozzle, in combination, a charging-tube; an outlet-tube, situated within the charging-tube; a valve on the outlet-tube adapted to control the passage of the charge in the charging-tube; means whereby the charging-tube is moved to engage and disengage with the charging-orifice; other means whereby the outlet-tube is moved to open and close the valve in the charging-tube and engage and disengage with the outlet-orifice; and a locking device on the nozzle by which the nozzle is secured to the charging-orifice until the charging-tube is disengaged therefrom, substantially as described.

8. In a charging device, in combination, the charging-tube 1; means whereby the tube is moved to engage and disengage with the charging-orifice; ring 16, encircling the tube and provided with the recess 23, and adapted to engage with the orifice; and key 22 on the tube 1, arranged to engage with the recess, whereby the ring 16 is prevented from disengaging from the orifice until the tube is withdrawn therefrom, substantially as described.

9. In a charging-nozzle, in combination, the charging-tube 1; outlet-tube 2, situated within tube 1; valve 4 on the tube 2 arranged to engage with the valve-seat 3; means whereby the tube 1 is moved to engage and disengage with the charging-orifice; other means whereby the tube 2 is moved to engage and disengage with the outlet-orifice; ring 16, encircling the tube and provided with the recess 23, and adapted to engage with the orifice; and key 22 on the tube 1, arranged to engage with the recess 23, whereby the ring 16 is prevented from disengaging from the orifice until the tube 1 is withdrawn therefrom, substantially as described.

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