(No Model.)

J. DREISÖERNER.

AMMONIA DIPPER VALVE.

No. 482,233. Patented Sept. 6, 1892.

Fig. I.

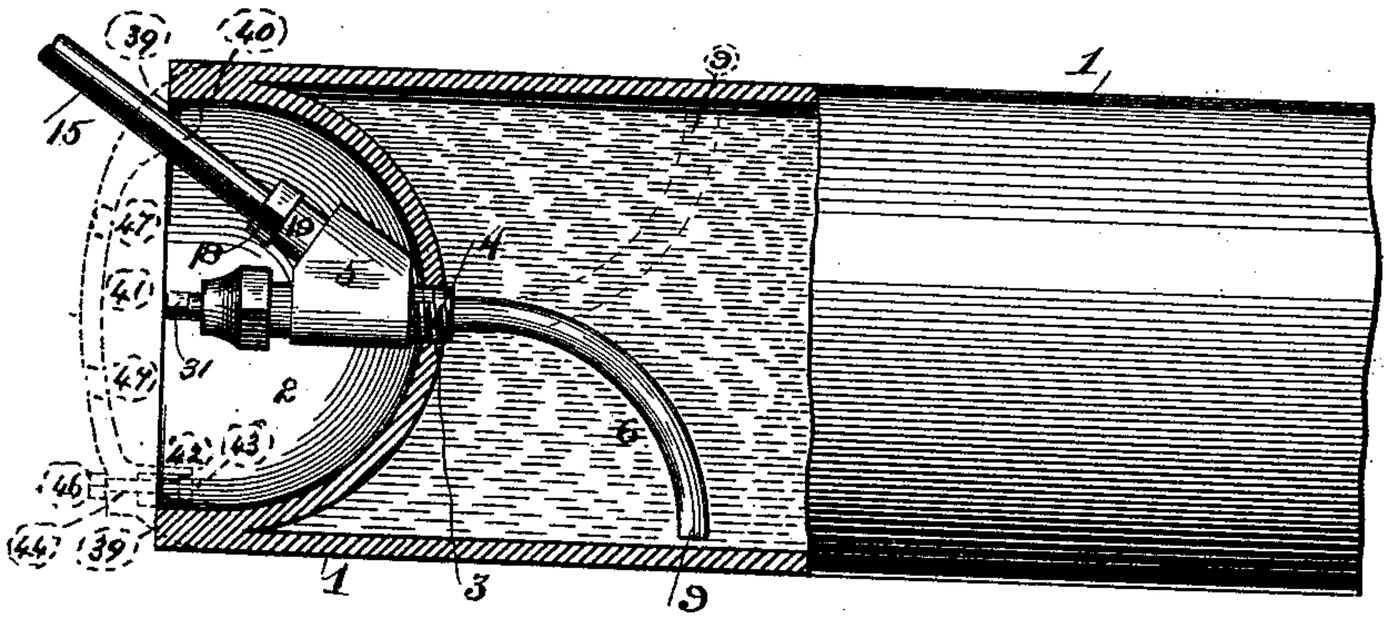


Fig. II.

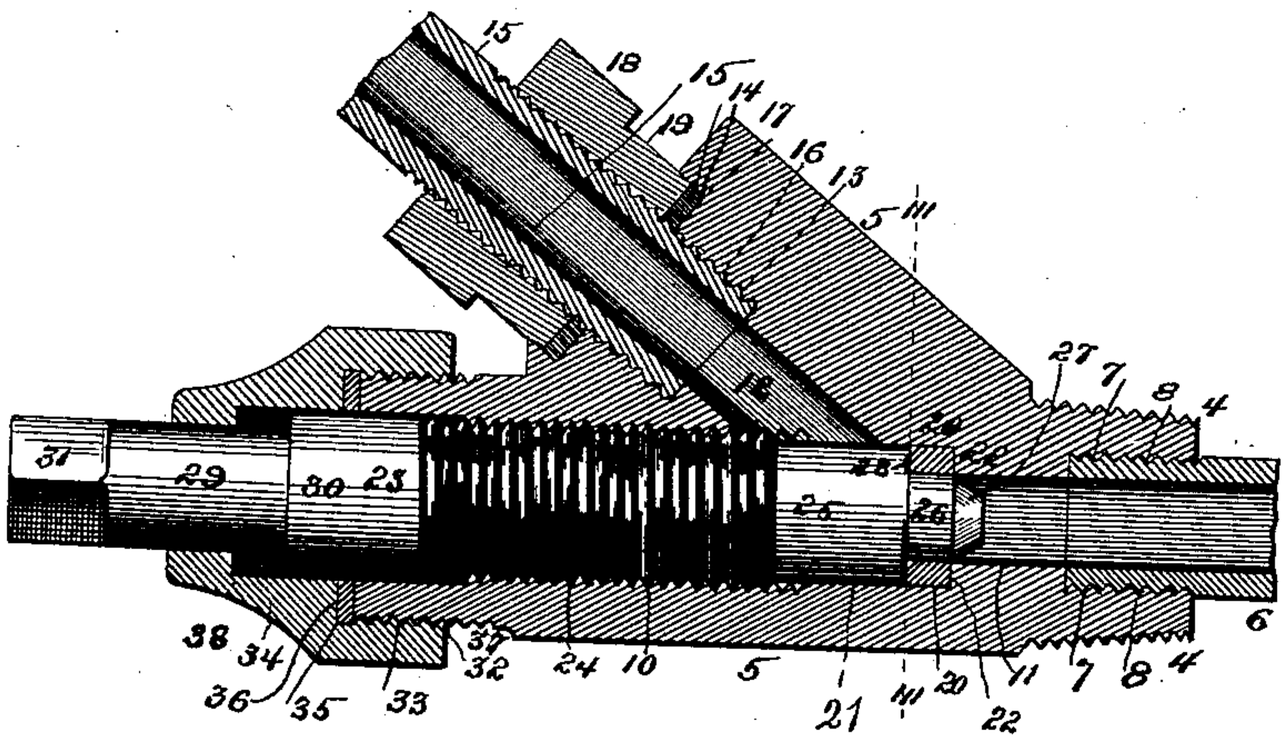
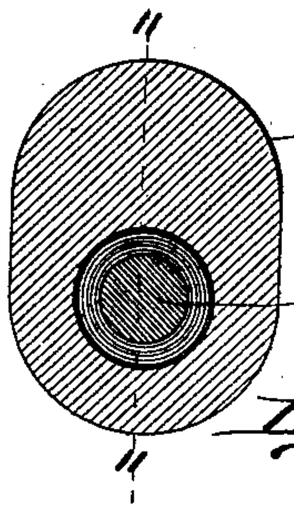


Fig. III.



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UNITED STATES PATENT OFFICE.

JACOB DREISÖERNER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE NATIONAL AMMONIA COMPANY, OF SAME PLACE.

AMMONIA DIPPER-VALVE.

SPECIFICATION forming part of Letters Patent No. 482,233, dated September 6, 1892.

Application filed April 18, 1892. Serial No. 429,672. (No model.)

To all whom it may concern:

Be it known that I, JACOB DREISÖERNER, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Ammonia Dipper-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to an ammonia-valve for charging and discharging the gas-cylinders in which the ammonia is shipped, and which valve has a branched duplex integral valve-joint, with which is combined a pendent dipper-pipe, whose mouth is in close proximity to the top of the gas-cylinder, as shown in broken lines in Figure I, when charging for the occasional release of the gas *via* the usual escape-valve, (not shown,) and the mouth of which dipper-pipe in the then inverted position of the cylinder when discharging is in close proximity to the then bottom of said gas-cylinder to insure the complete discharge of the ammonia from the cylinder.

Fig. I is a detail longitudinal view, part broken away and in vertical section, of the ammonia-gas cylinder and shows the integral branched ammonia-valve joint and the dipper-pipe secured thereto. Fig. II is a vertical detail section taken on line II II, Fig. III, and shows the interior duplex arrangement of the valve and the charging-pipe; and Fig. III is a vertical section taken on line III III, Fig. II, and shows the soft-metal cushion valve-seat.

Referring to the drawings, 1 represents the metal gas-cylinder, and 2 is the concave valve bearer-head thereof. 3 is the screw-threaded perforate seat in the center of said concave head, in which the screw-threaded nozzle 4 of the integral branched valve-joint 5 is seated.

6 represents the arc-curved dipper-pipe, the attachment screw-threaded end 7 of which is screw seated in the perforate-screw bore 8 of the nozzle 4. The nozzle 9 of said dipper-pipe extends to the near vicinity of the upper side of the gas-cylinder when said cylinder is being charged, as shown in broken lines in Fig. I, so as to allow vent for the escape of the air or volatile gas when it is crowded out by the charge of condensed liquefied gas, hereinafter explained. When, however, the gas-cylinder, after reaching its destination, is being discharged of its contents, the said cylinder is inverted to the reverse side to that on which it laid when charging, and is then in the position shown in Fig. I, in which the nozzle 9 of its dipper-pipe 6 is in close proximity to the then bottom side of said cylinder, so that in discharging the contents of the cylinder the said dipper-pipe by its suction entirely exhausts the same. The integral branched valve-joint 5 has a duplex bore, which is constituted of the main horizontal screw-threaded valve-bore 10, the smooth-bore terminal 21, the intermediate smooth-bore 11 at the mouth of the valve, which is on line with the bores 10, 21, and 8 and connect the same, but is of a smaller diameter than either, corresponding with the inside diameter of the dipper-pipe 6, and the angle-bore 12, which runs down into the main horizontal valve-bore 10, making together a duplex or fork bore.

13 represents an enlarged screw-perforate bore at the upper end of the smooth angle-bore 12 and at the same angle.

14 is a short smooth still further enlarged bore, which constitutes a gasket-seat at the upper end of and at the same angle as the two last-mentioned bores.

15 represents the compressor supply-pipe, (the detail attachment end of which is shown in Figs. I and II,) the screw-attachment end 16 of which engages in said screw-seat 13 in said integral branched joint. A rubber gasket 17 fits around said compressor supply-pipe and on said gasket-seat 14. 18 represents a jam-nut which is screw-mounted on said compressor supply-pipe 15 and the round stem 19 of which works down into the gasket-bore 14 and compresses said rubber gasket 17, so as through the gasket to tighten the joint and through the jam-nut to tighten the compressor supply-pipe to its screw-seat.

20 represents a soft-metal gasket, preferably made of lead, the diameter of which coincides with that of the slightly-reduced diameter of the smooth terminal 21 of the main horizontal screw-bore 10 of the valve-seat. The said soft-metal gasket is seated against the shoulder formed in the horizontal valve-seat by the reduced diameter of the intermediate bore 11

to that of 21. 23 represents the valve-stem, whose screw 24 engages in the aforesaid screw-bore valve-seat 10. 25 is the smooth slightly-reduced extension of said valve-stem, that is seated and works in its smooth-bore seat 21, and 26 is a still further reduced extension of said valve-stem, which works within and without the soft-metal gasket 20. 27 is the terminal bevel-point of said valve-stem, and 28 is the shoulder between the extensions 25 and 26, which shoulder, when the valve is closed, presses against the soft-metal gasket 20, (which gasket is preferably made of lead,) so as to effect a gas-tight seat for the ammonia-valve stem. 29 represents the reduced neck of said valve-stem. 30 is its shoulder, which is of the same diameter as the outer periphery of its screw 24, and 31 is the wrench seat-head, which forms the outer terminal of said ammonia-valve stem and by which its right-hand screw is turned in its seat, respectively, to open or close the valve. 37 represents the lower or valve fork of said branched valve-joint in which said screw valve-stem works, and 32 is the peripheral screw around the end of said fork, on which screw the perforate screw 33 of the jam-nut 34 engages. The said jam-nut perforate screw has a left-hand thread, and is thereby diverse from the valve-screw and so unaffected by its action.

35 represents a rubber gasket-ring around the valve-stem 23, and which gasket when tight pressed by the shoulder 36 of the jam-nut 34, when said nut is screwed upon its seat, makes a gas-tight joint around the aforesaid valve-bore 10. The neck 29 of said valve-stem is seated and works during the opening and closing of the valve in the circular opening 38 in the end of said jam-nut.

The operation of this ammonia-valve, in conjunction with the compressor supply-pipe, (both of which are seated and operate within the integral branched forked valve-joint,) is as follows: The empty gas-cylinder is placed on its side in the reverse position to that shown in Fig. I, so that the dipper-pipe, instead of presenting downward, as shown in full lines in said figure, presents upward, as shown in broken lines. The compressor supply-pipe 15, a detail of which is shown in Figs. I and II, by its screw-attachment end 16 is then screw-seated in the screw-bore 13 of the upper fork of the integral branched valve-joint, the rubber gasket-ring 17 being placed around said pipe and on the gasket-seat 14 within said upper fork. The jam-nut 18, that is screw-mounted on said compressor supply-pipe above said fork, is screwed down until it sufficiently compresses said rubber gasket 17 so as to form a gas-tight joint. The said compressor supply-pipe connects with the usual branch pipe, in which is located the supply-valve and the escape-valve, the said supply-valve connecting with and turning on and off the supply from the usual ammonia-refrigerator compressor-coil. The said two last-named valves and compressor-coil are not shown, as they are of usual construction, and therefore no novelty is claimed in them. At the same time they are referred to in the operation because they are operated in conjunction therewith, the said supply-valve to respectively stop and open the supply from the compressor ammonia-coil and the escape-valve to be intermittently opened to allow the escape of air or gas from the gas-cylinder in the process of filling. The ammonia-valve stem, the right-hand screw of which engages in the main horizontal screw-threaded valve-bore 10 in the lower fork 37 of said branched valve-joint, is then turned back by means of a wrench on its wrench-head 31, so as to open a free inlet through the compressor supply-pipe 15 and the angle-bore 12 into the main valve-bore 10, so that when the aforesaid usual supply-valve beneath the usual ammonia compressor-coil (said valve and coil not shown) is opened the compressed ammonia is charged through said valve-bore and through the arc-curved dipper-pipe into the gas-cylinder 1. The said cylinder at the time of filling is laid on its reverse side to that shown in Fig. I, so as to present said dipper-pipe upward, as shown in broken lines in said figure. Once or twice, or as many times as is deemed necessary, during the process of charging the gas-cylinder the supply-valve beneath the ammonia-coil is closed and the usual aforesaid escape-valve is opened to allow of the escape of air or volatile gas from said cylinder by the pressure of the charge. Now it will be seen that as during the process of charging the said arc-curved dipper-pipe is presented upward, with its mouth in close proximity to the top of the cylinder, in the position shown in broken lines in Fig. I, therefore the air or volatile gas which always rises to the top side of the cylinder during charging readily escapes through said dipper-pipe when the said usual supply-valve is closed and the escape-valve is opened. When the gas-cylinder is charged, the shoulder 28 of the ammonia-valve stem 23 is screwed home to its gas-tight pressure-seat against the soft-metal gasket 20, so as to effect a gas-tight joint that commands the sole outlet of the gas-cylinder. The compressor supply-pipe 15, that communicates with the ammonia-coil, is then disengaged from its screw-seat in the upper fork of the branched valve-joint, and a common screw-stopper may, if desired, be inserted in its place merely to keep the angle-bore clean. The gas-cylinder is then ready for shipping in the form shown in full lines in Fig. I, as its branched valve-joint and the wrench-seat of its valve-stem are in a measure protected within the concave recess 2 of said cylinder. In Fig. I, however, is shown in broken lines a modification of the valve end of said cylinder, in which its end periphery has an inward curve 39, in which the inwardly-projecting and peripherally-expanding lug 40 of the cover 41 engages and constitutes a

more perfect protection of the valve. On the opposite side of said cover an inwardly-projecting lug 42 confines and clamps against said inwardly-curved edge of the cover the square head 43 of the bolt 44, the screw end of which bolt passes through the bolt-hole 45 in said cover and is secured in its seat, and thus fastenes the cover by the screw-nut 46. 47 represents thumb and finger holes in said cover to enable the convenient handling of the same while it is being placed to its seat and bolted to the end of said gas-cylinder. The said cover provides a complete protection from both dirt and accident for the valve. After the charged cylinder has reached its destination and it is desired to discharge the same, the gas-cylinder is laid on the same side, as shown in Fig. I, which is the reverse side to that on which it is laid while charging, so that the mouth of its arc-curved dipper-pipe 6 is then, as shown in full lines, in close proximity to the bottom of said cylinder, so as to be able to completely discharge the contents of the same. The pipe connection to the usual receiver, which in the discharge is the equivalent of the compressor supply-pipe 15 used in charging, is then attached as was said supply-pipe, and as the mouth of said arc-curved dipper-pipe is in close proximity to the bottom of the cylinder the charge thereof is clean drawn.

I do not confine myself to the use of this valve and its coadjutant charging device confined in their integral branched joint to its use in charging and discharging ammonia-cylinders, for it is evident that the device may be advantageously used in connection with other fluids, especially of all such which are charged and inclosed in vessels under pressure.

I claim as my invention—

1. In an ammonia-valve, the combination of the gas-cylinder, the branched valve-joint, the bearer-head for the valve-joint, the valve-stem in said joint, and the arc-curved dipper-pipe 6, extending from the bearer-head to the side of the cylinder, substantially as described.

2. In an ammonia-valve, the combination of the gas-cylinder having the concave valve bearer-head, the integral forked branched valve-joint screw-seated in said head, one of the forks of said joint provided with the main horizontal screw-threaded bore 10 and the other fork provided with the angle-bore 12 and the enlarged screw-perforate bore 13, the screw valve-stem that works in said screw-bore 10, and the compression supply-pipe that engages in said screw-perforate bore 13, substantially as described.

3. In an ammonia-valve, the combination of the integral forked branched valve-joint provided with the main screw-threaded valve-bore 10, the screw-threaded valve-stem 23, having the shoulder 30, the elongated neck 29, the wrench-seat 31, the smooth reduced extension 25, the secondary reduced extension 26, the valve-shoulder 28 between said extensions, the soft-metal gasket 20, against which said valve-shoulder presses to produce a gas-tight seat, and the bevel end 27 of said valve-stem, substantially as described.

4. In an ammonia-valve, the combination of the integral forked branched valve-joint provided with the fork 37, the main screw-threaded valve-bore 10, and the peripheral screw 32, the screw valve-stem that works in said bore, the soft-metal gasket against which said valve closes, the rubber gasket 35, and the jam-nut 34, having the jam-shoulder 36 and the perforate screw 33, substantially as described.

5. In an ammonia-valve, the combination of the integral forked branched valve-joint having the fork 37, provided with the screw-threaded bore 10, the valve screw-threaded stem 23, the soft-metal gasket against which said valve closes, the said hunchback joint also provided with the angle-bore 12, that connects with the valve-bore 10, the enlarged screw-perforate bore 13, and the gasket-shoulder bore 14, the rubber gasket 17, the screw-attached compressor supply-pipe 15, and the jam-nut 18, having the round stem 19, the progressive butt-end of which jams against said rubber gasket 17, substantially as described.

6. In an ammonia-valve, the combination of the gas-cylinder 1, the concave valve bearer-head 2, having the perforate center screw-threaded seat 3, the integral branched valve-joint 5, having the screw-threaded nozzle 4, and the valve and compressor supply bores, the valve-stem in said valve-bore, the concave head of said gas-cylinder having the inwardly-curved lip 39, and the cover 41, having the inwardly-projecting lugs 40 and 42, and the bolt 44, whose head and screw-nut hold said cover to the concave valve-head of said cylinder, substantially as described.

JACOB DREISÖERNER.

In presence of—

BENJN. A. KNIGHT,

SAML. KNIGHT.