

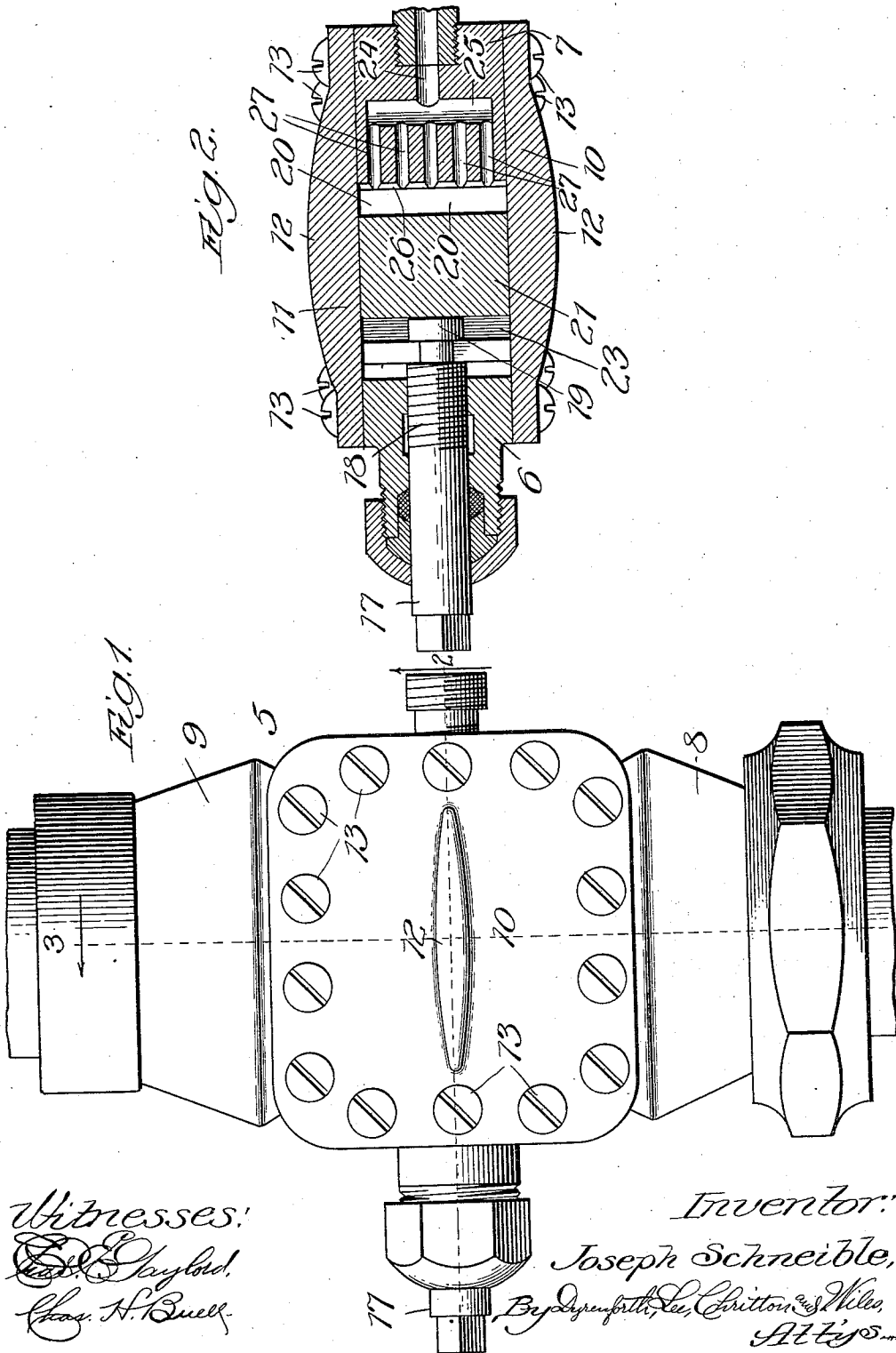
J. SCHNEIBLE.
JET PUMP.

APPLICATION FILED JAN. 19, 1912.

Patented June 24, 1913.

2 SHEETS-SHEET 1.

1,065,730.



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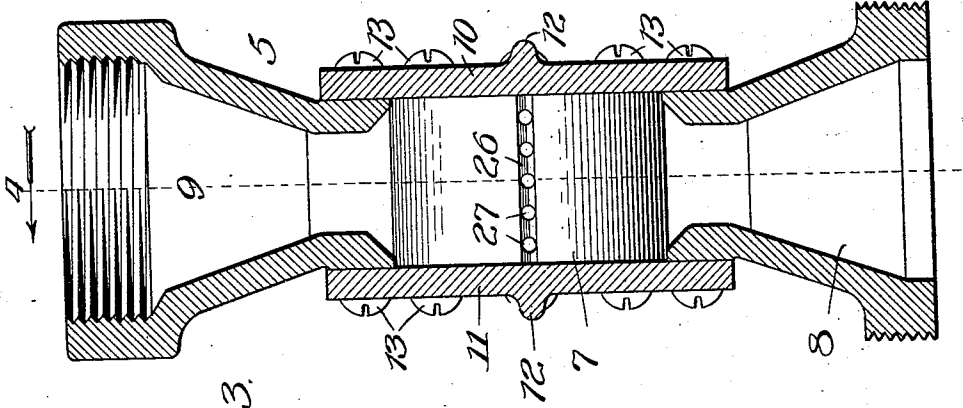


Fig. 3.

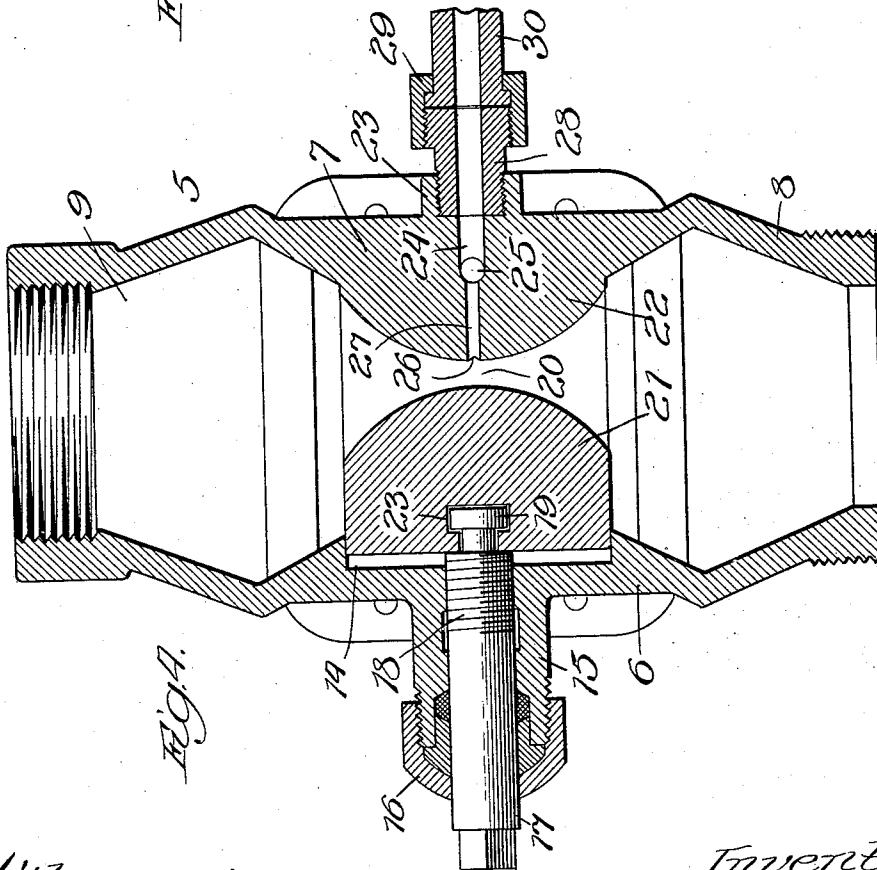


Fig. 4.

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UNITED STATES PATENT OFFICE.

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JET-PUMP.

1,065,730.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH SCHNEIBLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Jet-Pumps, of which the following is a specification.

My invention relates to an improvement in the class of jet-pumps used for causing one fluid passing through it under pressure or head to produce and maintain the flow of another fluid for any of various purposes, including that of effecting a thorough mixture of the two fluids, which is the more particular purpose of my improvement.

The primary object of my improvement is to provide a construction of jet-pump whereby its suction-action on the fluid operated upon may be regulated by adjustment to suit the quantity of the operating fluid passed through it, and maintain uniform velocity of the fluid coursing through every part of the jetting-passage in the pump.

In the accompanying drawings, Figure 1 is a view in elevation of my improved jet-pump; Fig. 2 is a section on line 2, Fig. 1; Fig. 3 is a section on line 3, Fig. 1, and Fig. 4 is a section on line 4, Fig. 3.

The casing 5 is a casting formed with side-walls 6 and 7, an inlet-chamber 8 at one end and an outlet-chamber 9 at the opposite end; and the open sides of the casting are closed by plates 10 and 11 reinforced by central ribs 12, these plates fitting between the inlet and outlet-chambers and being fastened to the side-walls, as by screws 13. In the inner face of the wall 6 is formed a rectangular guide-recess 14 with an internally-threaded opening at its center through the wall, about which opening extends from the outer face of the wall a bearing 15, provided with a stuffing-box 16, for a shaft 17 screw-threaded at 18 to work in said opening and terminating at its inner end in a circular head 19; and the outer end of the shaft is formed for the application to it of a suitable handle (not shown) for operating it to set the apparatus. The jetting-passage 20 is formed between two heads 21 and 22 projecting toward each other respectively at the inner sides of the walls 6 and 7, and of the preferred formation illustrated. The head 21 is of rectangular cross-section, to fit the recess 14, and has a convexly-rounded, or bulging, face; and it contains a rear slot 23, T-shaped in cross-

section, to adapt it to be slipped into the casing over the head 19 for connection with the shaft. The head 22, provided with a face like and opposing that of the head 21, is a permanent part of the wall 7 and may be cast therewith, as indicated, or formed separately and suitably united therewith. On the outer face of the wall 7 is formed, concentrically with the head 22, an internally-threaded collar 23 about an inlet-opening 24 leading to a header-like chamber 25 in that head extending transversely thereof and having one or more of parallel ducts 27 branching from it and opening into a groove 26 formed centrally across the bulging face of the head to register with the most constricted section of the passage 20. A nipple 28 screws into the collar 23 and has connected with it, by a coupling 29, a pipe 30 leading from the source of supply (not shown) of the fluid to be operated upon.

For the following explanation of the operation of my improved jet-pump, it may be supposed to be used for carbonating beer in the manufacture thereof, the supply of carbon dioxide coming through the pipe 30 and the beer being supplied under suitable pressure (as by a pump, not shown) or head to the inlet-chamber 8. As will be understood, however, the liquid to be carbonated may be other than beer; and my improved device is intended for use in any connection wherein it is applicable for performing the jet-pump or "aspirator" function of causing one fluid under pressure to produce and maintain, by its suction-action, the flow of another fluid.

Beer pumped into the chamber 8 in coursing through the constricted passage 20 exerts suction on the gas through the ducts 27 and produces and maintains the flow thereof to mix it thoroughly with the beer, and the charged liquid discharges through the outlet-chamber 9, as to a racker (not shown). For a given number of barrels (say 30) of the liquid to be passed through the device within a predetermined time to be charged with the gas, the head 21 is set accordingly, by properly turning the shaft 17, with relation to the head 22 to suitably constrict the passage 20 for that purpose, and when thus set the action of the jet-pump is uniform throughout the run. If a different number of barrels (say 45), in another run, are to be passed through the device in

the predetermined time, the head 21 is set to decrease the constriction of the passage, because the increased flow requires a greater amount of gas for carbonating the beer; but though the quantity of liquid coursing through the passage within the given time is one-half greater than that in the first-named run, the area of the passage need not be increased to a corresponding extent. The area of the passage must be adjusted according to requirements in each instance; and that my improvement enables to be accomplished readily and accurately. Moreover, it sometimes occurs, where a jet-pump is installed for use, that it is desired not to employ suction-action of the liquid, but merely to run it to its destination, through the course containing the jet-pump, without carbonating it or causing it to exert suction-action upon another liquid. In that case, it is only necessary, with my improved device, to shut off the pipe 30 and open wide the passage 20 by drawing backwardly the head 21 to the full extent.

The header-like chamber 25 with the ducts 27 leading from it form a desirable feature in my improvement, inasmuch as they effect a better distribution of the gas by presenting a greater surface thereof to be acted upon, which is important in handling large quantities of liquid or gas, since the thoroughness of commingling the gas with the liquid is thereby enhanced; and this effect is still further augmented by the provision of the groove 26, which receives the discharge from the ducts and promotes diffusion of the gas for action upon it by the liquid.

It is of the essence of my invention that the jetting-passage 20 be of rectangular cross-section, as shown in Fig. 2, requiring its opposite walls to be parallel in every adjustment of the head 21, since otherwise variations will ensue in the velocity of the fluid in different parts of the passage while coursing through the latter, causing whirls or eddies and consequent impairment or prevention of the suction-action on the fluid operated upon.

I realize that considerable variation is possible in the details of construction thus specifically shown and described, and I do not intend by illustrating a single, specific or preferred form to limit my invention thereto; my intention being in the following claims to claim protection upon all the novelty there may be in the device as broadly as the state of the art will permit.

What I claim as new and desire to secure by Letters Patent is—

1. A jet-pump having the side-walls of its casing provided with opposing heads forming between them a constricted passage for the operating fluid rectangular in cross-section to maintain the opposite walls of said

passage parallel in all of the head-adjustments, said heads being adjustable one with relation to the other to vary the degree of constriction of the passage, and means for fixing the adjusted relation of the heads.

2. A jet-pump having the side-walls of its casing provided with heads presenting bulging opposing faces forming between them a constricted passage for the operating fluid rectangular in cross-section to maintain the opposite walls of said passage parallel in all of the head-adjustments, one of said heads having an opening through it for the fluid to be operated upon leading to said passage, said heads being adjustable one with relation to the other to vary the degree of constriction of the passage, and means for fixing the adjusted relation of the heads.

3. A jet-pump having the side-walls of its casing provided with opposing heads forming between them a constricted passage for the operating fluid rectangular in cross-section to maintain the opposite walls of said passage parallel in all of the head-adjustments, one of said heads containing a chamber open to the supply of fluid to be acted upon and having a duct leading from it to said passage, said heads being adjustable one with relation to the other to vary the degree of constriction of the passage, and means for fixing the adjusted relation of the heads.

4. A jet-pump having the side-walls of its casing provided with heads presenting bulging opposing faces forming between them a constricted passage for the operating fluid, one of said heads having a groove extending across its face and containing a chamber open to the supply of fluid to be acted upon, with a duct leading from the chamber to said groove, said heads being adjustable one with relation to the other to vary the degree of constriction of the passage, and means for fixing the adjusted relation of the heads.

5. A jet-pump having one of its walls provided with a fixed head with an opening through it for the fluid to be operated upon, and its opposite wall provided with a head adjustable relative to the fixed head and forming therewith a constricted passage for the operating fluid traversing said opening rectangular in cross-section to maintain the opposite walls of said passage parallel in all of the head-adjustments, and a shaft journaled in said opposite wall and operatively connected with said adjustable head to move it back and forth and set it relative to the fixed head.

6. A jet-pump comprising, in combination, a casing formed with side-walls, an inlet-chamber and an outlet-chamber; and having plates fastened to said walls between said chambers, heads in the casing having bulging opposing faces forming between them a constricted passage for the operating fluid rectangular in cross-section to maintain

the opposite walls of said passage parallel in all of the head-adjustments, one of said heads being fixed on one side-wall and containing a chamber open to the supply of fluid to be operated on and a series of ducts leading from said chamber to said passage to be traversed thereby, and the other head being movably confined in the casing to adapt it to be adjusted relative to the oppos-

ing head, and a threaded shaft working in a bearing on the casing and connected with the movable head for adjustment thereof by turning the shaft. 10

JOSEPH SCHNEIBLE.

In presence of—

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R. SCHAEFER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."