

(No Model.)

J. B. HALL, Jr.

GAS BURNER.

No. 284,631.

Patented Sept. 11, 1883.

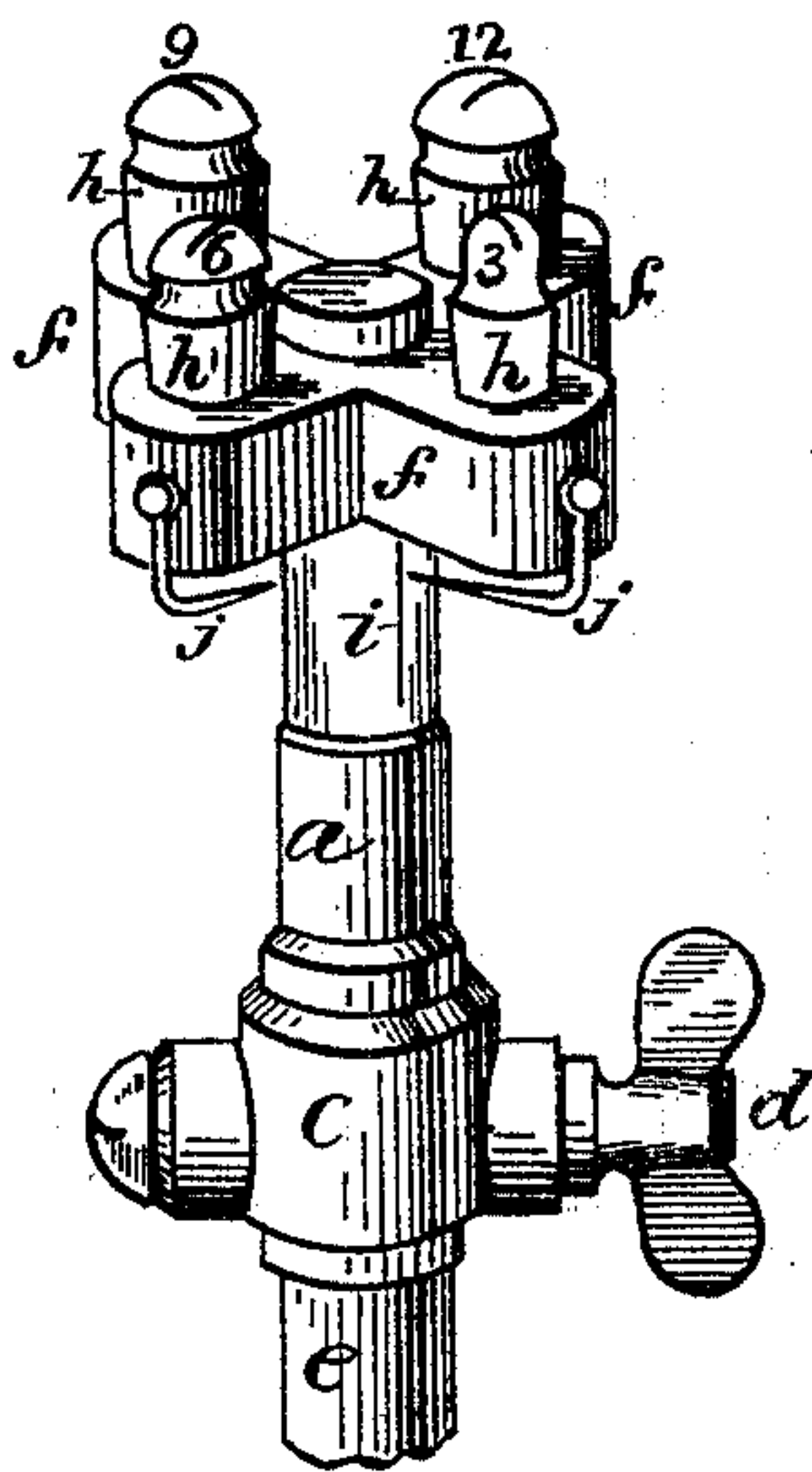


Fig. 1.

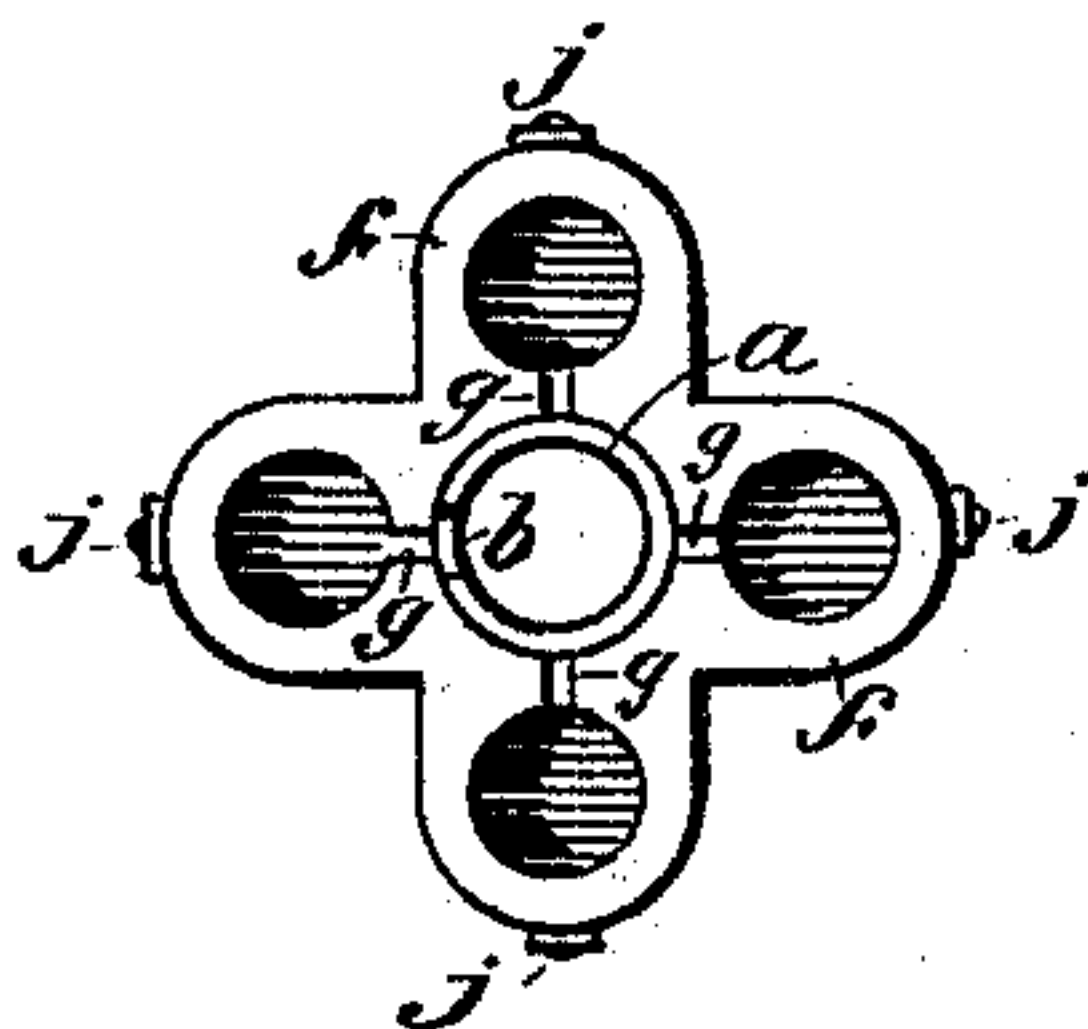


Fig. 3.

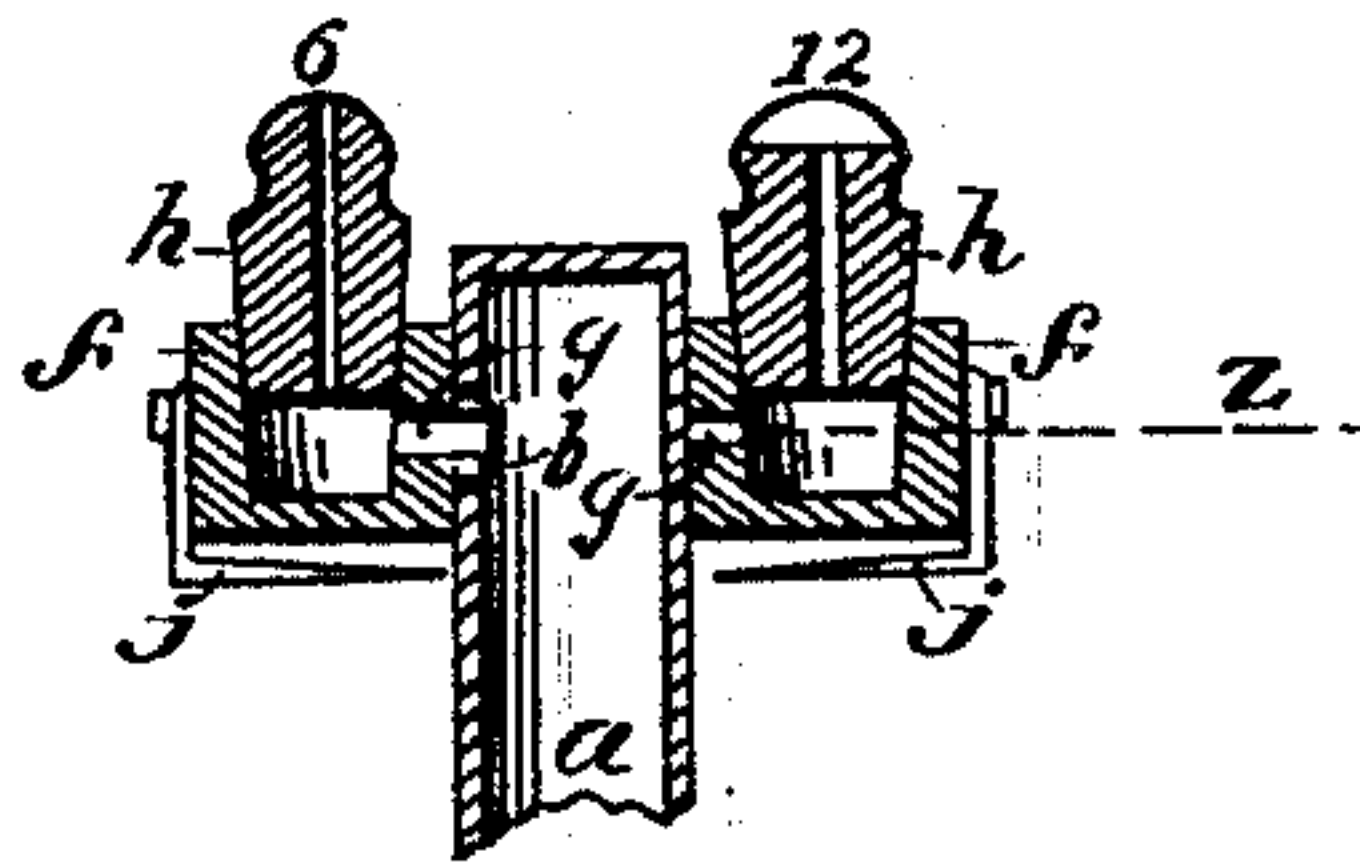


Fig. 2.

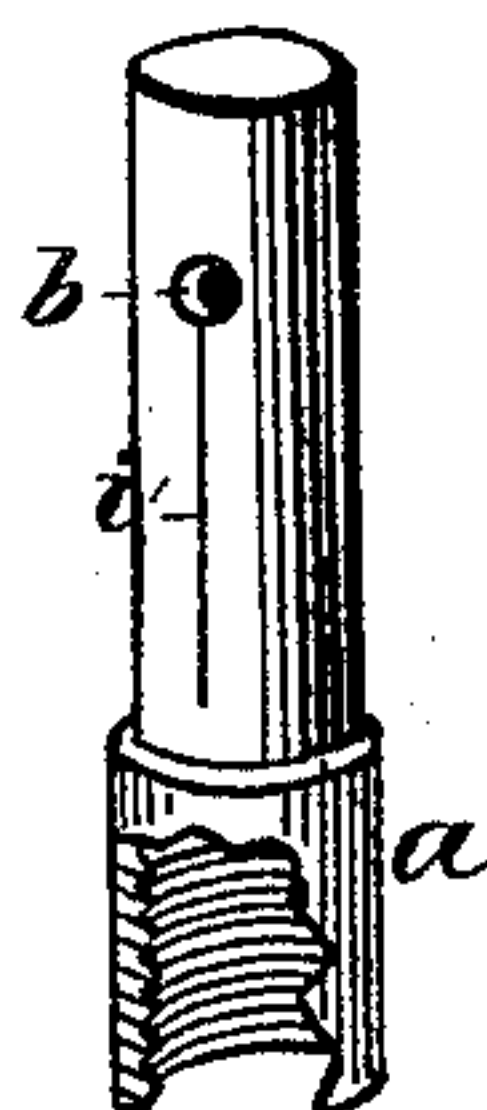


Fig. 4.

Witnesses:

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UNITED STATES PATENT OFFICE.

OSBORN B. HALL, JR., OF MALDEN, MASSACHUSETTS.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 284,631, dated September 11, 1883.

Application filed January 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, OSBORN B. HALL, Jr., of Malden, in the State of Massachusetts, have invented an Improvement in Gas-Burners, of which the following is a specification.

The object of this invention is the production in the same burner of a light of uniform illuminating power, irrespective of the percentage of combustible properties in the gas which is being consumed. I accomplish this result by arranging in the same burner a plurality of "tips" of varying capacities, in such manner that but one of said tips can at the same time be rendered operative, while either may at will be arranged to be so operative, the gas-supply conduits being of such size as to furnish the requisite quantity to the maximum burner; and hence when the gas is richest in illuminating properties the combustion thereof is effected in the tip of least capacity, while as the illuminating quality of the gas deteriorates tips of increasing capacity are successively arranged to be operative.

My invention is especially adapted for use in connection with "portable gas-machines" in which "gasoline gas," so called, is generated, and in which machines a uniform gas-pressure is easily maintained, but in which the gas which is rich in illuminating properties when the machine is first charged constantly deteriorates so long as the same supply of gasoline in the machine is drawn upon.

In the accompanying drawings, Figure 1 is a perspective view of my improved gas-burner shown as in position for use. Fig. 2 is a longitudinal vertical section taken through the axis of two of the tips. Fig. 3 is a horizontal section taken through the burner, as on line *z*, Fig. 2. Fig. 4 is a detached perspective view of the central conduit, on which the tip-supporting base is mounted.

In these views *a* represents the central tube of the burner, which is closed at the top, as shown in Figs. 1, 2, 4, and in which, near the top, is an opening, *b*, through the wall and communicating with the central passage. This tube is formed upon or secured in body *c* in the usual manner, and the gas is turned on or shut off by the usual stop-cock, *d*, the whole being mounted upon the usual supply-pipe. (Shown at *e*.) Upon tube *a* is fitted gas-tight

the tip support or base *f*, which may be threaded on said tube by a low-pitch thread, or it may be fitted thereon by a "ground" joint. In this base are formed two or more seats or circular recesses to receive and support the tips *h*, four being usually preferable, but any desired number may be arranged therein. A small passage, *g*, is formed in support *f*, to extend from its central opening to each of the tip-seats, as shown in Figs. 2, 3, and so as to communicate with passage *b* in tube *a*, when support *f* is so rotated as to bring either of said passages *g* in coincidence with opening *b*, said passage *b* being so much greater in diameter than passages *g* as to insure free communication with the same without critical adjustment of base *f*, for the purpose of which adjustment a longitudinal line or mark, *i*, is formed on tube *a*, coincident with opening *b*, and a pointer, *j*, is so arranged relatively to tips *h* that when either of said pointers is coincident with line *i* the corresponding tip will receive a full flow of gas through its passage *g* from central tube *a*. The tips *h* may be of such graduated sizes as are required for the production of the desired amount of illumination; but I usually arrange them, as shown, with four tips of a size as marked—that is, the smallest size, marked 3, being of a size adapted to a "three-foot" burner—the next in size being adapted to a six-foot burner, the next being adapted to a nine-foot burner, and the largest a twelve-foot burner, said passage *b* being of course of a size sufficient to supply the largest tip employed, and the several passages *g* may each be of a size proportioned to the tip it is intended to supply; but this I do not deem requisite, it being necessary, however, when all said passages are of uniform diameter, that they each be equal to supplying the requisite amount of gas to the largest tip employed in the burner.

The practical operation and advantage of my burner are described as follows: After the gas-machine is charged with gasoline the gas first given off is very rich in illuminating properties, while as the gas continues to be consumed there is a gradual and constant decrease in the percentage of such illuminating properties as compared with the gross bulk of gas consumed

per day or hour. Hence, in order to maintain a light of uniform illuminating-power, more gas must be consumed per hour when the gas has deteriorated than when the machine has just been filled; and if the attempt is made to so vary the consumption of gas with the use of the same tip the result is found to be that, if the tip be small enough to burn to advantage the minimum quantity when the gas is rich, then when the gas is reduced in quality, so as to render it necessary to consume a much greater quantity in a given time, it will be necessary to force the gas through the aperture in the tip with such rapidity, in order to supply such increased amount, as to either extinguish the light by the strength of the blast, or else the combustion will be rendered so imperfect that but little, if any, benefit will result from such increase in quantity of gas forced through the tip, while if the tip be large enough to burn such maximum quantity to advantage, then when it is rich and the minimum of gas is burned it will be so diluted with oxygen at the orifice of the tip before combustion is effected that the illumination obtained will be far below what it would be if the tip were of the proper size; and any single tip of a size intermediate between the needed largest and smallest will embody both of the above-described defects, as it will be too large for burning the richest gas and too small for burning the poorest; but by my invention these difficulties are entirely obviated, the smallest tip being first brought into use when the machine has been filled, and it is so used until there is a perceptible falling off in the quality or power of the light, when the next larger tip is, by rotating support *f*, brought into position for use, each tip being brought into position as the decrease in the quality of the gas renders necessary, and by this means the pressure per area may at all times be the same, and yet the consumption of gas in bulk

in a given time be varied as desired; or if at any time a light of greater or less power is required, such change can be at once made by bringing a tip of requisite capacity into use. By means of my invention no change in pressure per area is at any time requisite, and with whatever sized tip in use the stop-cock *d* may be opened wide, as the quantity of gas consumed in any given time is governed solely by the size of the delivery-passage in the tip then in use.

What I claim as my invention is—

1. In a gas-burner, the combination of conduit *a*, closed at top, and having an opening, *b*, tip-base *f*, formed and arranged to be rotated on said conduit and to receive a plurality of tips, and with passages *g*, arranged to be separately brought into coincidence with said passage *b*, and to conduct the gas from said conduit *a*, so that only a single tip can be used at one time to their respective tips, substantially as specified.

2. The combination of central conduit, *a*, tip-base *f*, and a plurality of tips, *h*, of different capacities, all constructed and arranged to operate substantially as specified, whereby either tip may, independently of the others, be brought into communication with the gas in said central conduit as the quality of the gas or the size and power of the required light may render necessary.

3. In a gas-burner, the combination of a plurality of tips of different capacities, each having a supply-conduit communicating with a supply-pipe, and a cock arranged to be adjusted to supply either of said tips independently one of the other, as desired, substantially as specified.

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Witnesses:

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