No. 615,717. Patented Dec. 13, 1898.

E. KNAPP.

PNEUMATIC GAS LIGHTER.

(Application filed Apr. 21, 1898.)

(No Model.)

Fig 1.

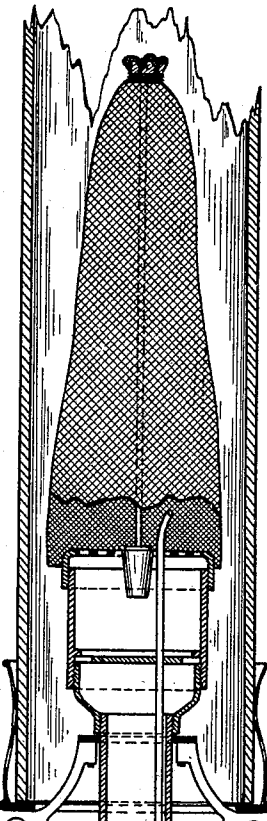


Fig 2.

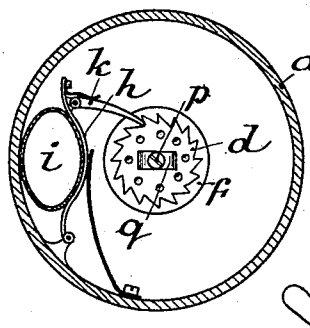
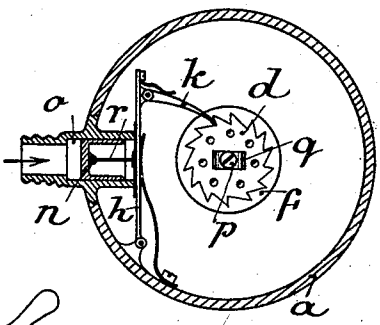
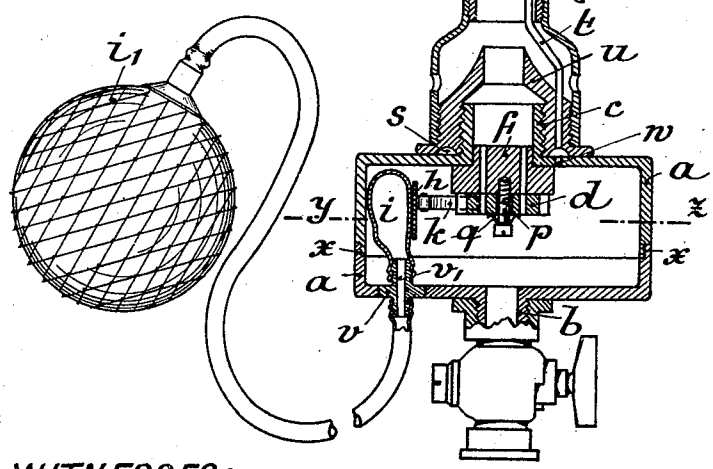


Fig 3.





WITNESSES:

E. R. Bolton

INVENTOR:

Ewald Knapp

By Howard & Howard

his Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EWALD KNAPP, OF COLOGNE, GERMANY, ASSIGNOR TO KÖLNER WASSER-MESSER WERK, GESELLSCHAFT MIT BESCHRÄNKTER HAFTUNG, OF SAME PLACE.

PNEUMATIC GAS-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 615,717, dated December 13, 1898.

Application filed April 21, 1898. Serial No. 678,364. (No model.)

To all whom it may concern:

Be it known that I, EWALD KNAPP, a subject of the Emperor of Germany, and a resident of Cologne, Germany, have invented certain new and useful Improvements in Pneumatic Gas-Lighters, of which the following is a specification.

This invention relates to an improved apparatus for the lighting and extinguishing of gas-lamps from a distance, especially of such lamps that are provided with what is known in the art as the "Welsbach light."

The invention consists in a pneumatic device for opening and closing the supply of gas from a distance.

Of the accompanying drawings, Figure 1 is a vertical section through the whole lamp, showing the apparatus forming the object of this invention. Fig. 2 is a horizontal section on line *y z* in Fig. 1. Fig. 3 is a horizontal section on the same line, showing modifications.

The letters of reference designate the same parts in all the figures.

a is a flat cylindrical box made of two pieces hermetically screwed together at *x*. The box *a* is provided with two screw-threaded studs *b* and *c*, the lower one, *b*, serving as inlet and the upper one, *c*, as outlet for the gas.

Any ordinary Welsbach lamp is shown in Fig. 1, being screwed onto the upper stud *c*. I will not, however, describe the latter in detail, as its construction is well known to those conversant with the art, and any other gas-lamp may be substituted without changing the nature of this invention.

The lower opening of the stud *c* is filled with a plug *f*, which latter is perforated with a suitable number of holes. The number of holes may vary, but it ought to be sufficient to admit enough gas to the burner under the ordinary pressure. In the center of the plug *f* a screw or pin *p* is fastened, which serves as a pivot for the disk *d*. The upper surface of the disk *d* and the lower surface of the plug *f* are ground smooth and so as to fit each other intimately. The disk *d* is likewise perforated with a number of holes. These holes are so placed that by turning the disk they will correspond to the holes bored in the plug *f*, thus making a free outlet for the gas to the burner in certain positions, while in others the spaces left between the holes in the disk will correspond with the holes in the plug *f*, and thus the supply of gas will be shut off. In order to secure a gas-tight fit of the disk on the lower surface of the plug *f*, a spring *q* is provided, which presses the disk against said surface and rests against the head of the pin *p*. In the upper lid of the box *a* another hole *w* is provided, and corresponding to this hole a circular groove *s* in the nozzle *u*. The nozzle *u* further carries a small tube *t*, reaching down to and communicating with the aforesaid groove *s*. The upper end of this tube *t* reaches right up above the burner and is provided with a small gas-outlet at its upper extremity.

The box *a* is further provided with a third stud *v*, which is prolonged into the interior of the box *a* and there forms the stud *v'*. Onto the stud *v'* a small india-rubber bag *i* is fastened, and onto the stud *v* a tube made of rubber or of any other suitable material and having any suitable length and carrying at its extremity another rubber bag *i'*. Against the rubber bag *i* a metal strip or spring *h* rests, which at its end carries a pawl *k*. The disk *d* has a toothed edge, so as to form a ratchet-wheel, and the pawl *k* engages with the teeth fashioned in the edge of the disk *d*.

Instead of the rubber bag *i* in some cases I prefer to employ the cylinder *o*, Fig. 3, in which the piston *n* and piston-rod *r* can move loosely. In this case the strip *h* is fastened to the piston-rod *r*.

The operation of my apparatus is as follows: The gas can pass freely through the hole *w* and the tube *t* and out of the opening at the upper extremity of the latter. Here it is lighted and the small flame thus obtained is allowed to burn without interruption. At ordinary times the disk *d* is supposed to be in such a position that the holes bored in the plug *f* are covered. Thus the gas cannot pass out of the box *a* to the burner. When the lamp is to be lighted, the rubber ball *i'* is compressed by hand or any other suitable means. The air inclosed in the two rubber balls and the tube connecting them is thereby com-

pressed and the rubber ball *i* consequently expanded. The rubber ball *i* acts upon the strip *h*, and by means of the pawl *k* pushes the ratchet-wheel *d* around. The teeth of the latter are so dimensioned that it will be pushed just so far as to make the perforations in the disk correspond with the perforations in the plug *f*. Thus the gas is allowed to pass through these perforations to the burner and the small flame burning at the top of the tube *t* serves to set it alight. When the ball *i'* is contracted a second time, the ratchet-wheel will again be turned around the same distance as before, and thereby the perforations in the plug *f* will now be covered up, thus cutting off the supply of gas to the burner.

The modification shown in Fig. 3 acts in the same way, with the difference only that instead of the expansion of the bag *i* the movement of the piston *n* is employed to push the ratchet-wheel around.

Having now particularly described and ascertained the nature of my invention and the manner in which the same is to be performed, I declare that what I claim is—

1. A pneumatic device for controlling the lighting and extinguishing of gas-lamps from a distance which consists of a gas-tight box the interior of which is in direct communication with the gas-conduits, but is separated from the gas-burner by a plug containing a number of concentrically-bored perforations and a disk closely fitting the surface of such plug and being pivoted in the center of same, such disk being likewise perforated by a corresponding number of holes, and means for turning such disk by contracting a rubber ball, which is connected to the device by means of an air-tube, substantially as and for the purpose set forth.

2. An apparatus for lighting and extinguishing gas-lamps from a distance, which consists of the combination of a gas-tight box the interior of which is in direct communication with the gas-conduits but is separated from the burner by a plug having a number of concentrically-placed holes and a disk fitting said plug closely and having a corresponding number of holes, said disk having a toothed edge and being pivoted in the center of said plug, of a pliable strip carrying at its extremity a pawl which engages with the toothed edge of said disk and a rubber ball placed between the wall of the box and said pliable strip and being in communication by means of a tube or pipe of any suitable length with another rubber ball, substantially as and for the purpose described.

3. An apparatus for lighting and extinguishing gas-lamps from a distance, which consists of the combination of a gas-tight box the interior of which is in direct communication with the gas-conduits but is separated from the burner by a plug having a number of concentrically-placed holes and a disk fitting said plug closely and having a corresponding number of holes, said disk having a toothed edge and being pivoted in the center of said plug, of a pliable strip carrying at its extremity a pawl which engages with the toothed edge of said disk and a cylinder with a piston and a piston-rod connected with said strip, said cylinder being in communication by means of a tube or pipe of any suitable length with a rubber bag, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

EWALD KNAPP.

Witnesses:

WILLIAM H. MADDEN,

KÄTCHEN SLENZ.