(No Model.)

P. GROEBBELS.

IGNITING APPARATUS.

No. 546,923. Patented Sept. 24, 1895.

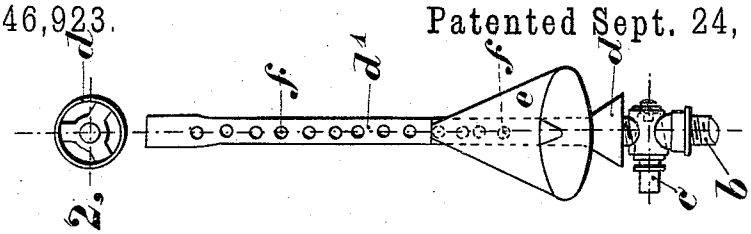

Fig. 2.

Fig. 3.

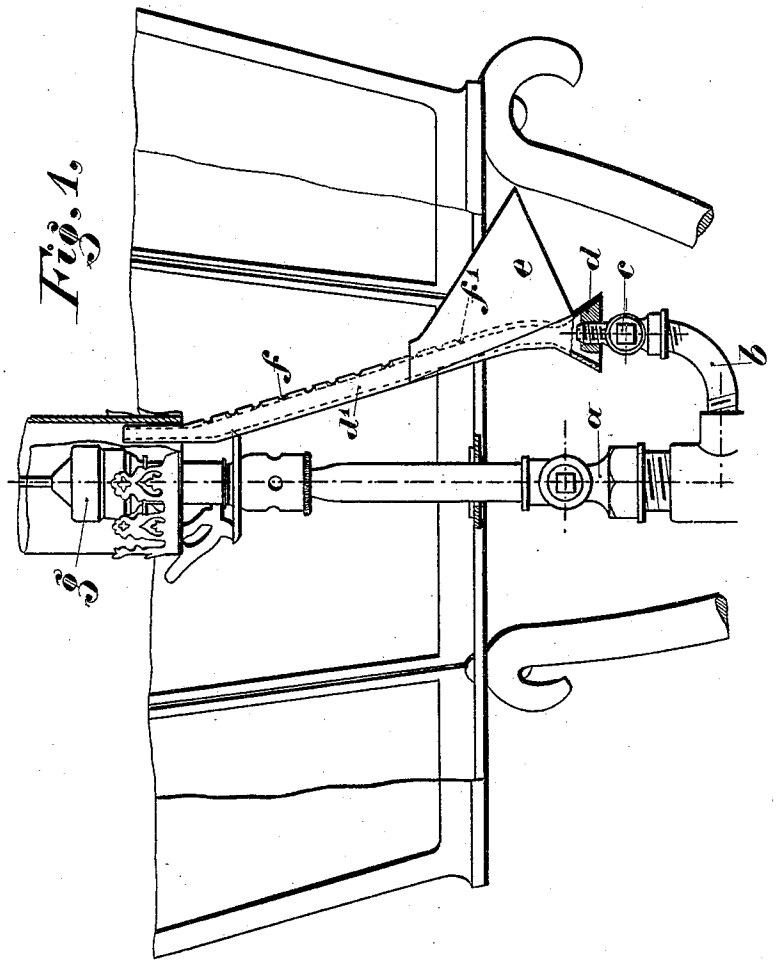

Fig. 1.

Witnesses.
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UNITED STATES PATENT OFFICE.

PAUL GROEBBELS, OF WEIMAR, GERMANY.

IGNITING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 546,923, dated September 24, 1895.

Application filed January 31, 1895. Serial No. 536,827. (No model.)

To all whom it may concern:

Be it known that I, PAUL GROEBBELS, engineer, a subject of the Grand Duke of Saxe-Weimar, residing at Weimar, in the Grand Duchy of Saxe-Weimar and German Empire, have invented new and useful Improvements in Igniting Apparatus, of which the following is a specification.

My invention relates to an igniting apparatus for gas-lamps with air-suction nozzle for producing a mixture of gas and air, and with a lateral protective cone or funnel and an igniting-tube.

The igniting apparatus, according to my invention, serves for igniting the burners of gas-lamps without necessitating the opening of the lamp, which is closed on all sides. It has the peculiarity that a mixture of gas and air is produced and employed for producing the igniting-flame, which said mixture does not illuminate, but burns well. A mixture of air and gas of this kind is capable of burning continually in the interior of the igniting-tube, so that the flame travels along in the interior of the igniting-tube. In this manner the igniting apparatus acts much more effectively and safely than the igniting devices heretofore employed comprising ignition by means of a running flame, in which the gas does not burn in the interior of the igniting-tube, but only becomes capable of burning in consequence of its escape through numerous small holes and thus coming in contact with atmospheric air when escaping.

The igniting apparatus consists of the lower branch pipe *b*, branching off on one side from the lamp-cock proper *a*. This pipe *b* carries the igniting-tap *c*, which is provided only with a small opening for the passage of gas. The pipe *b* also carries an open and downwardly-expanding nozzle *d*, arranged around the outlet-opening of the pipe *b*. The fine stream of gas in escaping through the igniting-tap *c* produces a suction of a suitable quantity of air to produce a non-luminous but yet properly-burning mixture of gas and air.

The nozzle is shown from the under side in Figure 2, and in Fig. 3 in side elevation, with igniting-tube and igniting-tap.

Fig. 1 illustrates the whole igniting apparatus.

The igniting-tube *d'* is provided with small holes *f f'*, commencing a little above the nozzle and continued up to about its upper end. The tube *d'* is open at its upper end and extends up to just below the head of the street-burner. The lower holes *f'* of the igniting-tube are inclosed by a funnel *e*, which is arranged on one side and has the object of preventing the lighting-jet or lamp of the lamplighter from becoming extinguished in windy weather. The upper part of the funnel *e* extends through the bottom of the lamp, so as to prevent the bottom glass plate from becoming cracked by the flames or gases escaping at one side from the igniting-tube.

The manipulation of the lamp and the operation of the igniting apparatus are as follows: The lamplighter opens the cock *c* and introduces his igniting-jet from below up into the funnel *e*. The gas passing through the igniting-tap *c* draws a suitable quantity of air through the nozzle, which becomes intimately mingled with the gas. A portion of this mixture passes out through the lowest holes *f'* of the igniting-tube *d'*, becomes ignited, and the flame strikes into the mixture of gas and air in the interior of the igniting-tube. In consequence of the mixture of gas and air the whole contents of the igniting-tube is caused to explode. The excess forces the flame through the small holes *f*, so that these holes serve to soften the explosive ignition of the mixture of gas and air inside the igniting-tube *d'*—that is to say, to carry off an excess of explosive mixture, while, however, there is still left a flame of several centimeters in length which passes out through the upper opening of the igniting-tube *d'*. The ignition from below upward inside the igniting-tube takes place almost instantaneously. The lamplighter now opens the lamp-cock proper *a* and the gas escaping from the burner becomes at once ignited at the igniting-flame. There remains then merely to shut the igniting-tap *c*.

Having now particularly described and ascertained the nature of my invention, what I claim, and wish to be protected, is—

1. In an igniting apparatus, the combination with the main gas-tube provided with a burner, of a branch pipe projecting from the main-tube and provided with an upper threaded end, a perforated igniting tube lead-

ing from the branch tube to the burner, and provided at its lower end with a bell-mouth an apertured plug secured within the bell mouth and into which the end of the branch pipe is screwed, and an air opening in said plug, substantially as described.

2. In an igniting apparatus, the combination with the main gas-tube provided with a burner, of a branch-pipe projecting from the main-tube and provided with a nipple, a perforated igniting tube leading from the branch pipe to the burner and provided at its lower end with a bell-mouth, into which the free end or nipple of the branch pipe passes so as to leave an air opening, and a funnel attached to the lower portion of the igniting tube and inclosing some of the perforations, substantially as described.

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

PAUL GROEBBELS.

Witnesses:
FANNIE MOORE,
MATIE LITTORF.