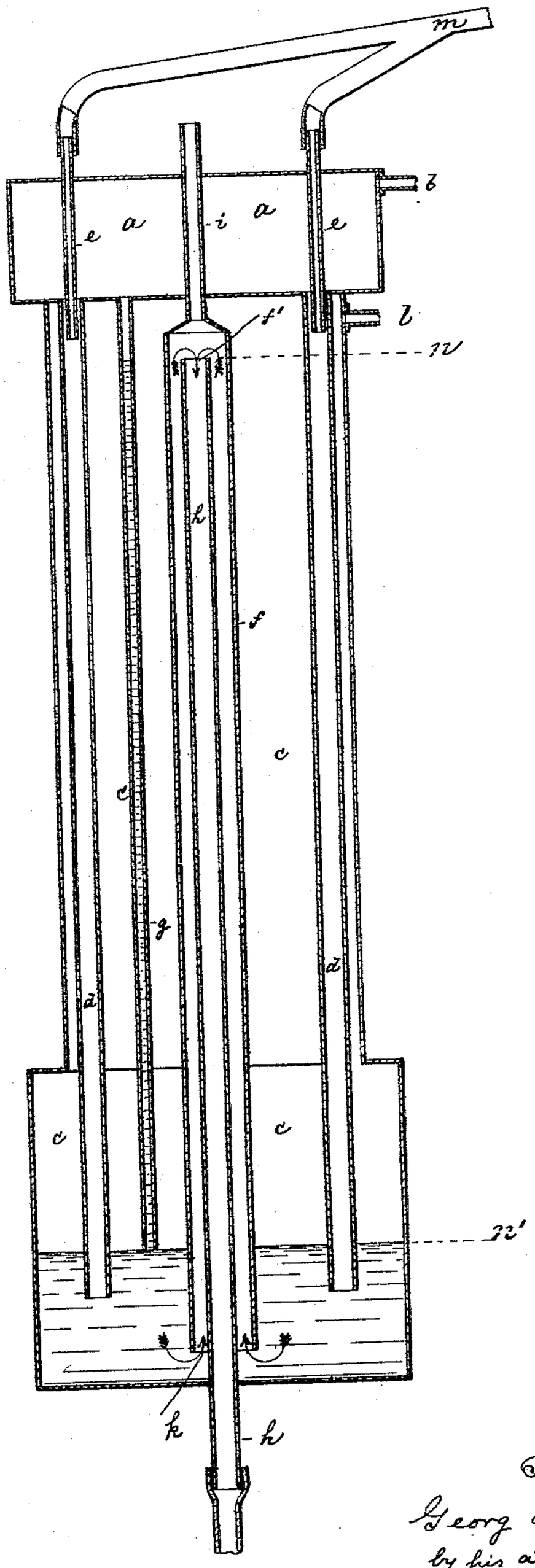
(No Model.)

G. ROTHGIESSER.

APPARATUS FOR COMPRESSING GAS FOR INCANDESCENT GAS LAMPS.

No. 597,783. Patented Jan. 25, 1898.



Witnesses:
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by his attorneys
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UNITED STATES PATENT OFFICE.

GEORG ROTHGIESSER, OF DUSSELDORF, GERMANY, ASSIGNOR TO THE INTERNATIONALE HYDRO-PRESS-GAS-COMPAGNIE, OF HAMBURG, GERMANY.

APPARATUS FOR COMPRESSING GAS FOR INCANDESCENT GAS-LAMPS.

SPECIFICATION forming part of Letters Patent No. 597,783, dated January 25, 1898.

Application filed June 9, 1897. Serial No. 640,005. (No model.)

To all whom it may concern:

Be it known that I, GEORG ROTHGIESSER, a subject of the German Emperor, residing at Dusseldorf, Germany, have invented certain new and useful Improvements in Apparatus for Compressing Gas for Incandescent Gas-Lamps, with description as follows.

Heretofore incandescent gas-lamps were fed with the gas under the usual pressure of about two or three inches water column as furnished by the gas companies. It is well known that a much higher gas-pressure, say of about forty to sixty inches water column, considerably increases the light effect of a single incandescent body; but such an increased-pressure system has not been adopted because the gas companies cannot furnish the same and it would have been necessary to introduce a power or hand pump into the gas-supply pipes in order to obtain the required pressure. The necessity of requiring this complicated machinery is the reason that pressure-gas light has not been introduced.

In order to permit the introduction of pressure-gas light into the houses of the civilized world, I have devised an apparatus consisting of an automatic gas-pump operated by water under pressure, which is obtained from the existing high-pressure-water-service pipes.

The construction of the pressure apparatus may be varied, though I prefer to employ the injector system, which is always the most advantageous where water under a minimum pressure of forty pounds per square inch is available. The automatic pressure apparatus is composed of one or more injector-tubes the upper ends of which enter a suction-chamber into which the gas under low pressure can enter. The lower ends of the tubes open within a separating-chamber having an upper opening out of which the gas may escape, while the water escapes at the bottom. Into the upper ends of the tubes there is injected a jet of water from the high-pressure water-service. While these jets pass through the tubes, they draw or tear the gas along, so that a high pressure is obtained within the separating-chamber, which is transmitted through the conduits to the lamps.

It is of great importance to maintain a uniform gas-pressure, as otherwise the incandescent body and the burner would become quickly destroyed and the light would burn unevenly. To insure this uniform pressure, I have so constructed the injector that it is practically impossible for the gas-pressure to exceed a certain point, while the pressure can only fall below such point when the water-supply becomes insufficient for the number of lamps burning. This effect is accomplished by means of an arrangement that compels the outflowing water to rise to a certain level which corresponds to the gas-pressure desired before it is brought into contact with the atmosphere. This arrangement consists of an upright tube or stand-pipe, which may be four or five feet long and the lower end of which projects into the separating-chamber, while its upper end brings the outflowing water into contact with the atmospheric pressure. Besides this water-outlet tube I employ a second smaller regulating-tube that connects the lower part of the separating-chamber with the suction-chamber which contains the gas under its usual pressure to deliver it to the injector-tubes. By means of this regulating-tube gas under pressure is returned to the suction-chamber as soon as the gas-pressure has exceeded a certain point, which occurs whenever the water-level in the separating-chamber has sunk beneath the lower mouth of the regulating-tube. In this way the gas-pressure will always correspond to the vertical height between two horizontal lines—viz., between the upper end of the water-discharge tube and the lower end of the regulating-tube.

The suction-chamber, as well as the separating-chamber, can be made of any suitable form. They can be arranged separately from one another and connected only by the injector and regulating tubes, or they can be arranged side by side, so that the injector and regulating tubes are located within the separating-chamber itself. This latter construction is illustrated in the accompanying drawing, which represents a vertical section of my improved apparatus.

a represents the suction-chamber, having a gas-inlet *b*, that may contain a check-valve.

c is the separating-chamber.

d are the injector-tubes; *e*, the water-nozzles projecting into the same; *f*, the water-discharge tube or stand-pipe, and *g* the regulating-tube. The outflowing water is discharged through tube *h*, embraced by tube *f*, after it has been brought into contact with the atmosphere at *f'* by means of the air tube or vent *i*, that enters the upper part of tube *f*.

The water leaves the separating-chamber at *k*, while the compressed gas is discharged at *l* to be conducted to the lamps.

As the water under pressure from pipe *m* is discharged through nozzles *e* the gas from chamber *a* is sucked into and compressed within chamber *c*, where a pressure is attained that corresponds to a water column the height of which is defined by the lines *n* and *n'*. As soon as the gas-pressure through any cause exceeds this height the level of the water in the separating-chamber will fall below the lower mouth of the regulating-tube *g*, so that the water within such tube, as well as a quantity of compressed gas, will be returned to the suction-chamber *a*. In consequence thereof the gas-pressure will sink somewhat and the water-level will immediately rise until the lower mouth of tube *g* is covered. The water and gas pressed through the tube *g* into the suction-chamber *a* is then again drawn through the injector-tubes *d*.

What I claim is—

1. An apparatus for compressing gas for incandescent gas-lamps, composed of a suction-chamber, a separating-chamber, an injector-tube for conveying a mixture of gas and water into the separating-chamber, a stand-pipe opening into the separating-chamber, and a regulating-tube which connects the separating-chamber with the suction-chamber, substantially as specified.

2. An apparatus for compressing gas for incandescent gas-lamps, composed of a suction-chamber, a separating-chamber, water-injector tubes connecting the same, and a regulating-tube adapted to return the excess of compressed gas from the separating-chamber to the suction-chamber, substantially as specified.

3. An apparatus for compressing gas for incandescent gas-lamps, composed of a suction-chamber, a separating-chamber, injector-tubes projecting into the latter, water-discharge nozzles entering the tubes, a water-outlet pipe communicating with the separating-chamber, and a gas-pressure-regulating tube that connects the two chambers with each other, substantially as specified.

4. An apparatus for compressing gas for incandescent gas-lamps, composed of a suction-chamber, a separating-chamber, injector-tubes projecting into the latter, water-discharge nozzles entering the tubes, a stand-pipe communicating with the separating-chamber, a vent entering the upper end of such pipe, a water-discharge tube embraced by the stand-pipe, and a gas-pressure-regulating tube that connects the separating-chamber with the suction-chamber, substantially as specified.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORG ROTHGIESSER.

Witnesses:
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EMIL HOETTE.