

No. 620,583.

Patented Mar. 7, 1899.

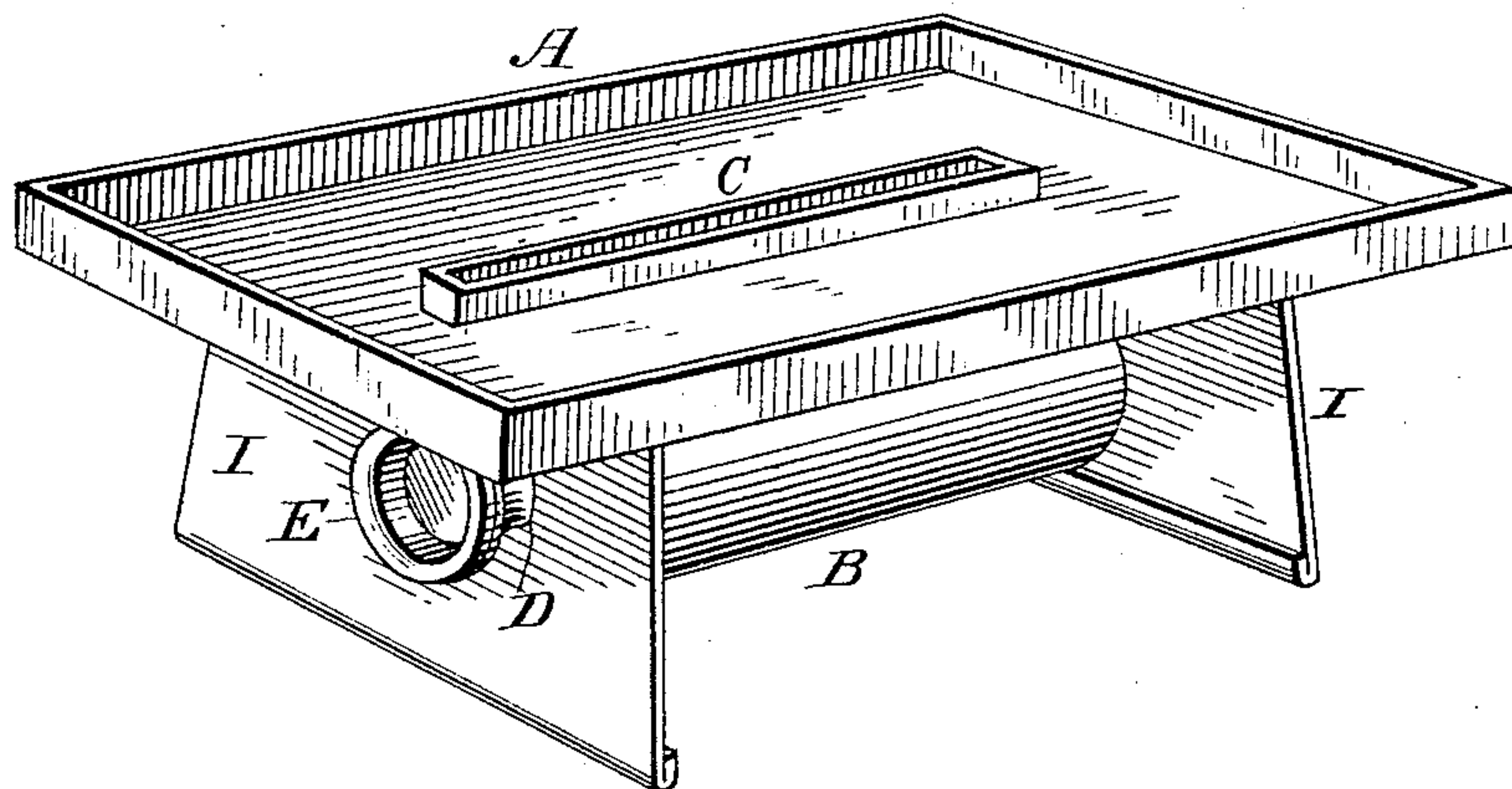
H. W. HALES.

FLASH LAMP.

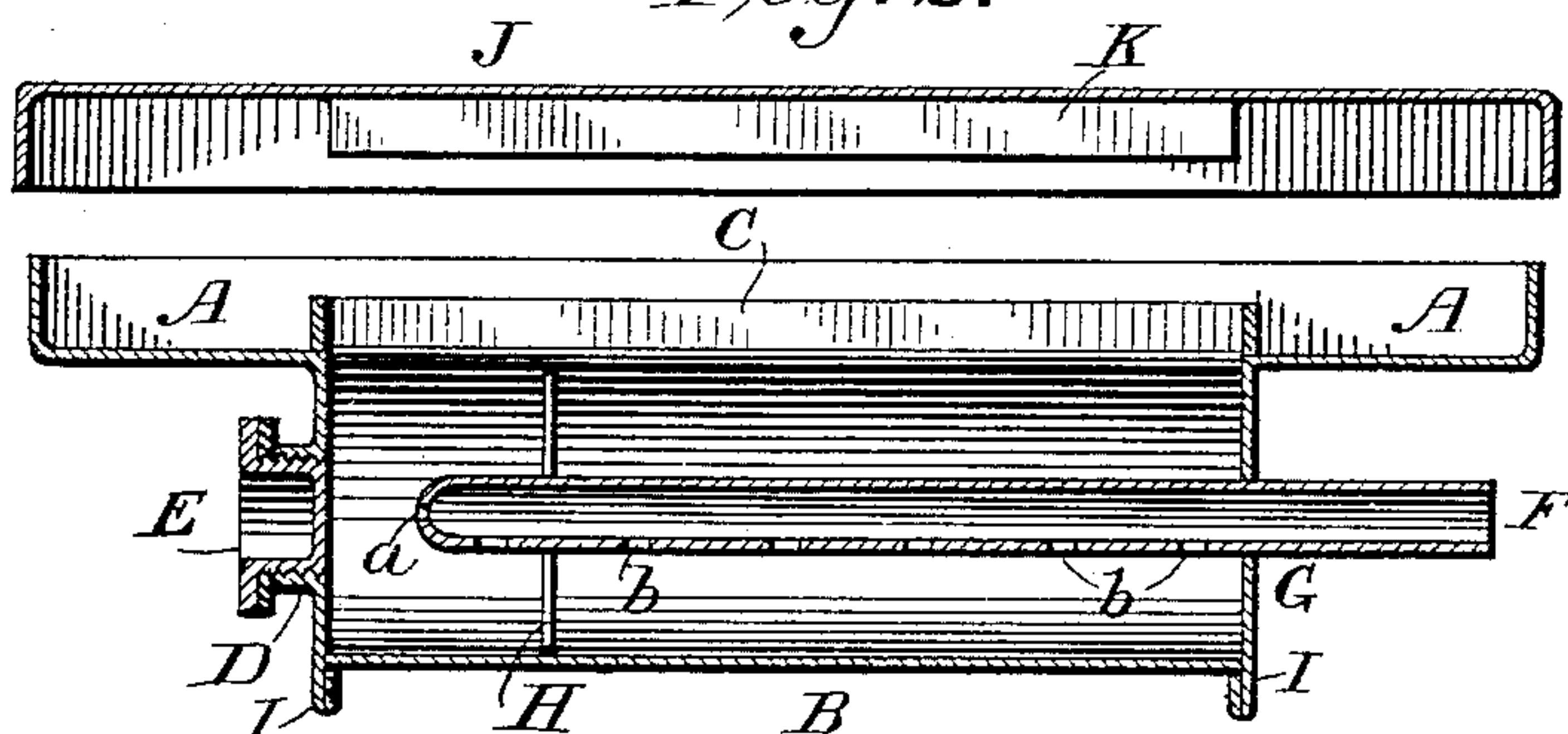
(Application filed Apr. 4, 1898.)

(No Model.)

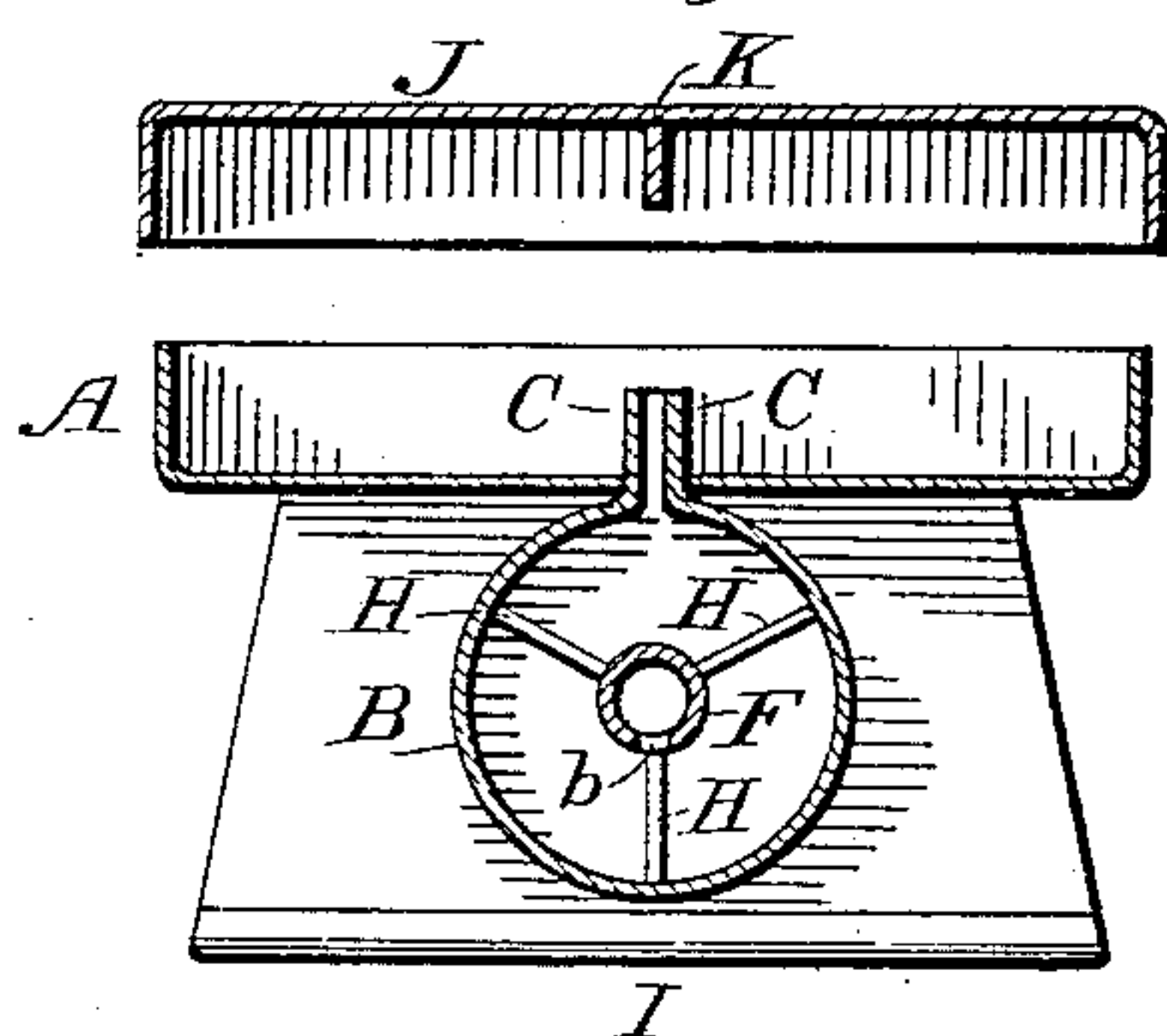
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## FLASH-LAMP.

SPECIFICATION forming part of Letters Patent No. 620,583, dated March 7, 1899.

Application filed April 4, 1898. Serial No. 676,345. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY W. HALES, of Ridgewood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Flash-Lamps, of which the following is a specification.

The object of this invention is to produce an efficient flash-lamp for use in photographing, so as to furnish a broad sheet of brilliant flame. As is usual in such flash-lamps, magnesium powder or other similar ignitable and inflammable powder is employed, which at the proper instant is brought into association with a flame and is thereby ignited, thus producing the brilliant flash desired. The present invention consists in an improved construction of flash-lamp, whereby the inflammable powder is brought into contact with the flame in a broad sheet, so that a flame of extended area is produced, and the duration of the flame can be varied by regulating the quantity of powder delivered.

The present improved flash-lamp is illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of the lamp. Fig. 2 is a vertical longitudinal section, and Fig. 3 is a vertical cross-section.

The lamp comprises as its principal features a fire-pan A and a powder-reservoir B. The fire-pan is a shallow trough, which is adapted to receive the material which furnishes the initial flame before the flash is produced. A convenient plan is to place in the pan a sheet of asbestos, upon which alcohol may be poured. Any convenient substitute for the asbestos sheet may be employed, such as lamp-wicking or other porous absorbent material. The asbestos sheet, however, is preferred.

The powder-reservoir B is located immediately beneath the fire-pan and extends lengthwise of the same. Preferably the powder-reservoir is, as shown, a cylindrical tube, since this affords a proper shape for the uniform distribution of the powder by the action of the air-blast, which is used for projecting the powder from the reservoir. The powder-reservoir communicates with the fire-pan throughout substantially the entire length of

the powder-reservoir, the communication being afforded by means of an elongated nozzle C, which projects through and extends above the bottom of the fire-pan. This nozzle is of substantially the same longitudinal extent as the powder-reservoir and is of substantially the same length throughout, so that it is substantially as long where it communicates with and emerges from the powder-reservoir as it is where it discharges into the fire-pan. The nozzle is, however, narrow, so as to afford a narrow slit only as the outlet from the powder-reservoir. By means of this arrangement and construction of the nozzle the powder is ejected with substantial uniformity throughout the entire length of the nozzle, so that a broad flame of equal intensity throughout is secured. The nozzle projects above the bottom of the fire-pan, so that the alcohol or other combustible material placed in the fire-pan cannot flow or pass down into the powder-reservoir.

The powder-reservoir has an inlet D at one end, by means of which the inflammable powder is introduced thereinto. This inlet is normally closed by a screw-cap E. Entering the opposite end of the powder-reservoir from the inlet D is the air-blast-supply pipe F. This pipe F projects at its outer end beyond the air-reservoir, as shown at G, to afford means for the attachment of the conductor which supplies the air or other gaseous blast, which will hereinafter be referred to as the "air-blast." The air-blast device and the connecting-conduit leading therefrom to the coupling end G are not shown, since they may be any of the usual devices employed for this purpose. It is sufficient that any suitable air-blast-producing device should be employed which is capable of producing air blasts or puffs of varying volume, depending upon the will of the operator.

The air-blast-supply pipe F extends centrally and longitudinally through the middle of the powder-reservoir and is maintained in place therein by means of suitable spokes H. The air-blast-supply pipe terminates a short distance from the opposite end of the powder-reservoir and has an air-discharge opening a at its end, out of which the air



passes. The pipe F also has other air-outlets *b* distributed with substantial uniformity throughout its length, so that the air from the air-supply pipe is distributed with substantial uniformity throughout the length of the powder-reservoir. The air-outlets *b*, it will be noted, are on the under side of the air-blast-supply pipe, and consequently the air on being discharged from said openings is directed away from the nozzle C and downwardly into the mass of powder contained within the reservoir B. Consequently the powder is thrown into a state of agitation, and a portion thereof passes out with the air through the nozzle. It is obvious that this injection of the air downwardly into the mass of the powder is much more efficient than if the air were discharged from the air-supply pipe upwardly. The air-outlets *b*, as indicated in the drawings, are circular apertures; but it is manifest that elongated slits could be employed, and, indeed, it would be practicable to use instead of separate outlets a long narrow slit in the under side of the air-supply pipe, provided that the area thereof was properly determined with reference to the work to be done.

The lamp is provided with suitable supporting-legs I, upon which it rests, with the fire-pan in a horizontal position when in use. The fire-pan and powder-reservoir are conveniently and economically made of sheet metal, the longitudinal walls of the nozzle being conveniently continuous with the periphery of the powder-reservoir and the reservoir and fire-pan being conveniently soldered together. The legs I are conveniently made out of sheet metal and constitute the ends of the powder-reservoir, being soldered thereto and to the bottom of the fire-pan.

In order to use the lamp, the ignitable powder is introduced into the powder-reservoir, the asbestos pad is placed in the fire-pan, and the lamp is then rested in position on its legs. Alcohol is then poured on the asbestos pad and is lighted. The air-blast device is then operated, whereby the air is ejected through the numerous air-outlets of the air-supply pipe, whereby the powder within the powder-reservoir is set in commotion and a portion thereof is blown out of the nozzle in a broad extended sheet. On the emergence of the powder from the nozzle it is ignited by the burning alcohol, so that a broad luminous light is produced. The quantity of powder ejected from the powder-reservoir, and consequently the duration of the flash, is regulated by the volume of the air-blast, which in turn is regulated and determined by the manipulation of the air-blast-producing devices. For example, if the usual air-bulb is employed a short puff will produce a short flame and a long puff will produce a long flame. Thus not only the duration of the flame but its brilliancy as well is within the control of the photographer at will.

When the lamp is not in use, the fire-pan is covered with a suitable sheet-metal cover J, such as shown in Figs. 2 and 3, detached from the lamp. This cover has a depending rib K of proper size and location to enter and fit into the nozzle C when the cover is placed over the fire-pan. The rib thus furnishes a stopper for closing the outlet-nozzle of the powder-reservoir. Consequently when the cover is in place the ignitable powder can neither be lost from the lamp or pass from the reservoir to the fire-pan.

I claim as my invention—

1. The combination of a fire-pan, a powder-reservoir extending lengthwise of the fire-pan and communicating throughout its length with the fire-pan by means of an elongated narrow nozzle, and an air-supply pipe located within said reservoir and extending longitudinally through the middle thereof, said air-supply pipe having numerous small outlets distributed throughout its length so as to supply air to the reservoir with substantial uniformity throughout the length thereof, substantially as set forth.

2. The combination of the fire-pan, the powder-reservoir, the elongated narrow nozzle affording communication between the reservoir and the pan, and a cover for said fire-pan carrying a stopper for said nozzle, substantially as set forth.

3. The combination of the fire-pan, the cylindrical powder-reservoir located beneath said fire-pan and extending longitudinally thereof, the elongated narrow nozzle projecting above the bottom of the fire-pan and communicating with the powder-reservoir through substantially the entire length thereof, the powder-introducing inlet for said powder-reservoir, the air-blast-supply pipe extending centrally and longitudinally through substantially the entire length of said reservoir, said air-supply pipe having numerous air-distributing outlets located along the length thereof so as to furnish air to said reservoir with substantial uniformity throughout its entire length, said pipe being substantially parallel with said nozzle, and suitable supports for maintaining said fire-pan in proper position during operation, substantially as set forth.

4. The combination of a fire-pan, a powder-reservoir extending lengthwise of the fire-pan and communicating with the fire-pan by means of an elongated narrow nozzle, and an air-supply pipe extending longitudinally within said reservoir and substantially parallel with said nozzle and having a plurality of air-outlets which direct the air away from the nozzle and into the powder within the reservoir, substantially as set forth.

5. The combination of a fire-pan, a powder-reservoir extending lengthwise of the fire-pan and communicating with the fire-pan by means of an elongated narrow nozzle, and a plurality of air-outlets located within the reservoir and



distributed at different parts of the length thereof which direct the air away from the nozzle and into the powder within the reservoir, substantially as set forth.

5 6. The combination of a fire-pan, a powder-reservoir extending lengthwise of the fire-pan and communicating therewith by means of an elongated narrow nozzle, and a plurality of air-outlets located within the reservoir and  
10 distributed at different parts of the length thereof, substantially as set forth.

7. The combination of a powder-reservoir having an elongated narrow nozzle, and a plurality of air-outlets located within the reservoir and distributed at different parts of the  
15 length thereof, substantially as set forth.

8. The combination of a fire-pan, a powder-reservoir extending lengthwise thereof and communicating therewith by means of an elongated narrow nozzle, said nozzle extending  
20 lengthwise of said reservoir and being substantially the same length where it communicates with and emerges from said reservoir as where it discharges with the fire-pan,  
25 and an air-supply pipe entering said reservoir and adapted to furnish air thereto, substantially as set forth.

9. The combination of a fire-pan, a powder-reservoir extending lengthwise thereof and  
30 communicating therewith by means of an elongated narrow nozzle, said nozzle extending lengthwise of said reservoir and being of substantially the same length where it communicates with and emerges from said reservoir as where it discharges into the fire-pan,  
35 and an air-supply entering said reservoir and supplying air thereto throughout substan-

tially the entire length thereof, substantially as set forth.

10. The combination of a fire-pan, a powder-reservoir extending lengthwise thereof and communicating therewith by means of an elongated narrow nozzle, said nozzle extending  
40 lengthwise of said reservoir and being of substantially the length where it communicates with and emerges from said reservoir  
45 as where it discharges into the fire-pan, and an air-supply entering said reservoir and supplying air thereto throughout substantially the entire length thereof and in a direction  
50 away from said nozzle, substantially as set forth.

11. The combination of a fire-pan, a powder-reservoir communicating therewith by means of an elongated narrow nozzle, said nozzle extending  
55 lengthwise of said reservoir and being of substantially the same length where it communicates with and emerges from said reservoir as where it discharges into the fire-pan, and an air-supply pipe entering said  
60 reservoir and extending lengthwise thereof and substantially parallel with the nozzle, said air-supply pipe discharging air into the reservoir throughout substantially the entire  
65 length thereof and in a direction away from said nozzle, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY W. HALES.

Witnesses:

HENRY HALES,  
THOMAS RAMSAY.