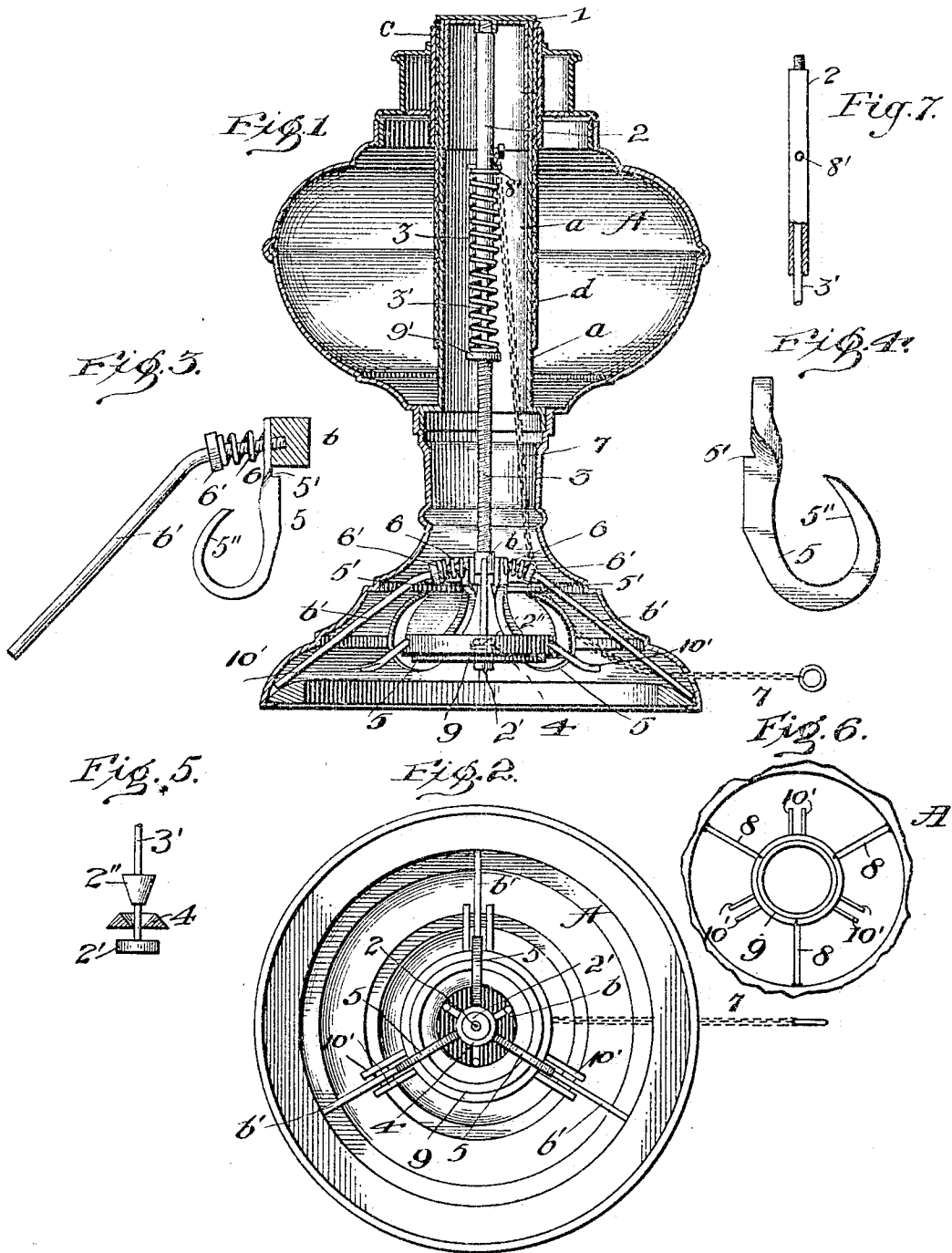


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H. C. STONE.
SAFETY LAMP.

APPLICATION FILED JUNE 30, 1903.



WITNESSES:

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SAFETY-LAMP.

SPECIFICATION forming part of Letters Patent No. 781,796, dated February 7, 1905.

Application filed June 30, 1903. Serial No. 163,769.

To all whom it may concern:

Be it known that I, HERBERT C. STONE, a citizen of the United States, residing in the borough of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Safety-Lamps, of which the following is a specification.

My invention pertains to lamps, and more especially to those which are intended to burn liquids, such as kerosene, which are readily inflammable.

The object of my invention is to provide a lamp which shall be combined with suitable mechanism which is arranged to extinguish the flame of the lamp should the latter accidentally assume a position in which its contents might be ignited by the flame from the wick.

Lamps which burn explosive liquids are adapted to do so with safety so long as they remain in a position which is approximately erect; but should such a lamp fall, whether to any distance or simply on its side, the contained liquid may flood the wick and burner and to some extent will leak out of the latter, and if the lamp be burning at the time the exuding liquid will be ignited and may set fire to surrounding inflammable matter. Furthermore, the conditions mentioned may cause the lamp to explode, the conflagration being thus greatly increased by the burning liquid, which has thus been spread to a great distance.

By my invention the flame of a lamp will be extinguished immediately upon the falling of the lamp or the tipping thereof to a considerable angle from its normal erect position, and the extinguishment of the flame will be accomplished before the contained liquid flows from the lamp, thus preventing the ignition of the liquid by the flame of the lamp.

In the drawings, Figure 1 is a central vertical section of a lamp which embodies my invention. Fig. 2 is a bottom plan view thereof. Figs. 3 to 6, both inclusive, are detail views; and Fig. 7 is an elevation of the rods 2 and 3' and of the cross-pin 8, the rod 2 being shown partly in section and the view being taken at right angles with Fig. 1.

Reference characters are relatively alike throughout the drawings.

Referring to the drawings, A in a general way designates a lamp of a common design.

c is a wick-holder, and *d* is a wick.

A flame-spreader 1 is attached to the upper end of a hollow rod 2, which is inclosed within a central draft-tube *a*, which is fixed in the vertical central part of the lamp. A helical spring 3 is coiled about the rod 2, and the upper end thereof is attached to a cross-pin 8', which passes through the rod 2. The lower end of the spring 3 is attached to a collar 9', which is fixed on a rod 3', part of the latter being slidably positioned within the rod 2, the remainder thereof passing downwardly and through a guide-frame *b*. The spring 3 tends to urge the rod 3' outwardly of the hollow rod 2 and should be of such length as to retain the flame-spreader 1 in its operatively normal positions relatively of the wick *d*. A helical spring 3'' is coiled about the rod 3', the upper end thereof being attached to the collar 9', the lower end thereof being attached to the guide-frame *b*. The spring 3'' urges the collar 9' and the rod 3' downwardly. A stop-collar 2' is fixed upon the end of the rod 3', and a conical collar 2'' is fixed on said rod above the collar 2'. Between the collars 2' and 2'' a circular engaging collar 4, which has its periphery formed at an acute angle, is loosely mounted upon the rod 3'.

The guide-frame *b*, as shown in the drawings, is in form a tripod, and the feet *b'* thereof are resiliently spread outwardly and engage a ring which is attached to the lamp A, thus retaining the guide-frame *b*, with the parts which are mounted thereon, in their proper positions relatively of the lamp A.

Loosely mounted on the feet *b'* and near the junction of the latter to the guide-frame *b* are swinging detaining members 5 5, one on each foot *b'*, each of said members being notched, as at 5', in a suitable manner to engage the engaging collar 4. The detaining members 5 are resiliently retained in their proper respective positions on the feet *b'* by suitable means, herein shown as helical springs 6 6, which are mounted on the feet *b'* and severally impinge against collars 6' 6' and against the detaining members 5, thus urging the latter in an inward direction or toward each other. The detaining members 5 are severally

formed as frames which surround relatively large apertures, the inner faces 5'' of the frame members thereof being inclined toward each other at their respective upper ends.

5 Suspended within the apertures of the several detaining members 5 is a weighted annulus 9, which is of such internal and external diametral dimensions that if the lamp A be in an upright or approximately upright position 10 the annulus 9 will contact inner faces of the detaining members 5; but if the lamp A assumes a position in which the contents thereof may exude and which is termed herein a "dangerous angle" the annulus 9 will be 15 thus made to contact the inwardly-inclined upper faces 5'' of the detaining members 5. Bifurcated guides 10' 10', which are attached to the annulus 9, respectively serve to retain the latter in a position which is, at least approximately, central with the detaining members 5. 20

Any suitable means may be used to retain the annulus 9 in an approximately central position relatively of the vertical center of 25 the apparatus before described. I prefer, however, to loosely suspend the annulus 9 by the means shown on a reduced scale in Fig. 6, in which are shown flexible members 8 8, which are severally attached to the outer edge 30 of the annulus 9 and also to the wall of the foot of the lamp.

A flexible member, such as a chain 7, may be attached at a suitable point to the rod 2 and descending thence may be carried outwardly 35 wardly of the foot of the lamp.

The operation of the apparatus may be described as follows: The lamp being in an upright or an approximately upright position, the rod 3' may be urged upwardly until the 40 engaging collar 4, which will be properly positioned by means of the conical collar 2'', is engaged by the notches 5' in the detaining members 5, and the latter will be retained by the annulus 9 in position to engage the collar 4, this result being effected by reason of 45 the contact of the inner surface of the annulus 9 with the lower inner curved faces of the detaining members 5. The flame-spreader 1 will then be properly positioned above the 50 wick-holder *c* to permit the wick to burn in a normal manner. Should the lamp A be tipped to a dangerous angle, so that its contents are apt to exude and possibly be ignited by the flame from the wick, the weighted annulus 55 9 will assume a position in which it will contact one or more of the faces 5'' of the detaining members 5 5, and thus disengage the engaging collar 4. The latter will thus be released from its engagement in the notches 5' 60 in the detaining members 5. The spring 3'' will urge the rod 3' downwardly or toward the foot of the lamp A, and the rod 2 will be drawn downwardly therewith by the spring 3, which, it should be noted, is fully extended 65 when at rest, and thus serves as a connecting-

link between the rods 2 and 3' under the conditions immediately specified. The rod 2 will carry the flame-spreader 1 against the top of the wick *d*, and the wick-holder *c*, with the flame-spreader 1, will then inclose the wick *d* 70 and extinguish the flame therefrom by preventing the access thereto of sufficient air to support combustion. Should it be desired to extinguish the flame without tipping the lamp A, this can be effected by pulling the flexible 75 member 7 downwardly, thus compressing the spring 3 and operating the rod 2 and flame-spreader 1, as before described, in which event the rod 2 will slide upon the rod 3'. It will be understood that the flexible members 8 8 should 80 be of sufficient length to permit the annulus 9 to swing loosely inside of the foot of the lamp. Thus, it will be noted, means are provided by which the flame-spreader 1 will be automatically operated, so as to close the outer end of 85 the wick-holder *c* if the lamp assumes a dangerous angle—that is to say, a position in which the contents thereof may exude.

I claim as new and as my invention—

1. A safety-lamp, comprising a wick-holder; 90 a flame-spreader operatable to close the outer end of the wick-holder; a rod attached to the flame-spreader and positioned in a central draft-tube; an engaging collar mounted on the rod; detaining members 5 arranged to engage 95 the engaging collar; a weighted annulus which may be caused to operate by tipping the lamp and which is operatable to disengage the detaining members 5 from the engaging collar; flexible members which loosely suspend the 100 annulus inside of the base of the lamp; and means arranged to so operate the rod when the detaining members 5 are disengaged from the engaging collar as to cause the flame-spreader to close the outer end of the wick- 105 holder.

2. A safety-lamp, comprising a wick-holder; a flame-spreader operatable to close the outer end of the wick-holder; a rod attached to the flame-spreader and positioned in a central 110 draft-tube; an engaging collar mounted on the rod; detaining members 5 arranged to engage the engaging collar; a weighted annulus which may be caused to operate by tipping the lamp and which is operatable to disengage the 115 detaining members 5 from the engaging collar; flexible members which loosely suspend the annulus inside of the base of the lamp; and a spring arranged to so operate the rod when the detaining members 5 are disengaged from 120 the engaging collar as to cause the flame-spreader to close the outer end of the wick-holder.

In testimony whereof I have signed my name to this application in the presence of two subscribing witnesses. 125

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Witnesses:

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