I. J. BABCOCK.

SMOKE INDICATOR.

APPLICATION FILED JULY 8, 1914.

1,135,651.

Patented Apr. 13, 1915.

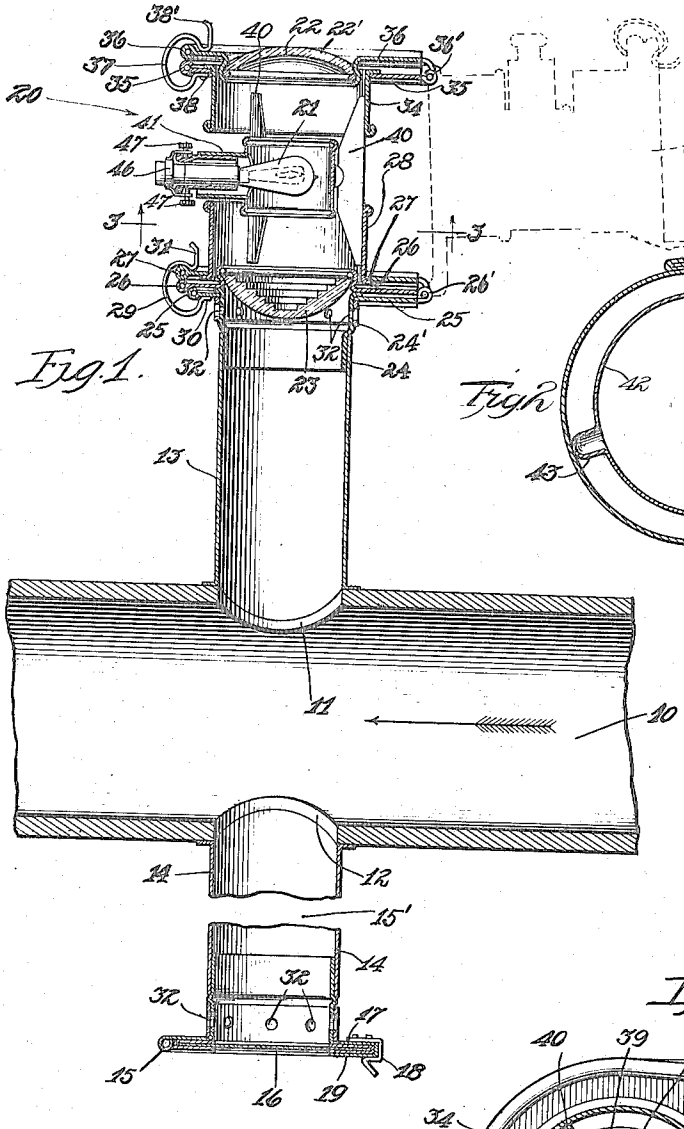


Fig. 1.



Fig. 2.

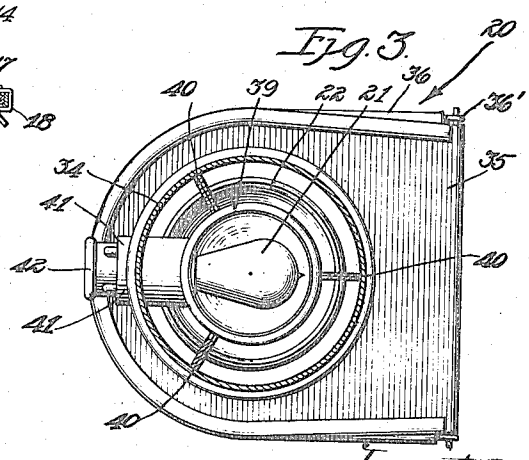


Fig. 3.

Witnesses:
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# UNITED STATES PATENT OFFICE.

IRA J. BABCOCK, OF CHICAGO, ILLINOIS.

## SMOKE-INDICATOR.

1,135,651. Specification of Letters Patent. Patented Apr. 13, 1915.

Application filed July 8, 1914. Serial No. 849,682.

*To all whom it may concern:*

Be it known that I, IRA J. BABCOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Smoke-Indicators, of which the following is a specification.

My invention relates to improvements in smoke indicators.

One of the objects of my invention is to generally improve the construction and efficiency of operation of devices of this character, such as disclosed in United States Letters Patent No. 1,012,403 granted to McNeill and Babcock, December 19th, 1911, and patent to be issued July 14th, 1914, granted to the same inventors.

My present invention, specifically considered, concerns structural features of the device whereby the projector, lens and other parts, having highly polished surfaces, are rendered more accessible for the operation of cleaning and repairing when soiled or defective.

Another specific object of my present invention is to provide means for conveniently adjusting the position of the source of light with reference to the axis of the protector and other means for adjusting the distance of separation of the light from the projector and from the lens through which the rays of light are caused to pass to render them parallel, that they may be evenly or uniformly distributed through the light conveying conduits and upon the observation screen at the other end thereof.

Other and further objects of my invention will become apparent to persons skilled in the art from a consideration of the following description when taken in conjunction with the drawing, wherein—

Figure 1 is a vertical sectional view of the breeching or smoke flue, showing a central, sectional view of my apparatus attached thereto. Fig. 2 is an enlarged transverse section of the lamp carrier, whereby to adjust the lamp transversely of the axes of the tubes. Fig. 3 is a similar view, taken on line 3—3 of Fig. 1.

In all the views the same reference characters are employed to indicate similar parts.

My indicator is for association with a smoke eduction flue, or other such conduit, for conveyance of smoke, or other gases or variable fluids to enable the observer to distinguish, at any time, the relative opacity or transparency existent within said passage-way at a relatively remote point of observation from such passage way.

In the specific exemplification herein, wherein the device is shown in connection with a smoke conveying pipe, 10 indicates a fragment of such a pipe or smoke flue—which may be specifically a smoke stack, breeching or other duct—through which products of combustion from a fuel burner may pass, or other conduit through which any other fluid having varying opacity, the condition of which is to be observed, may be conducted.

11 and 12 indicate apertures in the flue, axially alining in a transverse plane, in such relation that the fluid or gas must pass therebetween.

13 is a tube secured to the flue coaxially with the aperture 11. 14 is a tube in like manner connected to the aperture 12 upon the opposite side of the flue. The flue 14 is shown broken, as at 15′, to indicate that the observing screen 16 may be located at any suitable distance from the flue 10. The screen 16 consists preferably of a flat plate of ground glass, for diffusion of light that may impinge thereon, held in the head 17, which latter is hinged to the tube 14, as at 15, whereby the head may conveniently be swung upon its hinge for exposing the inner side of the screen 16 for cleansing or for replacement.

18 is a latch for holding the door 19 of the head in place.

The head 20, which contains the light producing agency, in the lamp 21; the light projecting agency, in the reflector 22 and the light lens 23 for paralleling the rays of light projected thereon, is secured to the end of the tube 13. This tube is preferably 12 or 14 inches in length, depending somewhat upon the curvature of the projector 22 and the lens 23, and the power of the lamp 21. A thimble 24 has telescopic association with the tube 13 for holding the head 20 in place and secured to this thimble is a plate 25 carrying parts of a compound hinge 26′. To this hinge is pivotally connected a plate 26, which carries the lens 23. Another plate 27 is also hinged, as at 26′, and carries a thimble 28. These three members are held together by means of a spring clip latch 29, having one end 30 secured to the plate 25 and the other end 31 overlying the circum-

ferential edges of the members 25, 26 and 27 to hold them in assembled position. The band 24′ and thimble 24 are each perforated at circumferential intervals, as at 32, to prevent the entrance of the smoke or gases into the tube 13, by admission of the air through the apertures 32, thereby preventing to a large extent clogging or soiling of the surface of the lens 23. This feature of the device is shown, described and claimed in the prior patents to which reference has heretofore been made.

A separable and adjustable thimble 34 has secured to it a plate 35 carrying a hinge part 36′ to which a plate 36 is hinged and to which is secured the light projecting parabola 22. A spring latch 37 is secured to the plate 35, as at 38, having a free end 38′ overlying the members 35 and 36 to hold them in assembled position.

A centrally disposed sleeve 39 is provided with three radially extending wings 40, which are adapted to make frictional contact with the inside surfaces of the sleeves 28 and 34 adjustable to place the lens of the projector 22 and the head to which it is secured, in proper relation with the light producing lamp 21. The thimble 34, and the parts carried thereby, may be bodily moved upon the wings 40—40 in a longitudinal direction so as to adjust the distance between the projector 22 and the lamp 21, or the lamp carrying part and the projector carrying part may be moved together by moving said parts longitudinally from or toward the lens 23 to vary the distance between the lamp 21 and the lens, so as to bring these three agencies in proper respective relation to produce the best results.

Secured to the sleeve 39 and projecting laterally therefrom is a sleeve 41 which is located in the space between the vertical adjustable thimbles 28 and 34. Telescopically associated and frictionally engaging the sleeve 41 is another sleeve 42, having radial projections 43, 44, and 45. To this sleeve 42 is secured the socket 46 of the lamp 21, as by means of thumb screws 47—47. The projection 43 is longer than the projections 44 and 45 of the sleeve 42 so that by rotating the sleeve 42 the lateral position of the lamp 21 may be adjustably secured, and by moving the sleeve 42 axially, with reference to the sleeve 41, the vertical position of the lamp may be adjustably secured.

The head 20 may be turned upon the hinge 26′ to the position shown in dotted lines, as at 50, and in the same manner the lens 23 may be moved upon the hinge 26′ so as to render both sides thereof accessible, and the plate 36 carrying the lens 22 may be moved, as shown in dotted lines, so that the inside of the projector 22 may be accessible for cleansing or repair.

The outside, convex surface of the glass lens 22, may be covered with polished metal, as in mirrors, so as to render the surfaces capable of reflecting or projecting the light that may impinge thereon.

The projector 22, when properly focused with reference to the lamp 21 will project substantially all of the light therefrom, to the lens 23, which when properly adjusted, will cause the rays of light to pass into the tube 13 through the breeching 10, in substantially parallel lines, thereby illuminating the translucent screen 16 uniformly, whereby the opacity or transparency of the medium passing through the flue 10 will be indicated uniformly over substantially the entire surface of the screen 16, and thereby the character of the medium passing through the flue 10 will be readily ascertained. The arrangement shown enables the screen 16 to be placed at a relatively remote point from the flue 10, with a better illumination effect upon the screen 16 than has heretofore been produced by similar devices known to me.

While I have herein shown my device in connection with a smoke flue it is manifest that it may be used in connection with flues conveying other mediums than smoke, such for instance as other gases or fluids having varying opacity and transparency, the condition of which it is desired to be observed.

What I claim is:—

1. In a device of the character described, the combination of two tubular, axially alining, spaced apart sections, a lens carried by one section, a reflector carried by the other section and a lamp carrier positioned intermediate said sections and having projecting parts telescopically engaging therewith.

2. In a device of the character described, the combination of two tubular, spaced apart, axially alining sections, a lens carried by one of said sections, a reflector carried by the other section, a lamp carrier positioned intermediate the sections and having projecting parts slidably engaging therewith and means independent of the inter-engaging parts for supporting one only of said sections.

3. In a device of the character described, the combination of two tubular, spaced apart, axially alining sections, a lens carried by one of said sections, a reflector carried by the other section, a lamp carrier positioned intermediate the sections and having projecting parts slidably and rotatably engaging therewith and means independent of the inter-engaging parts for supporting one of said sections.

4. In a device of the character described, the combination of a lamp structure comprising two tubular, spaced apart, axially alining sections, a lens carried by one section, a reflector carried by the other and a source of light carrier intermediate said sections and telescopically engaging therewith; a tubular

support in axial alinement with said tubular sections and hinge connections between said lamp structure and said support.

5. In a device of the character described, the combination of a lamp structure comprising two tubular, spaced apart axially alining sections, a reflector carried by one section and a source of light support intermediate said sections and forming a connection therebetween; a tubular support in axial alinement with said tubular sections, a hinge connection between said support and the section not carrying the reflector and a lens-carrying annular ring adapted to be clamped between the last mentioned section and said support.

6. A lamp support comprising a tubular part of a diameter greater than that of the lamp, a shell within said tubular part adapted to be clamped to the base of the lamp, and flanges of unequal length radiating from said shell and rotatably and slidably engaging the inner wall of the tubular part to eccentrically position said lamp base therein.

7. A lamp support comprising a tubular part of a diameter greater than that of the lamp, a shell within said tubular part adapted to be clamped to the base of the lamp, and means for mounting said shell rotatably and eccentrically within the tubular part.

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

IRA J. BABCOCK.

In the presence of—
MARY F. ALLEN,
FORÉE BAIN.