No. 806,174. PATENTED DEC. 5, 1905.

E. H. McCLOUD.

FLEXIBLE FIRE RESISTING CURTAIN.

APPLICATION FILED FEB. 9, 1905.

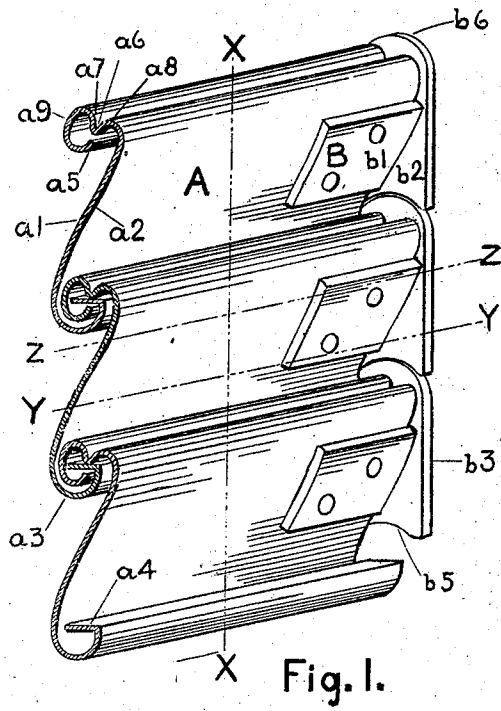


Fig. 1.

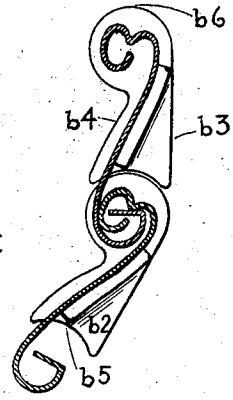


Fig. 2.

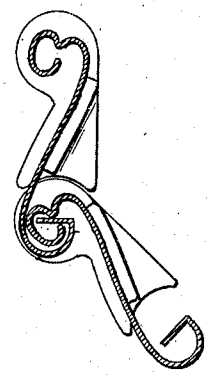


Fig. 3.

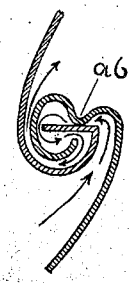


Fig. 4.

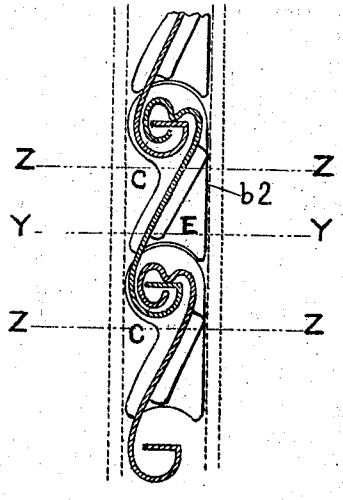


Fig. 5.
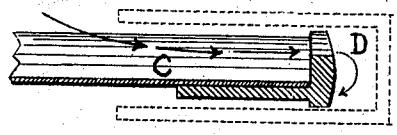


Fig. 6.

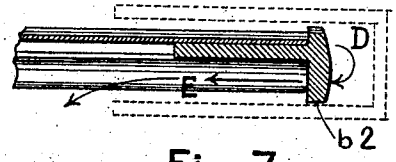


Fig. 7.

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FLEXIBLE FIRE-RESISTING CURTAIN.

No. 806,174. Specification of Letters Patent. Patented Dec. 5, 1905.

Application filed February 9, 1905. Serial No. 244,993.

To all whom it may concern:

Be it known that I, EDWARD HARRISON McCLOUD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Improvement in Flexible Fire-Resisting Curtains, of which the following is a specification.

My invention relates to improvements in flexible fire-resisting curtains in which flexibility is effected by means of hinge-like joints connecting together several longitudinal metallic sections.

The objects of my invention are, first, to provide a more perfect hinge, reducing friction therein and attaining a greater angular movement; second, to provide a hinge offering comparatively a greater resistance to the passage of fire; third, to provide a hinge that will not separate except by movement in the direction of its length; fourth, to provide a curtain having perfect water-shedding sections; fifth, to provide a section in which the form imparts a greater stiffness; sixth, to provide a curtain having a continuous contact between its edge and the groove, thereby preventing the passage of fire, smoke, and heat; seventh, to provide a curtain in which the sections are locked in alinement and their edges protected from wear in the grooves. I have illustrated in the annexed drawings the manner in which these objects are accomplished.

Figure 1 is an isometric view of a portion of the curtain and end pieces. Figs. 2 and 3 are sectional views taken on a vertical transverse plane. Fig. 4 is an enlarged sectional view of the hinge-joint. Fig. 5 is a vertical transverse section taken at X X. Fig. 6 is a longitudinal section taken on the line Z Z. Fig. 7 is a longitudinal section taken on the line Y Y.

Similar letters refer to similar parts in all figures.

In Fig. 1 the longitudinal metallic sections are designated A, the weather side of the inclined plane a', the reverse side a^2. It will be observed that the side a' presents a plane surface suitable to shed water and is free from indentations or projections, which would accumulate and retain dirt, snow, and moisture. a^3 is the cylindrical lower edge; a^4, the terminating plane which supports the adjoining section and in conjunction with the terminus a^5 prevents the disengagement of one section from another except by a longitudinal movement; a^6, the lower part of the reverse curve which acts as a fulcrum or point of suspension. The parts a^7, a^8, and a^5 are radials from a common center under the point of suspension. The surface a^9 is described by a radius from the same point. This particular formation of hinge diminishes the friction by reducing the area of movable contact between the sections and affords a free angular movement, as shown in Figs. 2 and 3. It further offers an efficient resistance to the passage of flame and heat, presenting a long passage interrupted in its direction by numerous turns and closed between the points a^6 and a^4. In Fig. 4 the probable direction of flame is indicated by arrows.

The ends of each section are fitted with the piece B, consisting of a flange b' and at right angles to it a flange b^2, having a straight side b^3 and an outwardly-curved side b^4 and inwardly- and outwardly curved ends b^5 and b^6, respectively. In order that the angular movement of the piece B may be uniform with that of the section, the ends b^5 and b^6 are described by a radius from a center between a^6 and a^4.

It is evident that the edges of the section traveling in contact with the grooves would wear away before the central portion. To prevent this, the sides b^3 and b^4 are extended beyond the section. The outwardly-curved portion b^5 overlaps the adjoining section, preventing the lateral movement of one section with respect to the other, thereby maintaining the alinement of the several sections.

In constructing a fire-resisting curtain it is necessary to take into consideration the increased size of curtain resulting from expansion when the curtain is subjected to the action of fire. If the edges of the curtain are confined, buckling and crippling will follow the application of heat. Flexible fire-curtains are usually made of steel, and .0000826 of a foot is generally allowed per foot for expansion for each degree of increase in temperature.

The curtain which I have here described contains sufficient lost motion in the hinge-joint to compensate for the vertical expansion. Provision for horizontal expansion is made by space between the ends of the sections and the bottom of the grooves in which they travel. In Figs. 5, 6, and 7 the dotted lines represent the groove. The relative positions of the groove and curtain are clearly shown. It is evident that flame or heated air could enter the groove through the space C on the line Z Z, thence upward through the space D, and out through the space E on the line

Y Y. To prevent this, I interpose the flange b^2, which closes the space E at the ends of the sections. It will be perceived that the flange b^2 bears against the side of the groove.

In order to obtain a section in which the form imparts a stiffness adapted to resist wind-pressure, I have selected a design which permits a distribution of considerable metal parallel to the direction of the force to be resisted—viz., the parts a^3, a^4, a^5, a^6, and a^9, which may be termed "flanges," on the main body of the section. By increasing the width of said flanges the resistance of the same is correspondingly increased. It is apparent that this design also admits of numerous bends, which will further stiffen the section.

While I have here termed this a "fire-resisting curtain," I do not limit myself to this particular application, as it can be utilized for closing windows and doors, for other purposes, and is particularly useful for core-oven and dry-kiln doors, where it is desirable to confine the heat.

What I claim, and desire to secure by Letters Patent, is—

1. A flexible fire-resisting curtain, composed of sections; the central portion of each section describing an inclined plane, its lower edge forming a semicylindrical surface, and terminating in an angular inward bend; its upper edge forming a reverse curve and an elliptical surface terminating under the downward portion of the reverse curve, adapted to form a hinge in conjunction with the lower edge of the adjoining section.

2. A flexible fire-resisting curtain composed of sections; the lower edge of each section forming in part a cylindrical surface, terminating in an inward bend; the upper edge forming a reverse curve; the downward portion acting as a fulcrum on the horizontal plane of the inward bend of the adjoining section.

3. A flexible fire-resisting curtain composed of a plurality of hinge-sections; the ends of each section fitted with a piece having a flange with an outwardly-curved end extending over the adjoining sections, and an inwardly-curved end adapted to receive the outwardly-curved end on the adjacent section.

4. A flexible fire-resisting curtain composed of a plurality of hinge-sections; the ends of each section closed by a piece consisting of a flange parallel to the section, and a flange at right angles to the same; the right-angle flange having an outwardly-curved side and end, a straight side and inwardly-curved end.

5. A flexible fire-resisting curtain composed of hinge-sections; the ends of each section closed by a piece having a projecting flange; one side of said flange being straight and parallel to the general plane of the curtain.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD HARRISON McCLOUD.

Witnesses:
CARL LEON CRANDELLE,
ESTELLE OREWILER.