June 15, 1937. E. H. WELLS, JR 2,083,933

SMOKE JACK

Filed March 13, 1935

Fig. 1.

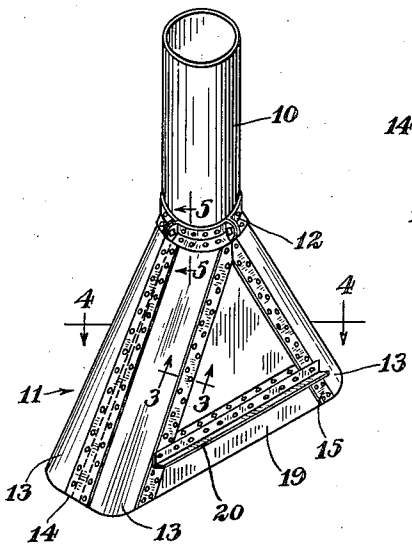


Fig. 2.

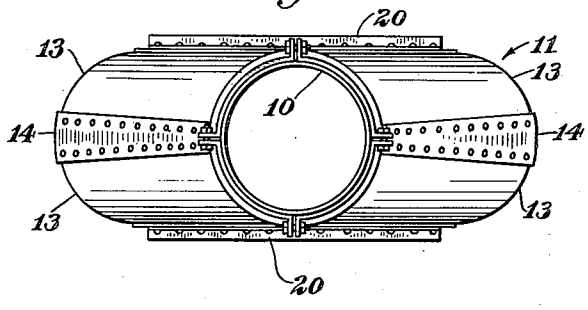


Fig. 3.

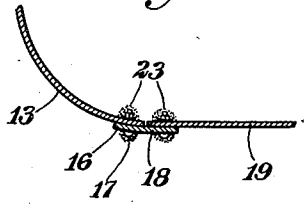
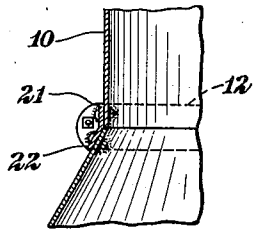


Fig. 5.



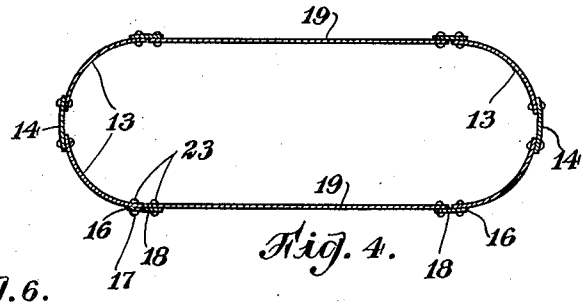
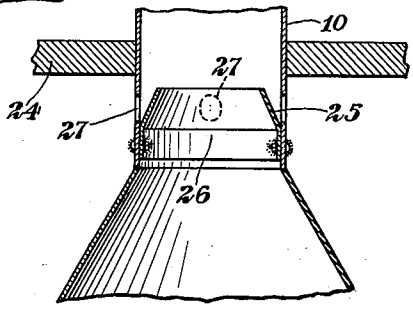


Fig. 4.

Fig. 6.



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SMOKE JACK

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Application March 13, 1935, Serial No. 10,842

6 Claims. (Cl. 104—52)

This invention relates to an improved smoke jack and particularly to one adapted to resist acidic fumes of coal or oil burning locomotives or the like.

There has been proposed heretofore a large number of various types of smoke jacks to be used, for instance, in railroad round-houses. One of the most successful types has been made from asbestos and cement compositions by a process including intermingling of asbestos, Portland cement, and water, shaping the composition and removing excess water therefrom, allowing the composition to take an initial set and then shaping the partially set composition to curved form desired for the corner pieces of the hood or exhaust pipe.

It is an object of the present invention to provide an improved smoke jack, constituted largely at least of a composition of asbestos and Portland cement, that is strong, rigid, free from shaping cracks, and of smooth, regular surface with a minimum number of fastening elements required, particularly in the curved corner sections and in the stack where erosion or corrosion is ordinarily the greatest. Another object is the provision of a smoke jack that may be constructed of materials of thickness greater than can be molded into curved form after initial setting and are adapted, therefore, for longer use than are the thinner materials previously used, or that, for a given durability, may be of lesser weight. A further object is to provide a smoke jack that may be readily and conveniently assembled, without the introduction of internal stresses ordinarily necessitated by making imperfectly shaped curved pieces conform to gusset plates, battens or the like.

The present invention comprises means of minimizing deterioration of the smoke jack in the presence of acidic smoke, including curved units of asbestos fibres and Portland cement that are substantially free from minute, hair-link cracks, in distinction from elements shaped to curved form after being first molded and partially set.

A preferred embodiment of the invention will be described in connection with the drawing in which

Fig. 1 shows a perspective view of a smoke jack constructed in accordance with the invention;

Fig. 2 shows a top plan view of the same;

Fig. 3 shows an enlarged sectional view on line 3—3 of Fig. 1;

Fig. 4 shows a sectional view on line 4—4 of Fig. 1;

Fig. 5 shows an enlarged sectional view on line 5—5 of Fig. 1; and

Fig. 6 shows a vertical sectional view of a portion of a jack with a modified form of stack.

In the various figures like reference characters denote like parts.

There are shown an integral exhaust pipe 10, a hood disposed therebelow, indicated generally at 11, and means including a conoidal collar 12 securing the hood at its top portion to the lower end of the exhaust pipe.

The hood contains curved corner members 13 that in cross section are suitably sectors of a circle, say quadrants made as will be described below. The sides of the hood include gusset plates 19 of plane surface.

The curved corner members are united to each other by batten strips 14 that conform at their edge portions to the curvature of the corner pieces.

Likewise, the plane gusset plates are united each to a curved corner member by a batten strip 15 that is curved at the side portion 16 (Fig. 3) to conform with the curvature of the said member and is secured thereto by means of the element 17. At the opposite side portion 18, the batten strip is of plane surface and conforms to and is secured to a gusset plate 19. In this manner a good tight fit is obtained.

The union strip or batten 14, of free width (width between the edges of adjacent corner members) increasing towards the lower end of the strip, makes possible the use of curved pieces of uniform cross section from top to bottom portion of the hood, while, at the same time giving a flaring hood, having a bottom substantially wider in its shortest dimension (thickness) than the top portion which is secured to the exhaust pipe. The flaring gusset plates 19 give a flaring width, also, to the hood.

Suitable bracing may be used, for example, as indicated at 20.

The collar 12 is shaped at its upper portion 21 to conform to the exhaust pipe and at its lower portion 22 to conform approximately to the top portion of the hood.

The fastening members throughout may be of the type illustrated at 17, say, bolts both ends of which are protected by acid-proof putty or plastic 23.

In making an assembly of the type shown, there are provided, initially, the constituent parts of proper size and shape.

Thus, there are made members adapted for use as the exhaust pipe 10 and curved corner mem-

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bers 13. The pipe and these members are suitably made by forming, first, a suspension of asbestos fibres and Portland cement in a large volume of water, forming a thin felt of the suspended material on a cloth conveyor or belt, and transferring the felt continuously to a rotating mandrel, whereby there is built up a tubular blank. The resulting tube thus is compressed, simultaneously with the shaping of the green or unset composition to the final curvature desired, and the Portland cement therein is allowed to harden; the felt on the mandrel is continuously compressed.

The product is a shaped, compressed and densified composition, free from hair-line cracks or voids and of minimized wick action in the direction of the shortest dimension of the wall, inasmuch as the asbestos fibres to which such wick action is due are predominantly oriented transversely with respect to the thickness or shortest dimension of the wall of the tube.

The apparatus used in making such a tubular product is not shown, as the apparatus constitutes no part of the invention.

To make the individual corner members 13, a pipe such as 10, is quartered longitudinally. The quarters are cut at one end so that, when they abut under the collar 12, they form an approximately circular opening through which smoke may pass freely into the exhaust pipe 10. At the other end the sections are cut, likewise, to cause termination substantially in a single plane when the hood is fully assembled.

The strength of the corner pieces and the integrality of the stack make unnecessary the use of so many fasteners as previously employed. This reduces the number of centers of corrosion and overall frictional resistance to flow of gas through the jack.

Because these quarters of the pipe have each a radius equal to that of the pipe 10, the abutment of the corners of the several sectors under the collar 12 gives an opening of suitable size.

The batten strips 14 and the gusset plates 19 are suitably constituted of composition similar to that of the pipe 10 and the corner pieces 13.

Another feature is the low proportion of asbestos fibres used in making the curved corner pieces or stack, this low proportion contributing also to minimized wick action through the product. There may be used, for example, 20 parts by weight of asbestos fibres to 80 of Portland cement.

Since the composition is felted and shaped simultaneously into the final curved form desired and since there is no disturbance of the originally established intimate association of the reenforcing fibres and cement, the present product is sharply distinguished from compositions of low content of asbestos fibres as made by other methods. Such methods include forming a sheet of asbestos and Portland cement and subjecting the formed sheet to a reshaping operation. This causes cracking and minimizes the effect of the reenforcing by the asbestos fibres, especially since the reshaping is frequently made after the cement in the formed sheet has taken an initial set to an extent permitting handling of the sheet.

The jack shown in Fig. 6 is adapted to ventilate adjacent space. Thus, the exhaust pipe is so constructed as to draw into itself smoke that may otherwise collect below the roof 24 of a round-house.

This modified form of exhaust pipe or stack has a conoidal or other hollow member 25 disposed within the pipe, conforming at its lower part with the inside of the stack, and defining a hole 26 becoming narrower towards the top. The pipe is provided also with inlet openings 27 located at a level above the bottom and below the top of the member 25 and also below the roof 24.

Gases, passing rapidly upwardly through the restricted hole 26 and then expanding, induce suction in the vicinity of the openings 27, with consequent ventilation of the adjacent space, as desired.

It will be understood that the details given are for the purpose of illustration, not restriction, and that variations within the spirit of the invention are to be included in the scope of the appended claims. It will be understood, also, that the invention is not limited to any theory of explanation of the cause of the superior properties of the applicant's structure.

What I claim is:

1. An acid-resisting smoke jack of the type described comprising shaped, compressed and densified, and hardened units including an intimate mixture of Portland cement and asbestos fibres, the fibres in the several units being arranged predominantly in direction transverse to the thickness of the said units to minimize wick action on the part of said fibres.

2. An acid-resisting smoke jack of the type described comprising an integral exhaust pipe, a hood disposed below the exhaust pipe and means securing the hood to the said pipe, the hood including curved corner members and the said corner members and exhaust pipe comprising shaped, compressed and densified, and hardened units including an intimate mixture of Portland cement and asbestos fibres, the fibres in the several said units extending therein predominantly in direction transverse to the shortest dimension of the units to minimize wick action on the part of said fibres.

3. An acid-resisting smoke jack of the type described comprising an integral exhaust pipe formed of an intimate mixture of asbestos fibres and Portland cement, a flaring hood disposed below the exhaust pipe, means securing the hood to the said pipe, said hood comprising curved corner members, sheets of substantially plane surface disposed between the said corner members and in edgewise relationship thereto, and batten strips, each of which has a plane portion secured to one of the said sheets and a curved portion conforming to the curvature of one of the said corner members and secured thereto, the asbestos fibres in the said pipe being arranged predominantly in direction transverse to the thickness of the wall thereof to minimize wick action on the part of said fibres.

4. A smoke jack of the class described comprising an exhaust pipe, a hollow member within said pipe constituting a restriction and defining a passage becoming narrower towards the top of the said member, and an opening in the said pipe at a level above the bottom and below the top of the said member, whereby ventilation of the space around the exhaust pipe is obtained.

5. A smoke jack of the class described comprising shaped, compressed and densified, and hardened curved units, including a strongly compressed and hardened composition comprising an intimate mixture of Portland cement and asbestos fibres, the proportion of fibres being of the order of 20 parts by weight to 100 parts of the composition and the composition being in

the condition of having been shaped to final form before the cement therein has taken an initial set.

6. An acid-vapor resisting, asbestos-cement smoke jack structure, comprising a cylindrical exhaust stack and a composite hood disposed therebelow, the corners of said hood being quadrants of a cylindrically shaped blank in which asbestos-cement products of this type are initially formed, whereby curved elements may be used throughout the structure which have been permanently shaped before the material from which they are formed has taken an initial set, so as to avoid the existence of hairline cracks.

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