J. A. HORNE.

TUNNEL ATTACHMENT.

APPLICATION FILED JAN. 13, 1909.

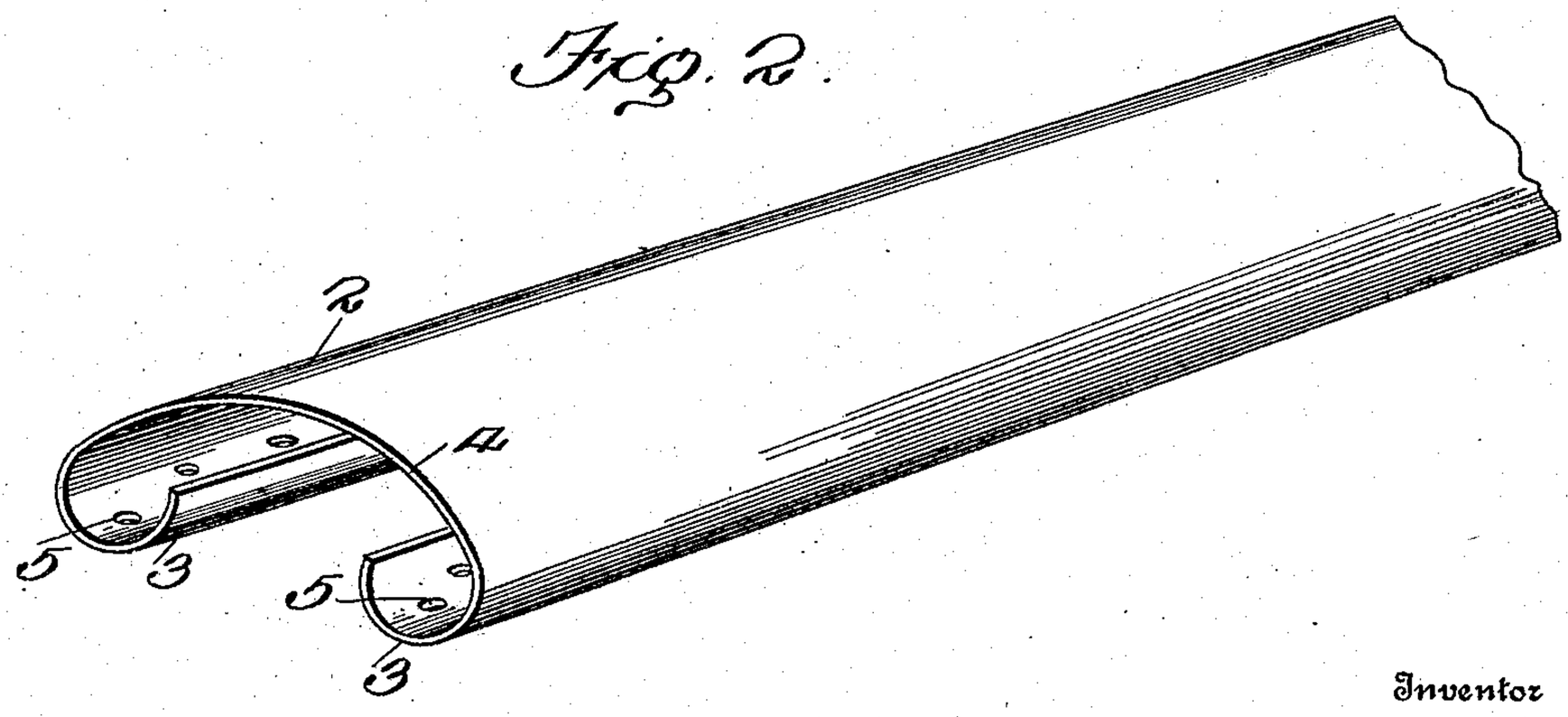
936,628.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

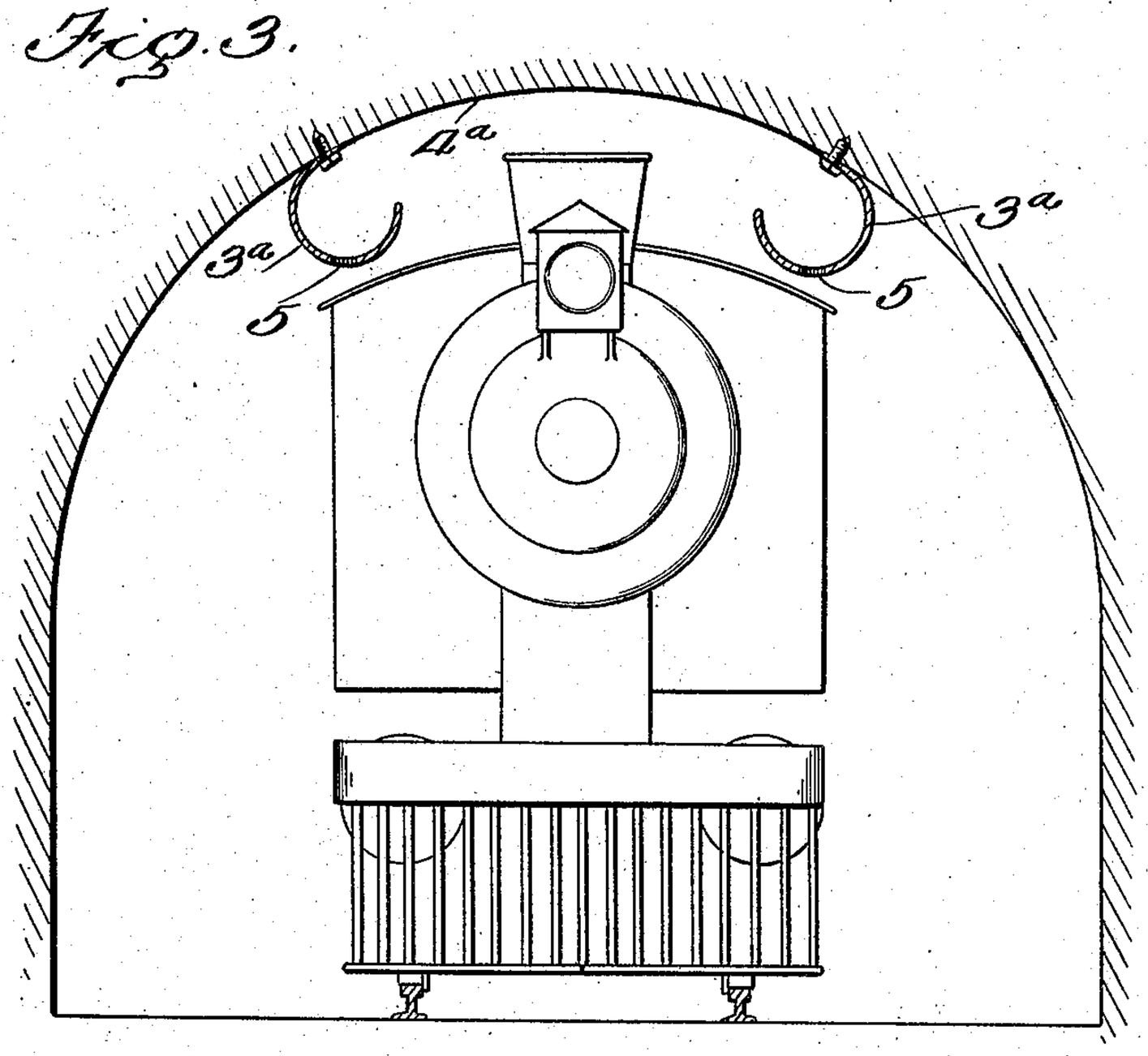


Fig. 4.

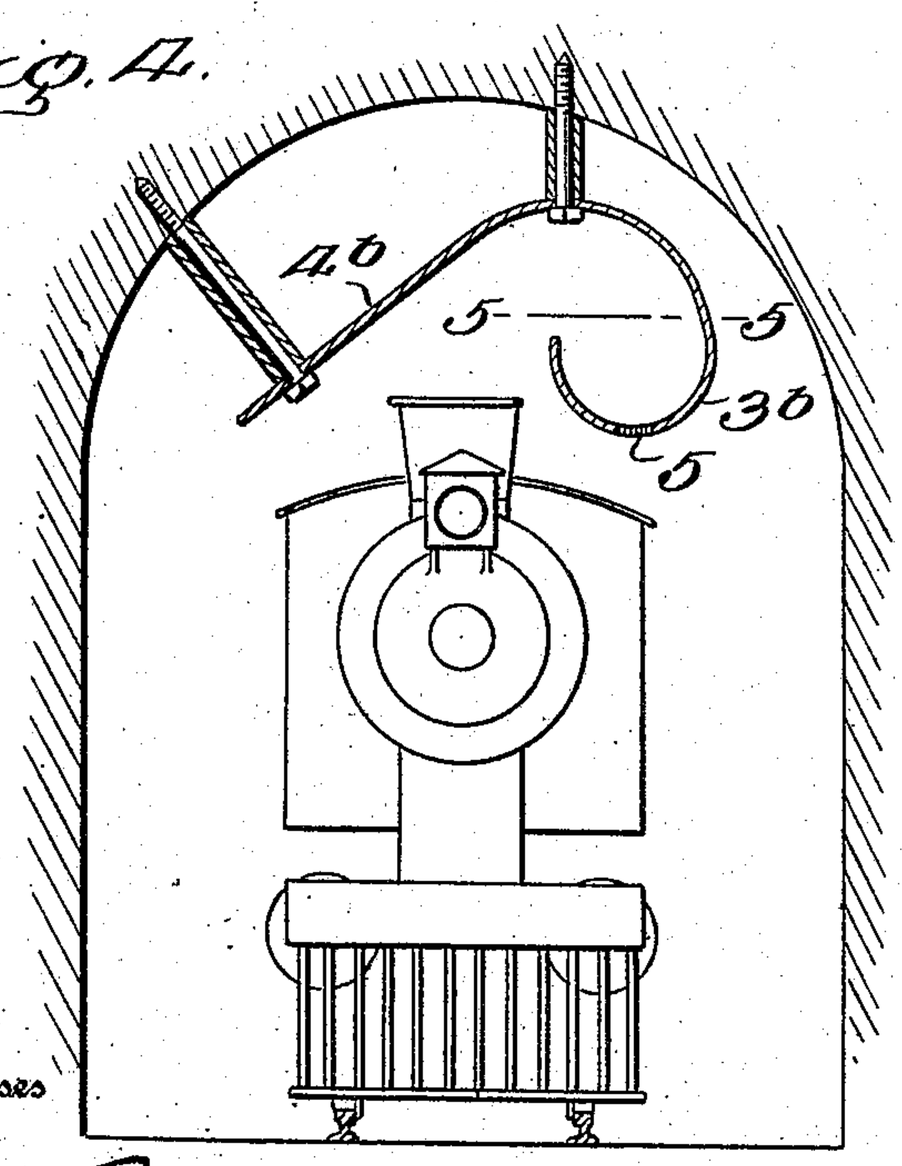
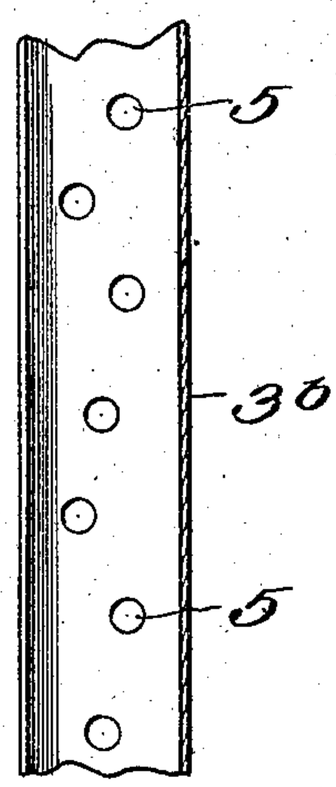


Fig. 5.



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TUNNEL ATTACHMENT.

936,628. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed January 13, 1909. Serial No. 472,110.

To all whom it may concern:

Be it known that I, JAMES A. HORNE, citizen of the United States, residing at Oregon City, in the county of Clackamas and State of Oregon, have invented certain new and useful Improvements in Tunnel Attachments, of which the following is a specification.

It is well-known that one of the serious problems confronting railroads and municipalities at the present day is the matter of tunnel construction and maintenance, the disposition or consumption of the smoke accumulating in the tunnel being a serious factor. This is especially true during the warmer months of the year when it is well-nigh impossible to keep all of the ventilators and windows of the cars closed when a train is going through a tunnel, particularly if the tunnel be a long one, with the result that the cars of the train are filled with smoke to the intense discomfort and possible injurious effects upon the passengers; and even where the ventilators and windows are kept tightly closed, the stifling atmosphere is no less a source of considerable discomfort. In order to overcome these difficulties, it has been proposed to equip the locomotives with smoke consumers, which has not up to the present time been successful, and it has also been proposed to install pumping plants in connection with the tunnels of a road to draw out the smoke and thus dispose of it. But this latter plan has its manifest disadvantages and has been found by actual test to be a poor expedient at the best, for the reason that the fans or blowers have not been sufficient to adequately cope with the nuisance to keep the tunnels clear, while on the other hand, particularly in cities, the smoke drawn from the tunnels has settled upon the property adjoining the stack of the suction apparatus and numerous complaints have thereby resulted.

In some instances, railway systems have been electrified to overcome the above named obstacles, at least to the extent of the tunnel equipment, but this has necessitated a delay in shifting from a steam locomotive to an electric locomotive, and for this and other reasons has not been altogether successful.

With a knowledge of these conditions, my present invention has for its object a very simple smoke attachment for tunnels which may be very cheaply made and installed and maintained at practically no expense whatever, and which will efficiently dispose of the smoke and prevent it from entering the cars, the invention consisting essentially in one or more smoke pockets or deflectors secured in any desired way to the walls of the tunnel roof and designed to receive the smoke as it issues from the stack of the locomotive and automatically cause it to be retained therein as against any reëntrance into the body of the tunnel below the plane of the deflector, the smoke by its own momentum and whirling motion caused by the peculiar shape of the pocket, being finally emitted at the tunnel mouth. And the invention also consists in certain constructions and arrangements of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which,

Figure 1 is a transverse sectional view of a tunnel equipped with one form of my improved attachment. Fig. 2 is a perspective view of the attachment. Fig. 3 is a transverse cross-sectional view of a tunnel embodying a modified form of smoke attachment. Fig. 4 is a similar view illustrating another modification, and Fig. 5 is a horizontal sectional view of one of the smoke pockets.

Referring to the drawings, and now particularly to Figs. 1 and 2, 1 designates a tunnel and 2 one form of my improved smoke attachment. The said attachment may be constructed of sheet metal or any other desired substance or material and may be secured to the roof of the tunnel in any desired way. The attachment embodies two pockets 3, which extend longitudinally of the tunnel and which are spaced from each other at inner side edges. In that embodiment of the invention illustrated in Figs. 1 and 2, the two pockets are both formed, as well as their attaching or connecting web 4 out of one piece of sheet metal curved transversely, as shown, and with its ends turned inwardly and upwardly in partial convolutions, so as to produce upwardly facing pockets with relatively narrow entrance portions. Care is to be taken that the attachment be so located in the tunnel that the stack of the locomotive is in proper alinement with the space between the two pockets

and care should also be taken that the lowermost walls of the pockets lie above the plane of the car roof so as to avoid any danger of being struck.

In the practical operation of the device, smoke issuing from the stack of the locomotive will strike the curved web or deflecting wall 4 of the attachment and be thereby directed laterally in either direction, or both, and be sent with a whirling motion into the pockets 3, the curling or whirling motion thus set up being continued for a considerable time, and the smoke being effectually retained within the pockets until it effects its own exit at the end of the pocket, which, it is to be understood, will be located at the mouth of the tunnel. Hence, it will be seen that after the smoke has once been received in one of the pockets 3 with the whirling motion caused by the peculiar shape of the attachment, it will be retained in the pockets and be prevented from again blowing downwardly into the body of the tunnel. By this means, the tunnel itself will at all times be kept clear. Obviously, although it is not essential that this be the case, as far as my invention is concerned, the forward motion of the locomotive will give an upward impetus to the smoke as it is emitted from the stack and accelerates the escape movement; but I have found that even with the stack remaining still, the smoke will finally creep longitudinally along the walls of the pockets and find its exit only at the mouth thereof.

Where the attachment is to be installed in a tunnel, the roof of which is comparatively low, the attachment may be formed in few parts, as illustrated in Fig. 3, the pockets 3^a separate from each other, as shown, and the deflecting web being formed by the curved roof of the tunnel itself as indicated at 4^a. Where again, the attachment is to be installed in tunnels of more than ordinary height, I form only one pocket designated 3^b, the deflecting web designated 4^b being in the form of a parabola, as clearly illustrated in Fig. 4. With this form of invention it is clear that the outer edge of the deflecting portion of the attachment may be continued or extended considerably so as to insure the catching of the smoke issuing from the stack of the locomotive. As a subsidiary feature of my invention, reference is to be had to Fig. 5 which shows the lower wall of the smoke collecting pocket provided with a plurality of apertures or perforations 5, of any desired number and located at any desired intervals, the purpose of the openings being merely to avoid an accumulation of cinders in the pockets and in no wise interfering with the retention of the smoke.

Having thus described the invention, what is claimed as new is:—

The combination with a tunnel, of an attachment therefor, the attachment consisting of an integral or one-piece sheet of metal bent transversely with downwardly, inwardly and upwardly curved side edges and a connecting web portion merging into the curved side edge portions, the side edges facing upwardly as shown, the curved portions being formed at their lowermost points with a longitudinally extending series of perforations, as and for the purpose set forth.

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

JAMES A. HORNE. [L. S.]

Witnesses:
W. N. Woodson,
Frederick S. Stitt.