Nov. 8, 1932. H. E. RICCIUS 1,886,427

LOCOMOTIVE STEAM PIPE CASING

Filed April 18, 1931

Fig. 1.

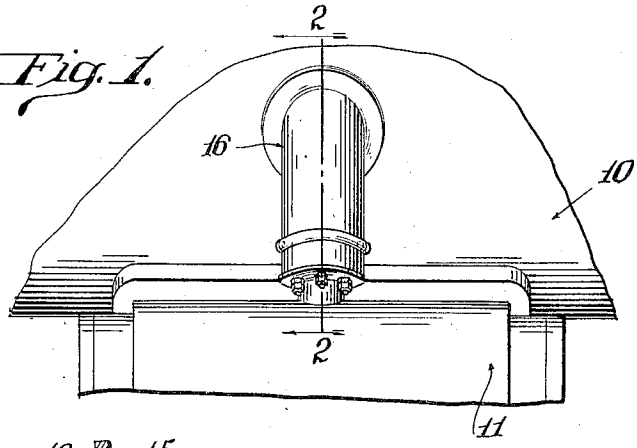


Fig. 2.

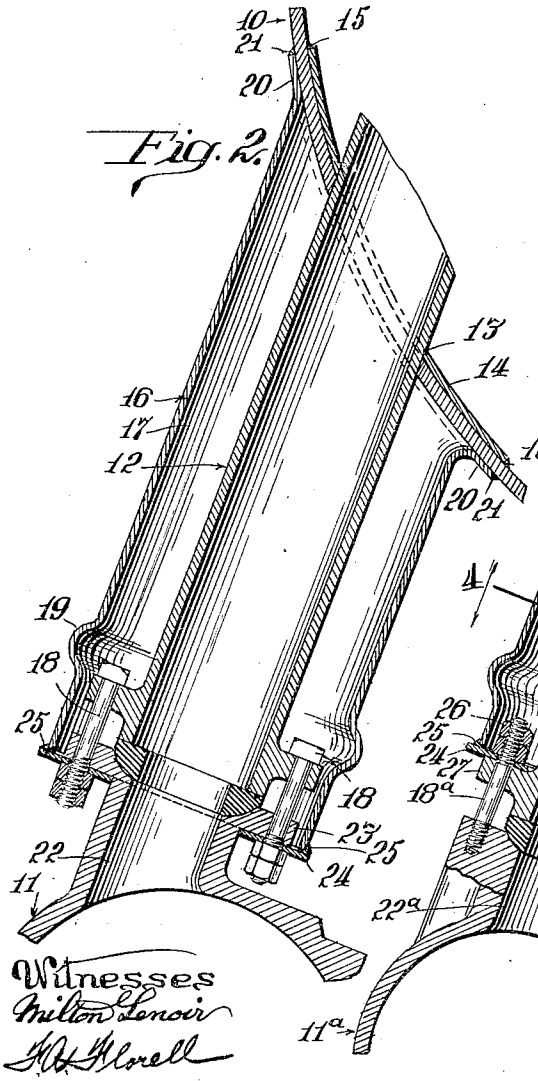


Fig. 4.

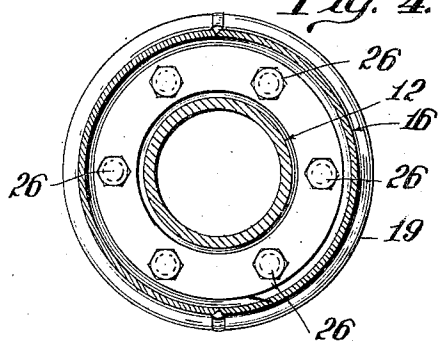
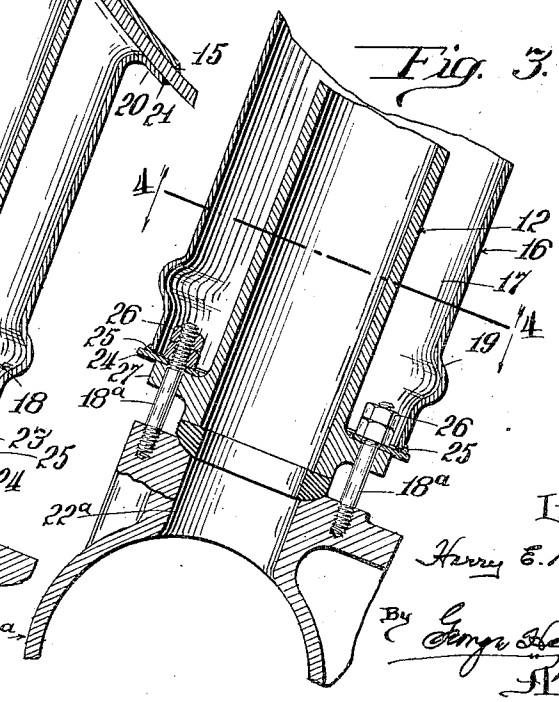


Fig. 3.



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UNITED STATES PATENT OFFICE

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LOCOMOTIVE STEAM PIPE CASING

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My invention relates to a casing more especially intended for the live steam pipes leading from the smoke-box of a locomotive to the steam chests; that is to say a casing for the portions of the steam pipes located to the exterior of the smoke-box shell and the steam chests or valve chambers on opposite sides of the locomotive.

The invention has for its object the provision of a casing so secured to the smoke-box shell about the steam pipes that air leaks into the smoke-box will be prevented and hence a material saving of fuel obtained, while at the same time providing for proper insulation of the exterior steam pipes leading to the steam chests; my invention contemplating a casing construction which is independent of the steam pipes and hence its air tight relation and insulating effect for the steam pipes will not be affected by the constant vibrations to which the means are subject during operation of a locomotive.

The objects and advantages of my improved structure will be readily comprehended from the following detailed description of the accompanying drawing, wherein:

Figure 1 is a side elevation of a portion of a smoke-box and steam chest with the steam pipe provided with my improved casing.

Figure 2 is a longitudinal section view taken on the line 2—2 of Figure 1, with the usual insulation about the steam pipe omitted.

Figure 3 is a longitudinal sectional view illustrating a modified application to a different type of steam pipe connection with the steam chest with the steam pipe insulation omitted.

Figure 4 is a cross sectional view taken substantially on the line 4—4 of Figure 3 looking in the direction of the arrows.

In the embodiment of the invention as shown in the first two figures of the drawing, 10 represents a portion of the smoke-box of a locomotive and 11 a portion of one of the steam chests or chambers arranged as is usual in locomotive construction.

The live steam from the steam dome and throttle passes through a suitable steam pipe extending forwardly to the smoke-box of the locomotive where it is provided with a suitable coupling and a pair of steam pipes leading downwardly through the smoke-box and out through suitable openings adjacent to the bottom and on opposite sides of the smoke-box for connection with the respective steam chests or valve chambers.

One of these steam pipes is shown at 12 in Figure 2 coming through the opening 13 in the smoke-box shell 10.

Arranged on the interior of the smoke-box shell 10, about the steam pipe 12, is an inside liner plate 14, apertured so as to have comparatively close relation with the steam pipe and its outer perimeter preferably continuously welded into intimate relation with the smoke-box shell as shown at 15.

Disposed about the exterior portion of the steam pipe 12 and extending substantially throughout the length of the steam pipe is my improved casing 16.

The casing 16 comprises a cylindrical shell of materially greater inside diameter than the outside diameter of the steam pipe 12 so as to provide an insulation receiving space 17 therebetween; and the shell adjacent to the lower end in proximity to the upper ends of the bolts 18, is provided with a circumferential outward bulge or corrugation 19.

When the casing 16 is applied during construction of the locomotive it may be a continuous or single piece shell. On the other hand, if it is applied to a locomotive in use, the shell may be made in half sections and the sections then welded together at their longitudinal meeting edges to provide an integral air tight joint.

The upper end of the shell is flared or flanged outwardly as shown at 20, the flange portion extending entirely about the shell and adapted to extend flush with the smoke-box shell to which it is integrally secured by welding entirely around the flange 20 as shown at 21 so as to make an air-tight connection.

In the construction shown in Figure 2, where the steam chest inlet 22 is provided with an annular flange 23, apertured to receive the various clamping or fastening bolts 18, I provide an annular plate 24 which is firmly clamped to the under-side of the flange

by the nuts on the bolts. This plate, especially when the casing is applied to a locomotive in use, is preferably made in half sections to permit application about the steam chest inlet hub 22, and these sections then welded together into a continuous annular plate having flush fitting relation with the flange 23 against the admission of air.

The plate 24 is of larger diameter than the diameter of the inlet hub 22 and its flange 23 to permit the outer perimeter of the plate to extend sufficiently beyond the flange 23 to receive the lower end of the shell and at the same time enable the shell and plate to be welded together continuously about the shell as shown at 25 into air-tight relation.

It is apparent from the construction that the space intermediate of the shell and the steam pipe is hermetically sealed against ingress of air, while at the same time the shell is without contact or connection with the steam pipe itself. This fact is of great importance because of the differences in expansion and contraction between the steam pipe and the shell, as well as the different vibrations encountered, which would soon tend to disrupt any direct connection betwen the outer casing and the steam pipe and would then permit air leaks into the casing and hence also into the smoke-box which would result in material loss in efficiency of the locomotive and a consequent increase in fuel consumption.

In Figure 3 I show application of my improved shell to a slightly different type of steam chest 11^a wherein the walls of the steam chest are coincident with the steam inlet 22^a, thus necessitating the use of screw bolts 18^a which screw into tapped openings in the steam chest wall and hence require the fastening nuts 26 to be secured above the flange 27 of the steam pipe 12. With this type of construction, the lower annular plate 24 is arranged on top of the steam pipe flange 27 and firmly clamped thereto into air-tight relation by the nuts 26. The casing proper is substantially the same as that previously shown and described, with its upper end securely welded to the smoke-box shell, while the lower end rests on and is firmly welded to the plate 24 as shown at 25; the shell being also preferably provided adjacent to its lower end with the annular outward bulge or corrugation 19 which will compensate for expansion and vibration without subjecting the welded joints to undue strains.

In the application of my improved casing to a locomotive, the casing is preferably filled with suitable insulation or asbestos which, when properly applied, also prevents ingress of air as well as heat radiation; but as the insulation may be of a well known type at present in use and in itself is not a part of my invention, for the purposes of clarity in the drawing, I have omitted the insulation in Figs. 2, 3 and 4 so as to more clearly show the manner of securing the ends of the casing in place and the relation between adjacent elements.

I am aware that casings have been applied to the steam pipes of locomotives intermediate of the smoke-box shell and the steam chests, but such casings as heretofore employed consisted of separate shells, one within the other, with the inner shell so formed as to necessitate attachment of this shell at certain points to the steam pipes.

That is to say, the inner short shell tapered inwardly at its lower end toward the steam pipe at a short distance from the smoke-box shell and was secured to the steam pipe while a second or outer shell extended to the steam chest and the outer shell was clamped about the inner shell. This arrangement, in practice, has been found quite objectionable because the strains and vibrations encountered soon resulted in breaking the welded connections and permitted air leakage.

My invention, however, contemplates a casing which is not integrally secured to the steam pipes nor integrally secured to the steam chests, but wherein the shell is provided with a bottom plate which affords means for clamping or securing the shell at its lower end without necessitating welding the lower end of the casing to the steam pipe or to the inlet hub or portion of the steam chest and hence provides greater flexibility and takes care of the vibrations to which these elements of a locomotive are subjected while at the same time providing a constant seal and insulation covering throughout the lengths of the steam pipes.

I have shown and described my improved casing provided with an annular bulge or corrugation 19, but this corrugation may be omitted because the annular plate at the bottom of the casing extends sufficiently beyond the flange to which it is clamped to permit flexing and thus take care of any expansion and contraction that might occur; and while I have shown exemplifications of the invention as at present in use, modifications may be made without, however, departing from the spirit of my invention.

What I claim is:

1. A locomotive steam pipe casing adapted to be disposed intermediate of the smoke-box shell and the steam chest of a locomotive and comprising a single shell disposed throughout the length of the steam pipe and having a flanged upper end arranged flush with the smoke-box shell about the steam pipe opening therein and secured in air tight relation with the shell; an annular flat plate adapted to extend parallel with the flange at the lower end of the steam pipe and to be held in place by the fastening bolts which secure the steam pipe to the steam chest; the

lower end of said shell seating on said plate and hermetically secured thereto in air-tight relation.

2. A locomotive steam pipe casing adapted to be disposed about the steam pipes intermediate of the smoke-box and the steam chests of the locomotive and comprising a continuous shell provided with an inwardly extending plate integrally secured to its lower end, the plate having bolt receiving apertures adjacent to its inner perimeter whereby said casing is secured in place by the fastening bolts between the steam pipes and the steam chests and the shell held in spaced relation with the steam pipe throughout its length; the upper end of the shell being hermetically sealed to the smoke-box.

3. A locomotive steam pipe casing adapted to be disposed about the steam pipes intermediate of the smoke-box and the steam chests of the locomotive and comprising an annular plate adapted to be secured in place by the bolts whereby the steam pipes are fastened to the steam chests; and a continuous shell hermetically sealed at its upper end to the smoke-box while the lower end is hermetically sealed to said plate and the shell throughout its length held in spaced relation with the steam pipe, said shell being provided with annular corrugation.

4. A locomotive steam pipe casing adapted to be disposed about the steam pipes intermediate of the smoke-box and the steam chests of the locomotive and comprising an encompassing plate apertured adjacent to its inner perimeter to receive the bolts whereby the steam pipes are secured to the steam chests; and a continuous shell hermetically sealed at its upper end to the smoke-box while the lower end seats on said plate and is hermetically sealed thereto and the shell througout its length held in spaced relation with the encompassed elements, said shell intermediate of its ends being provided with an annular bowed portion.

HARRY E. RICCIUS.