Aug. 22, 1939. J. L. HEARN 2,170,302

LOCOMOTIVE SMOKE BOX SHROUD AND HINGE THEREFOR

Filed Sept. 29, 1937 2 Sheets-Sheet 1

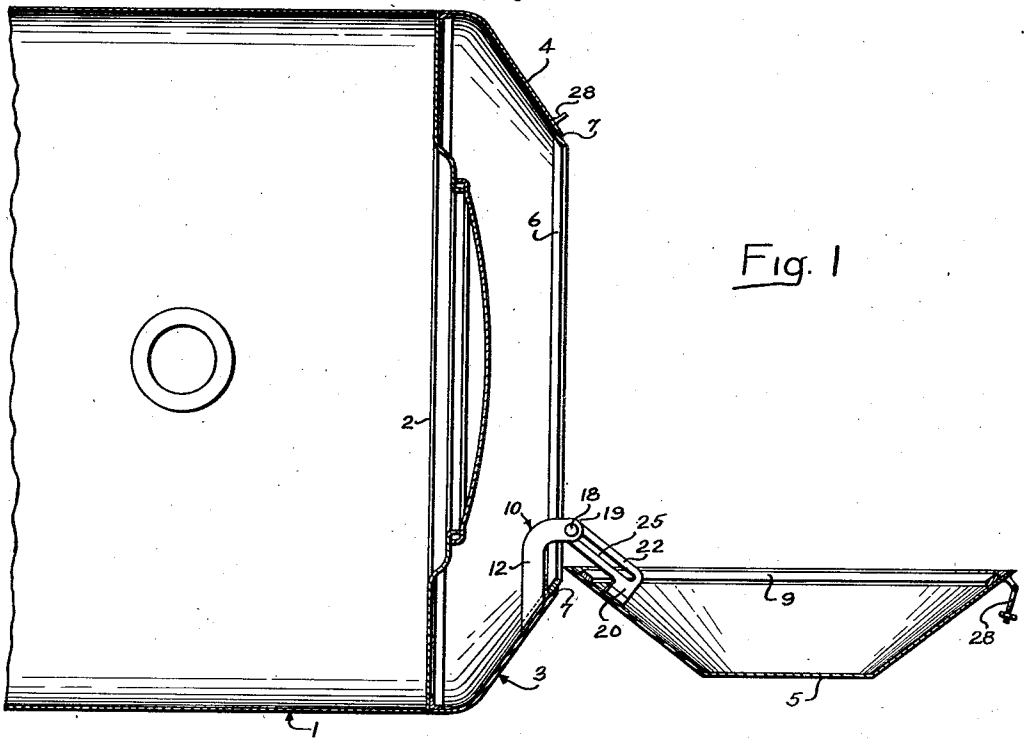


Fig. 1

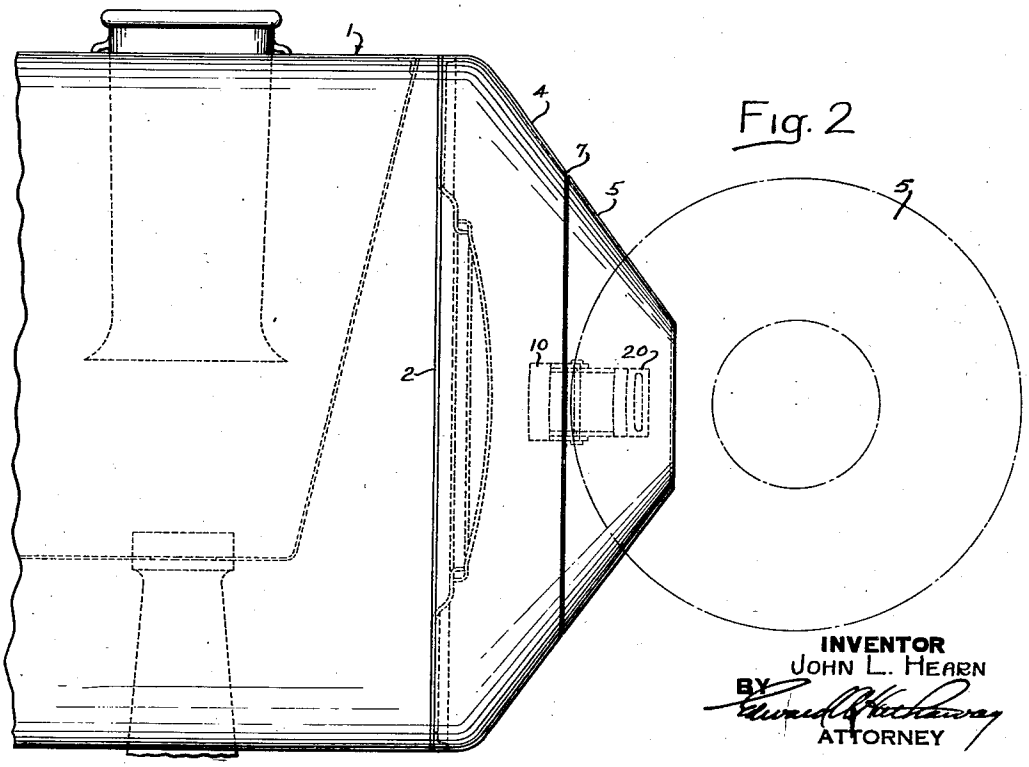


Fig. 2

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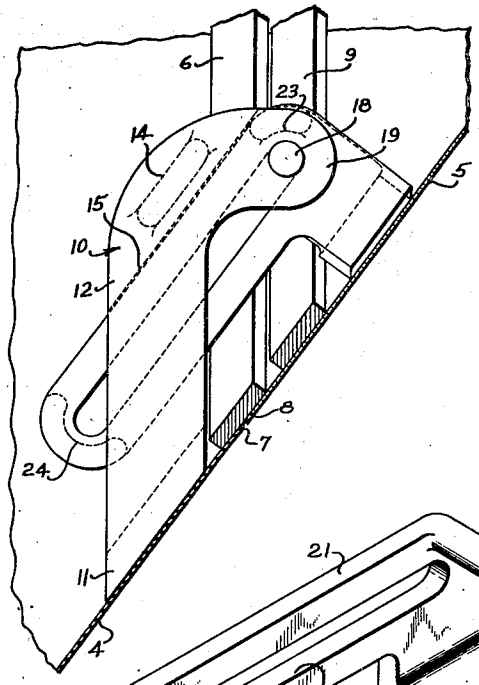


Fig. 3

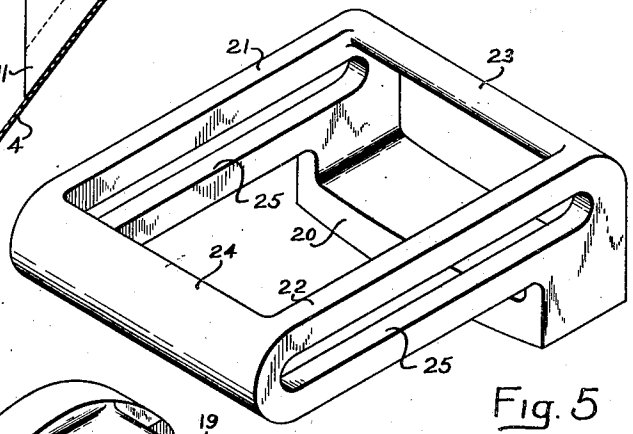


Fig. 5

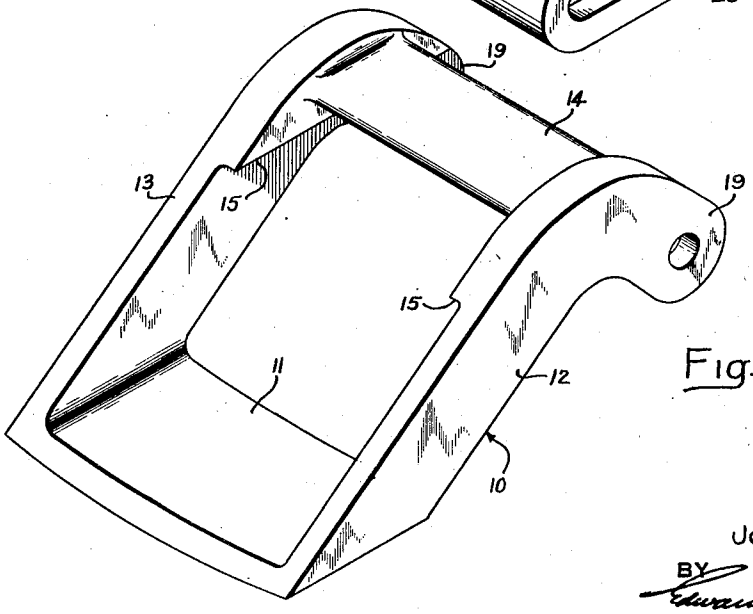


Fig. 4

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2,170,302

LOCOMOTIVE SMOKE BOX SHROUD AND HINGE THEREFOR

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Application September 29, 1937, Serial No. 166,342

2 Claims. (Cl. 16—179)

This invention relates generally to locomotives and more particularly to an improved smokebox shroud applicable to streamlined locomotives and to hinges for a shroud closure or cover.

The development of streamlined steam locomotives has not in general involved any fundamental change in the steam locomotive mechanism but has principally involved the provision of sheet metal members specially curved or shaped to enclose with a smooth or pleasing contour certain portions of the locomotive mechanism. However, such special enclosing members have introduced various problems in connection with making certain of the locomotive mechanisms conveniently accessible for purposes of inspection, repair or lubrication, and this problem has been aggravated in some instances as in the present disclosure by the necessity of having hinges for supporting a removable cover portion of the sheet metal while still maintaining the hinge completely hidden and yet readily operable notwithstanding that the removable portion may have a peculiar shape conforming to the general streamline contour. In the present disclosure, a shield or shroud of substantially conical shape is provided for the front end of the locomotive boiler, but it is necessary that a portion of this shield should be opened conveniently to permit access to the usual locomotive smokebox door.

It is one object of my invention to provide an improved combination of elements that will permit a removable portion of the peculiarly shaped streamlined boiler shroud to be readily and safely opened with a hinge construction that is completely hidden and yet is sufficiently sturdy to adequately support the shroud cover in its opened position and compel a predetermined cooperative movement thereof during opening and closing of the cover.

A further object is to provide an improved combination in which the hinge is relatively simple and economical in construction and operation, and is compact and efficient in holding a removable shroud cover in position during operation of a locomotive at high speed during which the shroud is continuously subjected to air currents whose forces are constantly varying in magnitude and direction.

Other objects and advantages will be more apparent to those skilled in the art from the following description of the accompanying drawings in which:

Fig. 1 is a sectional plan view of the front end of a locomotive showing a streamlined shroud applied to the front end of the boiler and incorporating my improved structure by which the end portion of the shroud may be hinge supported;

Fig. 2 is a side elevation of Fig. 1 except that the removable shroud portion is shown in dot and dash lines in its open position and in full lines in its closed position;

Fig. 3 is an enlarged plan view of the hinge shown in its relation to a fragmentary portion of the shroud and its removable cover;

Fig. 4 is an enlarged perspective of the portion of the hinge which is secured to the main body portion of the shroud;

Fig. 5 is an enlarged perspective of that part of the hinge secured to the removable cover and adapted for cooperation with the stationary hinge part shown in Fig. 4.

In the particular embodiment of the invention which is disclosed herein merely for the purpose of illustrating one specific form among possible others that the invention might take in practice, I have shown in Fig. 1 a fragmentary portion of any suitable type of locomotive boiler smokebox generally indicated at 1 having a front 2. To streamline the boiler, a shroud generally indicated at 3 is suitably supported upon the front end of the smokebox, this shroud being generally of conical formation and divided into a rigid base part or frustum 4 and a removable part or cover 5. This shroud is preferably made of sheet metal while a reinforcing strip or flange 6 is secured by welding, riveting or other suitable means to the stationary part 4 and projects outwardly beyond the edge 7 thereof. This flange is suitably shaped so as to conform to the conical sides of the shroud, thereby permitting the inclined side of cover 5 to snugly fit flange 6 as indicated at 8 in Fig. 3. A second reinforcing flange 9 is secured to the inner side of cover 5 so as to be located closely adjacent to flange 6 when the shroud is completely closed.

To pivotally support cover 5 so as to not only permit, but also compel, complete clearance of the cover with conical flange 6 before any pivotal movement of the cover takes place, I have provided a stationary hinge part 10 having an inclined base 11 adapted to be riveted, welded or otherwise suitably secured to base 4 adjacent flange 6, it being understood that the hinge is located at the side of the shroud as indicated in the plan view of Fig. 1. Projecting horizontally in a transverse direction from said base 11 are upper and lower supporting arms 12 and 13 cross-connected at one end by a bracket 14 and provided with a pair of shoulders 15. As seen in Fig. 3, each shoulder 15 is substantially parallel with the

inclined side of the shroud. A pivot pin 18 extends through the outer longitudinally turned ends 19 of the arms 12 and 13.

The cover part 5 is pivotally supported on the stationary hinge part 10 by a bracket having a base 20 welded, riveted or otherwise suitably secured to cover part 5 and provided with a pair of parallel combined slide and pivot arms 21 and 22, the ends of these arms being connected by members 23 and 24. The member 24 is preferably of semi-cylindrical shape as shown in dotted lines in Fig. 3. The arms 21 and 22 are provided with slots 25 through which pivot pin 18 extends. Arms 21 and 22 when in the normally closed position of the cover as shown in Fig. 3 are closely adjacent shoulders 15 of the stationary arms 12 and 13. A suitable bolt or pin 26 located at the opposite side of the hinge structure is employed to hold the cover closed.

In operation, to open the cover part 5 it is compelled to be first moved in the diagonal direction of shoulder 15 during which time the arms 21 and 22 move outwardly until the left end of slots 25 engage pin 18 whereupon the inner end portion 8 of cover 5 is completely free in all directions of flange 6 whereby it is then possible to swing cover 5 horizontally to the position shown in Fig. 1. To replace the cover it must be first swung to its approximately aligned position with flange 6 and thereafter it may be moved inwardly in the direction of shoulder 15. During either of said opening or closing operations it is seen that there is no possibility whatsoever of the operator intentionally or unintentionally pivotally swinging cover 5 before it is entirely free of flange 6, and it is also seen that throughout all operations the cover part 5 is firmly and strongly held by the hinge construction but without in any way causing an operator to indulge in unnecessary labor or time in opening or closing the cover. It is further seen that my improved arrangement permits the stationary and removable shroud portions 4 and 5 to have a cooperative supporting relation by virtue of my improved hinge construction being functionally related to said cooperative relation or by bringing the cover 5 into overlapping substantially rectilinearly seating contact with flange 6 as shown in Fig. 3. With this seating relation the varying action and magnitude of air forces acting on the shroud insures minimum possibility of undue stresses being imposed upon the hinge structure as would otherwise be the case during high speed travel of the locomotive where utmost safety is desired in maintaining removable parts of the locomotive firmly in position so as to avoid having such parts come loose and hit a passing passenger train or bystanders along the right-of-way. All of these results and others are accomplished in a relatively simple and compact manner in my improved arrangement and at the same time none of the operative parts are exposed to view so as to break the smooth streamlined effect of the equipment.

It will of course be understood that various changes in details of construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. In combination, a pair of cooperating hinged members adapted respectively to be supported on the inner side of relatively movable substantially conical shroud portions, means for pivotally connecting said hinged members together and for allowing the same to have linear movement therebetween, one of said hinged members having a shoulder extending substantially in the direction of a plane tangent to the conical sides of said shroud portions, and means formed with the other hinged member for cooperation with said shoulder to prevent pivotal movement between said members while allowing linear movement therebetween in the direction of said tangent plane, said pivotal connection being so related to said shoulder and to said cooperating means that one of said hinged members may pivot after a predetermined extent of said linear movement.

2. The combination set forth in claim 1 further characterized in that the shouldered hinge member has opposed arms at least one of which is provided with said shoulder and the other cooperating hinge member is also provided with a pair of opposed arms receivable within the arms of the other hinge member so as to lie in close juxtaposition to said shoulder, and the means for pivotally connecting said members includes elongated slots formed in one of the members and a hinge pin supported by the other member and extending through said slots with the hinge pin located at the forward portion of said shoulder.

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