May 26, 1942. W. H. FARR ET AL 2,284,485

BRAKE SHOE

Filed Aug. 3, 1940

Fig. 1.

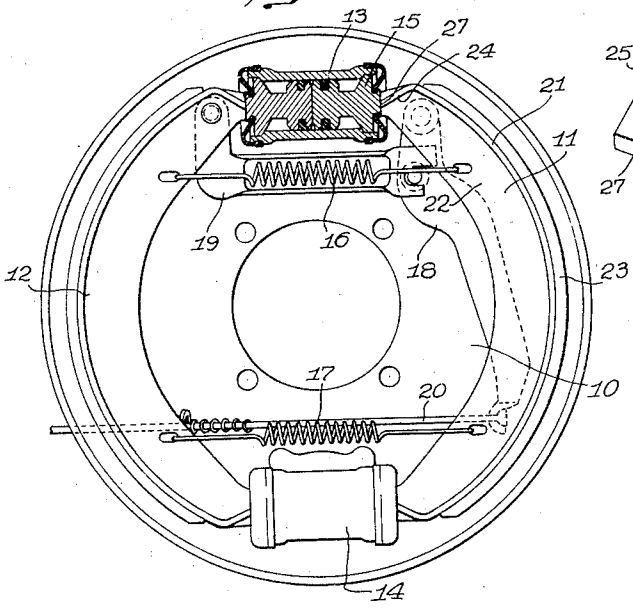


Fig. 2.

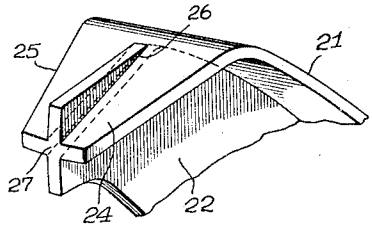


Fig. 3.

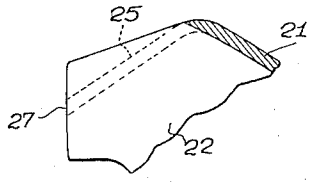


Fig. 4.

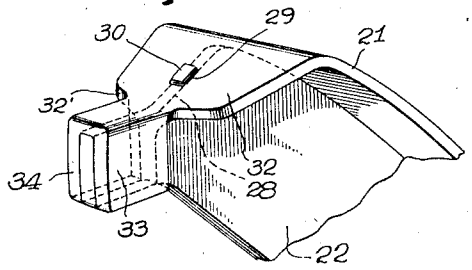


Fig. 6.

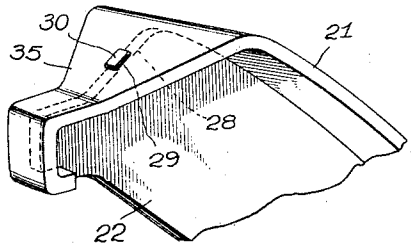


Fig. 5.

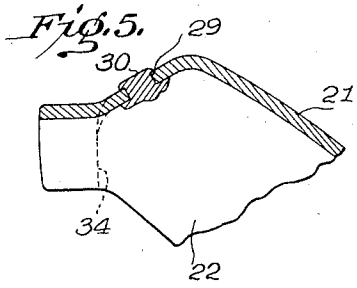
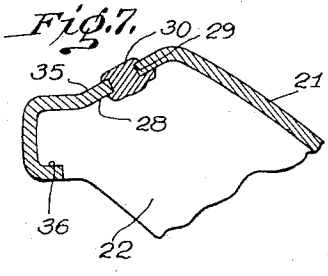


Fig. 7.



INVENTORS

Warren H. Farr,
Carolus L. Eksergian and
Carl C. Harle

BY John P. Dalton

ATTORNEY

Patented May 26, 1942 2,284,485

UNITED STATES PATENT OFFICE

2,284,485

BRAKE SHOE

Warren H. Farr, Carolus L. Eksergian, and Karl C. Harle, Detroit, Mich., assignors to Budd Wheel Company, Philadelphia, Pa., a corporation of Pennsylvania

Application August 3, 1940, Serial No. 350,880

4 Claims. (Cl. 188—250)

The invention relates to brake shoes, and more particularly to generally T-section form, such shoes fabricated out of wrought or sheet metal.

More specifically, the invention relates to brake shoes for use in brake assemblies in which the shoes are fluid actuated, and the ends thereof are arranged to directly engage the pistons of the actuating cylinders. Such shoes are ordinarily fabricated of two parts, one consisting of a sheet metal strip curved to the form of a drum which forms the flange of the shoe adapted to receive for direct securement thereto the usual brake lining. The other comprises an edge-wise bent strip forming the web of the shoe and secured as by welding to the central portion of the flange so as to extend inwardly thereof. They may also be fabricated of a rolled-section of T-form bent to the desired curvature. Ordinarily the web portion of the shoe is extended beyond the flange at the ends of the shoe and is adapted to directly engage a piston of the fluid actuator.

It has been found that shoes so constructed and actuated develop squealing noises when the brakes are applied, and such noises are believed to be due to the lateral instability of the end portion of the web where it projects beyond the flange. Accordingly it is an object of the invention to overcome this difficulty and to do this without materially adding to the weight or cost of the shoe.

It is proposed to attain this object by laterally stiffening this extended portion of the web of the shoe and preferably by utilizing an extended end portion or portions of the flange of the shoe to accomplish this. There are shown in the accompanying drawing various ways of accomplishing the object of the invention, and it will be understood that the invention may be embodied in forms other than those shown and that other and further objects and advantages will become apparent from the following detailed description of the forms of the invention as shown in the drawing forming a part of this specification.

In the drawing,

Fig. 1 shows an elevational view, parts being shown in section, of a brake assembly to which the invention is shown applied;

Figs. 2 and 3 are enlarged fragmentary views of an end of a shoe according to the disclosure of Fig. 1, Fig. 2 being a perspective view and Fig. 3 a sectional view taken in a plane coinciding with the face of the web;

Figs. 4 and 5, and 6 and 7 are corresponding views to Figs. 2 and 3 of modifications of the invention.

In the drawing, the invention is shown applied to a brake assembly comprising the usual backing plate 10 bolted or otherwise secured to the fixed axle housing, symmetrical brake shoes 11 and 12 arranged on opposite sides of the vertical central plane of the backing plate, and brake cylinder actuators 13 and 14 arranged between the adjacent ends of the shoes. The shoes have their ends arranged to abut the pistons at 15 operating in the cylinders 13 and 14. The engagement of the shoe ends with the pistons is one to permit floating movement of the shoes, and the shoes are held in their returned position by coil springs 16 and 17. If desired, the shoes may be additionally actuated by an emergency actuating mechanism comprising lever 18 hinged to one of the shoes and acting through a link 19 upon the other shoe, a cable 20 connected to the end of the lever 18 opposite its hinged end forming the actuating means for the lever.

Each of the shoes comprises an arcuate flanged portion 21 and a radially extending web portion 22 preferably bent to shape prior to assembly and then assembled together by welding the web to the flange. The flange carries the usual anti-friction lining 23, shown in Fig. 1 but not shown in the detail views. Ordinarily the flanged portion 21 would stop slightly beyond the arcuate portion carrying the lining, and the end of the shoe therebeyond being constituted solely by the web 22. In the preferred form, and according to the invention, the flange 21 is extended to the end of the shoe by lateral portions 24 and 25, which portions taper toward a narrow width at their extreme ends. In the assembly of the parts 21 and 22, the tapering end portion of the flange 21 is centrally slotted at 26, this being of a width corresponding to the thickness of the web 22. The lateral portions 24 and 25 of the end of the flange are bent to embrace the opposite sides of the end of the web, and form therewith a substantially cross-shaped abutting end portion 27. To stiffen the entire end structure, it is understood that the lateral portions 24 and 25 of the flange are welded or otherwise rigidly secured to the radial web 22. The cross-shaped end face of the reinforced end formed by the web 22 and the extensions 24 and 25 of the flange provides a very stiff and stable shoe end free from the vibrations which result in squealing, and furthermore it provides a wide bearing area for engagement with the piston of the hy-

draulic actuator which, in this embodiment, also serves as anchor for the shoe ends depending on the direction of rotation of the drum. It is preferred that this bearing area be very slightly rounded both vertically and transversely so that the shoe can tilt slightly with respect to the piston without placing undue forces upon the piston tending to tilt it on its axis and to prevent point contact between shoe and piston.

According to the form of the invention shown in Figs. 4 and 5, the flange 21 is extended as a whole or at least for the major portion of its width to overlap the top inclined end face 28, and may be provided in this region with a hole 29 through which a portion 30 of the flange projects and is riveted over in final assembly. This extended portion of the flange 21 is here designated 32, and prior to assembly it is formed with lateral cut-out portions as 32'. The portions 33 and 34 beyond the cut-outs 32' are then bent parallel to the end portion of the web 32 and are secured thereto by welding, thus further reinforcing and stiffening the extreme end of the web and providing an enlarged bearing area for abutting relation with the piston. In this case also the abutting end may be vertically and transversely slightly curved for the same purpose as described in connection with the preferred form.

In Figs. 6 and 7, a third modification is shown in which the tapered extended end 35 of the flange 21 is extended to overlap not only the inclined top portion 28 of the web 22 but also the horizontal top portion of the extreme end of the web and the vertical end of the web as well as a short overlap with the off-set portion 36 of the bottom of the end of the web 22. This extended flange portion may be welded to all the faces of the web which it overlaps, and it may be additionally secured by a rigid connection smiilar to the connection 30 shown in Fig. 5. It will be seen that in this form, the end of the web is again strongly stabilized laterally by the extended portion of the flange, and it is also widened laterally by the width of the end of the extended flange portion to form a wide seat for engagement of the piston. In this case, the abutting end portion of the shoe may again be slightly curved in vertical and transverse directions for the purpose indicated in connection with Figs. 2 and 3 and 4 and 5.

It may be noted that in each of the modifications described, the lateral stability of the extreme end of the shoe is assured by the integral extensions of the flange secured thereto so as to provide not only lateral stability but an enlarged end bearing area through which the shoe may engage the piston.

It will be understood that the broad features of the invention could be obtained by a large number of variations of the above specifically described modifications, and it is applicants' purpose to cover all such modifications as readily fall within the spirit and scope of the terminology of the appended claims.

What is claimed is:

1. An arcuate brake shoe fabricated of sheet metal and having a transverse flange and a radial web secured thereto in its medial plane, the ends of said web being of reduced radial dimension, said ends being laterally braced by extensions of said flange, the end faces formed by said web and flange extensions being generally of cross-shape.

2. An arcuate brake shoe having a transverse flange portion and a radial web portion secured centrally to said flange portion, the adjacent ends of both said flange and web portions being of reduced dimension and secured together to form an end abutting portion of generally cross-shape.

3. An arcuate brake shoe having a transverse flange portion and a radial web portion secured centrally to said transverse flange portion, the adjacent ends of both said radial web and transverse flange portions being of reduced dimension and secured together to form an end abutting portion having transverse and radial faces of substantially similar extent intersecting each other.

4. An arcuate brake shoe having a transverse flange portion and a radial web portion secured centrally to said transverse flange portion, both ends of said radial web and transverse flange portions being of reduced dimension and secured together to form end abutting portions at each end of the shoe having transverse and radial faces intersecting each other.

WARREN H. FARR.
CAROLUS L. EKSERGIAN.
KARL C. HARLE.