Sept. 26, 1933. W. J. ANDRES ET AL 1,928,044

BRAKE

Filed May 31, 1930

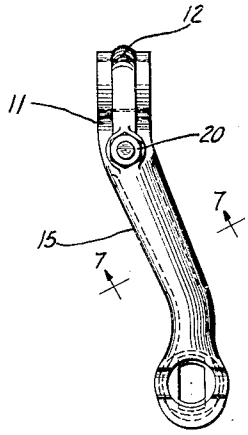


FIG. 1

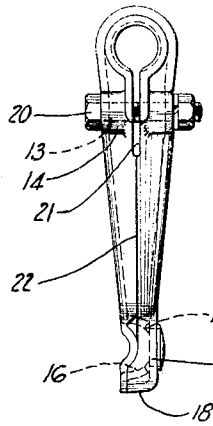


FIG. 2

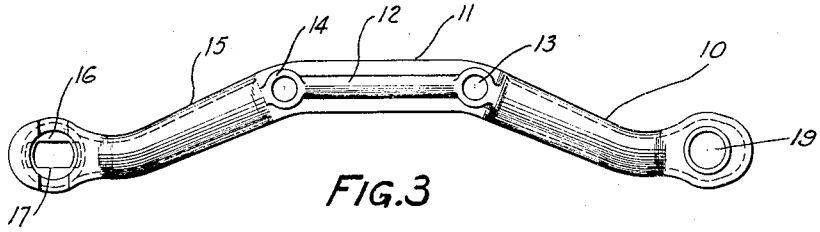


FIG. 3

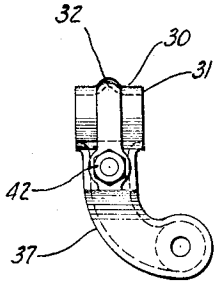


FIG. 4

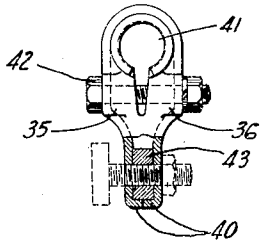


FIG. 5

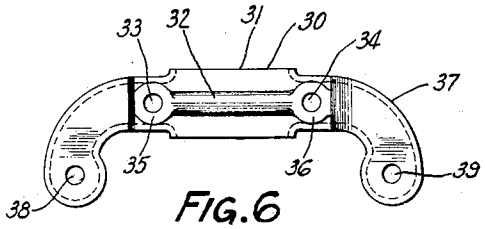


FIG. 6



FIG. 7

INVENTOR.
WILLIAM J. ANDRES
CLARENCE E. WARD
BY M. W. McConkey
ATTORNEY

Patented Sept. 26, 1933 1,928,044

UNITED STATES PATENT OFFICE

1,928,044

BRAKE

William J. Andres and Clarence E. Ward, South Bend, Ind., assignors to Bendix Aviation Corporation, South Bend, Ind., a corporation of Delaware

Application May 31, 1930. Serial No. 458,483

5 Claims. (Cl. 74—5)

This invention relates to levers and more particularly to levers adapted to operate brakes.

A major object of the invention is to provide a lever comprising a single stamping.

An important object of the invention is to provide a lever comprising a single stamping having great strength and rigidity.

A further object of the invention is to provide an operating lever in which the amount of required machine operation during manufacture shall be materially reduced.

Still a further object of the invention is to provide an operating lever comprising a single stamping which possesses advantages of superiority over levers of similar character in that it is rigid yet light and simple in structure and its manufacture may be economically facilitated.

A salient feature of the invention is a lever comprising a single stamping formed and bent upon itself to provide a sleeve which may be easily and quickly attached to an operating shaft.

An important feature of the invention is the particular structure of the sleeve portion of the lever and of the force applying end of the lever.

Other objects and features of the invention will appear from the following description taken in connection with the drawings, which form a part of this specification, and in which:

Figure 1 is a side elevation of the lever,

Figure 2 is a view illustrating the lever rotated ninety degrees from the position shown in Figure 1,

Figure 3 is a plan view of a stamping from which the lever is formed,

Figure 4 is a side elevation of a modified form of the lever,

Figure 5 illustrates the lever shown in Figure 4 rotated forty-five degrees,

Figure 6 is a plan view of a stamping from which the lever illustrating Figure 4 is formed, and

Figure 7 is a sectional view substantially on line 7—7, Figure 1.

Referring to the drawing for more specific details of the invention, 10 represents a stamping, the central portion of which has parallel edges 11 between which is swaged a rib 12. Positioned in the stamping at each end of the rib is an aperture 13 and immediately adjacent the aperture the metal is swaged to provide a sleeve 14.

The ends of the blank are offset as indicated at 15 and the extreme end portions are positioned in a plane parallel to a plane through the center of the body portion. These end portions are cupped and are somewhat wider than the body portion.

The respective ends are formed to provide a suitable socket for the attachment of a force applying means. As shown, one of the ends is swaged to provide a socket 16 having an opening 17 and the other end is formed to provide a shoulder 18 having an aperture 19.

After stamping the blank in the form illustrated in Figure 3 the blank is placed on a mandrel and bent upon itself. In this deformation of the blank, the apertures 13 register to receive a bolt 20 for clamping the lever in position and the apertures 17 and 19 in the respective ends also register to provide a suitable seat and attaching means for the force applying means.

It is to be observed that by the increased width of the offset portions, there is provided on each side of the lever immediately adjacent the sleeve a slot 21 providing means for adjustment of the lever to an operating shaft.

It is also to be observed that by reason of the swaged portion 16 in one end of the blank and the shoulder 18 on the other, there is provided a socket for the reception of the force applying means. As shown, the edges of the offset portion and the respective ends are welded together as indicated at 22 to provide a hollow crank arm of great strength and rigidity.

Figures 4, 5 and 6 illustrate a modification of the invention. This modification differs only in details of structure of the crank arm. As shown, the blank is stamped to provide a central portion 30 having parallel side edges 31 and a central rib 32 at the respective ends of which are apertures 33 and 34 and the edges defining the apertures are swaged to provide sleeves 35 and 36. The respective ends are offset as shown at 37 and are provided with apertures 38 and 39. These end portions are cupped as indicated at 40, the object of which will hereinafter appear. This stamping is deformed on a mandrel to provide a sleeve 41.

In deforming the blank, the apertures 33 and 34 and the apertures 38 and 39 are brought to register for the reception of a clamping bolt 42 and an attaching means, not shown. If desired, the force applying end of the lever may be strengthened by reinforcing plates 43, but this is by no means essential.

In this modification, as well as in the preferred form, the general contour of the stamping is such that when the blank is deformed on a mandrel to produce the sleeve, there is formed a suitable slot which permits clamping of the sleeve

on an operating shaft and in this modification, as well as in the preferred form, the edges on the respective ends are welded together to provide a hollow rigid crank.

It is to be understood that the forms of the invention herein shown and described are to be taken as preferred examples of the same and that various changes in shape, size and arrangement of parts may be resorted to without departing from the invention or the scope of the subjoined claims.

Having thus described the various features of the invention, what we claim as new and desire to secure by Letters Patent is:

1. A lever arm comprising two sections engaging each other lengthwise of said arm, and which are formed with parts jointly providing a transverse cylindrical opening extending crosswise between said sections at the end of the arm and adapted to embrace a shaft and with other aligned parts adjacent said opening on the side opposite the said end of the arm and forming between said sections a slot communicating with said opening, and a clamping bolt extending through said slot.

2. A lever arm comprising two integrally-connected sections engaging each other lengthwise of said arm, and which are formed with parts jointly providing a transverse cylindrical opening extending crosswise between said sections at the end of the arm and adapted to embrace a shaft and with other aligned parts adjacent said opening on the side opposite the said end of the arm and forming between said sections a slot communicating with said opening, and means extending through said slot for clamping said sections together.

3. Operating means for a shaft comprising, in combination, a sheet metal arm including a portion looped about the shaft and extended to form a double thickness portion integral with the looped portion having parallel spaced portions and engaging portions, and a clamping member engaging the spaced parallel portions and arranged to draw them together to contract the looped portion about the shaft.

4. Operating means for a shaft comprising, in combination, a sheet metal arm including a portion looped about the shaft and extended to form a double thickness portion integral with the looped portion, having parallel spaced portions, and a clamping member engaging the spaced parallel portions and arranged to draw them together to contract the looped portion about the shaft.

5. Operating means for a shaft comprising, in combination, a sheet metal arm including a portion looped about the shaft and extended to form a double thickness portion integral with the looped portion, said double thickness portion comprising two channeled sections having their edges for a part only of the length contacting with each other, and a clamping member engaging the sections and arranged to draw them together to contact the looped portions about the shaft.

WILLIAM J. ANDRES.
CLARENCE E. WARD.