Mar. 27, 1923. 1,449,611.

O. KONIGSLOW.

STAMPED METAL LEVER.

FILED JAN. 14, 1921.

Fig. 1

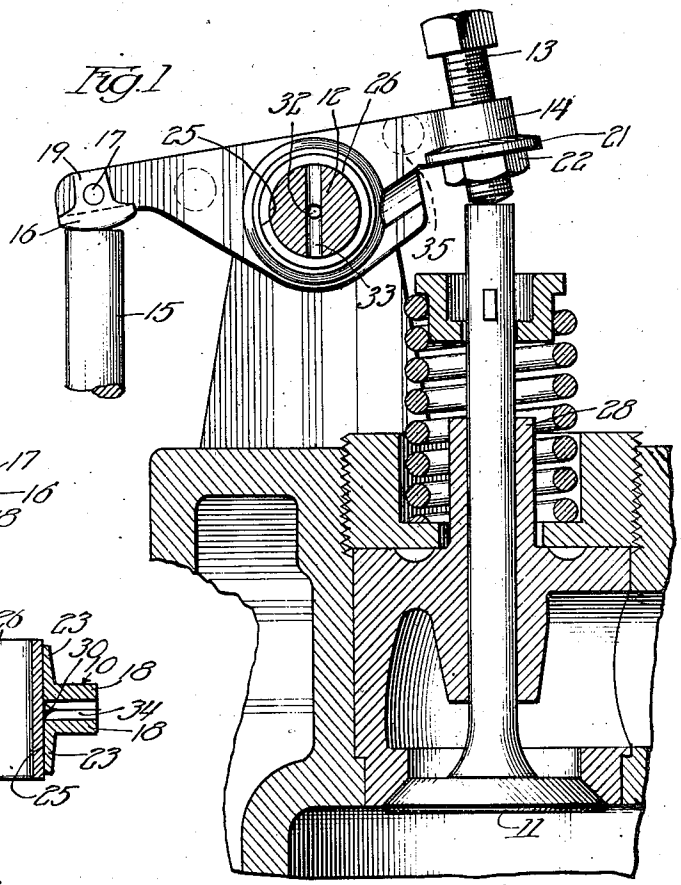


Fig. 5

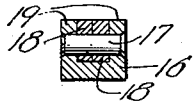


Fig. 4

Fig. C

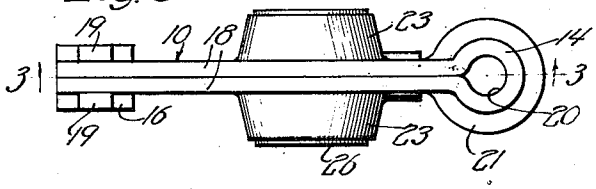


Fig. 7

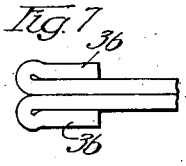


Fig. 3

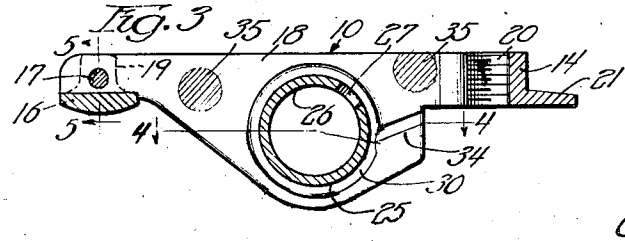
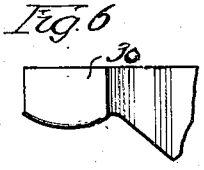


Fig. 6



Inventor
Otto Konigslow
Williamson, Bradbury
See & McCaleb Attys.

Patented Mar. 27, 1923.

1,449,611

UNITED STATES PATENT OFFICE.

OTTO KONIGSLOW, OF CLEVELAND, OHIO, ASSIGNOR TO OTTO KONIGSLOW MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

STAMPED METAL LEVER.

Application filed January 14, 1921. Serial No. 437,220.

To all whom it may concern:

Be it known that I, OTTO KONIGSLOW, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Stamped Metal Levers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to stamped metal levers and more especially to stamped metal levers of the type wherein each lever comprises a bar or strip of metal superimposed upon itself to provide a cross-sectional area for the lever, sufficient to resist the stress imposed upon it.

My improved lever finds great utility when employed as a rocker arm in an internal combustion engine as it has the attributes of rigidity and strength coupled with comparatively little weight.

The objects of my invention are to provide a stamped metal lever of superimposed layers of metal having a hub adapted to journal a pin or shaft disposed transversely to said lever, the hub comprising a plurality of annular flanges struck from the layers of metal of which the lever is made; to provide a lever of the class described having an aperture adapted to receive a set screw or the like, the metal of the lever being bent around the set screw, and to provide a rocker arm for an internal combustion engine having means for supplying the oil drawn from its pivotal journal to its associated valve stem.

These and other objects of my invention will be more clearly pointed out as the following description progresses, reference being had to the following drawings wherein

Figure 1 is a side elevation of a lever embodying the novel features of my invention, the lever being illustrated as a rocker arm of an internal combustion engine.

Figure 2 is a plan view of the lever.

Figure 3 is a section taken on line 3—3 of Figure 2 looking in the direction of the arrows.

Figures 4 and 5 are sections taken on lines 4—4 and 5—5 respectively of Figure 3 looking in the direction of the arrows.

Figures 6 and 7 are a fragmentary side elevation and a fragmentary plan view respectively of a modified form of my invention.

Similar characters of reference indicate similar parts throughout the several views.

Referring to Figure 1, the reference character 10 designates my improved lever which is illustrated as a rocker arm for an internal combustion engine having a valve 11 of the usual puppet type. The lever 10 is pivotally mounted intermediate its ends upon a pin 12 secured in the frame of the engine, and carries a set screw 13 threaded into an eye 14 formed at one end of the lever. The set screw 13 engages the stem of the valve 11. A tappet rod 15 reciprocated by any suitable means is adapted to engage a shoe 16 rigidly secured by a rivet 17 to the other end of the lever 10. The functions of the tappet rod, rocker arm and valve are well known to those skilled in the art and need not be described in this application. The lever 10 comprises a bar or strip of metal folded upon itself to provide superimposed layers 18—18.

As shown in Figure 2, the lever 10 is made of a comparatively thin strip of metal, the length of which must be substantially twice that of the finished lever, allowance being made in both the length and width of the strip for the desired conformation. The shoe 16 comprises a U-shaped bar having upwardly extending lugs 19—19. The shoe may be made of a material having different characteristics than those of the metal of which the lever proper consists. The rivet 17 passes through the lugs 19—19 of the shoe 16 and through the layers 18—18, one of the lugs 19—19 being disposed on each side of the lever 10. This construction prevents separation of the layers 18—18, thereby adding materially to the rigidity of the lever.

The eye 14 is formed by bending the strip from which the lever is made around a cylindrical punch whereby an aperture 20 is obtained in the eye. The aperture 20 is threaded to receive the set screw 13, the axis of the set screw being disposed in the plane in which the lever 10 is adapted to oscillate. In the preferred form of my invention, I provide an outwardly extending flange 21 about

the bottom end of the eye 14. The flange 21 serves to strengthen the eye 14 and provides a seat for a lock nut 22 threaded upon the set screw 13.

As hereinbefore set forth, the lever 10 is mounted upon the pin 12. For this purpose I provide a hub intermediate the ends of the lever, the hub comprising a pair of annular flanges 23—23 struck from the layers 18—18. Referring to Figure 4, it will be noted that each of the flanges 23—23 projects outwardly from one of the layers 18—18 and are oppositely disposed upon either side of the lever. An aperture 25 is thus formed extending transversely through the lever, the aperture 25 being adapted to receive and securely retain a bushing 26 which journals the lever 10 upon the pin 12. The wall of the bushing 26 is apertured as at 27 for a purpose which will presently appear.

In some instances, it is advantageous to lubricate the contacting surfaces of the set screw 13 and the stem of the valve 11 and of course the valve stem guide in which the valve stem is slidably journaled. In the drawings the valve stem guide is indicated at 28. To supply lubricant to the aforesaid points, I preferably provide an annular chamber 30 disposed around the bushing 26, the flanges 23—23 being formed to provide this chamber. The aperture 27 in the wall of the bushing 26 connects the bore of the bushing with the chamber 30. The bearing surface of the pin 12 upon which the lever 10 is mounted may be lubricated in any suitable manner. I have shown a central oil hole 32 adapted to lead lubricant from an oil cup or the like to the bearing surface of the pin 12 by way of a duct 33 in the pin. The lubricant may pass through the aperture 27 into the chamber 30 and then by means of a hole 34 in the lever 10 to a point adjacent the eye 14. The hole 34 is obtained by forming a groove in the inner surface of each of the layers 18, the grooves registering when the layers are superimposed one upon the other.

The rapid oscillation of the lever 10 during the operation of the engine will cause the lubricant which flows from the hole 34 to be splashed upon the set screw 13 and the valve stem. This will insure lubrication of the bearing surfaces of the valve stem.

I have found that the lever may be strengthened by spot-welding the layers 18—18 to each other at several points as indicated by the reference characters 35—35.

In Figures 6 and 7, a modified form of my invention is illustrated, the shoe 16 being dispensed with and the two ends of the strip of which the lever is formed bent upon themselves to provide additional superimposed end layers 36—36. This end of the lever is shaped to provide a convex under-surface adapted to be engaged by the tappet rod 15.

While I have described the details of one form of my invention, it is to be understood that I am not limited to these details except by the scope of the appended claims.

What I claim is:—

1. A stamped metal lever having substantially parallel superimposed layers, a hub intermediate its ends comprising annular flanges struck in opposite directions from said layers, and an oil duct in said lever between said layers extending to said hub.

2. A stamped metal lever comprising a strip folded to provide superimposed layers, a hub comprising a plurality of annular flanges struck from the layers, one of the annular flanges extending outwardly from either side of the lever, and an oil duct extending to said hub, said oil duct being formed by opposed grooves in the adjacent surfaces of said layers.

3. A stamped metal lever comprising a strip folded over upon itself to provide superimposed layers, a hub comprising annular flanges struck from the layers, the flanges being adapted to secure bearing metal having an aperture therein, and an oil duct formed by opposed grooves in the surfaces of said layers communicating with said aperture.

4. A stamped metal lever comprising a strip folded to provide superimposed layers, an end formed in the folded end of the lever, a hub disposed intermediate the ends of the lever, the hub comprising annular flanges struck from the layers and extending outwardly from either side of the lever, a bearing within said hub having an aperture therein, and an annular oil chamber between said layers and communicating with said aperture.

5. A stamped metal lever comprising a strip folded to provide superimposed layers, an eye formed in the folded end of the lever, a hub formed intermediate the ends of the lever, the hub having an aperture by means of which the lever may be pivotally mounted upon a shaft or the like and an oil duct communicating with the aperture of the hub and with the surface of the lever at a point adjacent the eye.

6. A stamped metal lever comprising a strip folded to provide superimposed layers, a hub disposed intermediate the ends of the lever comprising flanges struck from the layers, and a bushing for journaling the lever disposed in rigidly secured by said flanges, and an oil duct positioned between said layers extending to said bushing.

7. A stamped metal lever comprising a strip folded back on itself to provide superimposed substantially parallel layers, an eye in the folded end of the lever adapted to adjustably secure a set screw or the like, the strip being bent around the set screw, and

a flange formed integral with the material about said eye and extending at substantially right angles to the axis thereof.

8. A stamped metal lever comprising a strip folded to provide superimposed layers, an eye in the folded end of the lever adapted to adjustably secure a set screw or the like, the strip being bent around the set screw, and an outwardly extending flange formed around one end of the hub.

9. A stamped metal lever comprising a strip folded upon itself to provide superimposed layers, the folded end of said lever having an outwardly extending flange and being formed into an eye having a threaded hole, a hub intermediate the ends of said lever, said hub comprising annular flanges pressed from said strip, a bushing disposed in said hub having an aperture in its wall, an oil duct in said lever extending from said bushing to a point adjacent said eye, means connecting said aperture to said duct, and a shoe secured to the other end of said lever, said shoe being adapted to be engaged by a tappet rod or a cam.

10. A stamped metal lever comprising a strip folded to provide superimposed layers, the folded end of said lever having an outwardly extending flange and being formed into an eye having a threaded hole, a hub intermediate the ends of said lever, said hub comprising annular flanges pressed from said strip, a bushing disposed in said flanges having an aperture in its wall, said lever being provided with a passageway extending from said aperture to a point adjacent said eye, and a shoe secured to the other end of said lever.

11. A stamped metal lever comprising a strip folded on itself to provide superimposed layers, and a bearing in said lever, said lever being provided with an oil duct extending to said bearing formed by opposed grooves in the adjacent surfaces of said layers.

In witness whereof, I hereunto subscribe my name this 8th day of January, 1921.

OTTO KONIGSLOW.

Witnesses:
A. L. MILLER,
J. H. MCDONALD.