Feb. 29, 1944. J. K. SCOTT 2,343,208

CAM FOLLOWER ASSEMBLY

Filed March 14, 1942

Fig. 1

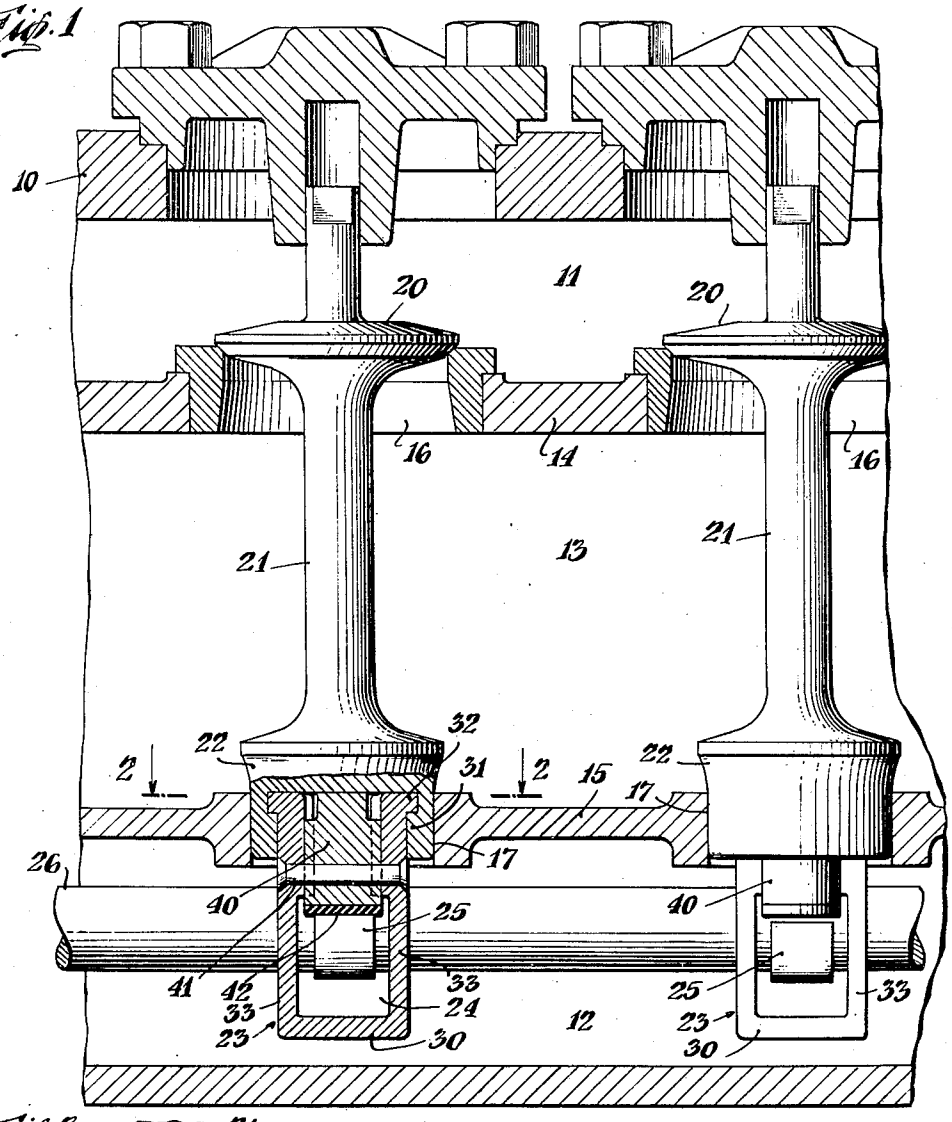
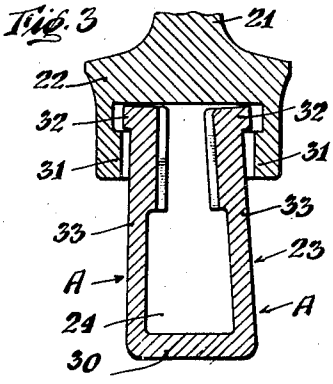


Fig. 3



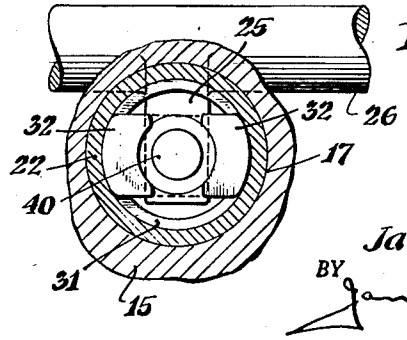


Fig. 2

INVENTOR.
James K. Scott
BY James J. Whalen
ATTORNEY

Patented Feb. 29, 1944

2,343,208

UNITED STATES PATENT OFFICE

2,343,208

CAM FOLLOWER ASSEMBLY

James K. Scott, Richmond, Va., assignor to American Throttle Company, Inc., New York, N. Y.

Application March 14, 1942, Serial No. 434,725

3 Claims. (Cl. 74—569)

The present invention relates to an improved cam follower of the stirrup type mounted in swivelling relation on the end of a valve stem or the like. This application is a continuation-in-part of that filed in my name on May 23, 1940, under Serial No. 336,768.

In multiple throttles, such as are used with locomotive superheaters, a number of valves are arranged in a line in the superheater header to be operated by individual cams on a rock shaft extending longitudinally of the header below and parallel with the line of valves. In one form of mechanism for operating the valves, as shown in the patent to Pippy, No. 1,863,063, issued June 14, 1932, the cam for each individual valve extends into the slot of a stirrup member and by engaging surfaces at the ends of the slot raises and lowers the valve. The stirrup member is mounted in swivelled relation on the end of the valve stem so that the valve and its connected parts may be turned for the purpose of grinding it on its seat while the stirrup is kept from turning by the operating cam.

The lift surface engaged by a cam to open a valve in some instances is actually the lower end of the valve stem projecting into the slot of the stirrup member. Such an arrangement is shown in my copending application. In the arrangement shown in Smith Patent 2,208,736 issued July 23, 1940, the lift surface is the lower end of a "wear plug" removably mounted at the upper end of the slot in the stirrup member and against the end of the valve stem. In both of these arrangements the valve stem has threaded thereto an enlarged head portion formed with an undercut lip or shoulder for retaining the stirrup member. This shoulder borders a recess in the head portion into which the end of the valve stem projects or in which recess the removable wear plug is mounted between the legs of the stirrup member. Consequently, to get at the end of the valve stem for renewing a coating of wear resistant metal or for replacing the wear plug as a whole it is necessary to break the joint between the recessed head portion and the end of the valve stem.

According to the present invention the construction of such cam followers for valves or the like is simplified by providing a recessed head portion integral with the valve stem. The stirrup member is attached to this integral head portion in the novel manner disclosed in my earlier application, as will be described hereinafter. With such an integral head portion on the valve stem I provide a removable wear plug fastened to the stirrup member so that it may readily be removed without dismantling the head portion of the valve stem as heretofore.

In the drawing

Figure 1 is a longitudinal sectional view through a superheater header having a multiplicity of valves of the type to which the invention is directed.

Figure 2 is a sectional view on the line 2—2 of Fig. 1; and

Figure 3 is a sectional view illustrating the manner of applying the stirrup member to a part carried by the valve stem.

As shown in Fig. 1 the superheater header 10 is formed with outer chambers 11 and 12 separated from an intermediate chamber 13 by division walls 14 and 15, respectively. In the wall 14 are a number of ports 16 arranged in a straight line while the wall 15 is formed with circular guide openings 17 alined with the ports 16. The flow of steam from the chamber 11 to the chamber 13 through each port 16 is controlled by a valve disk 20 carried by a stem 21 which at its lower end is provided with an enlarged head 22 fitting in the related opening 17 to guide the movements of the valve. Associated with each head 22 is a stirrup member 23 having a slot 24 for receiving a cam 25 carried by a rock shaft 26 which extends longitudinally through the chamber 12 below the partition 15.

In accordance with the present invention the head 22 is an integral part of the valve stem 21 instead of being threaded thereon and held in place by a pin as in my copending application or the Smith patent. To raise the valve the cam 25 engages the lower end of a removable "wear plug" 40 held in place by a rivet 41 extending through the legs 33 of the stirrup member 23. The plug has a coating 42 of wear-resistant metal such as "Stellite" at its lower end. To lower the valve the cam engages the bridge piece 30 of the stirrup.

As disclosed in my copending application the stirrup member 23 is mounted and joined to the end of the valve steam as follows: The head 22 is formed with a centrally located recess and an undercut flange or shoulder 31 at or near the outer end of the recess thus providing an inwardly extending annular lip the lip provided by shoulder 31 is adapted to interlock with outwardly extending lip portions 32 at the upper ends of the leg portions 33 of the stirrup 23. It may be seen that the stirrup member 23 is in the form of a U-shaped yoke consisting of spaced legs 33 connected at their lower ends by the bridge piece 30 and having the lips 32 located in dia-

metrically opposed relation at the upper end of the legs 33 and extending outwardly from the outer side faces thereof. To join the stirrup member 23 to the head 22 the legs 33 of the stirrup are, preferably, heated (as in regions designated A in Fig. 3) and bent inwardly so that the distance between the outer faces of the lips 32 is reduced to a dimension at least as small as the distance separating opposite face portions of the flange 31 on head 22. While the stirrup 23 is still heated, the ends of the legs 33 are inserted in the recess in the head 22 and the legs are then bent outwardly to engage their lips 32 behind the flange 31 on the head 22. The stirrup 23 is thus joined in swivelled relation to the head 22 of the valve stem 21.

After attachment of the stirrup 23 to the head 22 the wear plug 40 may be inserted between the legs 23 of the stirrup and pushed up to engage the base of the recess in the head 22 of the valve stem. The rivet 41 is then applied to hold the wear plug in place. It will be apparent that replacement of a wear plug requires only that the rivet be driven out and that disassembly of the head 22 from stem 23 as heretofore, is rendered unnecessary.

What I claim is:

1. In a valve operating structure having a cam; a valve stem provided at one end with a head portion formed on its end face with a centrally located recess and an undercut shoulder bordering said recess; a yoke-like stirrup member having two legs spaced to form a smooth walled slot for receiving said cam and joined at one end by a bridge piece, said slot being of uniform width at its upper end opposite said bridge piece; outwardly extending diametrically spaced lips located at the other end of said legs engaged behind said shoulder to mount said member on said head portion of said valve stem; a wear member having a smooth exterior wall surface loosely mounted in said slot between the legs of said stirrup member with one end of said wear member in spaced relation to said bridge piece for engagement by said cam; and a removable fastening member extending through the legs of said stirrup and said wear member for securing the latter to said stirrup member, the wall surfaces of said wear member and said slot being of such configuration that they would be relatively free to move longitudinally of one another upon removal of the fastening member.

2. In a valve operating structure having a cam; a valve stem provided at one end with an integral head or guide portion formed on its end face with a centrally located recess and an undercut shoulder integral with said head portion bordering said recess; a yoke-like stirrup member having two legs spaced to form a slot for receiving said cam and joined at one end by a bridge piece; outwardly extending diametrically spaced lips located at the other end of said legs engaged behind said shoulder to mount said member on said head portion of said valve stem; a wear member positioned in said slot between the legs of said stirrup member with one end thereof positioned in spaced relation to said bridge piece for engagement by said cam; and a removable fastening member securing said wear member to said stirrup member.

3. In a valve operating structure having a cam; a valve stem provided at one end with an integral head or guide portion formed on its end face with a centrally located recess and an undercut shoulder integral with said head portion bordering said recess; a yoke-like stirrup member having two legs spaced to form a slot for receiving said cam and joined at one end by a bridge piece; outwardly extending diametrically spaced lips located at the other end of said legs engaged behind said shoulder to mount said member on said head portion of said valve stem; a wear member positioned in said slot between the legs of said stirrup member with one end thereof engaging said head and the other positioned in spaced relation to said bridge piece for engagement by said cam; and a rivet extending through said wear plug and seated in the legs of said stirrup member for fastening said plug thereto.

JAMES K. SCOTT.