

A. C. SARGENT.
VALVE TRUING TOOL.
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1,044,254.

Patented Nov. 12, 1912.

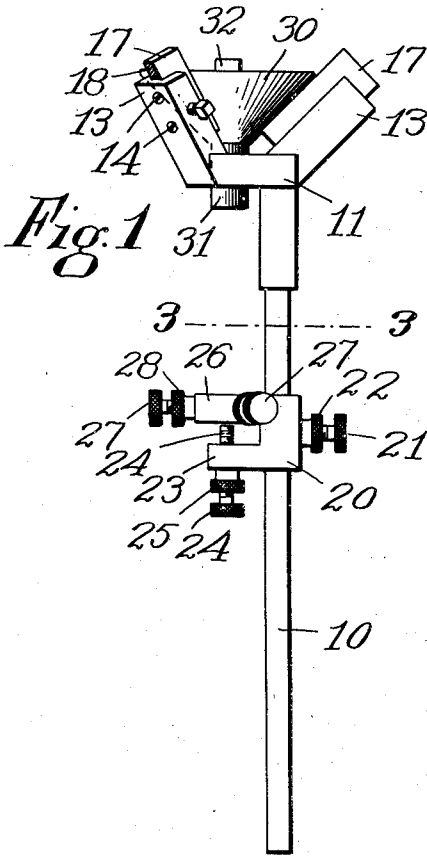


Fig. 1

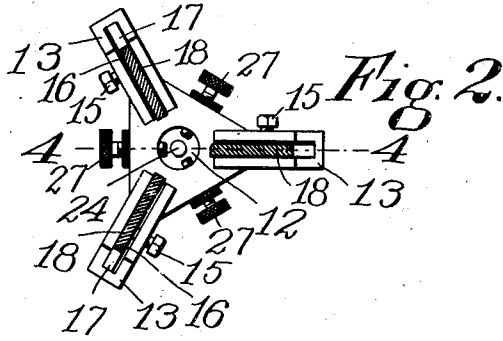


Fig. 2.

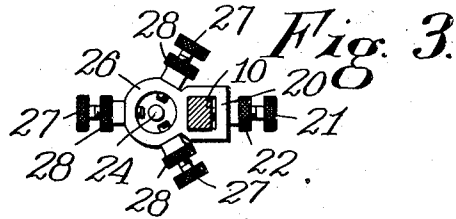


Fig. 3.

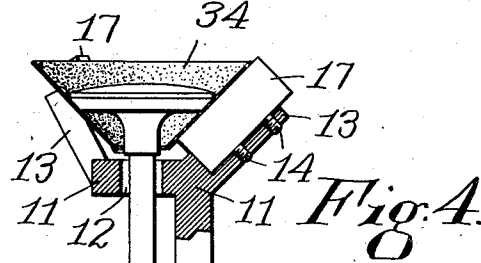


Fig. 4.

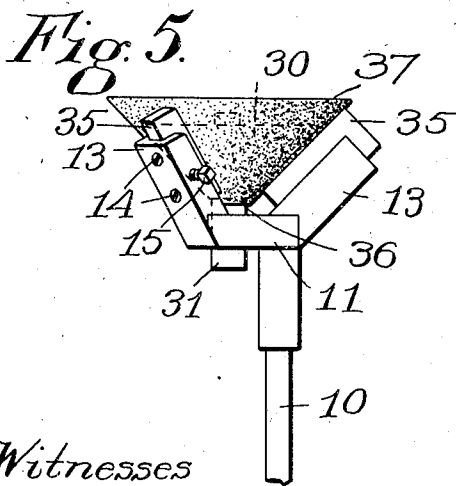
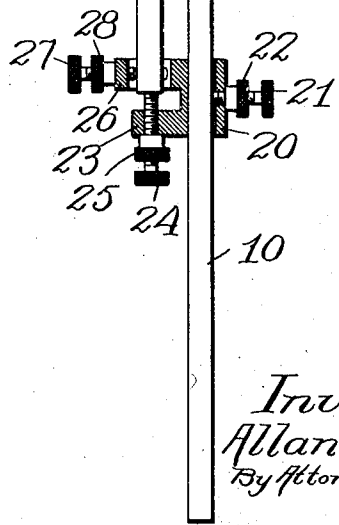


Fig. 5.



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VALVE-TRUING TOOL.

1,044,254.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed November 1, 1911. Serial No. 657,936.

To all whom it may concern:

Be it known that I, ALLAN C. SARGENT, a citizen of the United States, residing at Westford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Valve-Truing Tool, of which the following is a specification.

This invention is an improvement over my Patent No. 983,571 granted February 7, 1911. I have found in using the device which is the subject of that patent and other valve truing tools that if the valve stem is crooked the difficulty is not overcome by ordinary processes of grinding.

The principal object of this invention is to provide a construction in which the valve can be ground to a true conical surface even if the valve stem is out of true.

The invention also involves means whereby the grinding surfaces can be set up in a very simple and convenient way so as to grind the valve to the true conical surface required, means whereby the cutting surfaces can be themselves ground slightly to bring them to a true conical surface for the purpose intended, means whereby the valve itself can be polished after having been ground without any danger of changing the angle of the surface thereof, and an improvement in the grinding members themselves.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a front elevation of a grinding tool constructed in accordance with this invention showing how the grinding surfaces are brought to the proper angle by aid of the templet. Fig. 2 is a plan of the head with the templet removed. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 1. Fig. 4 is a vertical sectional view of the line 4—4 of Fig. 2 showing the truing up of the conical valve surface after it has been ground, and Fig. 5 is a front elevation of the head showing the use of the same for truing up the cutters.

The invention is shown in a simple form comprising a main frame or support adapted to be put in a vise for the purpose of enabling the implement to be firmly supported during the operation. On the end of this support is a head 11, preferably triangular in form, having a large central pas-

sage 12 therethrough. From this head extend a plurality, preferably three, of arms 13, in an inclined direction spaced equally from the center. Each of these arms is provided with a pair of adjusting screws 14 in the back and with a fastening screw 15 in one side. These screws extend inwardly into a slot 16 with which each of these arms is provided. These slots are designed to hold the cutting or grinding tools 17. Each of these grinding tools preferably consists of a piece of tempered steel having a surface 18 on each longitudinal edge provided with a file surface, that is, a surface such as is found in files for filing metal to a smooth surface. It will be understood, however, that tools such as shown in my above mentioned patent can be used and they are adjusted to fit in the same way as the one which has been illustrated.

On the frame 10 is located a slide 20 adapted to be fixed in adjusted position by a set screw 21 having a lock nut 22 thereon. The slide is provided with a platform 23 through which extends a screw 24 parallel with the bar having a lock nut 25 and constituting an adjustable rest for receiving the end of the valve stem, as will appear hereinafter. At the top of the slide is a ring-shaped projection 26 in a plane parallel with the platform and having a passage therethrough. Into this passage extend preferably from three sides as many screws 27 each having a lock nut 28 thereon.

In the use of the device the end of the valve stem is set into the socket formed by the passage in the plate 26. It is adjusted to proper position first by adjusting the slide and fixing it and then by finally adjusting the screw 24. After it is properly adjusted for length so that the conical surface of the valve rests on the surfaces of three tools the screws 27 are tightened up so as to prevent lateral play of this end of the valve stem but yet not to bind it. It will be obvious, of course, that the valve stem passes through the passage 12 and it will be observed that this is large enough so that the valve stem has all the play it may need. In other words, the valve stem is not guided in the plate 11 but the valve is supported on the grinding surfaces and located by them.

The device is used in a manner similar to that indicated in my above mentioned patent for the purpose of grinding the conical sur-

face of a valve, particularly the ordinary gas engine valve. An important difference will be observed, however, in that instead of having the valve centered near both ends as in my above mentioned patent, it is centered only at its remote end and is free to move at the valve end, the valve being guided there only by the surfaces on which it rests and which constitute the grinding surfaces. From this it results that if the valve stem is out of true the valve will not be ground out of true as is the case in the prior devices. It has been found in practice that while these prior devices were extremely valuable when used in connection with valves having a true stem, they did not exactly meet the requirements when the valve stem was bent. The reason for this was that on account of centering the valve stem at both ends its fault would be accentuated in the valve itself so that on grinding it would be found that the valve would be ground off on one side before it was on the opposite side and consequently it would take a great deal of grinding to get it into a true condition. Moreover when it was ground it would not be ground absolutely accurately but the axis of the cone would be slightly out of line with the axis of the stem. Consequently when the stem was badly out of true, valves never could be prepared which would seat with exact accuracy. With this improvement, however, these disadvantages are entirely overcome because the valve is centered from its old surface at one end and the other end is centered by the slide as has been described. Therefore any obliquity of the valve stem will not show up in the trued surface either in the operation of truing or in the result after the operation is completed.

In addition to what has been said it will be observed that the use of the file surfaces for grinding the valve is an important advance as it results in grinding by a plurality of very small cuts such as the file ordinarily produces, thus permitting a faster operation and producing a truer surface in the end.

In order to set these grinding tools a conical templet 30 is employed having a stem 31 at the apex of the cone and a handle 32 for manipulating it extending into the cone. The stem 31 is designed to fit in the opening 12 and to regulate the position of the templet with respect to the head 11. The use of this templet is simple and obvious from Figs. 1 and 5. These figures show the templet in position and it will be clear that the grinding parts can be adjusted one at a time to bring them to the proper angle in a very simple and expeditious manner.

Another advantage of this invention is shown in Fig. 4. A piece of emery or carborundum cloth or paper 34 in the form of

a cone with the operative surface on the inside is applied under the valve after it has been ground and the valve returned back to position. Then the valve is turned as in the original grinding. On account of the emery cloth resting on the cutters they form a surface to back it up and it will be seen that the conical surface of the valve is smoothed off very expeditiously and accurately without any danger of getting it out of true.

Another important advantage of the invention lies in the fact that with the ordinary kind of cutter 35 such as shown in my prior patent, a cone 37 of cloth or paper provided with an emery or carborundum surface on the convex side can be applied to the templet and turned therewith to smooth off the surface of the cutting tools. (See Fig. 5.) The conical grinding sheet is provided with a single hole 36 of course to permit the guide 31 to pass through it. The operation is very simple, as when the parts are in position shown they are simply turned by the handle 32 and a true surface must necessarily be produced on the grinding cutters.

While I have illustrated and described a preferred embodiment of the invention I am aware that many modifications can be made therein without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described but

What I do claim is:—

1. In a valve truing device, the combination with a frame, of a plurality of inclined filing tools supported thereby for engaging the conical valve surface to be ground and centering the same, and an adjustable support on said frame for the end of the valve stem having means for centering the stem without binding it, said frame being free of supports for the valve stem between said centering means and the grinding tools.

2. In a device for truing valves, the combination with means for adjustably supporting the extreme end of the valve stem, of a tool for grinding the bearing surfaces of the valve on a bevel, and a support for said tool having a passage through which the stem of the valve passes freely, whereby the valve will be capable of lateral motion.

3. As an article of manufacture, a valve truing device comprising an adjustable support for the end of the valve stem, a head, and a truing tool located in inclined position on the head, said head being provided with a passage therethrough for the stem of the valve larger than the valve stem, whereby the valve is free to move sidewise in said passage.

4. As an article of manufacture, a valve

truing device comprising a main frame or support, a ring adjustably mounted on said support having surfaces adjustable therein to permit the end of the valve stem to be
5 centered loosely thereby, a longitudinally adjustable rest below said ring for the end of the valve stem, a head having an opening therethrough for the valve stem of a size to permit the valve stem to have a lateral

motion therein, and truing devices carried 10 by said head.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

ALLAN C. SARGENT.

Witnesses:

JAMES M. SARGENT,
BERTHA GALBRAITH.