F. H. WOBIG.

VALVE WELDING.

APPLICATION FILED MAR. 6, 1920.

1,366,108. Patented Jan. 18, 1921.

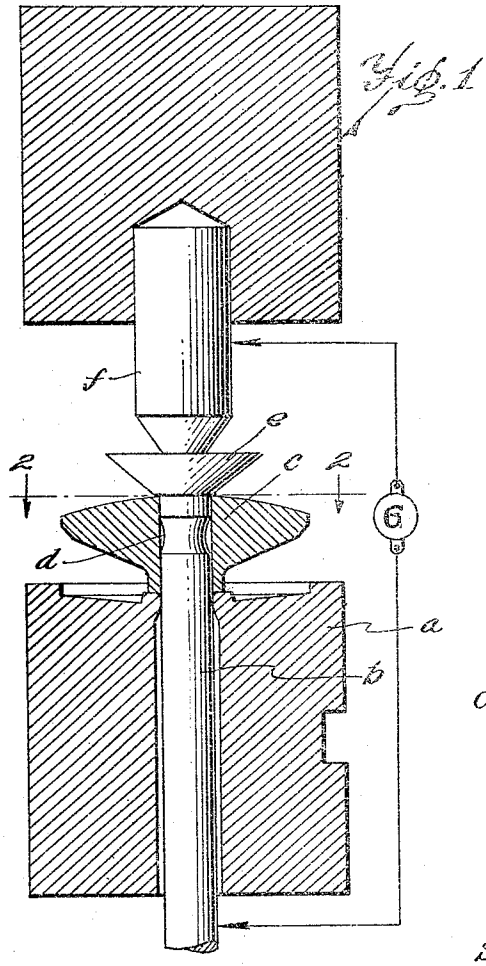


Fig. 1

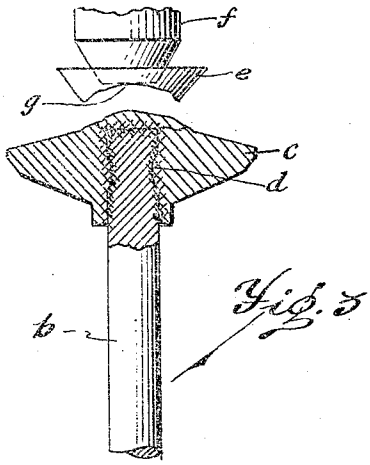


Fig. 3

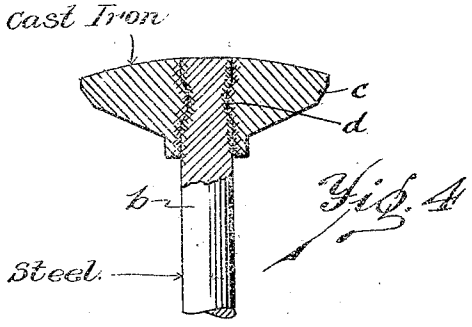


Fig. 4

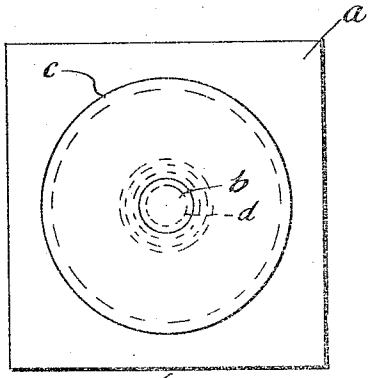


Fig. 2

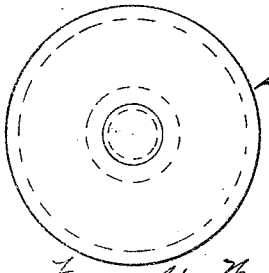


Fig. 5

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FRED H. WOBIG, OF DETROIT, MICHIGAN, ASSIGNOR, BY JUDICIAL DECREE, TO MERIDIAN MOTOR VALVE COMPANY, A CORPORATION OF DELAWARE.

VALVE-WELDING.

1,366,108. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed March 6, 1920. Serial No. 363,731.

To all whom it may concern:

Be it known that I, FRED H. WOBIG, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Valve-Welding, of which the following is a specification.

This invention relates to valve welding, and has for its object a new method of affixing heads to valve stems. It also results in a new and better valve.

The method used involves the employment of a cast iron button in connection with a butt or spot-welding apparatus, causing the cast iron to flow into a groove in the valve stem. This method eliminates the necessity of counter-boring the perforation through the valve head and also results in the cast iron being fused into the steel in such a way as to form a strong and intimate union between the steel stem and the cast iron head. This will more fully appear in the description following.

In the drawings,—

Figure 1 is a sectional view showing the valve, the die that supports the valve, and the die which is provided with a welding electrode.

Fig. 2 is a plan view of the lower die with the valve in place.

Fig. 3 is a sectional view showing the condition of the valve immediately following the welding operation.

Fig. 4 is a fragmentary section showing the finished valve.

Fig. 5 is a plan view of the valve when finished.

a designates a die adapted to receive the steel valve stem *b* and the cast iron valve head *c*. The valve stem *b* is provided with an annular groove *d* near its end. The valve head is perforated and the valve stem with the groove *d* is inserted in this perforation so that the end of the stem is substantially flush with the upper face of the valve head. The cast iron block *e* is inserted on the valve head over the end of the valve stem. The electrode *f* of the butt-welding or spot-welding apparatus is brought down against the button *e*. With the current turned on this generates a great deal of heat fusing the center out of the block *e*, as shown at *g* (Fig. 3) and also fusing the end of the valve stem and the adjoining portions of the cast iron valve head. This causes the metal in the cast iron valve head to run into the annular groove *d* in the stem and fill this up. Not only this but the steel and the cast iron are more or less fused together forming an intimate union between the two. The stock of the valve head is caused to run into the annular groove *d* and is replenished by the cast iron taken from the block *e*. This leaves a protuberance at the top of the valve, as shown in Fig. 3, which may be easily machined off, as shown in Fig. 4.

Either a butt-welding machine with the electrode vertically directed or a spot-welding machine can be used for this work. The electrode *f* is initially laid against the button *e* and is caused to follow into the button by suitable pressure kept up thereon by a lever, pedal or otherwise, as the button melts down.

What I claim is:

1. The method of welding valve stems to valve heads, which comprises perforating the valve head, inserting the end of the valve stem thereinto, the valve stem being provided with a recess therein, and the fusing of additional metal into the valve head and simultaneously causing the stock of the valve head to run into the recess in the valve stem, thereby locking the valve stem to the valve head.

2. The method of welding valve heads to valve stems, which comprises the perforating of the valve head, the recessing of the valve stem near the end and inserting the recessed portion of the valve stem in the perforation, the placing of a block of metal over the end of the valve stem and head, and the fusing of the stock of the valve head into the recess in the valve stem and simultaneously replenishing the stock of the valve head from the said block.

3. The method of welding valve stems to valve heads, which comprises perforating the valve head, placing an annular recess near the end of the valve stem and inserting the recessed valve stem end into the perforation, and the fusing of the metal in the valve head into the said recess and at the same time replenishing the metal taken from the valve head by additional metal.

4. The method of welding valve stems to valve heads, which comprises perforating the valve head, cutting a recess near the end of the valve stem, placing the recessed end of the valve stem into the perforation

in the head, placing a block of metal on the top of the valve stem and head, and coupling the valve stem up to a welding circuit in which the other electrode is caused to contact and follow against said block as the same melts down.

5. The method of welding valve stems to valve heads, which comprises perforating the valve head, making an annular recess near the end of the valve stem, inserting the recessed end of the valve stem into the perforation, placing a metal block on the top of the valve head and the valve stem, and fusing the metal of the valve head into the annular recess and coincidently melting down the portion of the block into the said valve head by means of electric welding.

6. A valve, comprising a perforated valve head, a valve stem provided with a recess near its end inserted in said valve head and the stock of the valve head only adjacent the perforation being fused and run into the annular recess and additional metal added to the top of the valve head.

7. A valve, comprising a perforated cast iron valve head, a steel valve stem provided with a recess near the end thereof, said recessed end being inserted in the perforation, the cast iron metal of the head only adjacent the perforation being fused and run into the recess to lock the stem to the head.

8. A valve, comprising a cast iron perforated valve head, a recessed valve stem having the recessed end inserted in the perforation, the cast iron stock of the head only adjacent the perforation being fused and run into the recess and additional cast iron added to the top of the valve head to replenish the iron flowing into the recess of the valve stem.

9. A valve, comprising a cast iron head which is perforated, and an annularly recessed steel stem, the annularly recessed end of the stem being inserted in the perforation of the head, the metal of the head only adjacent the perforation being fused with the metal of the stem and caused to run into the annular recess of the stem.

10. A valve, comprising a perforated cast iron head, an annularly recessed steel stem inserted in the perforation of the head, the metal of the head only adjacent the perforation being fused with and caused to run into the annular recess in the valve stem, and metal being added to the head and homogeneously united therewith to take the place of the metal that is fused and caused to run into the annular recess of the stem.

11. A valve, comprising a perforated cast iron head, and a recessed stem inserted in the perforation of the stem, the metal of the cast iron head portion adjacent the stem being melted and caused to run in the recess of the stem.

12. The method of welding stems to heads, which comprises perforating the head, recessing the stem, and fusing the metal of the head into the recess of the stem to lock the head upon the stem.

In testimony whereof I affix my signature.

FRED H. WOBIG.