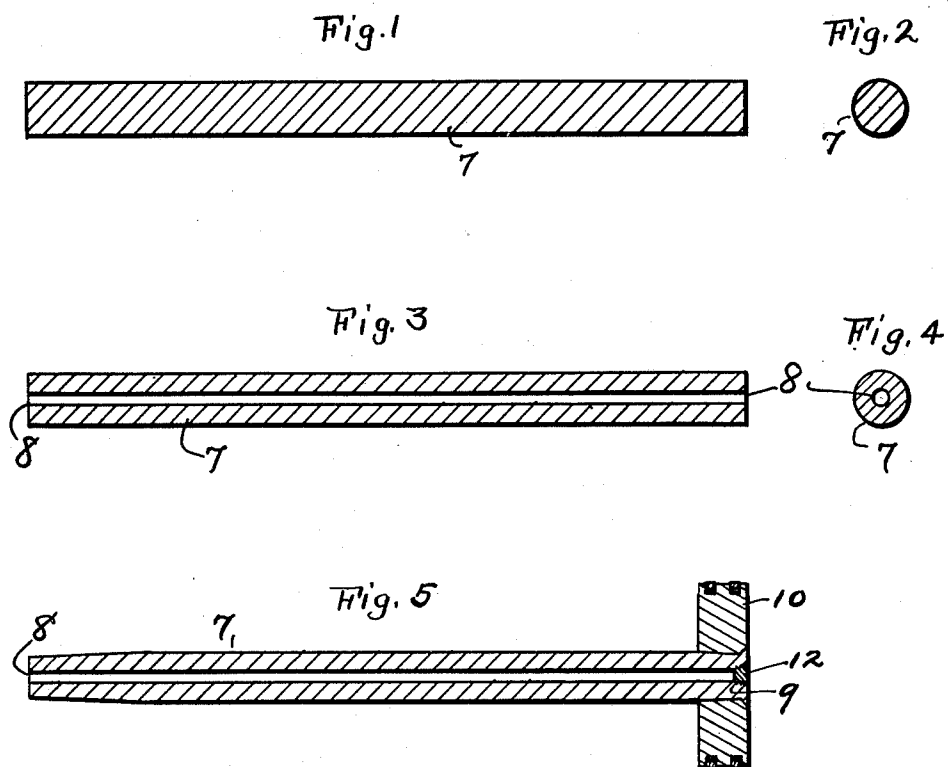


E. J. McILVRIED.
PISTON ROD AND PROCESS OF MAKING SAID ROD.
APPLICATION FILED JUNE 30, 1920.

1,383,002.

Patented June 28, 1921.



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UNITED STATES PATENT OFFICE.

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PISTON-ROD AND PROCESS OF MAKING SAID ROD.

1,383,002.

Specification of Letters Patent. Patented June 28, 1921.

Application filed June 30, 1920. Serial No. 393,011.

To all whom it may concern:

Be it known that I, EDWIN J. McILVRIED, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented a new and useful Piston-Rod and Process of Making Said Rod, of which the following is a specification.

This invention relates to an improved piston-rod and process of making said rod, and pertains more especially to the production of an improved piston-rod suitable for use as the piston-rod in a steam-hammer and adequately able to successfully withstand great stresses or strains to which such a piston-rod is liable to be subjected.

The primary object of this invention is to produce a piston-rod which is uniformly and adequately tough and strong from end to end thereof and not liable to be broken by subjection to the hereinbefore mentioned stresses or strains.

Another object is to produce my improved piston-rod by a simple and inexpensive process.

With these objects in view, and to attain any other object hereinafter appearing, this invention consists in certain peculiarities of construction of my improved piston-rod, and in the hereinafter described steps or process practised in the production of said piston-rod.

The accompanying drawings are illustrative of certain steps of the process practised in making my improved piston-rod, and in said drawings Figure 1 is a side view of a rolled or forged solid steel rod which is to be subjected to said process. Fig. 2 is a cross-section of said rod. Fig. 3 is a longitudinal central section of the rod illustrated in Figs. 1 and 2 after said rod has been bored longitudinally and centrally from end to end. Fig. 4 is a cross-section of the bored rod shown in Fig. 3. Fig. 5 is a longitudinal central section of my improved piston-rod provided with a piston-head.

Referring to Figs. 1 and 2 of said drawings, 7 indicates a rolled or forged solid steel rod which is circular in cross-section.

I would here remark that substantially all rolled or forged solid steel rods have defects such, for instance, as minute fractures or traces of segregation, centrally of the rod, and I have found that breakage of solid steel piston-rods, more especially where said rods have been subjected to great stresses or

strains, is the result of larger fractures which have their beginning in the minute fractures or traces of segregation centrally of the rods.

In order to produce a piston-rod which has no defects such, for instance, as minute fractures or traces of segregation, centrally of the rod, and which is uniformly tough and strong from end to end of the rod, I take the solid steel rod 7 shown in Figs. 1 and 2 and bore the same centrally and longitudinally from end to end so as to form a central bore 8 which extends longitudinally of and through the rod, as shown in Fig. 3, and is circular in cross-section as shown in Fig. 4. In thus forming a bore 8 centrally and from end to end of the rod any defective metal centrally of the rod is removed, and the bored rod is then subjected to heat-treatment internally from end to end of the bore as well as externally from end to end of the rod. The surrounding wall of said bore is therefore heat-treated and hardened and toughened. Thereupon the end portions of the rod are externally tapered or otherwise turned and shaped to finish the rod externally, and the surrounding wall of the bore 8 is screw-threaded, as at 9, at the end at which the rod is to connect with a piston-head 10, (see Fig. 5) so as to render the rod capable of receiving at said end a correspondingly externally screw-threaded plug 12 engaging and closing the screw-threaded end of said bore.

The piston-head 10 is applied to my improved piston-rod in any approved manner, and it will be observed that the outer end face of the plug 12 forms the central portion of the face of the piston formed by the head 10 and the adjacent end portion of the hereinbefore described bored and heat-treated rod.

What I claim is—

1. A steel piston-rod having a central bore which extends longitudinally of the rod and has a heat-treated surrounding wall.

2. A steel piston-rod having a central bore which extends from end to end of the rod and has a heat-treated surrounding wall and is closed at its end at which a piston is to be formed.

3. In a piston-rod composed of rolled or forged steel, a central bore which extends from end to end of the rod and has a heat-treated surrounding wall and is engaged, at its end at which a piston is to be formed,

by a plug threaded into the rod and having its outer end face adapted to form the central portion of the face of said piston.

4. An improvement in the art of making
5 a piston-rod, consisting in boring a rolled
or forged solid steel rod centrally and longitudinally and heat-treating the surrounding wall of the bore thus formed.
5. An improvement in the art of making
10 a piston-rod, consisting in boring a rolled

or forged solid steel rod centrally and from end to end of the rod, then heat-treating the surrounding wall of the bore formed, and then plugging said bore at one end.

In testimony whereof I sign the foregoing 15
specification in the presence of two witnesses.

EDWIN J. McILVRIED.

Witnesses:

CASPER J. DORER,
ROBT. H. KRAUSE.