

(No Model.)

H. K. JONES.
METHOD OF PREPARING METAL FOR STAMPING OR DRAWING IN DIES.
No. 552,763.

Patented Jan. 7, 1896.

Fig. 1.

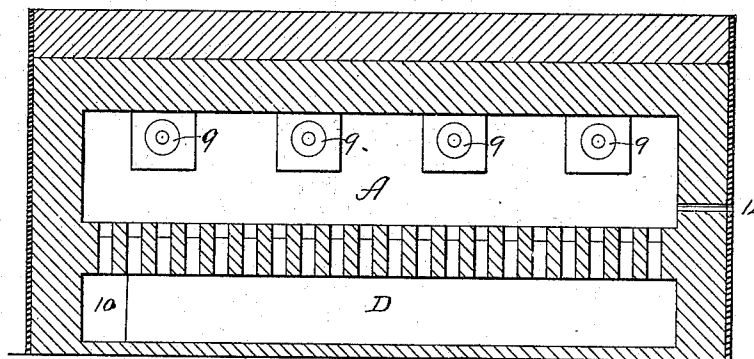


Fig. 2.

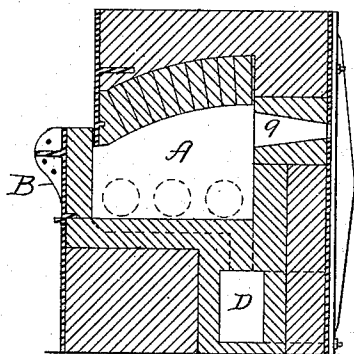


Fig. 3.

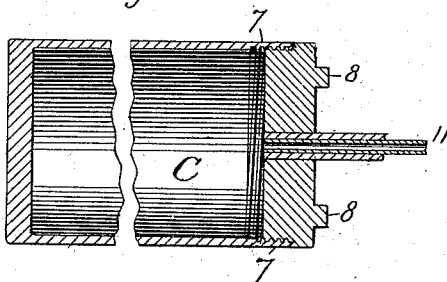


Fig. 5.

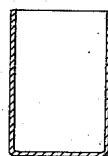
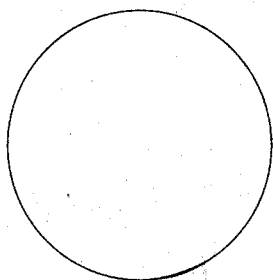


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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METHOD OF PREPARING METAL FOR STAMPING OR DRAWING-IN DIES.

SPECIFICATION forming part of Letters Patent No. 552,763, dated January 7, 1896.

Application filed May 13, 1895. Serial No. 549,067. (No model.)

To all whom it may concern:

Be it known that I, HORACE K. JONES, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in the Methods of Preparing Metal for Stamping or Drawing-In Dies, of which the following is a specification.

My invention relates to improvements in the methods of preparing metal for stamping or drawing-in dies; and the main object of my improvement is to provide the metal with a coating during the annealing process which will prevent oxidization and also facilitate the operation of stamping or drawing-in dies.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a furnace suitable for use in carrying out my process. Fig. 2 is a transverse section of the same. Fig. 3 is a central longitudinal section of a vessel suitable for holding the metal to be treated, the middle portion of the vessel being broken out. Fig. 4 represents a sheet-metal disk such as may be treated by my process, and Fig. 5 is a sectional view of a cup-shaped object as struck up from said disk.

A designates the heating-chamber, which may be of any desired length and is preferably provided with a rising and falling door B at its front for substantially its whole length. The furnace shown is arranged for oil, the hydrocarbon-burners being set in the port-holes 9. The smoke-flue D is under the heating-chamber and may communicate with a chimney by any suitable exit, as at 10.

C designates a vessel which I prefer to make in the form of a long cylinder and provide the same with a suitable cap or cover at one end. This cover may be fitted to the vessel by means of screw-threads, as at 7, Fig. 3, and should be provided with some means for the application of a wrench or lever to facilitate screwing and unscrewing the cover, as, for example, the projections 8 8. The cover I prefer to provide with a small pipe 11, for use as hereinafter described, and to let said pipe project through an opening 12 at one end of the heating-chamber.

Any form of sheet metal, or blanks, or articles that have been partly formed of sheet metal and which are to be again stamped, struck up, or drawn by means of dies—as, for

example, disks, as shown in Fig. 4, or cup-shaped blanks, or partly formed articles, as shown in Fig. 5, and the surfaces of which are substantially free from oxide—are thoroughly coated or smeared with an oleaginous substance, as oil or grease, and then placed in a suitable vessel, as C, which is closed except at some small vent. These vessels may be nearly as long as the heating-chamber and can be rolled in at the front. In Fig. 2 the broken circles indicate three such vessels lying side by side in the heating-chamber. They are here subjected to heat to make the cylinder or vessel and its contents red-hot for as long a time as may be desired, as in ordinary annealing processes. The oil on the work is in part converted into gas under the influence of the heat, and as the gas expands it flows out through the vent, or if air is commingled with gas in the vessel a flow of air and gas passes out through said vent, and thereby an excessive pressure on the vessel is avoided. The flow through the vent continues as long as the heat increases. The oil when thus heated leaves a smooth carbonaceous coating on the work, resembling lamp-black. After being heated for the requisite time for annealing the metal, the vessels or cylinders are removed for cooling. Thus, in the operation above described, the metal is simultaneously annealed and a coating is produced which protects the surface from oxidation and also acts as a lubricant in the subsequent operation of stamping or drawing. As soon as they are removed I connect the vessel with a gas supply—for instance, any pipe leading to the ordinary gas main—by means of a rubber tube which can be slipped on the small pipe 11, whereby as the gas within the vessel shrinks in cooling gas from the gas main will flow in and thus exclude the free ingress of air. I have sometimes provided the small pipe 11 with a stop-cock which is closed during the removal of the cylinder from the heating-chamber, so that what little shrinkage of gas there may be while transferring the vessels from the heating-chamber to their place of cooling will not draw in so much air as would be the case if the stop-cock was not employed; but even if air does enter the vessel, as it generally will to some extent, the carbonaceous coating previously

formed has the tendency to protect the metal and avoid the oxidizing effect of the air.

In subjecting the metal to further operation in dies—as, for example, drawing the disk, 5 Fig. 4, into the cup-like blank, Fig. 5—the carbonaceous coating instead of being a detriment serves as lubricant to protect the dies and facilitates working without any injurious effects whatever on the metal. Oil may be 10 used in connection with the carbonaceous coating when subjecting the metal to the stamping or drawing operation.

The metal to be heated may be smeared with oil or grease for the express purpose of being 15 treated as before described, or if the metal has been coated with oil, as is frequently the case, for cutting it into shape or in partially forming it up or other working, this coating of oil may be left on and will generally be 20 found sufficient for the purpose of my process. If it is desired to again anneal for further drawing-in dies a piece of work that has been operated upon, it can be again treated as before described, and so on as many times as 25 may be desired. Whatever means may be

taken to exclude the air when the vessel is cooling, or whether or not any means for so doing is made use of, the beneficial effect of the carbonaceous coating in stamping and drawing the metal after annealing is the same, 30 and said coating is always formed prior to cooling the vessel.

I claim as my invention—

The method of preparing metal for stamping or drawing in dies which consists in coating the metal to be worked with an oleaginous substance, then heating it in an inclosing vessel which substantially excludes the flame and combustion products of the heating medium, through the expulsive action of the gas 35 given off by the coating material and allowed to escape from the inclosing vessel, thereby simultaneously annealing the metal and producing thereon a smooth, protecting and lubricating carbonaceous coating substantially 40 as described. 45

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Witnesses:

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