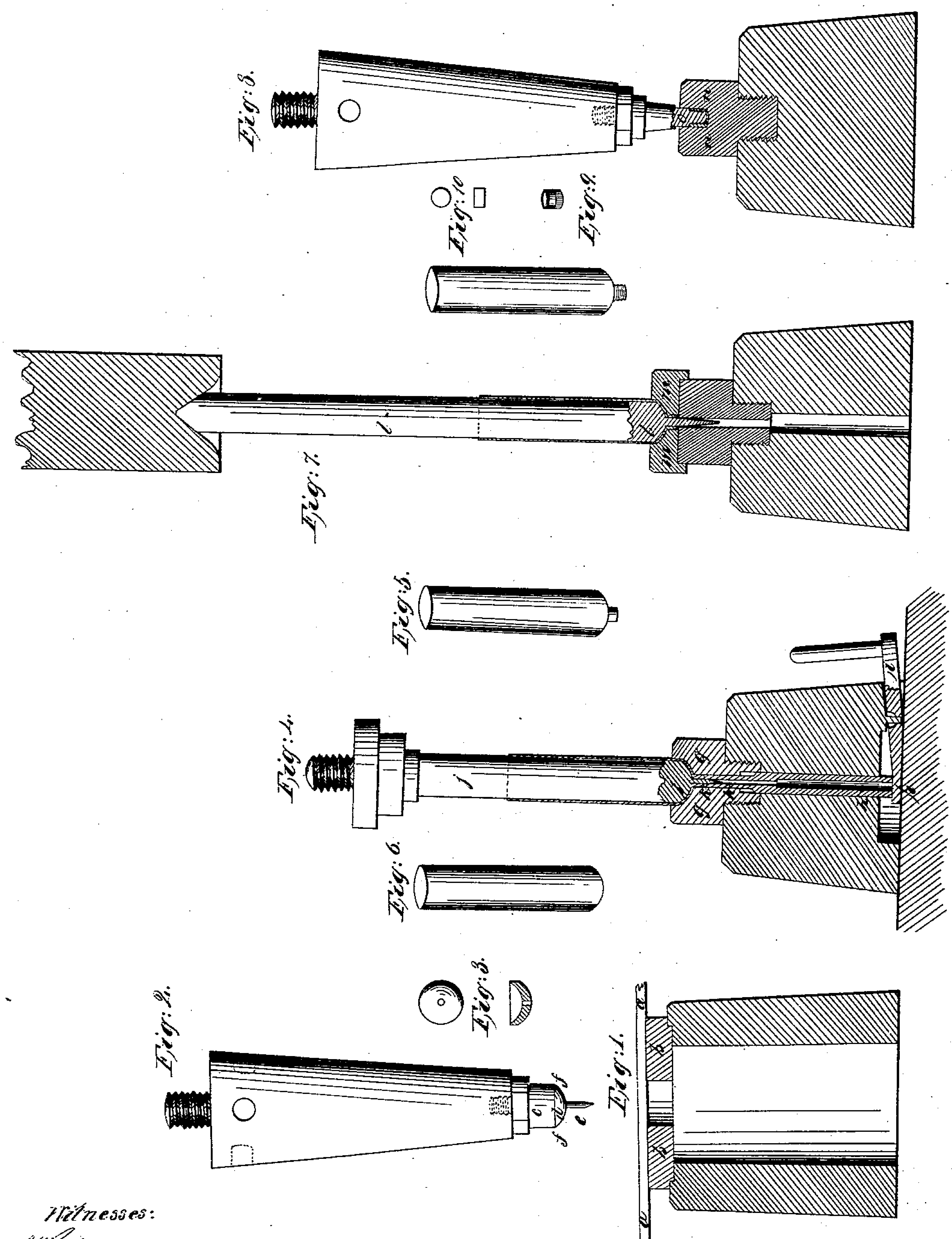
J. Rand,

Making Sheet-Metal Vessels.

No. 3694.

Patented Aug. 7, 1844.



Witnesses:

Inventor:

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UNITED STATES PATENT OFFICE.

JOHN RAND, OF HOWLAND STREET, COUNTY OF MIDDLESEX, ENGLAND.

IMPROVEMENT IN THE METHOD OF MAKING VESSELS OF SOFT METAL.

Specification forming part of Letters Patent No. **3,694,** dated August 7, 1844.

To all whom it may concern:

Be it known that I, JOHN RAND, a citizen of the United States of America, and now residing at Howland Street, in the county of Middlesex, within the Kingdom of Great Britain, artist, have invented or discovered new and useful Improvements in Making Vessels of Soft Metal; and I, the said JOHN RAND, do hereby declare that the nature of my said invention and the manner in which the same is to be performed are fully described and ascertained in and by the following statement thereof, reference being had to the drawings hereunto annexed, and to the figures and letters marked thereon—that is to say:

My invention relates, first, to a mode of forming vessels of metal, tin, and other metals sufficiently malleable to be operated on by the process of pressing the same into the depth of vessel desired; and, secondly, my invention relates to a mode of cutting a screw on the neck or nozzle of metallic vessels and also the mode of making screw-caps.

In order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed, first remarking that I would not have this patent compounded with another previous patent granted to me by the United States for the use of collapsible metallic vessels, though at the same time my new discovery will facilitate the making of said collapsible vessels; but I consider my present invention as an entirely new mode of making metal vessels for any purpose whatever.

I first cut a disk of metal out of a plate by means of a punch similar to the method of punching holes in sheet-iron for making boilers, with this difference, that I form the punch so as to make the disk a little convex, if required, and perforated if the vessel is to have a nozzle, as I have accurately described in Figures 1 and 2, but which forms no part of my invention; but the principle of my invention which I claim is making this disk into a complete cylindrical vessel of a required length by a fly-press or other suitable power. This is done by placing the above-mentioned disk of metal into a hardened steel die, Fig. 4, *g*, sunk cylindrically to the depth of the thickness of the disk of metal, (say one-quarter of an inch,) the bottom of which is concave to form the end of a vessel, and if a nozzle is required, a sinking of the required form for that purpose. The metal being placed in this die fills or nearly fills it. The metal receives a blow from a perpendicular steel cylinder, *j*, whose diameter would lack the thickness of the intended vessel from completely filling the die *g*. When this cylinder *j* is forcibly pressed upon the metal in the situation above described, the metal will be forced to escape from this confined position, and it can only do so by the small aperture between the cylindrical forcer *j* and the circumference of the die *g*. It is thus forced to leave the die *g* and run up the cylindrical forcer *j*, thus forming the cylindrical part of the vessel, and the forcer *j* being stopped before it reaches the bottom of the die *g*, by the thickness of the metal required for the end, it thereby leaves the lower end of the tube entire, except where a nozzle is required, which is formed by the metal being forced into the cavity above mentioned for that purpose in the die *g*, which nozzle is perforated by a pin, *k*, in the end of the forcer, as described in the annexed drawings. The end of the spike *k* enters a cylindrical steel pipe, *h*, which supports the end of the nozzle and stops the metal from escaping that way. The lower end of the pipe *h* rests on one end of the lever *i*, and by means of a gentle blow on the other end will throw the vessel out of the die when completed.

Secondly, the means by which I cut a screw on the neck or nozzles of the vessels above described. They are slipped on the cylinder *l*, Fig. 7, which is very similar to the cylinder *j*, with this exception, that the pin in the end is larger and conical, being a little larger at its greatest diameter than the pin *k* in the cylinder *j*, so that when forced through the hole in the nozzle made by the pin *k* it will enlarge the external diameter of said nozzle, which being previously placed into a steel die, *m*, with a female thread, it thereby receives the impression of the thread on its outward surface. This die is supported by a block of steel in which there is a hole to receive the end of the pin, and stops the metal from being carried down by the operation. When the cylinder, together with the vessel on it, is raised from the block, having pressed the metal and extended it into the thread of the die, it lifts up the die from the block, being fixed to the end of the vessel by the screw which it

has formed, and is disengaged by simply turning it off. Fig. 5 shows the perspective view of the thin metal vessels, such as are produced by the dies, Fig. 4. When vessels are required without any neck or nozzle, such as is shown by Fig. 6, in making such vessels the pin in the punch, Fig. 2, would be dispensed with, and also the point or pin in the cylindrical forcer *j*, Fig. 4, and in the place of the tube *h*, a solid steel cylinder enough longer than the tube *h* to be flush with the bottom of the die, thus preventing the metal from forming a nozzle and serving to throw the work out of the die as before.

Thirdly. I form metallic screw-caps for closing vessels by means of a cylindrical steel forcer, *o*, Fig. 8, the lower end of which is formed into a screw as large as the required depth of the cap. This screw must not be quite so large in diameter as the cylinder *o*, on the end of which it is formed, but must lack as much of it as the required thickness of the cylindrical part of the cap. Next a disk of metal, as shown in Fig. 10, cut out of a plate, as above described for making a vessel, is placed in a die, *n*, which exactly receives the cylindrical forcer *o*, so as to leave no space for the metal to escape upward and a little deeper than the required length of the cap. When the forcer *o* is pressed with great power on the disk of metal at the bottom of the die *n*, it runs up till it meets the shoulder at the upper end of the screw, and being stopped by this it is compelled to fill the thread of the screw. When the forcer *o* ascends, it draws it up from the die *n*. After being raised a little above the upper surface of the die *n*, another thin die is placed upon the top of the die *n*, in which there is a sinking to form a milled rim round the top of the cap, and the bottom of which may be lettered if required. The forcer, being returned gently, will press the end of the cap into the die *p*, and give it the impression of any device thereon engraved, and by which die the cap may be turned off from the screw on the end of the forcer.

Having thus described the nature of my invention and the manner in which the same is to be performed, I would have it understood that I do not confine myself to the precise details shown provided the peculiar character of my invention be retained; but

What I claim is—

1. The mode herein described of making soft-metal vessels by causing a thick piece of metal to be pressed in the required form by pressure of dies, as is described in respect to the dies, Fig. 4.

2. The making a screw by pressure in dies on the necks of metal vessels, as shown in Fig. 7.

3. The making of metal screw-caps by pressure in dies, as shown at Fig. 8.

JOHN RAND.

Witnesses:
JOHN ALCOCK,
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Both of Lincoln's Inn, London.