(No Model.) 2 Sheets—Sheet 1.

C. D. MILNE & A. R. PRITCHARD.

JOINING SPOUTS TO METALLIC KETTLES.

No. 502,046. Patented July 25, 1893.

Fig. 1.

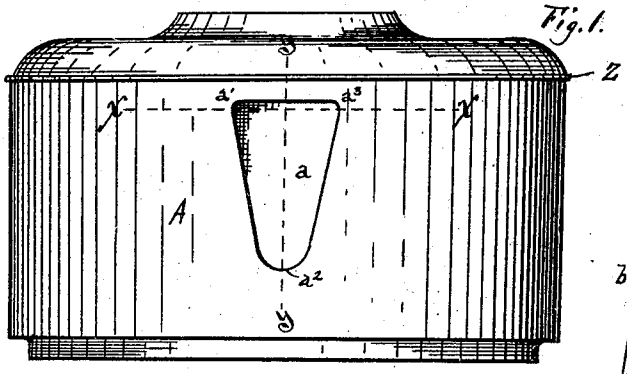


Fig. 2.

Fig. 3.

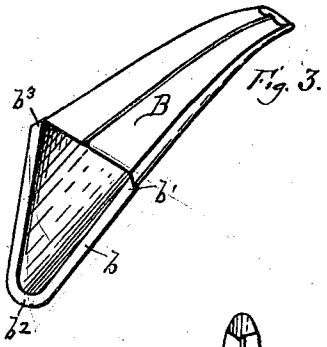
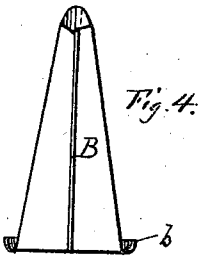


Fig. 4.



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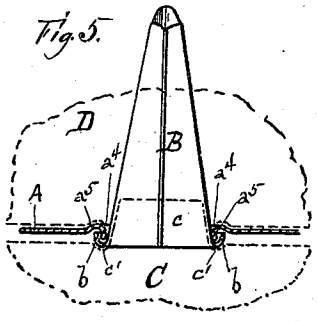


Fig. 6.

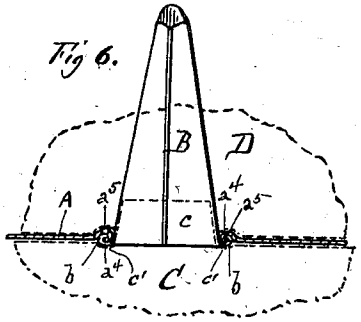


Fig. 7.

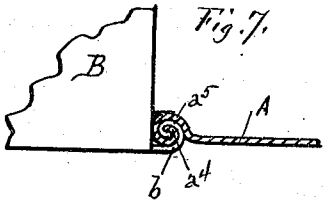
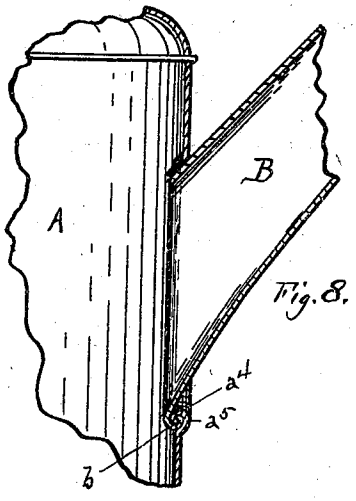


Fig. 8.



Witnesses;
J. E. N. Bates.
M. W. McRoden.

Inventors:
Charles D. Milne
Albert R. Pritchard
By
Howard L. Osgood
Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 9.

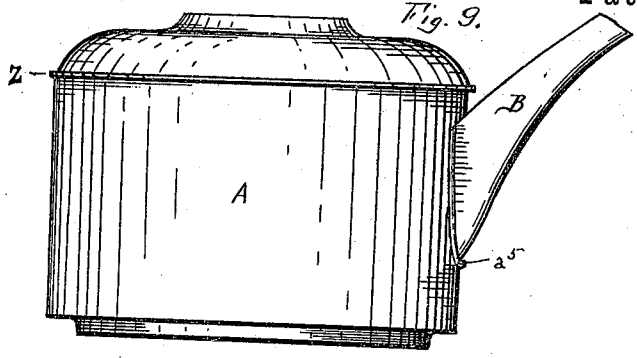


Fig. 10.

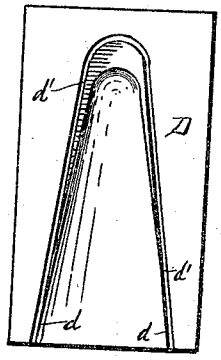


Fig. 12.

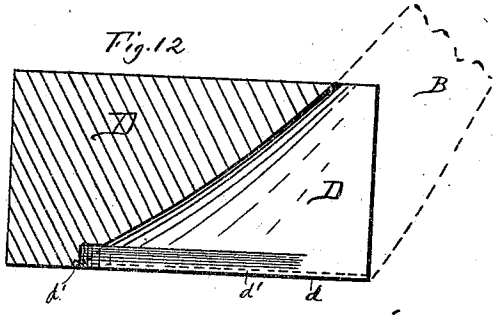


Fig. 11.

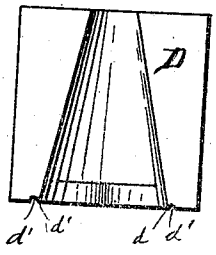


Fig. 13.

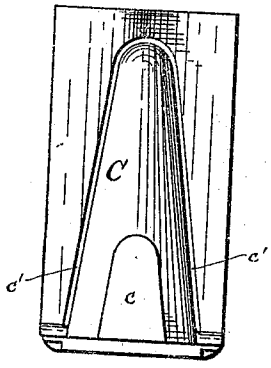


Fig. 14.

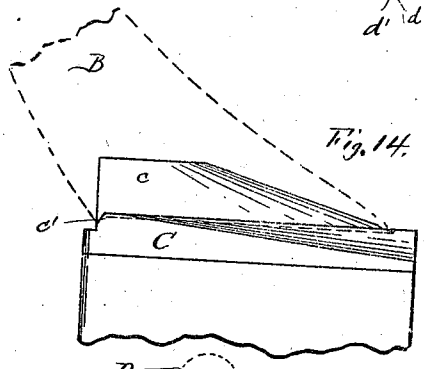
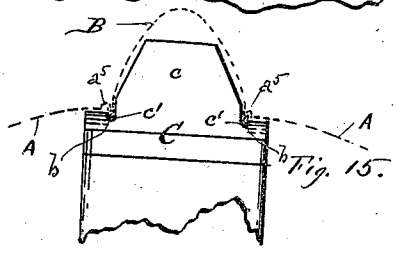


Fig. 15.



Witnesses;
H. E. Bates
M. W. McRoden.

Inventors,
Charles D. Milne
Albert R. Pritchard
By
Howard L. Ogden
Atty.

UNITED STATES PATENT OFFICE.

CHARLES D. MILNE AND ALBERT R. PRITCHARD, OF ROCHESTER, NEW YORK.

JOINING SPOUTS TO METALLIC KETTLES.

SPECIFICATION forming part of Letters Patent No. 502,046, dated July 25, 1893.

Application filed April 5, 1893. Serial No. 469,223. (No model.)

To all whom it may concern:

Be it known that we, CHARLES D. MILNE and ALBERT R. PRITCHARD, citizens of the United States, and residents of the city of Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Joining Spouts to Metallic Kettles and Similar Vessels, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a tea kettle perforated for the introduction of a spout, according to our method. Fig. 2 is a cross section on the line *x*—*x* of Fig. 1, after the edge of the perforation in the kettle has been flanged and beaded. Fig. 3 is a perspective view of a spout for a kettle provided with a flat flange. Fig. 4 is a top plan view of a spout, after the flat flange of Fig. 3 has been curved. Fig. 5 is a top plan view of a spout, after the flange has been curved, as shown in Fig. 4, and it has been set in place through the perforation in the kettle. Fig. 6 is a top plan view of the spout, after the flange of the kettle and the flange of the spout have been rolled together. Fig. 7 is an enlarged view in section on the line *x*—*x*, showing the edges of the kettle and spout flanges rolled together. Fig. 8 is a section on the line *y*—*y* of Fig. 1, but after the spout has been fastened to the kettle. Fig. 9 is a side elevation of a kettle, provided with a spout fastened thereto according to our method. Fig. 10 is a bottom plan view of the upper die for fastening the kettle and spout together. Fig. 11 is a front elevation of the same die. Fig. 12 is a longitudinal section of the same die on the line *z*—*z* of Fig. 10, and showing in dotted lines a spout in position in the die. Fig. 13 is a top plan view of the lower die for fastening the spout and kettle together. Fig. 14 is a side elevation of the same die, showing in dotted lines a spout in position on the die. Fig. 15 is a front elevation of same die, showing in dotted lines the positions of a spout on the die, and of the adjacent portions of the side of a kettle thereon.

In Figs. 2, 5, 6 and 7 the portions of the kettle body adjacent to the opening *a* are shown flat instead of curved.

In the manufacture of kettles it has heretofore been the practice either to solder the spout to the kettle body or to seam the whole base edge of the spout to the edge of an aperture in the body by hand. Where the spout is soldered to the kettle, an over heating will, of course, melt the solder and will release the spout from the kettle body, and even where rivets are used to assist in holding the spout to the kettle body the melting away of the solder will make openings which will leak. Where the spout is seamed to the kettle by hand, the operation is slow and expensive and a perfect joint cannot be obtained as when a die press is employed to compress the joined edges together.

The object of our invention is to join a spout to a tea-kettle whereby a water tight union is made between the two, and which shall not depend upon the use of solder, but which shall be accomplished as far as possible by mechanical processes accomplished by machinery, and our invention consists in the operations and devices hereinafter described and claimed.

In the drawings, A represents a kettle having a perforation *a*, in the side thereof. This perforation is triangular with rounded corners a' a^3, the apex a^2 of the triangle being truncated and rounded as shown; the upper edge a' a^3 is close to the upper edge Z of the kettle body. After the kettle has been perforated substantially as shown, the edges of the perforation *a*, from the corner a' around the lower end a^2 and thence to the corner a^3 are formed between dies, which produce a flange a^4 extending inwardly and a bead a^5 projecting outwardly adjacent to the flanged edge as shown in Fig. 2. A spout B having a contour at its base fitting the aperture *a* is provided with a flange *b* around the base, from the point b' around the lower portion b^2 to the corner b^3. Between the points b' and b^3, there is no flange; nor is there any flange or bead at the upper edge of the aperture *a* between the points a' and a^3. The flange *b* is next pressed by suitable dies so that said flange is curled outwardly substantially in U-form as shown in Fig. 4. The spout B extends upwardly at a rather sharp angle with the plane of the base as shown in Fig. 9. The die C is the lower or stationary die in the press. It has a suitable horn *c* which is shaped to support the lower part of the spout. Around the

base of the horn is a groove c' into which fits the curved flange b of the spout. The upper die D is hollow in order to bridge over the spout as it lies upon the die C and is provided with an edge d having a groove d' which is opposite and is the counterpart of the groove c' in the die C. The groove d' is so shaped as to fit upon the bead a^5 of the kettle body. After the spout and the kettle body have been flanged and the flanges have been curved as described, the spout is placed upon the die C with the curved flange b resting in the groove c'. The die C is supported upon the end of an arm for the purpose hereinafter described. After the spout has been placed in position upon the die C, the kettle body is placed upon the die by fitting the aperture a around the spout so that the flange a^4 projecting downwardly rests in the concavity of the flange b.

The parts, spout and kettle body, are so formed that when they are in the position just described upon the die, the spout tightly fits the aperture a in the kettle body. The die D is now brought down by the press (which is of any usual form) and the groove d' presses upon the bead a^5, pressing the flange a^4 downward into the concavity of the flange b, and by reason of the die C being stationary also compressing the edge of the flange b upward into the concavity of the bead a^5. As the compression continues the curved inner side of each flange forces the edge of the other flange to follow the contour of such curvature, and causes the two flanges to roll, each upon and within the other, and as the compression reaches its maximum the two flanges are tightly pressed together and produce a water-tight seam on all sides of the base of the spout, except at the top edge. This edge is placed so near the top of the kettle that leakage therethrough is of little consequence, and the upper side of the base of the spout is tightly pressed against the upper edge of the aperture a, and a very small quantity of solder serves to make the joint at this edge water-tight.

In our invention the seaming of a spout to a kettle body is by reason of the shape of the spout at its base and of the dies, carried to the maximum extent around the line of union between the two parts; and at all points where parts are seamed together the lower die sufficiently supports the upper die and the upper die moves in a direct line.

While other contours than those shown may be given to the base of the spout and to the aperture, we prefer to make use of a spout and an aperture triangular in contour with rounded corners. In any event the spout and kettle body are seamed together at their meeting edges, except at the upper meeting edge.

What we claim is—

1. The method of fastening sheet metal spouts to sheet metal vessels consisting in first forming an aperture in the side of the vessel substantially triangular in form with rounded corners and in forming around one corner of said aperture and around the contiguous edges thereof an inwardly projecting flange and an outwardly projecting bead and in forming an outwardly projecting flange around the base of a spout corresponding in contour to the flanged and beaded edges of said aperture, then fitting the flange of the spout over the flange of the aperture with the edge of each flange resting within the sides of the other flange, then compressing the two flanges together inwardly and outwardly at once between dies having grooves fitting upon the inner side of the curve of the spout flange and upon the outer side of said bead, whereby the edges of the flanges are rolled or curled together, each within the other, and then fastening together the unflanged portion of the base of the spout and the unflanged edge of the aperture in the vessel, substantially as described.

2. The method of fastening sheet metal spouts to sheet metal vessels, consisting in first forming an aperture in the side of the vessel and forming partly around the edges of said aperture an inwardly projecting flange and an adjacent outwardly projecting bead and in forming a coextensive outwardly projecting flange around the base of a spout fitting said aperture, then fitting said flanges together with the edges of each flange resting within the sides of the other flange, then compressing the two flanges together inwardly and outwardly at once between dies having grooves fitting upon the inner side of the spout flange and upon the outer side of said bead, whereby the edges of the flanges are rolled together each within the other, and then soldering together the unflanged edges of said aperture and of the base of said spout, substantially as described.

3. The method of fastening sheet metal spouts to sheet metal vessels consisting in first forming an aperture in the side of a vessel and forming partly around the edge of said aperture a continuous inwardly projecting flange and an adjacent co-extensive outwardly projecting bead and in forming a co-extensive outwardly projecting flange around the base of a spout fitting said aperture, then fitting said flanges together with the edge of each flange resting in and upon the curved base or bead of the other flange, then compressing the two flanges together inwardly and outwardly at once between dies having grooves fitting upon the inner side of the curve of the spout flange and upon the outer side of said bead, whereby the edges of the flanges are rolled or curled, each within the other, and then fastening together the unflanged edges of said aperture and of the base of said spout, substantially as described.

CHARLES D. MILNE.
ALBERT R. PRITCHARD.

Witnesses:
E. B. FENNER,
H. L. OSGOOD.