F. BOSHERT.

Stovepipe Elbow.

No. 52,520. Patented Feb. 13, 1866.

Fig. 1

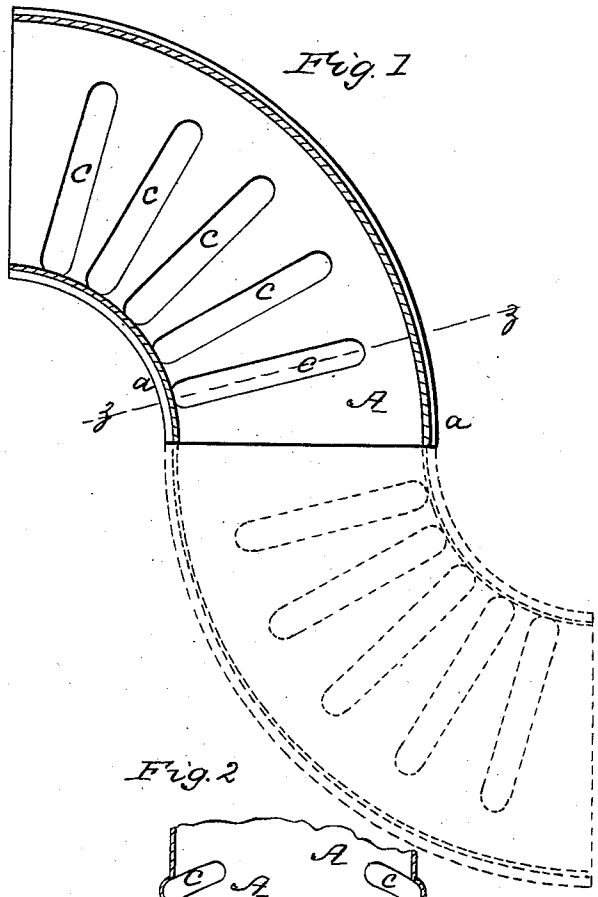


Fig. 2

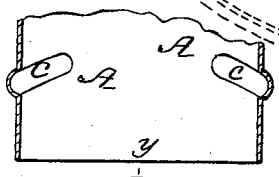
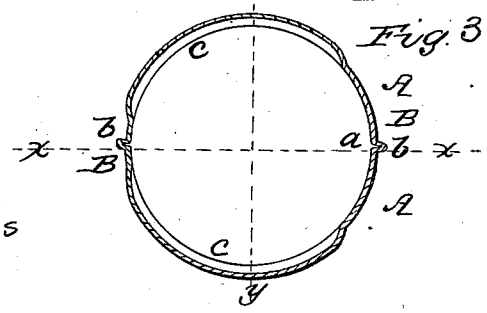


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

FREDERICK BOSHERT, OF NEW YORK, N. Y.

IMPROVEMENT IN STOVE-PIPE ELBOWS AND IN DIES FOR PRODUCING THE SAME.

Specification forming part of Letters Patent No. **52,520**, dated February 13, 1866.

To all whom it may concern:

Be it known that I, FREDERICK BOSHERT, of the city, county, and State of New York, have invented a new and useful Improvement in Constructing or Forming Elbows for Stove and other Sheet-Metal Pipes, together with the Dies for Producing the Same; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal central section of an elbow constructed according to my invention, *x x*, Fig. 3, indicating the line of section; Fig. 2, a longitudinal section of a portion of the same, taken in the line *y y*, Fig. 3; Fig. 3, a transverse section of the same, taken in the line *z z*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention is designed to avoid the expense in constructing the ordinary angular elbows for stove and other pipes by avoiding the miter joint, and at the same time obtain one which will be more durable and possess the advantage of being adapted to suit the different positions in which it may be required to place the pipe.

The invention consists in cutting the sheet-metal out of which the elbow is to be made in curved form, and then, by means of swaging between suitably-formed dies, giving a transverse semicircular form to the piece of sheet metal thus cut, so that when two such pieces are connected together they will form a quarter of a tubular cylindrical ring, the pieces of sheet metal being swaged with recesses in them in order to avoid the breaking of the metal while being swaged, as hereinafter set forth.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

In order to form the elbow I take two pieces of sheet metal cut in the form of a flat ring, comprising a quarter, or rather more than a quarter, of a circle of greater or less diameter, as may be required. These sheet-metal plates are then, by means of swaging, bent transversely in the form of a semicircle, so as to make the longitudinal halves A A of a tube, and these two parts are connected together by lock-joints B B, as shown clearly in Fig. 3, said joints being formed by having radial flanges *a* bent outward from the edges of one part or half of the tube A, and having a lip, *b*, bent on the edges of the other half to clasp and lock over the flanges *a*. This joint may then be flattened down by another lap or turn over.

In order to prevent the metal from rupturing or breaking during the swaging process, I swage the parts A A with recesses *c* in them, which have a radial position in each part, as shown clearly in Fig. 1, said recesses extending from the inner or concave side of the tube, but not reaching the outer part. These recesses take up the superfluous portion of the metal at the inner portion of the parts or halves A A, and greatly facilitate the proper swaging and bending of said parts. The shape or figure of these recesses or indentations may be varied at pleasure; but it is necessary they should take up the superfluous metal, requiring very nice calculations in making the dies.

By this manner of constructing the elbows a serpentine elbow may be made by connecting the elbows as shown in red and black in Fig. 1; or a complete circle or worm may be made by connecting together a suitable number of them in proper position, a single elbow being used when a turn only in a right-angular direction in a pipe is required.

The plates may be swaged either when heated or in a cold state, according to the quality of the metal used. Inferior and brittle metal (sheet iron) will, of course, require to be heated.

The nature of my invention also consists more especially in so constructing my dies, male and female, or convex and concave, one to press the sheet metal within the other, that in forming a double curvature the surplus metal resulting from the same will be taken up and pressed into recesses or projections of any desirable shape, thus avoiding crimping and breaking of said sheet metal at the curve or turn.

To enable others skilled in the art to make and use these dies, I will proceed to describe their construction and operation.

In the drawings, Fig. 1, Plate 2, represents a top view of the concave or hollow die; Fig. 2, an under-side view of male or convex die; Fig. 3, a lateral section through both on line

a b, showing the metal pressed between. Fig. 4 is a longitudinal view on line *c d*. Fig. 5 shows the metal plates ready for swaging.

In pressing soft sheet-metal plates into any shape little difficulty is experienced by irregularities of surface, curves, &c.; but to all skilled in the art it is known the contrary is the fact as to sheet-iron or other hard-metal plates, especially when swaged cold, giving rise to crimping and breaking, resulting from a surplus of metal. This I propose to absorb or take up, avoid crimping or breaking, by pressing it into figures of any desirable or fanciful shape, adding ornament to grace, at same time accomplishing a necessary result, a curved elbow or pipe being more pleasing to the eye, easier, and more cheaply constructed than an angular one.

A and B represent the two dies; C, the form of the plate, cut out before being pressed between them. In bad or brittle metal this plate should be heated to a proper degree before pressing. This, however, is not necessary in Russia sheet or other good metal.

Any screw-lever or other well-known press will answer to operate the dies after the plates are placed between them.

e and *f* are shoulders on the dies to prepare a ledge for the joint by which to connect the halves after being pressed into shape.

The process of completing the joint is well known to every worker in sheet metal, especially tinners or stove-pipe makers.

At the bend in the dies will be seen on A small radial projections *g*, and corresponding recesses *h* in the other die. These may be reversed, if preferred, and the figure varied; but I prefer those shown—graceful and easily made.

Generally one set or half-dies will answer by reversing one of the plates after pressing.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An elbow for stoves and other sheet-metal pipes, constructed of flat plates cut in the form of quarter rings of the required width, and then swaged transversely in semicircular form with the radial recesses to comprise the longitudinal halves of a tubular cylindrical ring, substantially as set forth.

2 The dies A and B, for preparing hard sheet-metal plates for stove-pipe elbows or other curved pipes, having projections *g* and corresponding recesses *h*, by which to take up or absorb the surplus metal resulting from a double curvature and avoiding crimping or breaking of the same, substantially as shown and described, and for the purpose set forth.

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Witnesses:
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