R. Montgomery,

Corrugating Metal Plates,

No. 23,599. Patented Apr. 12, 1859.

Fig. 1.

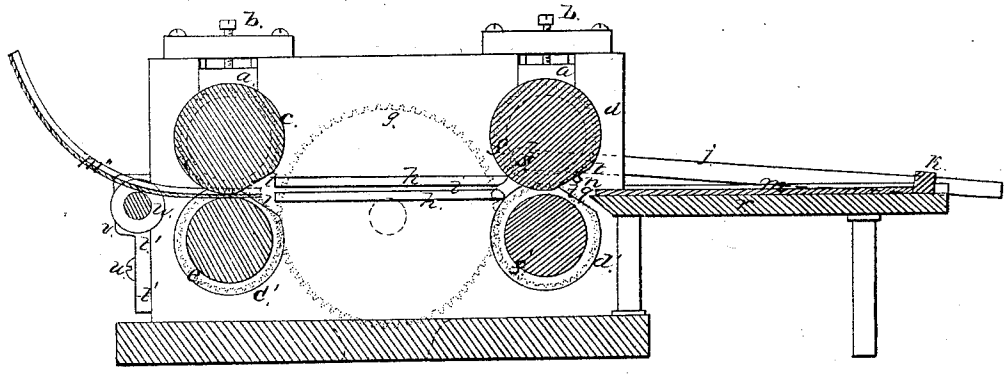


Fig. 3.

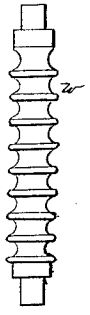


Fig. 2.

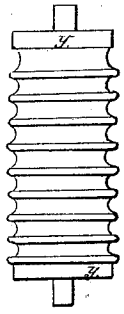


Fig. 4.



Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

RICHARD MONTGOMERY, OF NEW YORK, N. Y.

IMPROVED MACHINE FOR CORRUGATING METAL PLATES.

Specification forming part of Letters Patent No. **23,599**, dated April 12, 1859.

To all whom it may concern:

Be it known that I, RICHARD MONTGOMERY, of the city of New York, in the State of New York, have invented a new and useful Improved Machine for Corrugating Iron for Boiler-Plates and other Purposes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In using corrugated iron for the various purposes to which it is adapted it is a great advantage to have the margins left smooth and plain, so as to afford a convenient surface for uniting and riveting the different sheets or pieces together. It is also important to have as much thickness of metal at such places as possible, since the sheets are somewhat weakened by the holes made for the rivets.

In corrugating sheets of metal it is also found that by the ordinary modes now in use there is great liability to get the sheets out of true while they are being fed to the machine, and which results in considerable loss to the manufacturer.

It is also found that iron which has been corrugated by passing it between but one set of rolls is often injured, while if subjected to the same amount or degree of corrugation by passing it between two sets of rolls, the first set commencing the corrugation and the second completing it, that the iron is much better than if the corrugation had been done at one operation or by being pressed between but one set of rolls.

It is also found that it is necessary to have the two sets of rolls bear a certain peculiar relation to each other, in order to effect the operation by "one heat."

To facilitate the foregoing operations, together with the attainment of other advantages in the process of corrugating iron, is the object of the present invention.

To enable others skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it, reference being had to the accompanying drawings, in which—

Figure 1 represents a longitudinal section through the machine; Fig. 2, a top view of one of the rolls *c c' d d'*; Fig. 5, a section of the plate after it has passed through the first pairs of rolls *d d'*; Fig. 4, a section of the plate after it has passed through the second pair of rolls *c c'*.

The plate *m* to be subjected to corrugation is placed on table *r* in front of the feeding-bar *k*. This bar *k* is attached to two arms *j*, of which only one is represented in the drawings. The bar is attached to the arms in any suitable way, so that it can be set at a greater or less distance from the ends of the arms. The arms *j* have at their front ends pins *s*, which may be adjusted in the radial slots *l* at a greater or less distance from the center of the gear-wheels *d*. By this means a reciprocating motion will be imparted to the bar *k*, which during its forward sweep serves to push the plate *m* toward and between the first pair of corrugating-rolls *d d'*.

The shoulders *y y* of the roll *d* are provided with one pin *n* each, these pins taking into corresponding holes *q* in the shoulders of the lower roll *d'*.

Between the rolls *d d'* the plate receives its first corrugation. As the plate passes from between the rolls *d d'* its edges enter and are guided by slots *i*, one on each side of the machine, formed by guide-pieces *h h*. Passing beyond the front end of the slots, the plate enters between the second pair of rolls *c c'*, which latter are not so far apart as the first two rolls *d d'*, for the purpose of compressing the material to its final thickness, and thus completing the process of corrugation. Of course the indentations of the second pair of rolls *c c'* are deeper than those of the rolls *d d'*, so as to correspond with the expansion of the material consequent upon the diminution of its thickness.

From the rolls *c c'* the corrugated plate passes over the sweeping and forming roll *w*, as represented by red lines in Fig. 1.

Part of the corrugated circumference of the rolls is cut off, as seen at *t t t t* in Fig. 1, for the purpose of leaving the ends of the plates smooth.

The distance of the bar *k* from the first pair of rolls is such that the front end of the plate will just arrive at and abut against the pins *n* as they begin to enter the holes *q*. Thus these pins serve to adjust and regulate the front end of the plate, so as to be parallel with the axis of the rolls when entering between the rolls.

The upper rolls c and d have their bearings in blocks a, which can be adjusted by screws b.

The four rolls are properly geared together by cog-wheels $e\ e'\ g\ f\ f'$.

The roll w is what I term a "sweeping and forming roll." This roll is placed just back of the last or second set of corrugating-rolls, and is placed in bearings v, which are adjustable by means of set-screws u and slots $t'\ t'$, so that it can be set in the proper position to sweep or form the sheet into a curved form suitable for the purpose to which it is to be applied. This roll is grooved out, as fully shown in Fig. 3, so that as the corrugated sheet or metal plate leaves the last set of rolls it is received onto the corrugated or grooved sweeping and forming roll, by which it is guided and directed as it leaves the last set of rolls, and at the same time it gives the corrugated sheet or plate such a direction that it (the sheet) is bent into a curved form, as fully shown in red lines in Fig. 1.

The distance between the two sets of rolls is such that the front margin of the plate enters the space $t\ t$ between the rolls $c\ c'$ at the same time that the rear margin of the plate leaves the first set of rolls, so that the margins of the corrugated sheets are left smooth and plain. It may also be remarked in this connection that the circumference of each roll is such that it completes one revolution during the passage of the sheet between each set of rolls.

The shoulders y of the rolls $d\ d'$ are the same distance from each other as those of the rolls $c\ c'$, so as to preserve the same thickness of the side margins of the corrugated plates, as shown at $z\ z$, Figs. 4 and 5.

The regulating and adjusting pins p are shown attached to the roll d; but they may be attached to the roll d' or to all of the rolls, and may be used with advantage when the plates are fed by hand and also when the corrugation is completed by passing the sheet between only one set of rolls.

The sweeping and forming roll w may also be used with advantage when only one set of corrugating-rolls is used.

Having described my improved machine for corrugating iron for boiler-plates and other purposes, what I claim therein as new, and desire to secure by Letters Patent, is—

1. Feeding the sheets or plates of metal at the proper time by a feeding device constructed and operated substantially as above described.

2. The feeding device above described, in combination with the adjusting-pins on the first set of corrugating-rolls, as herein set forth.

3. The combination of two sets of corrugating-rolls with the side guides $h\ h$, constructed, arranged, and operated substantially as shown and described.

4. The corrugated sweeping and forming roll w, constructed and used as and for the purposes described.

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Witnesses:

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