2 Sheets—Sheet 1.

S. S. LAPHAM.

MACHINES FOR CORRUGATING SHEET-METAL FOR WASH-BOARDS.

No. 182,585. Patented Sept. 26, 1876.

Fig. 1

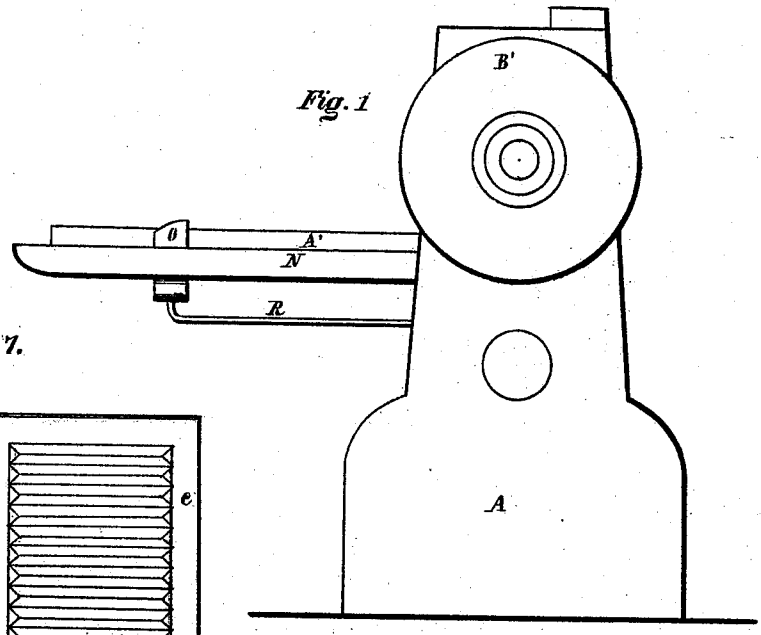


Fig. 7.

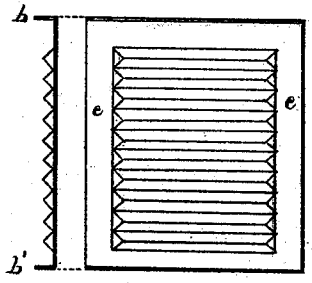
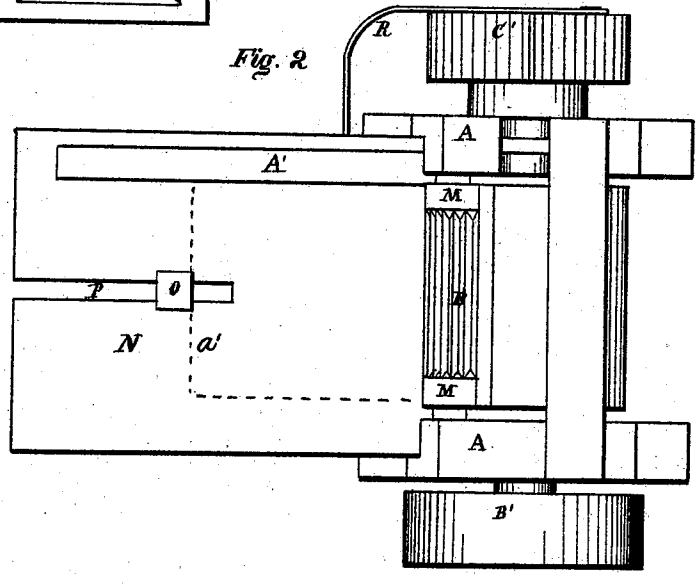


Fig. 2



Witnesses

E. M. Gross

J. H. Burridge

Inventor

S. S. Lapham

Per Burridge & Co

Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

S. S. LAPHAM.

MACHINES FOR CORRUGATING SHEET-METAL FOR WASH-BOARDS.

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Fig. 3

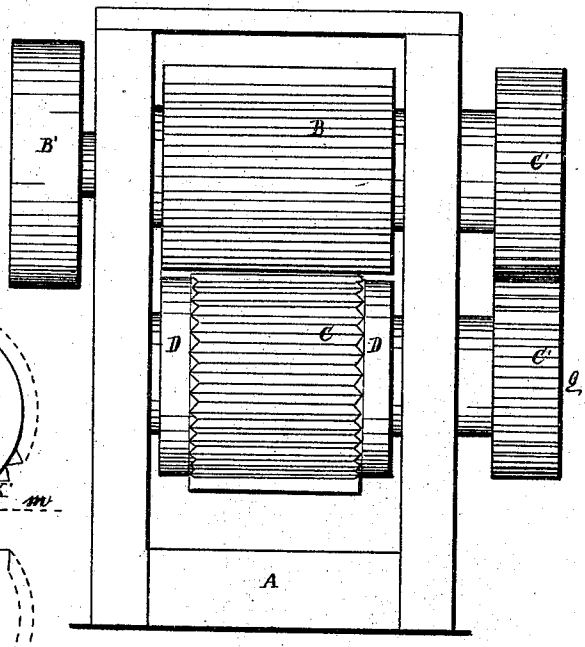


Fig. 5.

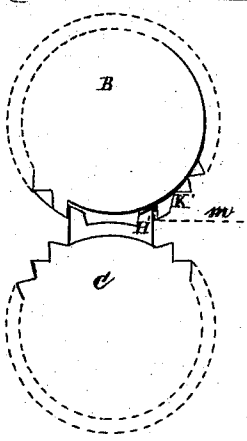


Fig. 4

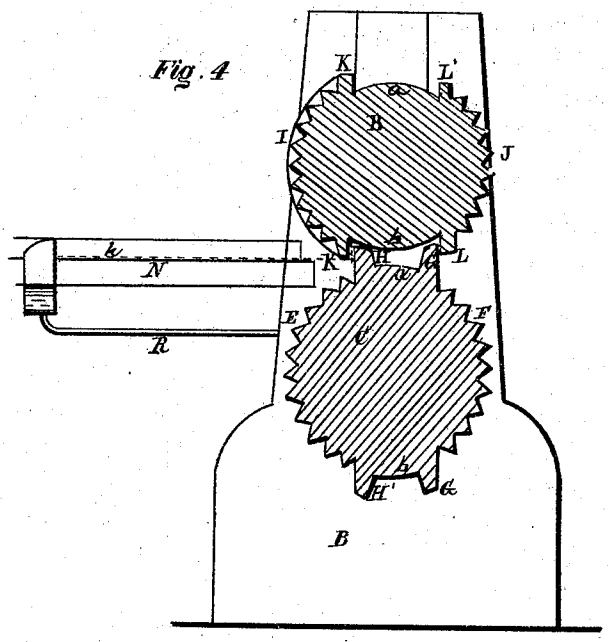
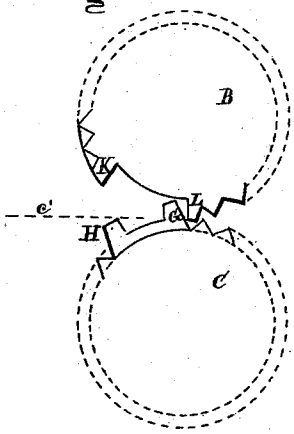


Fig. 6.



Witnesses

E. N. Ivors

S. H. Burridge

Inventor

S. S. Lapham

Per Burridge & Co

Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SIMON S. LAPHAM, OF CLEVELAND, OHIO.

IMPROVEMENT IN MACHINES FOR CORRUGATING SHEET METAL FOR WASH-BOARDS.

Specification forming part of Letters Patent No. **182,585**, dated September 26, 1876; application filed June 17, 1876.

To all whom it may concern:

Be it known that I, SIMON S. LAPHAM, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Machine for Corrugating, Edging, and Flanging Sheet Metal; and I do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings, making a part of the same.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view. Fig. 3 is a front elevation. Fig. 4 is a longitudinal vertical section. Figs. 5 and 6 are detached sections. Fig. 7 is a view of a sheet of metal operated on by the machine.

Like letters of reference refer to like parts in the several views.

This invention consists in certain improvements in machines for corrugating and preparing sheet metal for wash-boards, and which, by one operation, corrugates the sheet, turns flanges on the ends of the same, and leaves the side margins smooth and flat, or free from corrugations.

A full and complete description of the construction and operation of the machine is as follows:

In the frame or housings A, Fig. 1, are mounted a pair of corrugated rollers, B C, Figs. 3 and 4, arranged one above the other, as shown. The corrugations in the lower roller C do not extend entirely across the face of the roller, but terminate a short distance from the ends, leaving on either end of the roller a plain, smooth band, D, Fig. 3, below the ridges of the corrugations, and flush with the depressions between them, the purpose of which will presently be shown.

It will be also seen on examination of the drawing that the corrugations are not continued uninterruptedly around the roller, there being two breaks in their continuity, as will be seen at *a* and *b*, Fig. 4, thereby dividing the corrugations into two sections or series, E and F. The ends of each series terminate, respectively, at a flanging bar or brake, G G and H H′. Said brakes project above the corrugations. The corrugations in the upper roller are in like manner divided into two series, I and J. The ends of each series terminate, respectively, at a flanging brake, K K′ and L L′. The series of corrugations J extend entirely across the face of the roller, whereas the corrugations of the series I terminate at a short distance from the ends, thereby leaving at each end of the roller a plain, smooth band, M, Fig. 2, the surface of which is flush with the ridges of the corrugations; hence, when the two rollers are in such relation to each other that the series of corrugations I engage the corrugations of the lower roller, the two plain bands, M and D, will run upon each other. N is a table or platform, whereon sheets of metal are laid for being fed to the machine. O is an automatic feeding-slide, moving in a slot, P, Fig. 2, in the table, and which is actuated by the lowermost gear-wheel, to which it is attached by a link, R.

The practical operation of the machine is as follows: In the manufacture of wash-boards the zinc plate is usually corrugated entirely across its surface, the edges of which are set in grooves made in the inner sides of the side pieces of the board. Said grooves are as wide as the corrugations are deep; hence the corrugations serve as channels to carry water into the grooves which are open between said corrugations, which in time produces moldiness and decay of the wood. To avoid making so wide a groove, but on the contrary a groove only a trifle more than the thickness of the zinc, is one purpose of this machine.

Ordinarily the lower and upper ends of the zinc are set in the back of the board in grooves. To this end a flange is turned at either end for insertion in the grooves. Said flanges are usually turned after the sheet has been crimped or corrugated, requiring for this purpose a special machine and extra labor and time, to avoid which is also the purpose of this invention—that is to say, this machine crimps the sheet or zinc, leaving two uncrimped marginal edges to be secured in the sides of the frame of the board, as shown at *c* in Fig. 7, and at the same time turns the flanges *b b′* at the top and bottom to be inserted in the back of the wash-board in grooves about the width of the thickness of the metal. To this end a sheet of metal of the proper size is laid upon the table N, between the rollers and the feed-gage O, as indicated by the dotted lines *a′* in Fig. 2. One

edge of the sheet is adjusted to the guide A′. As the rollers are made to revolve by the drum B′ and gearing C′ C′, the feed-gage O will at the proper time push the sheet forward until the front end of the sheet reaches the rollers, which at this instant hold the relation to each other as shown in Fig. 6. In this position of the rollers the sheet is pushed so far forward as to rest upon the brake H, at this time flush with the surface of the table. The sheet at this time is indicated by the dotted lines *c′*. As the rollers continue to revolve, the end of the sheet is lifted by the brake H by virtue of its becoming higher than the surface of the table. At this instant the brake K (the end of the series of corrugations) comes down, between the side of which and the side of the brake H the sheet is clamped and the edge thereby turned upward by the upward tendency of the brake H and the downward tendency of the brake K, thereby forming a flange, *b*. (Shown in Fig. 7.) The sheet at this particular moment in the machine is indicated by the dotted lines *h* in Fig. 4. The sheet, in its onward course between the rollers, is corrugated by the corrugations of the rollers; and as the sheet is about to pass from the machine a flange, *b′*, is turned in the end, in a similar manner as the flange *b*, by the joint action of the brake H′ and the brake K′, or the end of the series I of corrugations, which, during the movement of the rollers, turns the end of the sheet upward, against the side of the brake H′, forming a flange between them, as will be seen in Fig. 5, in which the dotted line *m* indicates the sheet of metal corrugated, and about leaving the rollers with the flange *b′*, yet held between the brakes of the rollers, and which, when completed and out of the machine, is as shown in Fig. 7.

It will be observed that the crimping of the sheet is done by that division of the corrugations of the roller B in which the corrugations do not extend entirely across the roller in its conjunction with the lower one; hence the margin of the sheet passes through the rollers uncrimped. The section or series of the corrugations of the roller B, which extend the entire length of the roller, is intended to run in combination with a lower roller having corrugations of equal length, for the purpose of crimping a sheet wholly across it. A reciprocating bed-plate, provided with corresponding corrugations and brakes, may be used instead of the roller C, operating in conjunction with the roller B, essentially in the same manner and with the same results. A roller, however, is preferable.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The roller B, provided with two divisions or series of corrugations, I and J, the series I having marginal bands M, and each series terminating, respectively, at a flanging brake or bar, K K′ and L L′, in combination with the roller C, provided with two divisions or series of corrugations, E F, terminating at the flanging brakes or bars G G and H H′, substantially in the manner as described, and for the purpose set forth.

2. The flanging brakes or bars H H′ of the roller C, in combination with the brakes K and K′ of the roller B, arranged to co-operate substantially in the manner as described, and for the purpose specified.

SIMON S. LAPHAM.

Witnesses:
J. H. BURRIDGE,
J. H. LAPHAM.