(No Model.) 3 Sheets—Sheet 1.

L. L. SAGENDORPH.

MACHINE FOR CORRUGATING SHEET METAL.

No. 342,387. Patented May 25, 1886.

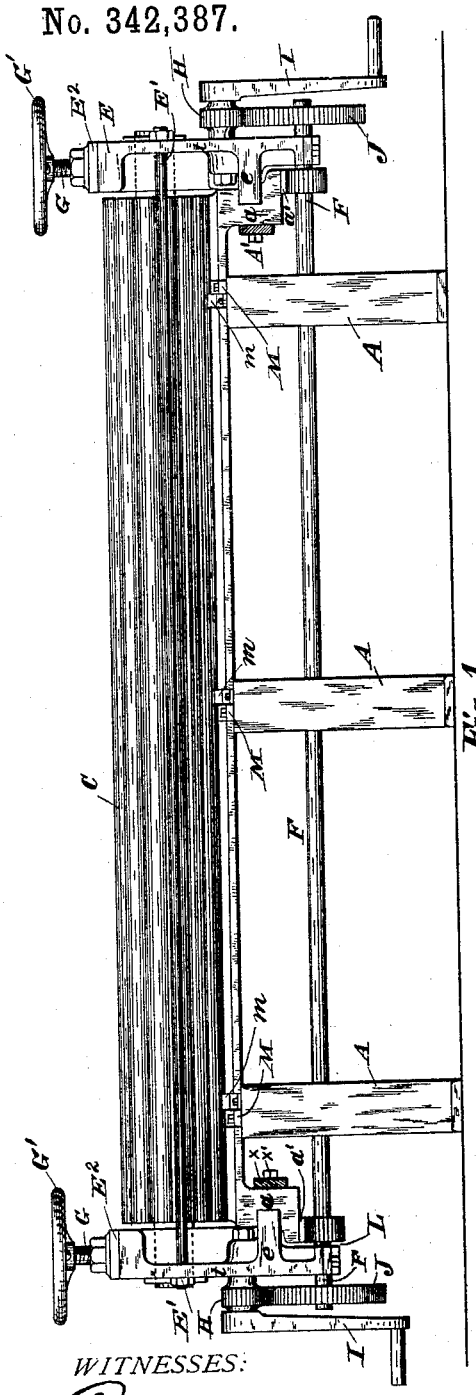

Fig. 1.

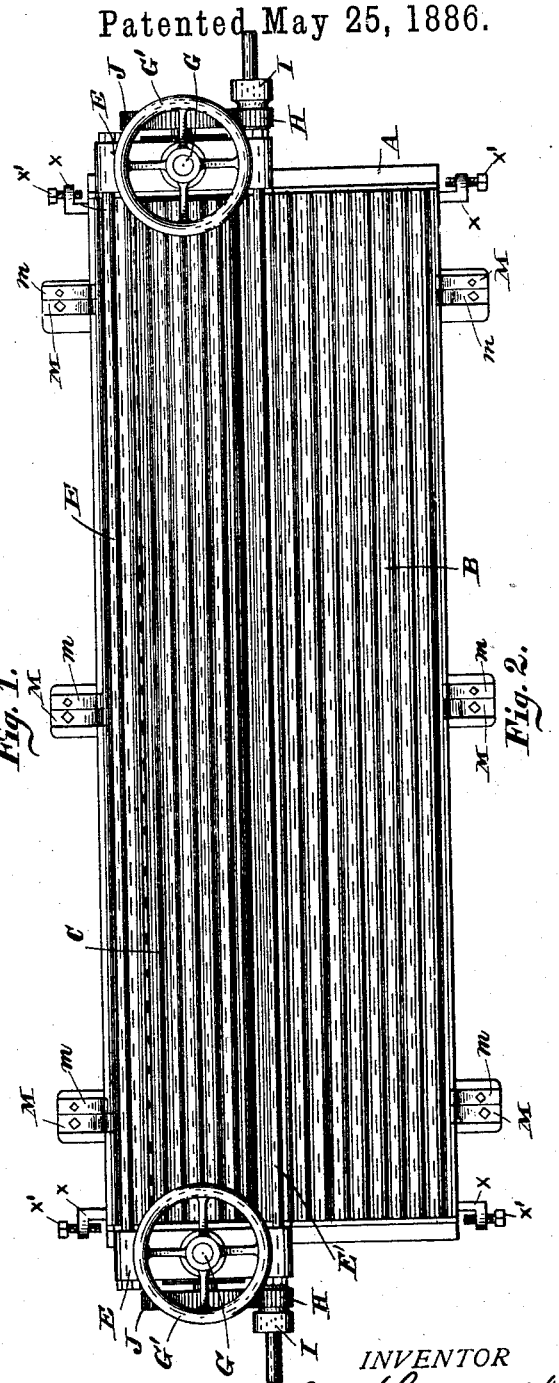

Fig. 2.

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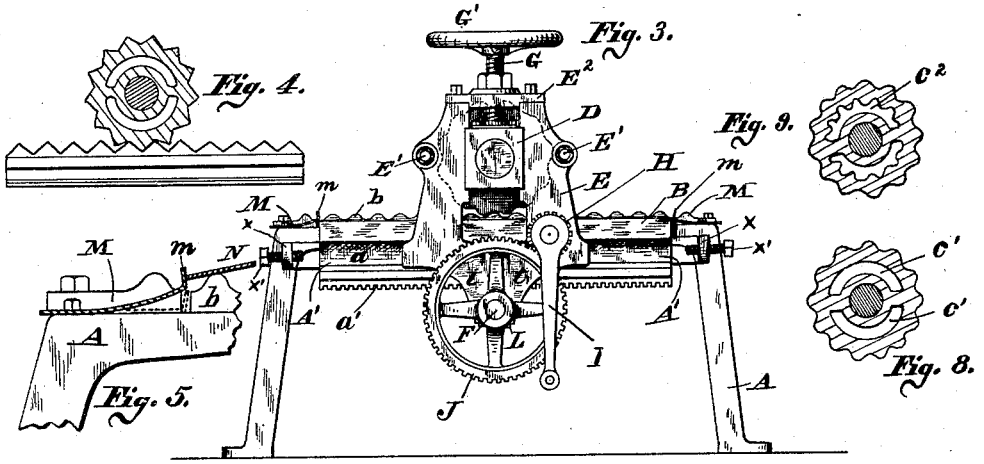

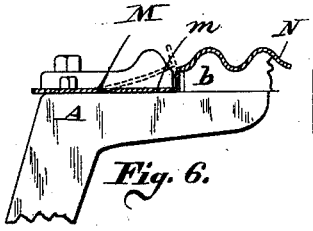

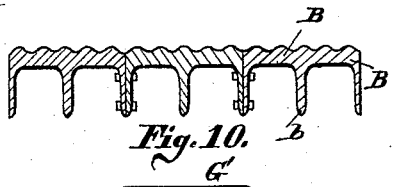

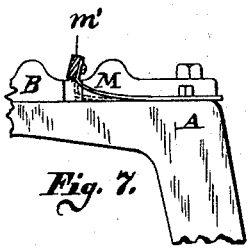

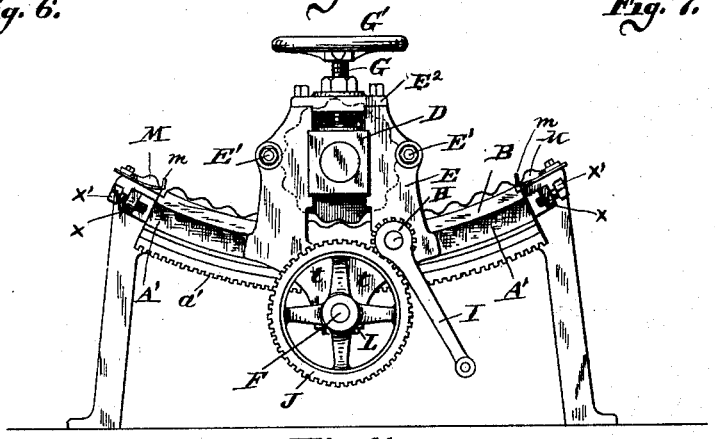

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(No Model.) 3 Sheets—Sheet 3.

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MACHINE FOR CORRUGATING SHEET METAL.

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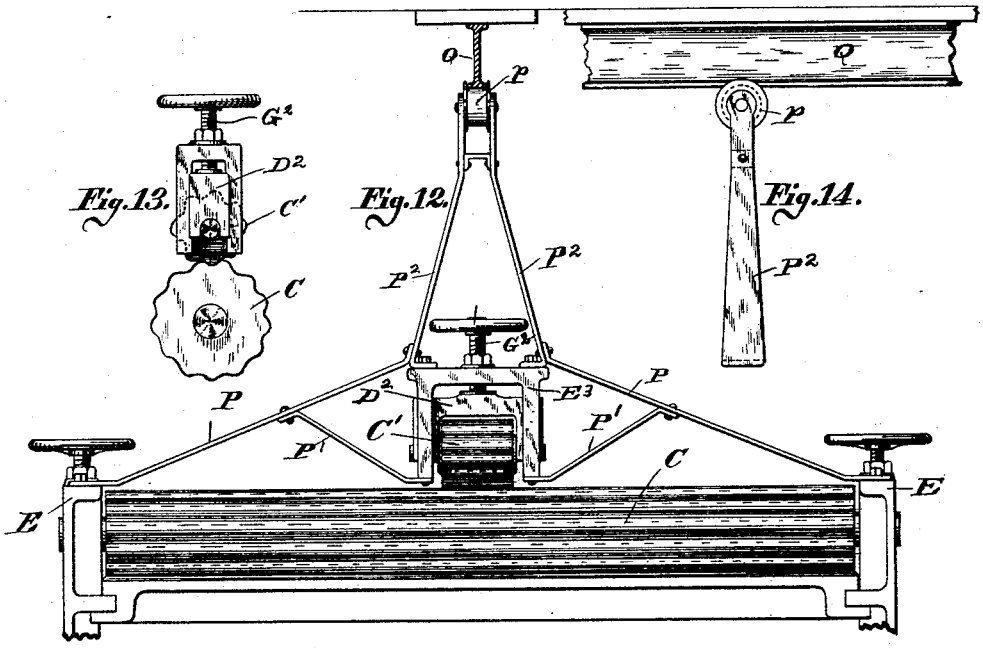

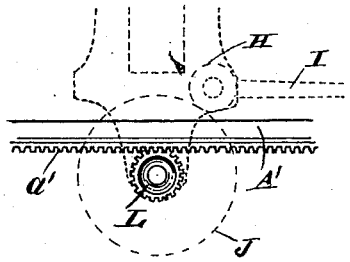

Fig. 15.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR CORRUGATING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 342,387, dated May 25, 1886.

Application filed September 3, 1885. Serial No. 176,117. (No model.)

To all whom it may concern:

Be it known that I, L. LEWIS SAGENDORPH, a resident of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Machines for Corrugating Sheet Metal, of which the following is a specification.

The various features of my invention and the various advantages arising from their use, singly or conjointly, will be apparent from the following specification.

Figure 1 is a front elevation of my improved machine. Fig. 2 is a top view of the machine. Fig. 3 is an end elevation. Fig. 4 shows one method of shaping the teeth on roller and plate for the purpose of making the corrugation. Fig. 5 shows the stop-spring when in position to stop the sheet of metal introduced into the machine. Fig. 6 shows the spring depressed and the first corrugations in the sheet of metal. Fig. 7 illustrates a modification in the stop-spring. Figs. 8 and 9 are cross-sections of rollers, showing different means of strengthening and lightening them. Fig. 10 shows in cross-section the preferred method of making the bed-plate. Fig. 11 is an end elevation of my machine as adapted to corrugated curved plates. Figs. 12, 13, and 14 illustrate an auxiliarly device for increasing the pressure on the bed-plate. Fig. 15 represents in side elevation the stationary toothed plate and the pinion, which is journaled in the side frame and engages said stationary toothed plate.

The bed-plate B is suitably supported—as, for illustration, on a frame, A. This bed-plate B is provided with corrugations *b*, extending from end to end of the machine. A long roller, C, with corrugations to fit those of the bed-plate B rests on this bed. These two parts—viz., the corrugated bed-plate and corrugated roller—with apparatus to keep the roller down on the bed, and means to roll the roller back and forth on the bed-plate, constitute the main features of the device. The ends of the roller C are held in journal-boxes D, which, for the purpose of adjusting the roller to and from the bed-plate B, are adjustable, and slide in the side frames, E, as shown in Fig. 3. Two heavy pieces, A′, one near or at each end of the frame, respectively project downward from their respective ends of the frame. In each of these projections is a groove, *a*, in which groove slides the tongue *e*, projecting from the adjacent side frame E. The under surface of each frame or piece E is provided with a toothed plate *a′*. The side frames, E, are, for the purpose of securing greater firmness, rigidity, and strength to the machine, joined to each other across the machine by the long rods E′ above the bed-plate, and also by the rod F below the bed-plate. These side frames, E, rest against the face of the end pieces, A′, and the tongues *e* respectively fit into their respective grooves *a*, which latter thus serve as guides. The top of frame E is completed by the yoke E², through which is screwed the screw G. The screw G is swiveled into the top of the journal-box D, and above is provided with an appropriate crank or wheel, G′. This mechanism raises or lowers the journal-boxes, and regulates the distance between the bed-plate and the roller.

Each frame E is provided with a downwardly-extending lug or flange or extension, *t*, and these extensions *t* respectively constitute the respective bearings or journal-supports of the rod or shaft F. The gear is alike on each side, and may be described as follows: The pinion H is centered on the frame E, and derives its motion from the crank I or a power-pulley. This pinion H meshes with the spur-wheel J, centered on the shaft F, which latter turns with this spur-wheel. Also centered on the shaft F and rotating with it is the pinion L. This pinion L meshes with the toothed plate *a′*. The action of this gear is to run the side frames, E, back and forth across the ends of the machine. In their excursions these frames carry with them the roller C, which latter, meshing with the corrugated bed-plate, corrugates any sheet metal which may be beneath it. It is convenient to have stops *x* on the ends of the frame A, as shown in Figs. 1, 3, and 11, to prevent the frames E running off the bed entirely.

For imparting facility for regulating the distance which the roller is to travel, each stop *x* is provided with a stop-screw, *x′*, which latter can be screwed toward or from the longitudinal center of the machine, as occasion demands, and the distance which the frame

and its roller C travels be regulated. In operation the roller is moved to one side of the machine. The piece of sheet metal to be corrugated is then laid on the bed-plate, and the roller moved over it and corrugating it. The corrugated plate is now removed and another plate put in, preferably from the opposite side.

The mechanism for regulating the distance between the bed-plate and roller allows of the corrugations in the sheet of metal being varied in depth. Thus, if the roller be raised, it does not sink so deeply between the corrugations in the bed-plate, and consequently makes only a wavy plate. It is easily understood that the depth of these corrugations can be varied to suit the operator.

In operating the machine it is convenient to have a guide or stop which shall insure the sheet of metal being properly placed on the bed-plate. A preferred description of mechanism for this purpose is as follows: At intervals on the frame A are placed flat springs M, which tend to raise and present their ends *m* above the surface of the bed-plate. Grooves in the bed-plate accommodate said springs.

Fig. 5 shows the plate of sheet metal, N, impinging against the ends of the springs. Sometimes I provide a strip, *m'*, (see Fig. 7,) which is attached to the ends of the springs M, and extends the entire length of the bed-plate, resting in a longitudinal groove therein when depressed. When the roller is started, it depresses the springs M and passes over them, as shown in Fig. 6.

In Figs. 12, 13, and 14 is illustrated a device whose use is to make pressure on the corrugating-roller at its center. Such central pressure on the roller, in certain cases, becomes desirable when the corrugating-roller is long, better results being obtained by having the pressure thus distributed. A frame-work, P P', which rests directly on the side frames, E E, extends over the roller C, and supports in the center of the machine a frame, E^3. The frame E carries the roller C', which meshes with the roller C. Some means must be adopted to exert pressure on the roller C', and this is preferably accomplished by having the roller C' journaled into the yoke D^2, which latter slides in the frame E^3, and has pressure made on it by the screw G^2, passing through the top of the frame E^3. Should the frame E^3 need to be steadied, vertical frame-work, as P^2, is employed. In the upper fork made by the pieces P^2 the roller *p* is carried. This latter bears against the surface of the T-rail Q, which is attached to the ceiling, and which forms a track, along which the roller travels. In operation this auxiliary device is carried back and forth with the roller C, and all the time the roller C' keeps up pressure on the center of the roller C.

Instead of the frame-work P P' P^2, a hog-chain may be stretched over the frame carrying the roller C', and be connected to the frames E E.

The bed-plate B is preferably made in segments, each segment being backed by heavy ribs *b*, and adjoining segments united by bolts passing through these ribs. This arrangement is well shown in section in Fig. 10.

It is unnecessary to cast the roller C of solid metal, and the preferred forms of making it are illustrated in section in Figs. 8 and 9. In Fig. 8 the inside hollow spaces, *c' c'*, are plain, but in Fig. 9 the spaces c^2 are corrugated, the projections corresponding to the projections on the outside, and intended to strengthen the roller at these points.

The modification shown in Fig. 11 is very useful. It differs from the device already described in but one particular, and that is in having a concave bed-plate, instead of a flat one. It corrugates and bends at the same time, and produces a much neater specimen of work than can be obtained by bending a sheet after it has been corrugated.

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

1. A corrugating-roller carried in sliding frames, substantially as and for the purposes specified.

2. The frame A and bed-plate B, provided with piece A', having groove *a*, and teeth *a'*, in combination with the corrugated roller C in the side frames, E, the latter provided with the tongues *e*, and gear-wheels H, J, and L, substantially as and for the purposes specified.

3. The combination of frame A, bed-plate B, corrugated roller C, and spring M, substantially as and for the purposes specified.

4. The combination of frame A, bed-plate B, corrugated roller C, and spring M, provided with strip *m'*, substantially as and for the purposes specified.

5. The corrugated roller with corrugations on its inner surface, as shown, substantially as and for the purposes specified.

6. The roller C, in combination with the roller C', frame-work P P', frame E^3, yoke D^2, screw G^2, frames P^2, roller *p*, and rail Q, substantially as and for the purposes specified.

7. The combination of the stationary corrugated bed-plate and stops *x*, provided with a stop-screw, *x'*, and the reciprocating corrugated roller, and the sliding frames E, substantially as and for the purposes specified.

8. A corrugated roller carried in sliding frames, in combination with a corrugated bed-plate, substantially as and for the purposes specified.

9. A corrugated roller carried in sliding frames, in combination with a curved corrugated bed-plate, substantially as and for the purposes specified.

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Attest:
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O. M. HILL.