(No Model.) 2 Sheets—Sheet 1.

L. L. SAGENDORPH.

ROOF SHEET CRIMPING MACHINE.

No. 306,645. Patented Oct. 14, 1884.

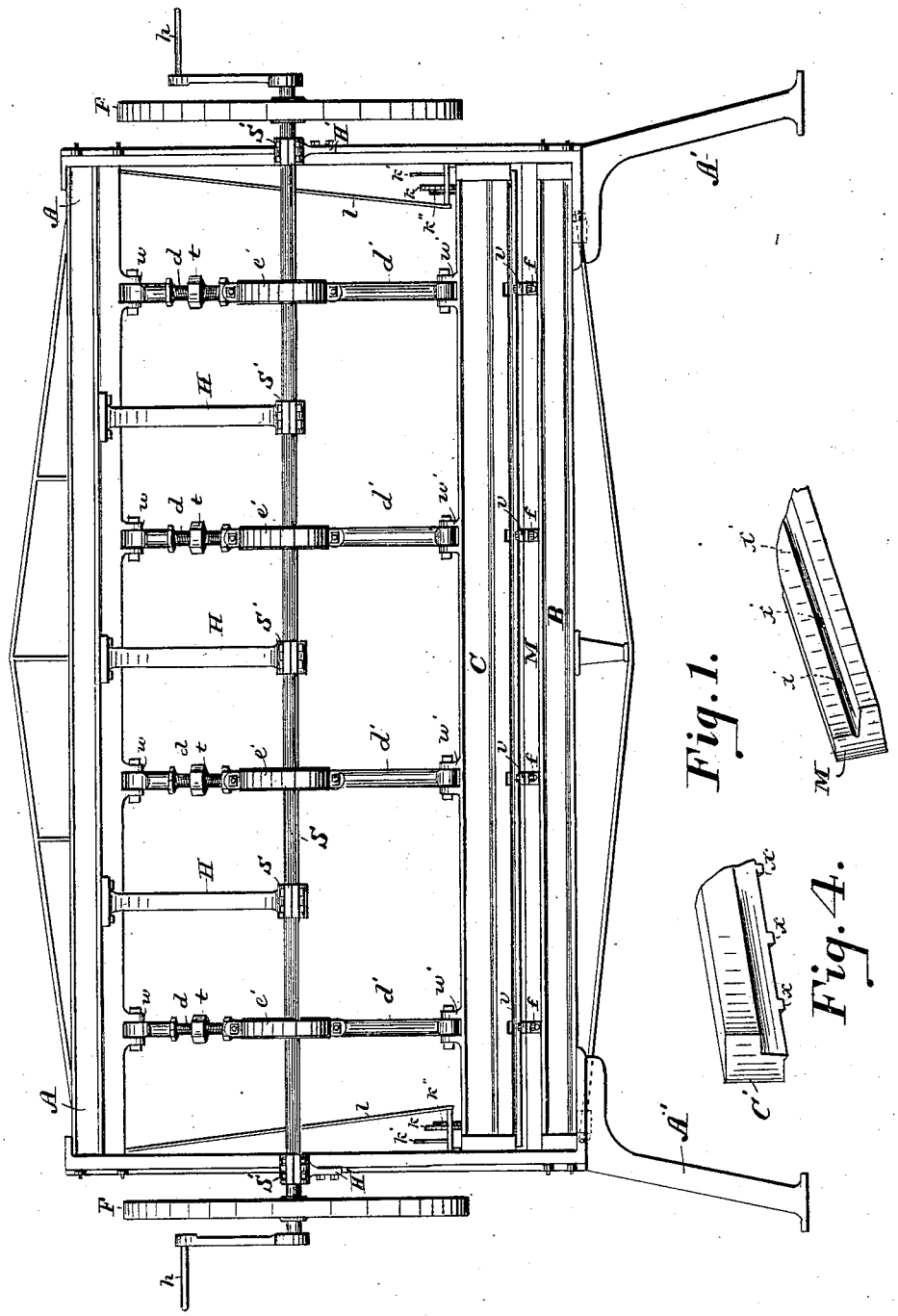

Fig. 1.

Fig. 4.

Attest:
Abram Hay
Charlie Kling

Inventor:
L. Lewis Sagendorph
per
L. McLeod Rhinehead
attys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

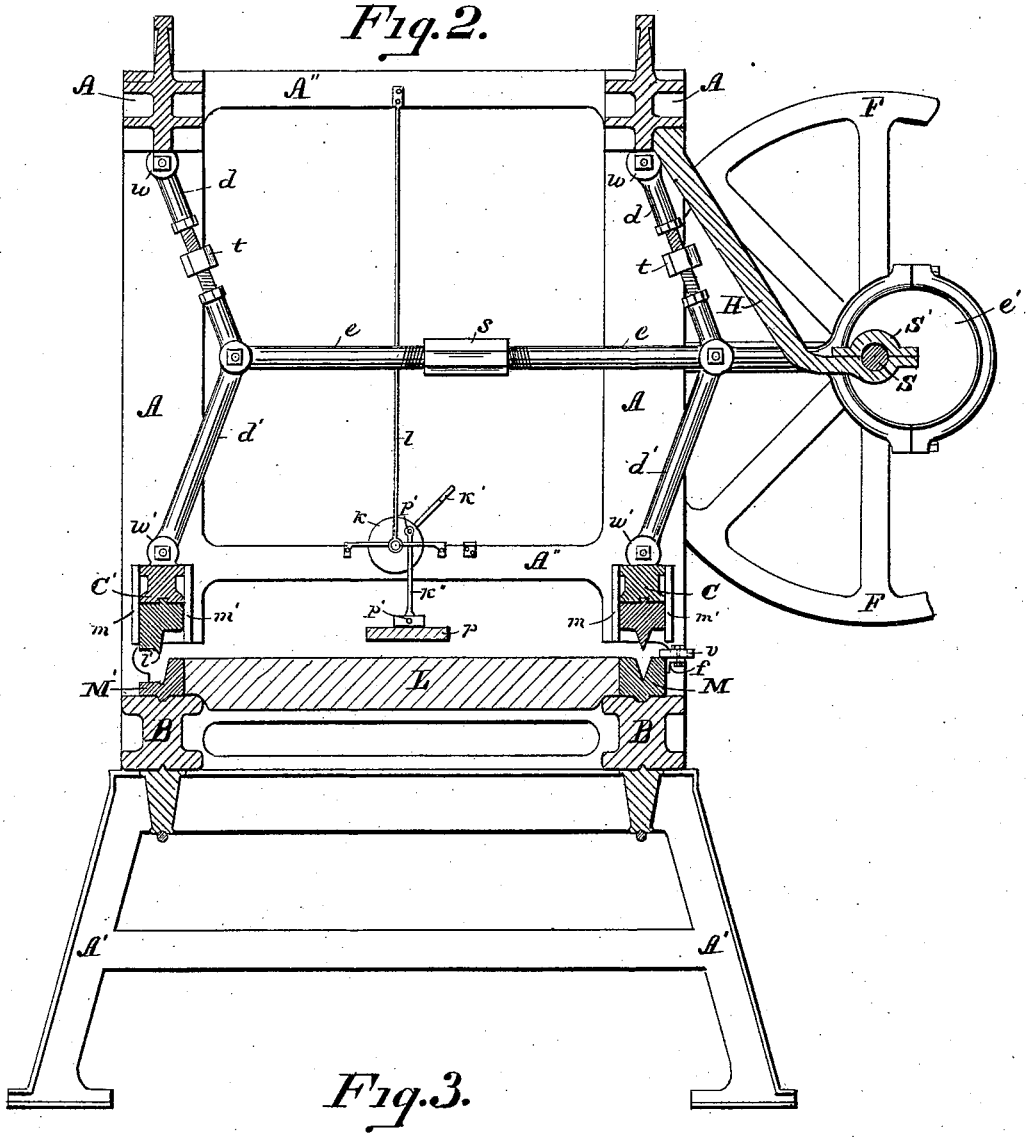

Fig. 3.

Attest:
Abram Thay
Charles King

Inventor:
L. Lewis Sagendorph
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UNITED STATES PATENT OFFICE.

L. LEWIS SAGENDOPH, OF CINCINNATI, OHIO.

ROOF-SHEET-CRIMPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,645, dated October 14, 1884.

Application filed August 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, L. LEWIS SAGENDOPH, a citizen of the United States, residing at Cincinnati, Ohio, have invented new and useful Improvements in Roof-Sheet-Crimping Machines, of which the following is a specification.

My invention relates to roof-sheet-crimping machines; and it consists in a construction and arrangement of parts whereby the economy and efficiency of the process are much increased by reason of the facility of operation of the machine with a minimum of labor.

Heretofore in machines of this class the operation of bending was performed by inserting the sheet to be bent at one side, and after the bending was performed on that side withdrawing it and reinserting it reversed, to be crimped on the other edge, which was expensive and caused a great loss of time. I provide means for inserting the sheets at one end, and whereby they can be put in position between proper guides, crimped, and removed at one operation, with the minimum expenditure of time and labor.

Mechanism embodying my improvements is shown in the accompanying drawings, in which Figure 1 is a side elevation of a machine complete. Fig. 2 is a vertical cross-section near the center. Fig. 3 is a vertical cross-section of a crimped sheet. Fig. 4 shows a modified die and die-seat.

Similar letters denote similar parts.

The principal constructive parts are an upper frame-work, A, mounted on suitable supports, A′, provided with longitudinal sills B, in which are recessed the die-seats M M′, formed to the contour of and adapted to receive the vertically-reciprocating dies C C′, actuated by toggle-jointed levers. The latter consist of arms *d*, pivoted above to the top sills of the framing by ears *w* and arms *d′*, pivoted to the dies below by ears *w′*. The arms are further connected at an intermediate point by pivots *b*, to which are also attached the horizontal actuating-arms *e*.

The arms *d* and *e* are provided with adjustable sleeve-nuts *t* and *s*, whereby the arms may be lengthened or shortened, according to the demands of use.

The actuating-arms *e* extend beyond the side of the upper frame, A, where they engage with eccentrics *e′*, secured to a shaft, S, journaled in bearings S′, secured to the upper frame, A, by suitable hangers, H, and by supporting-brackets H′ at either end.

The upper longitudinal sills are bridged and the lower ones trussed in the ordinary manner to resist the downward and upward thrust given the frame during the operation of the machine.

The shaft S is extended longitudinally beyond the frame-work A, and fly-wheels F mounted thereon at either end, suitable manipulating-cranks, *h*, or other means being provided to turn the shaft and operate the mechanism.

The dies C C′ slide vertically in guides *m m′* in the end uprights of the upper frame, consisting of inwardly-projecting lugs or ribs. The face of the dies may be of any contour desired, and provided with steel shoes dovetailed or otherwise fastened therein.

The die-seats M M′ are of cast steel or iron, adapted to the contour of die used, and rest on the trussed sills B, secured thereto, and extend throughout the whole length of the frame, and are open at their ends to allow insertion and withdrawal of the sheets to be crimped.

A floor or bed plate, preferably of wood to secure lightness and economy of construction, forms a flat level surface between the die-seats on either side, on which the plate to be crimped is placed.

Braces A″ connect the uprights of the upper frame at either end below, and others (not shown) at as many intermediate points in the length at the top as may be desired, to secure strength and stiffness to the frame. The lower braces, A″, are cut away at each end where they join the uprights, to allow lateral space for the easy insertion of the roof-sheets at one end and similar withdrawal at the other end, so that with one man to feed and another to withdraw the crimped sheets the operation is made rapid and continuous with but little labor.

To the lower braces, A″, at each end of the machine, centrally, are journaled rotating crank-plates *k*, said plates carrying eccentrically-pivoted suspending-links *k″*, and being provided with manipulating-handles *k′*; said links support below a plank, *p*, by pivotal connections, said plank extending centrally over the bed-plate of the machine between the dies.

The crank-plate shaft has its bearings at one end in the brace A″ and at the other in a tri-

angular bracket formed by two horizontal arms attached to the end braces, A″, and a rod, *l*, extending to the top brace of the end frame. The plank ordinarily rests on the bed-plate L, but is adapted by the connections just described to bring a varying pressure upon the metal sheet resting on the bed-plate by moving and setting the handle *k′* in any desired position.

The lengths of the toggle-joint arms in practice are adjusted to make the die C engage its die-seat M slightly in advance of the die C′, the difference being about a quarter of an inch. This is done to avoid tearing the sheet to be crimped, which might occur should both dies engage at the same instant. Adjustable gages *v*, to determine the position of the sheets with reference to the dies, are provided at convenient intervals. These rest upon the upper surface of the die-seat M, supported by brackets *f*, fastened to the sides of the die-seat, the outer shoulder of the upper die being recessed, as shown, to pass over the gages when extended, so as not to interfere with the full stroke of the dies. They are adjustable by means of a slot and set-screw therein, and can be moved on their supporting-brackets from or toward the V-shaped shoe of the die C, thus determining the length of the outer leg of the crimp produced in that edge of the sheet by varying the distance from point of die to edge of sheet. The operation of the machine in producing crimped sheets is as follows:

A sheet of the proper width, plain or corrugated, being inserted at one end, is slid through the machine upon the bed-plate, the plank *p* being previously raised to allow it to be done. It is further brought with one edge resting against the gages *v* along its length, which have been adjusted to produce the desired V-crimp at that edge. The arm *k′* being turned down horizontally brings the weight of the plank on the sheet, holding it in position. On turning the shaft S by the handles *h*, or otherwise, the eccentrics *e′* impart a horizontal reciprocating motion to arms *e*, which, by the described arrangement of toggle-joint arms *d d′* on their pivots *b*, move the dies C C′ vertically in their guides. The roof-sheet lying on the bed-plate L is bent at its edge, first by the die C, held in place by the plank *p* resting on it, the outer edge lying along the gages *v*. The outer edge, being free to move, is retracted into the die-seat as the die descends, until when the latter has reached the bottom the outer leg of the V-crimp extends nearly to or over upon the top of the die-seat, as determined by the gage-stops, making what I call a "full V-crimp." The die C′ meanwhile engages and at the same operation similarly bends the other edge into what I term a "half V-crimp."

I may provide a projecting teat, *l′*, on the shoe and a corresponding depression in the die-seat to give a rounded edge to the crimp; or, as shown in Fig. 4, I may provide pointed projecting lugs *x* to cut or pierce slits in the curved edge, adapting the sheets to be used with various kinds of cleat or anchors. In such cases the die-seat is suitably provided with depressions *x′* at the intervals corresponding to the projecting lugs upon the die.

Fig. 3 illustrates the sheet as ordinarily crimped by the machine.

I consider that any form of crimp produced by the herein-described or equivalent mechanism is within my invention, and I do not confine myself to the particular forms of die and die-seat described.

My invention is in the application of the principle of a sheet-crimping machine adapted to crimp the edges of metallic roofing-sheets, plain or corrugated, with any form of crimp, by inserting and withdrawing them at the ends, in connection with gage-stops for regulating the amount of crimp and preserving its parallelism to the edge of the sheet.

I claim as new and desire to secure by Letters Patent of the United States—

1. In a roof-sheet-bending machine, eccentrics *e′*, mounted on a shaft, S, at one side, in combination with horizontal reciprocating arms *e* and adjustable arms *d d′*, pivoted to a toggle-joint adapted to reciprocate vertically the dies C C′, and the dies C C′, substantially as and for the purpose specified.

2. In a roof-sheet-bending machine, the combination of a bed-plate, L, and die-seats M M′, adapted to receive the sheets at one end and permit withdrawal at the other, and reciprocating dies C C′, substantially as set forth.

3. The combination of regulating-weight *p*, dies C C′, and die-seats M M′, as and for the purpose described.

4. In roof-sheet-crimping machines, dies C C′ and die-seats M M′, in combination with adjustable stops *v*, to regulate the outer leg of a crimp, substantially as described.

5. The combination, in a sheet-crimping machine for roofing purposes, of reciprocating dies C C′, moving in guides *m m′*, die-seats M M′, adapted to receive the dies, adjustable weight *p*, suspended from the frame-work, as described, and adjustable stops *v*, adapted to regulate the outer leg of a crimp, substantially as described.

6. The herein-described arrangement of containing-frame A, shaft S carrying eccentrics *e′*, horizontal reciprocating arms *e*, toggle-joint arms *d d′*, dies C C′, die-seats M M′, bed-plate L, adapted to allow insertion and withdrawal of sheets at the ends, adjustable weight *p*, and regulating-stops *v*, the whole combined, arranged, and operating substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

L. LEWIS SAGENDOPH.

Witnesses:
R. M. HOSEA,
ABRAM MAY.

Correction in Letters Patent No. 306,645.

Affidavit having been filed showing that the name of the patentee of Letters Patent No. 306,645, granted October 14, 1884, for an improvement in "Roof-Sheet-Crimping Machines," should have been written and printed *L. Lewis Sagendorph* instead of "L. Lewis Sagendoph," it is hereby certified that the said Letters Patent should be read with this correction therein to make it conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 18th day of November, A. D. 1884.

[SEAL.]

M. L. JOSLYN,
Acting Secretary of the Interior.

Countersigned:

BENJ. BUTTERWORTH,
Commissioner of Patents.