(No Model.) 4 Sheets—Sheet 1.

L. L. SAGENDORPH.

MACHINE FOR MAKING METALLIC WEATHER BOARDING.

No. 362,117. Patented May 3, 1887.

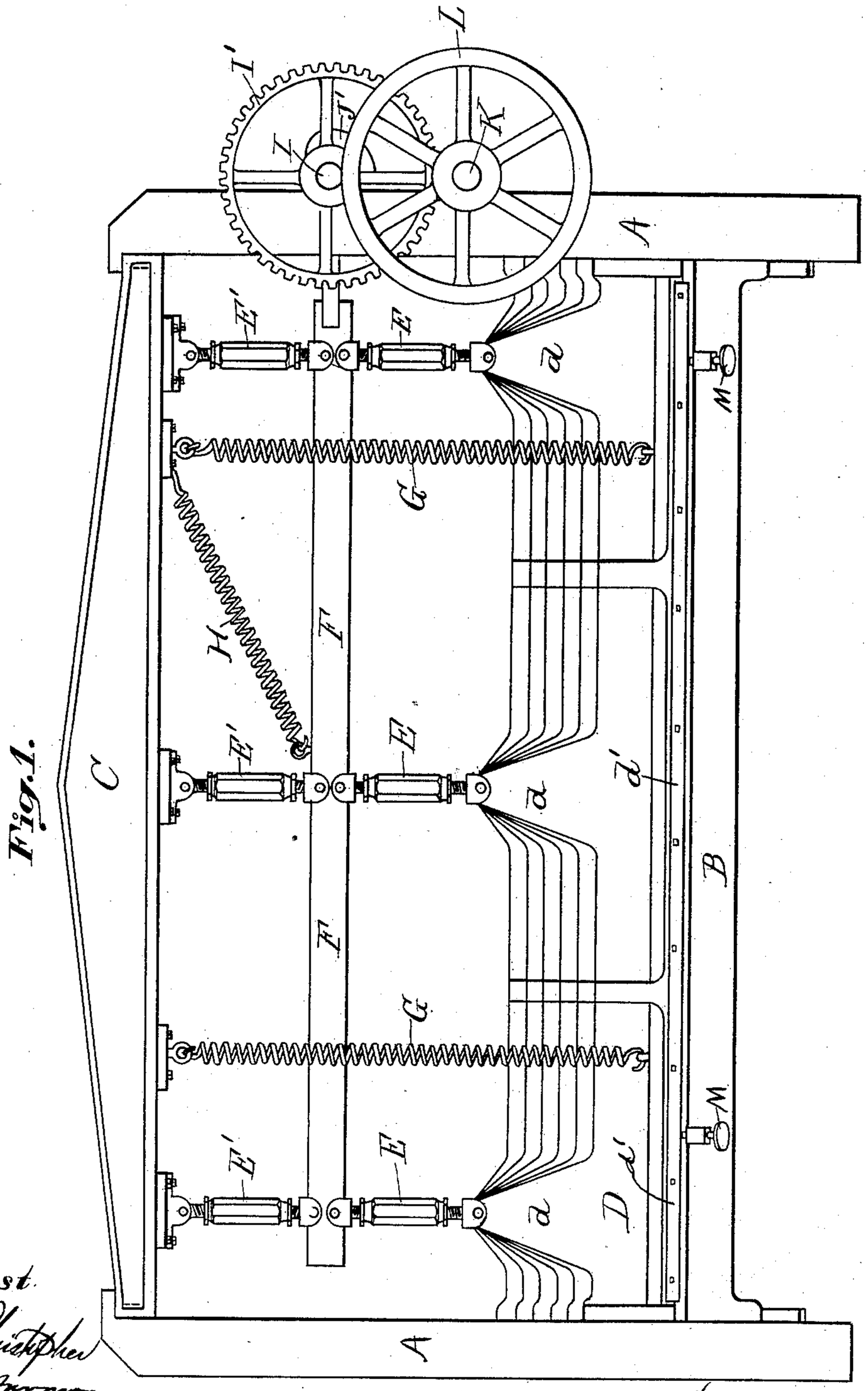

Fig. 1.

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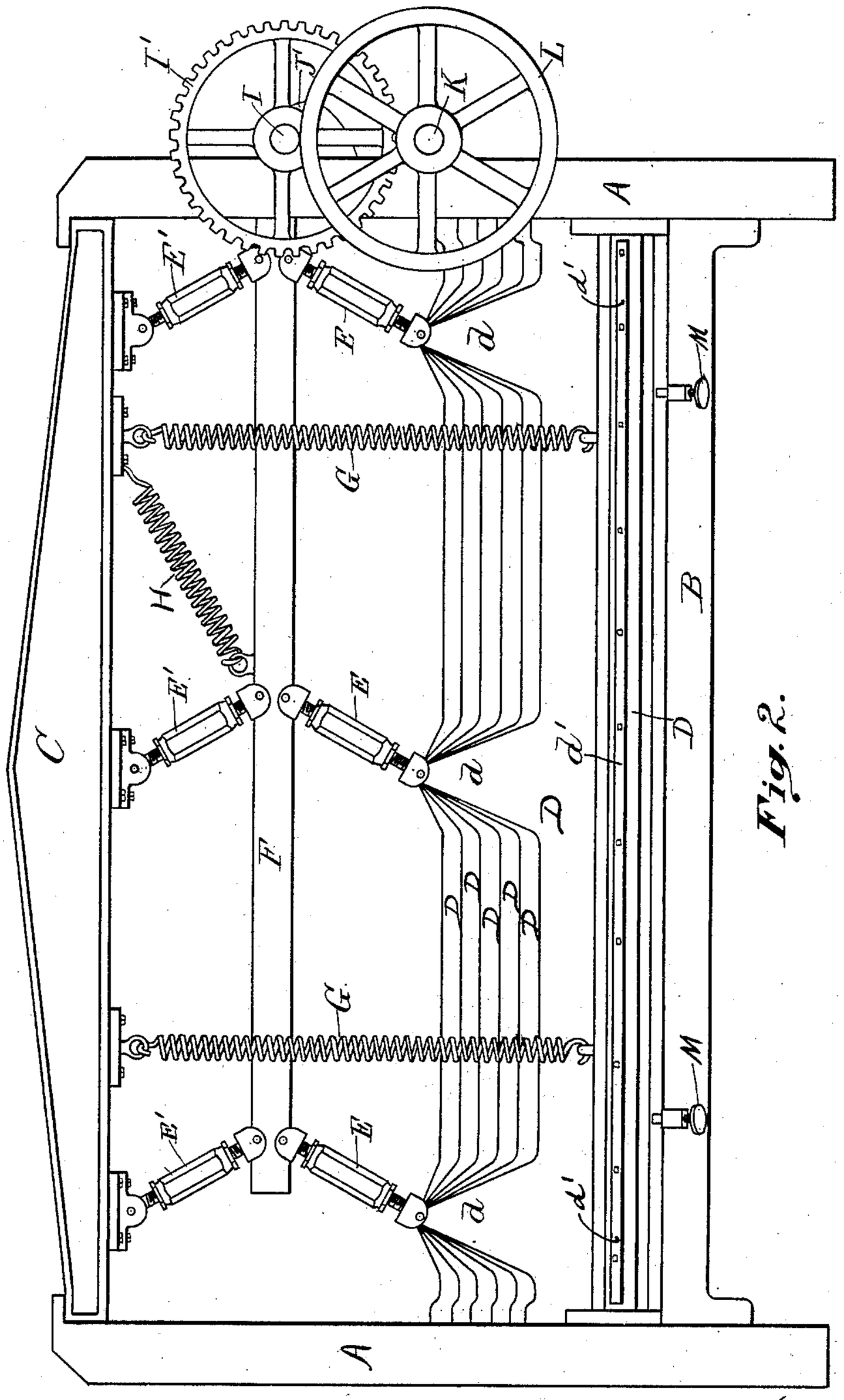

Fig. 2.

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(No Model.)

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Fig. 3.

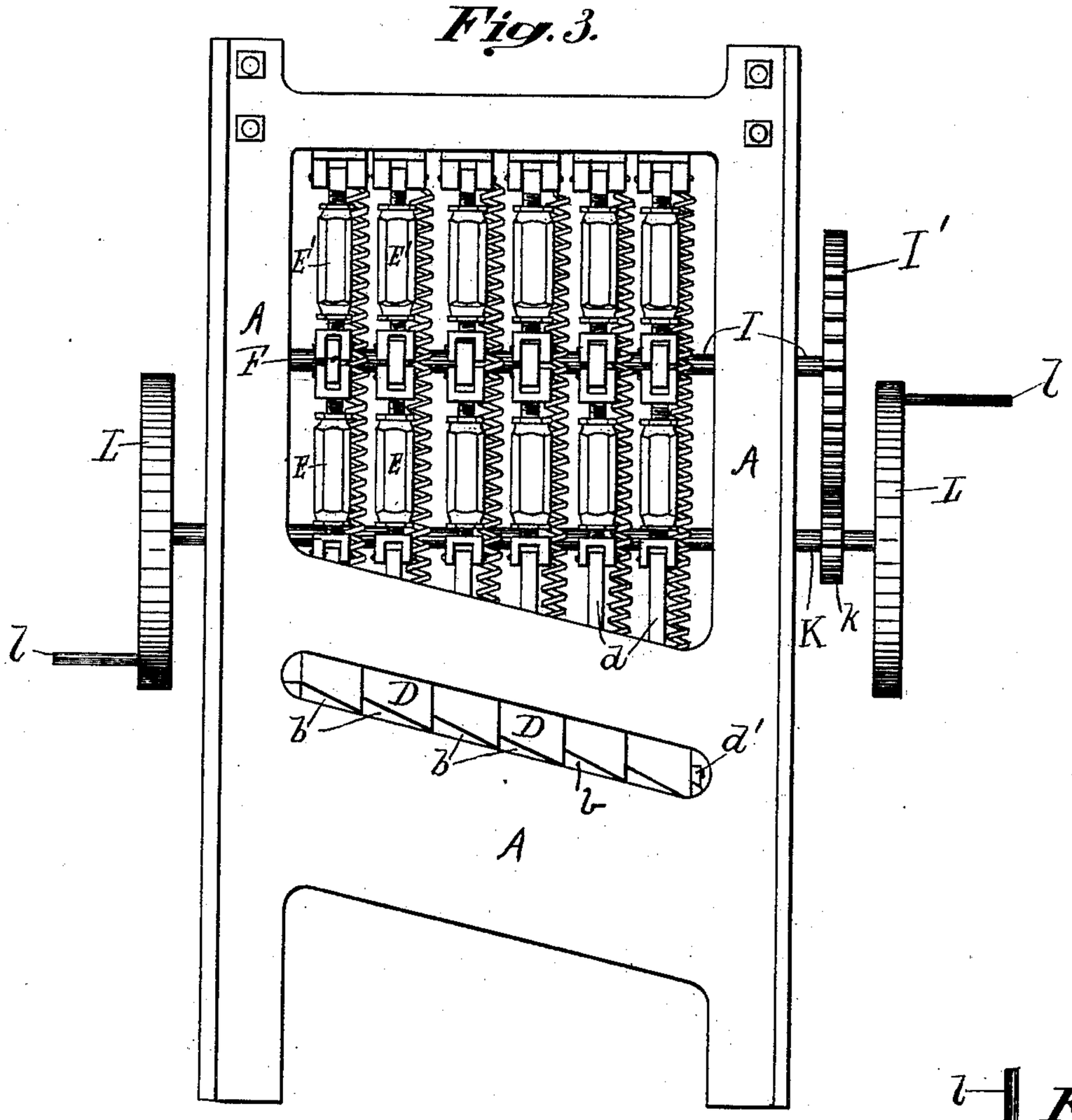


Fig. 5.

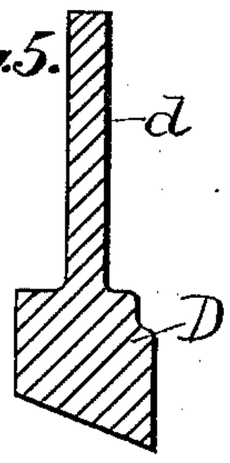
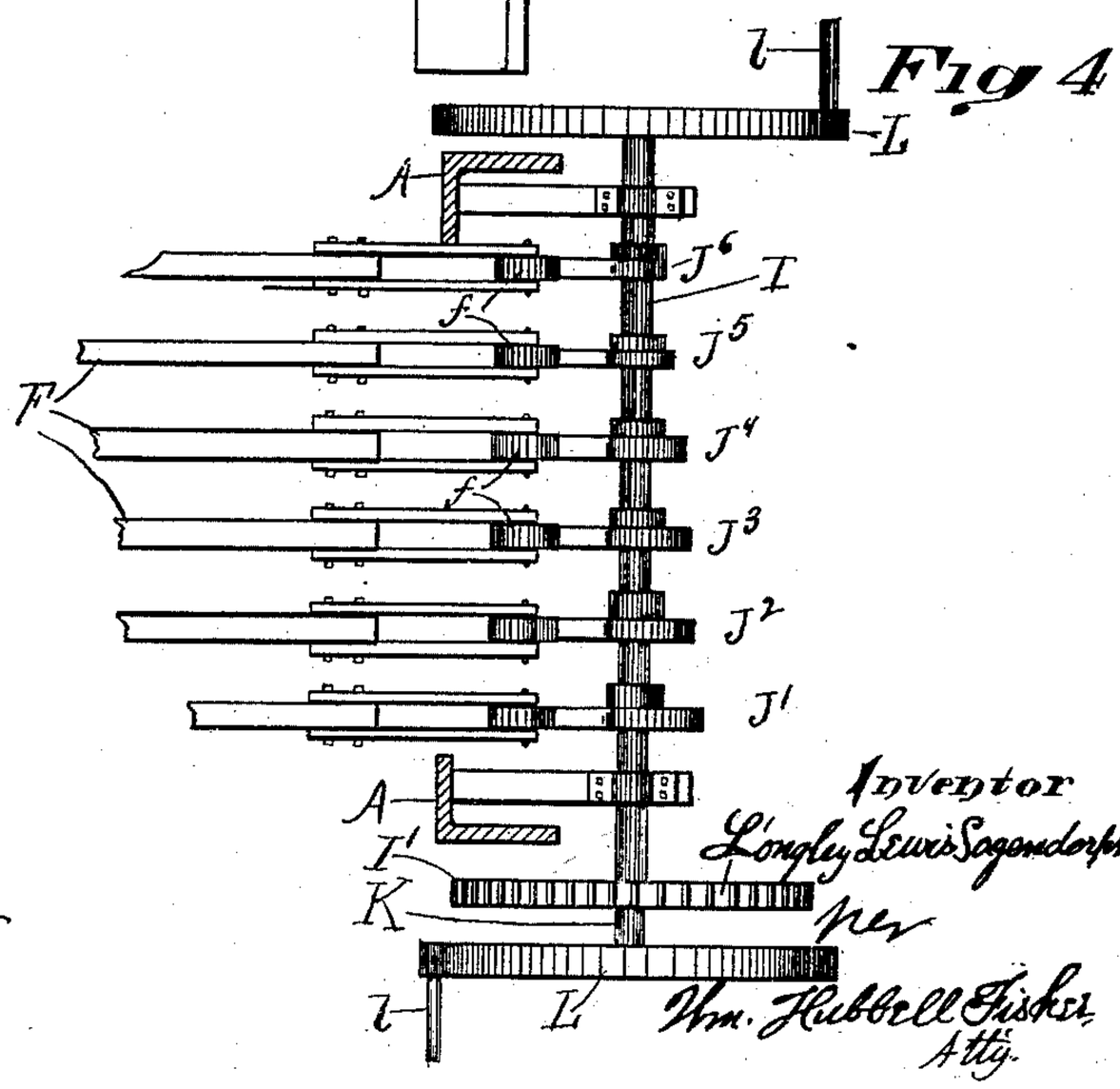


Fig 4



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(No Model.) 4 Sheets—Sheet 4.

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MACHINE FOR MAKING METALLIC WEATHER BOARDING.

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Fig. 6.

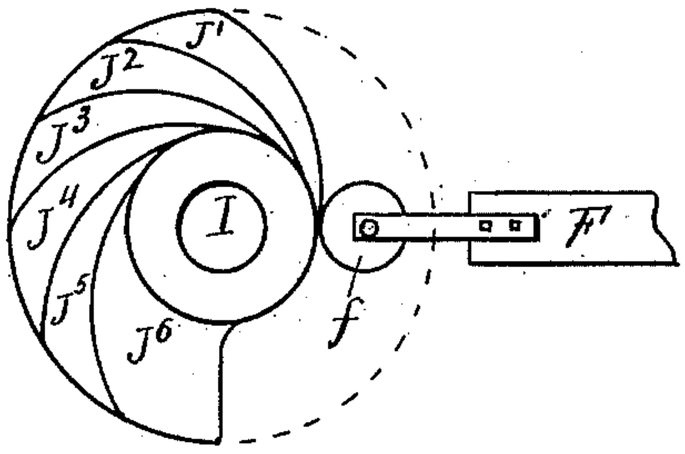
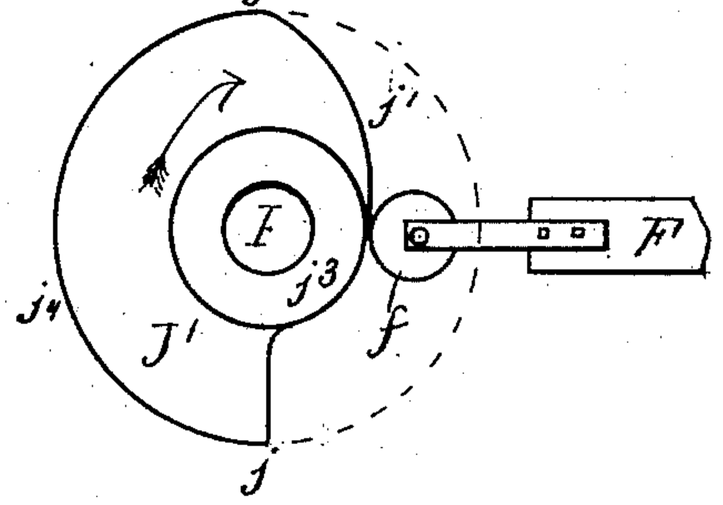


Fig. 7.



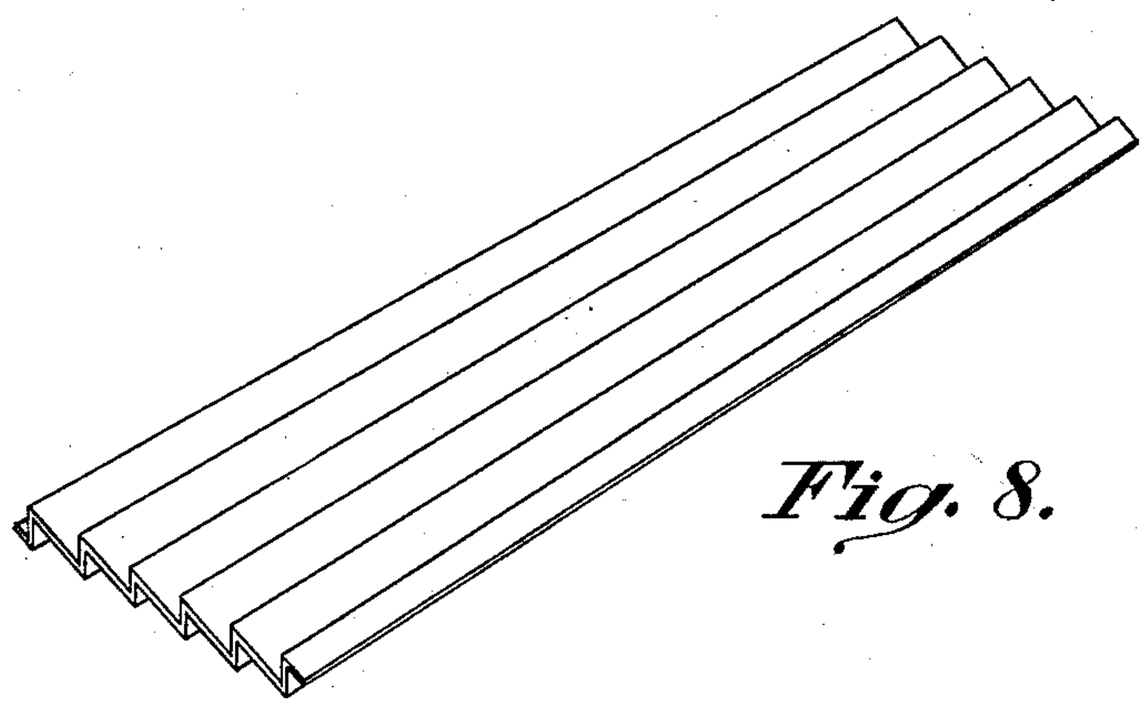


Fig. 8.

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UNITED STATES PATENT OFFICE.

LONGLEY LEWIS SAGENDORPH, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO HARLAN P. LLOYD, OF SAME PLACE.

MACHINE FOR MAKING METALLIC WEATHER-BOARDING.

SPECIFICATION forming part of Letters Patent No. 362,117, dated May 3, 1887.

Application filed July 6, 1886. Serial No. 207,180. (No model.)

To all whom it may concern:

Be it known that I, LONGLEY LEWIS SAGENDORPH, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Machines for Making Metallic Weather-Boarding or Clapboarding, of which the following is a specification.

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

In the accompanying drawings, Figure 1 is a front elevation of the machine with the dies down. Fig. 2 is a front elevation of the machine with the dies raised. Fig. 3 is an elevation of the left-hand end of the machine, as shown in Fig. 1. Fig. 4 is a top view of the right-hand end of the machine, as shown in Fig. 1, the top being removed. Fig. 5 is a central vertical section of one of the dies. Fig. 6 is an elevation of the series of cams, taken from the rear of the machine. Fig. 7 is an elevation of the front cam, looking from the rear of the machine. Fig. 8 is a perspective view of a sheet of metal weather-boarding produced by my machine.

The machine is supported on a frame-work consisting of the end pieces, A, united by cross-pieces C at the top and the bed-plate B at the bottom. The upper surface of the bed-plate B is provided with parallel angular ridges *b*, which extend across the entire width of the machine. The shape of the top of the bed-plate is the same as the shape of the product of the machine—a sheet of metallic weather-boarding or clapboarding, as shown in Fig. 8.

The machine is provided with dies D, preferably five or six, being one less than the number of ridges *b*. The dies lie in juxtaposition and extend entirely across the machine, their ends bearing against the end pieces, A, which form the guides for the dies. The lower face of each die is made to fit in one of the grooves between two adjacent ridges, *b*. The front die is provided with a lip, *d'*, which fits over the first ridge, *b*, as shown in Fig. 3. Each die is separately provided with means for raising and lowering it. Each die is provided with one or more—preferably three—upwardly-projecting shanks, *d*. These shanks are preferably arranged so that the top of all the shanks of all the dies lie in the same horizontal plane. Over each die is a horizontal bar, F, which is hung from the top of the machine by a series of short connecting-bars, E', which are pivoted to the top of the machine, and also to the bar F. Similar connecting-bars, E, attach the horizontal bar F to the shanks *d*. There is provided for each die a series of springs, G, attached to the die below and to the top of the machine above whose tendency is to raise the dies. There is also provided for each horizontal bar F a spring, H, which is attached to the bar F and to some part of the frame of the machine, preferably the top, which is to the right of its attachment on the bar F, as shown in Figs. 1 and 2. These springs draw the bars F to the right and keep them against the faces of their respective cams, to be described presently.

The combined actions of the springs H and G are to draw the bars F to the right and to raise the dies D. The right-hand end of each bar F is provided with a roller, *f*, preferably supported as shown in Fig. 3. The cam-shaft I extends across the right-hand end of the machine, as shown in Figs. 1 and 2, and is supported there in appropriate brackets. This shaft I carries a series of cams, J' J^2 J^3, &c., one for each bar F.

The cam J' is shown in Fig. 7. The part j^4 of the face of this cam is a periphery of a circle, whose center coincides with the center of the shaft on which the cam is mounted. At the point *j* the face of the cam lies in a radius of the circle and extends in to the hub j^3 of the cam. The circular periphery of the hub j^3 forms the face of the cam for about a quarter of a circle, and the rest of the face of the cam is made up by the part *j'*, a gentle curve extending from the edge of the hub j^3 to the point j^2. In the first cam, J', the part j^4 preferably extends through a semi-circumference. In each succeeding cam, however, the part j^4 is shorter—that is, in each cam the part j^4 is shorter than in the cam preceding it and longer than in the cam following it. The cams are arranged upon the shaft I so that the points *j*

of all the cams lie in the same radial plane of the shaft.

Fig. 6 is an elevation of the whole series of cams, taken from the rear of the machine, and showing the projection of each cam on the one preceding it.

Any suitable mechanism may be adopted for operating the cam-shaft, a preferred form being shown in Figs. 1, 2, and 3. One end of the shaft I is provided with a spur-wheel, I′, which meshes with a pinion, *k*, on a counter-shaft, K. The counter-shaft K is provided with one or two crank-wheels, L, each having a handle, *l*. On the front of the bed-plate B two adjustable stops, M, are placed.

The connecting-rods E E′ are made adjustable in length, and the preferred means of accomplishing this is by a right and left hand screw, as shown in Figs. 1 and 2. The rods E, attached to one of the dies, and the rods E′, corresponding thereto, constitute the links of a series of toggle-levers. For convenience, the proximate ends of these levers are pivoted to the bar F. The movement of the bar F in the general direction of its length will straighten or flex this joint, and thus depress or raise the die.

The mode of operation is as follows: Starting with the dies raised, as shown in Fig. 2, the plate of sheet metal to be shaped is placed on the bed-plate B, with its front edge against the stops M. The cranks L are now turned, so as to move the crank-shaft in the direction of the arrow in Fig. 7. The cams at starting are in the positions shown in Fig. 6 with reference to the horizontal bars F, and the latter are in the positions shown in Fig. 2. As the cam-shaft rotates, the first cam, J′, strikes against the roller *f* of its bar F, and gradually moves this bar to the left until the point j^2 of the cam rests against the roller *f*. When this point is reached, the bar F remains stationary until the point *j* of the cam has passed the roller *f*, when the springs G and H, attached to this particular bar F, comes into play and throws the bar F suddenly to the right, so that its roller *f* rests against the periphery of the hub of the cam. By reference to Figs. 1 and 2 it will be seen that as the bar F is moved to the left it gradually lowers the die D, attached to it, and when it has reached the position shown in Fig. 1 it has descended far enough to press the sheet of metal onto the first ridge *b* of the bed-plate. As the bar F moves to the right the springs G raise the die D. Now, by reference to Fig. 6, it will be seen that the dies, commencing with the first, are made to descend in regular order one after the other. As each additional fold in the sheet of metal is produced the width of the sheet—that is, from front to rear of the machine as it lies on the bed-plate—is lessened. If the dies should all descend at once, the sheet would not have an opportunity to shorten, and would in consequence be torn. The points *j* of all the cams pass the rollers *f* at the same time, and consequently the dies are all released at once and are raised together. The shaped sheet of metal is now removed and a new sheet of metal inserted, and the operations just described are again repeated.

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

1. In a metal-bending machine of the character described, the combination, with the bed-plate having parallel ridges, of the dies D, one less in number than the ridges on the bed-plate, the front die provided with a lip which fits over the front ridge of the bed-plate, and a series of cam mechanisms, substantially as described, whereby the front die is first depressed to form and retain the edge of the strip operated on and the dies toward the rear are depressed in succession, substantially as described.

2. The combination, in a metal-bending machine, of a bed-plate having a series of ribs, a series of dies above the same, and a set of connecting-bars, E E′, attached, respectively, to the frame and to the dies, each bar E E′ being extensible in length, the horizontal bar pivoted to the adjacent ends of bars E E′ of each set, and mechanism for actuating bar F in the direction of its length, substantially as described.

3. The combination, with the bed-plate having the series of ribs, of a series of dies, each die connected to the frame by a series of independently-extensible bars constituting toggle-levers, a longitudinal bar connecting the joints of the toggle-levers of each set, a spring connected to each die and to the frame for lifting the dies, a spring connected to each longitudinal bar and to the frame for withdrawing said bars and flexing the toggle-joints, and a series of cams arranged, as described, to actuate the longitudinal bars successively, but to permit their return simultaneously, substantially as described.

LONGLEY LEWIS SAGENDORPH.

Witnesses:
O. M. HILL,
W. P. GULICK.