

(No Model.)

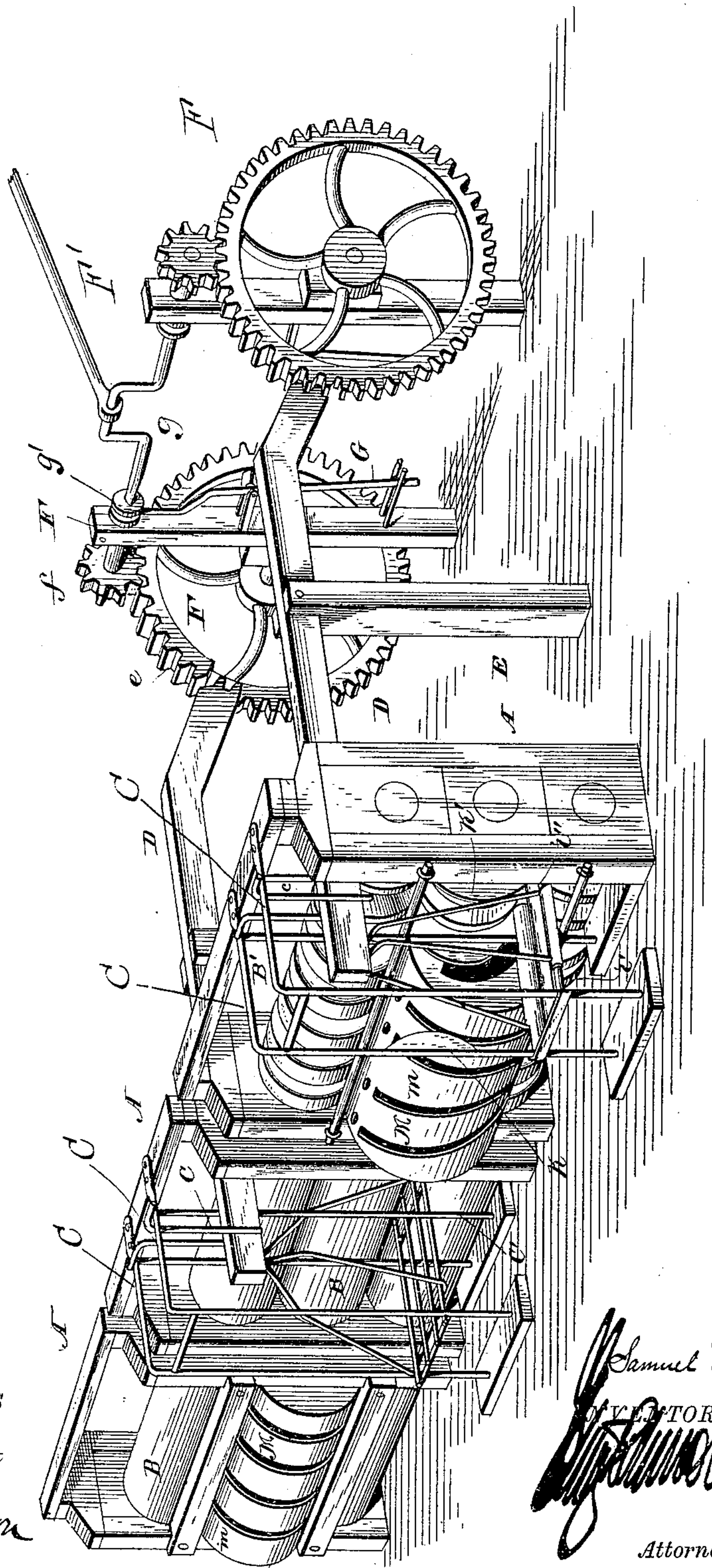
2 Sheets—Sheet 1.

S. DUFF.
ROLLING MILL.

No. 354,110.

Patented Dec. 14, 1886.

Fig. 1.



WITNESSES

G. S. Elliott
Ed. Johnson

Samuel Duff.

INVENTOR

Attorney

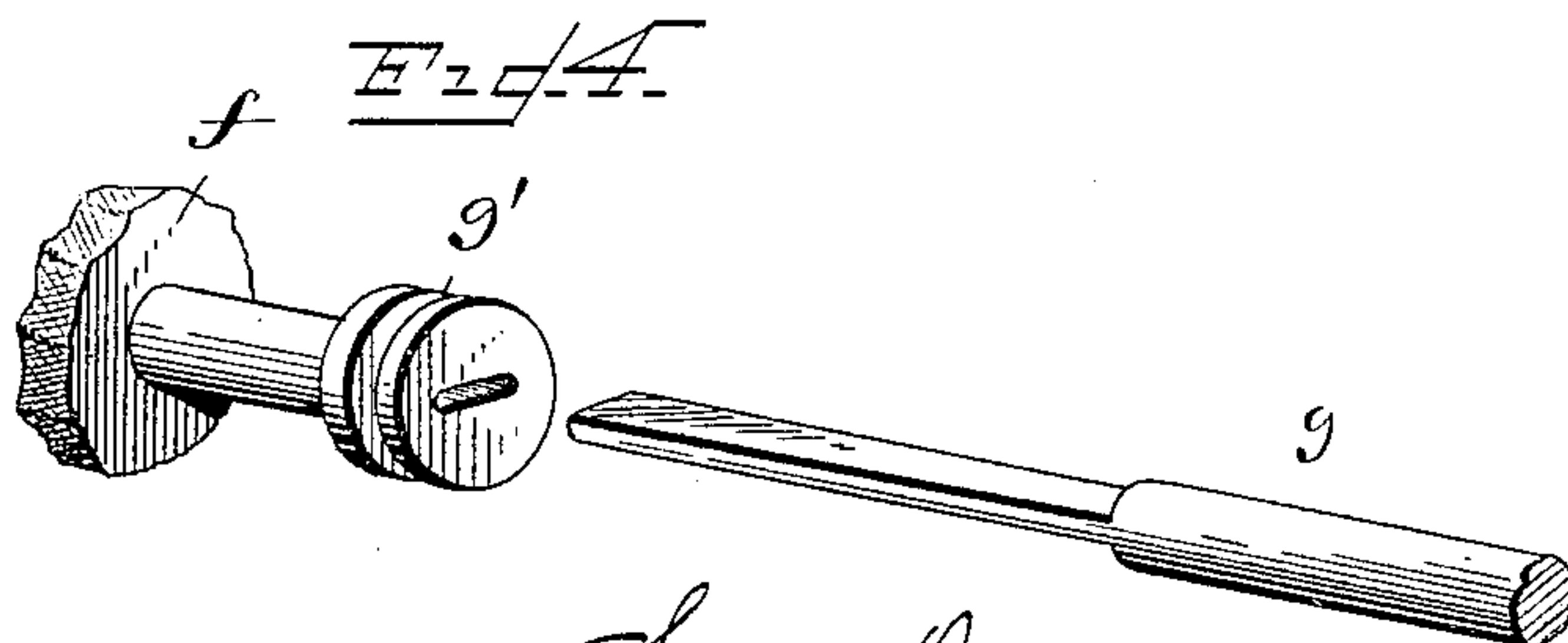
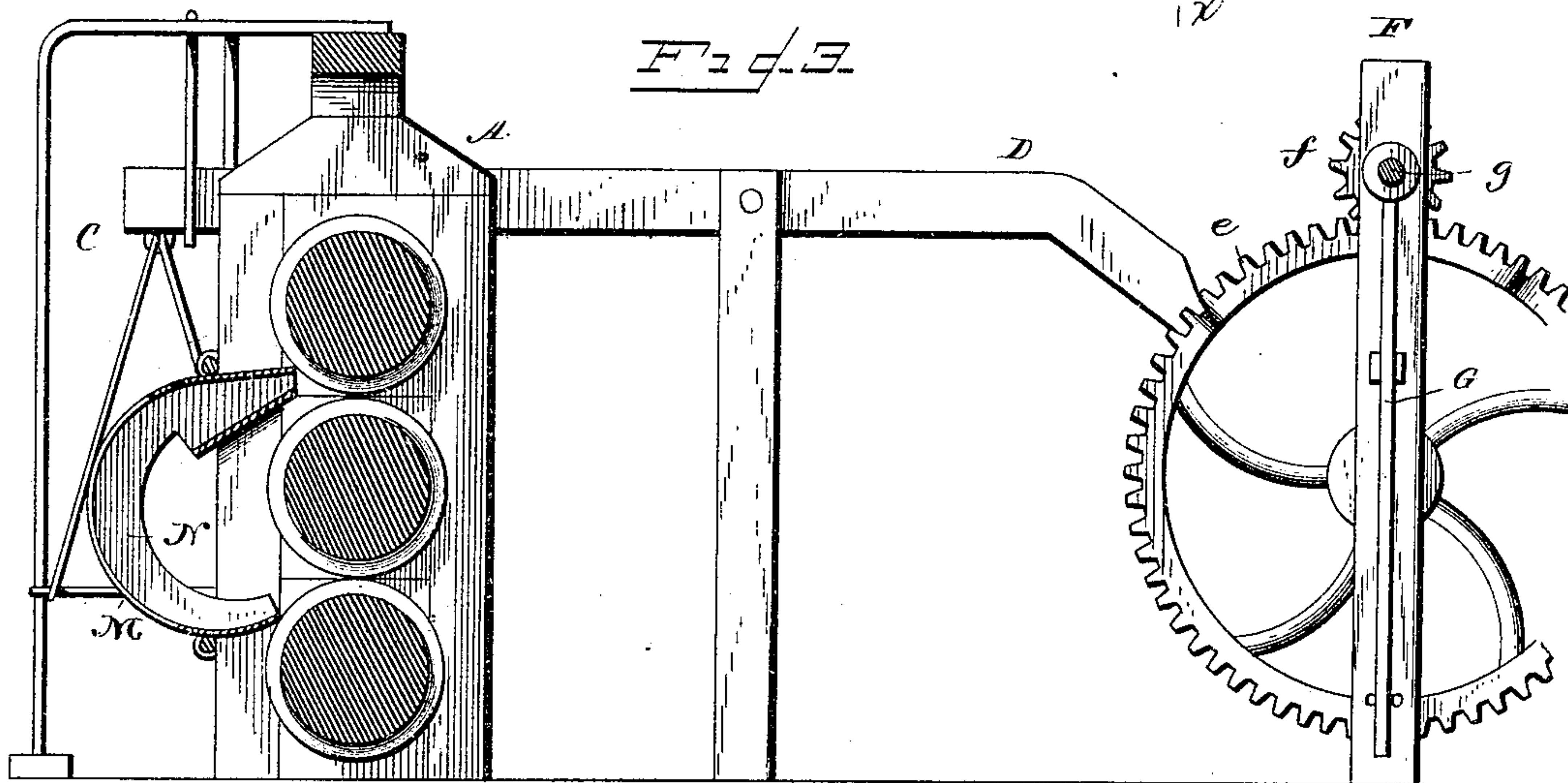
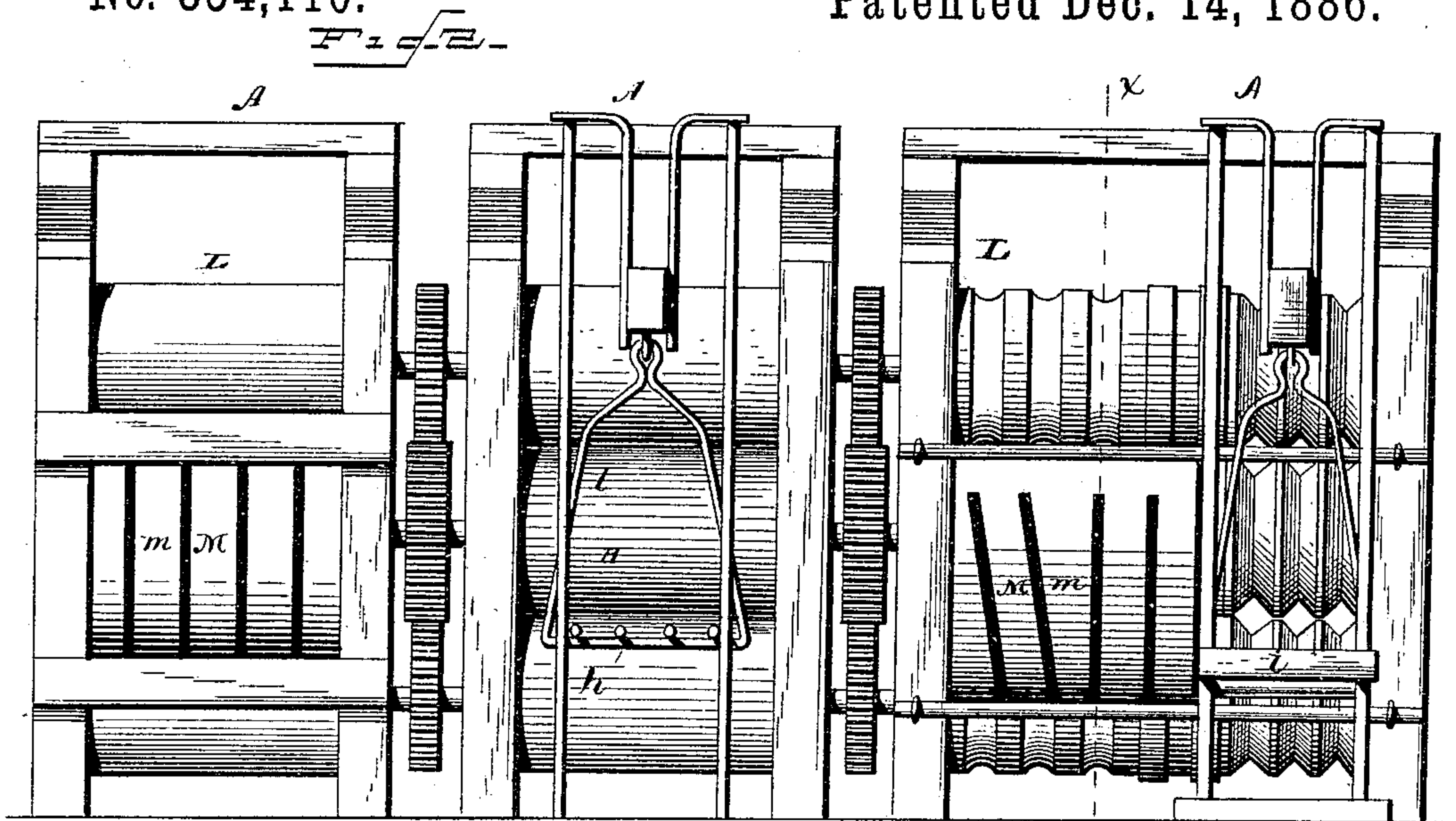
(No Model.)

2 Sheets—Sheet 2.

S. DUFF.
ROLLING MILL.

No. 354,110.

Patented Dec. 14, 1886.



WITNESSES
G. S. Elliott.
E. M. Johnson

Samuel Duff. INVENTOR
Wm. D. Duff. Attorney

UNITED STATES PATENT OFFICE.

SAMUEL DUFF, OF STEUBENVILLE, OHIO.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 354,110, dated December 14, 1886.

Application filed February 18, 1886. Serial No. 192,413. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL DUFF, a citizen of the United States of America, residing at Steubenville, in the county of Jefferson and State of Ohio, have invented certain new and useful Improvements in Roller-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in rolling iron; and it consists in providing the rolling mechanism with means for elevating the iron in front of the rolls so it may be readily passed through the same.

My invention also consists in the construction and combination of the parts as will be hereinafter fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, which illustrate my invention, Figure 1 shows my improvement applied to a set of rollers which are designed to roll bar-iron, and also to a set of rollers which are adapted to roll sheet-iron. Fig. 2 is an end view of my improvement. Fig. 3 is a sectional view. Fig. 4 is a detail perspective view of the means employed for throwing the lever which operates the elevating mechanism of the cage out of gear.

A A A refer to suitable housings within which are journaled rolls B B and B'. Two sets of these rolls, as indicated by B B, have smooth surfaces, and are adapted especially for rolling sheet metal, while the rollers B' are provided with suitable corrugations of different sizes and shapes for properly manipulating and forming bars or blanks of a desired shape. The rolls hereinbefore described are preferably located in line with each other, and are mounted on shafts which are geared to each other so that they will move in unison. No special claim is made to these rollers *per se*, as they form no part of my invention, and therefore a further description thereof or their action upon the metal will not be necessary.

C refers to braces or suitable standards, which are attached to the upper portion of the

frames A and extend horizontally therefrom for a suitable distance, after which they are bent downwardly and secured to the support or foundation upon which the frames A rest. The bars C are also provided with depending bars *c*, which extend vertically in front of the rolls and serve as guides for the ends of the lever D, which raises and lowers the carriage.

The levers D are supported at suitable distances from the rolls by standards E, to which they are pivotally attached, and the ends of these levers D are adapted to engage with a toothed segment or enlargement, *e*, which is formed integral with or attached to the cog-wheel F, which is mounted in suitable supports, F', so that when said cog-wheel is rotated the segment will engage with the end of the lever to elevate the opposite end of the lever.

The cog-wheel F is driven by a pinion, *f*, which is secured on the crank-shaft *g*, which is driven from a suitable engine or other power. The pinion *f* can be thrown in and out of gear by means of the lever G, the upper end of which embraces the recessed sleeve *g'*, into which the flattened end of the shaft *g* passes. By this construction I provide a means whereby when it is desired the pinion *f* can be thrown in engagement with the cog-wheel F, which will be caused to rotate so that the segment thereon will engage with the lever D and elevate the same, which movement is caused when it is desired to take the iron which is passed through the lower rolls and place it in position so that it will be returned between the upper rolls.

H refers to tables or elevators, which may be corrugated at their base when it is desired to elevate bars of metal, or plain when used for raising sheet metal. The bases *h* of these elevators at their outer ends have transverse bars *i*, which project beyond the standards, while the sides are cut away, as shown at *i'* and *i''*, so that the elevators or hoisting apparatus may have a slight swinging movement between the frames or supports C and C'. The base of the elevators H have attached thereto suitable bars, *l*, which converge toward each other at their upper ends and are formed into eyes through which a bolt passes for connecting the same to the ends of the levers.

The vertical bars C have attached thereto,

on a line with the space between the central rollers, segmental plates K, and smaller plates, K', are attached to the vertical bars C', opposite the central roller. By providing the frame with these plates the metal, after passing through the lower rollers, is deposited upon the platform H of the elevator, and when the elevator is raised it will be forced outwardly from the roller, so as to allow the end of the same to clear the central roller, and as soon as the metal bars are raised beyond the central roller the platform will engage with segmental plates K and be shifted or thrown toward the space between the upper rollers, so that the bars will be caught between said rollers and carried through.

By providing the mechanism hereinbefore described in rolling iron a hand or person is dispensed with and the work of returning the bars to the rollers is performed automatically and at the proper time.

If desirable, the platforms may be provided with spring-buffers upon which the elevator may strike in their downward movement.

The device hereinbefore described is especially adapted for rolling bars primarily or prior to forming them into suitable blanks, and after the bars have been rolled and rerolled they are inserted between the rollers indicated by the letter L.

The base of the platforms or elevators H may consist of plates or bars, which are suitably shaped and arranged, and when plates are employed they are perforated, so as to allow air to pass between the same, and thus avoid undue heating of the parts.

In front of the rollers L are located curved plates M, which are secured rigidly at their upper and lower edges by means of transverse bars to the outer vertical edges of the frames A, and these return-plates are provided with slots *m*, as shown in the accompanying drawings, and between said slots and the inner sides of said plates curved metallic bars N are rigidly secured, the upper portion of said metallic bars depending as shown in Fig. 3, the lower edge of said depending portion being curved upwardly, and to these upwardly-curved portions are secured a plate, *n*, thus forming an opening, through which the metal will pass to the upper rollers. In rolling plain sheets of metal, the intermediate bars, N, are dispensed with, and they are only employed in rolling

bars or blanks. Two or more of the guides or bars, M, may be at an angle, as shown in Figs. 1 and 2, so that the bars after passing through the rollers may be fed against the plates M, and will be guided by the projecting portions N to the adjacent rollers, thus making the rolling continuous from one end of the rolls to the other.

I am aware that it is not broadly new to provide rolls for rolling iron with means for returning the bars from the lower rolls to the upper ones in a "three-high" roll, as such mechanism is shown in Patent No. 220,818, dated October 21, 1879.

I do not herein claim the rigid devices (plates M and accessories,) for guiding the metal from one pass to another in a different vertical plane.

I claim—

1. In combination with three or more rolls, a vertically-movable platform supported opposite said rolls, means for elevating and lowering the platform, and cam-plates for moving the platform to the bite of the upper rolls, whereby the metal under treatment may be received from the lower rolls and raised to and thrust within the bite of the upper rolls, substantially as specified.

2. In a device for rolling metal, an elevator supported in front of a set of rolls, the guideways for said elevators having segmental plates K and K' secured thereto, so as to swing the platform when it is raised away from the central roll, and then move the same to the bite of the upper rolls, so that the bars will be caught and carried from the platform, substantially as described, and for the purpose set forth.

3. In combination with a set of rolls, a platform mounted in suitable frame in front of said rolls, said platform having recessed sides, and a transverse bar attached thereto for limiting its swinging movement, plates K and K', adapted to engage with the recessed edges of the platform, and a lever for elevating the same, the parts being organized substantially as shown, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL DUFF.

Witnesses:

FRANK A. M. KREPS,
L. B. D. REESE.