

(No Model.)

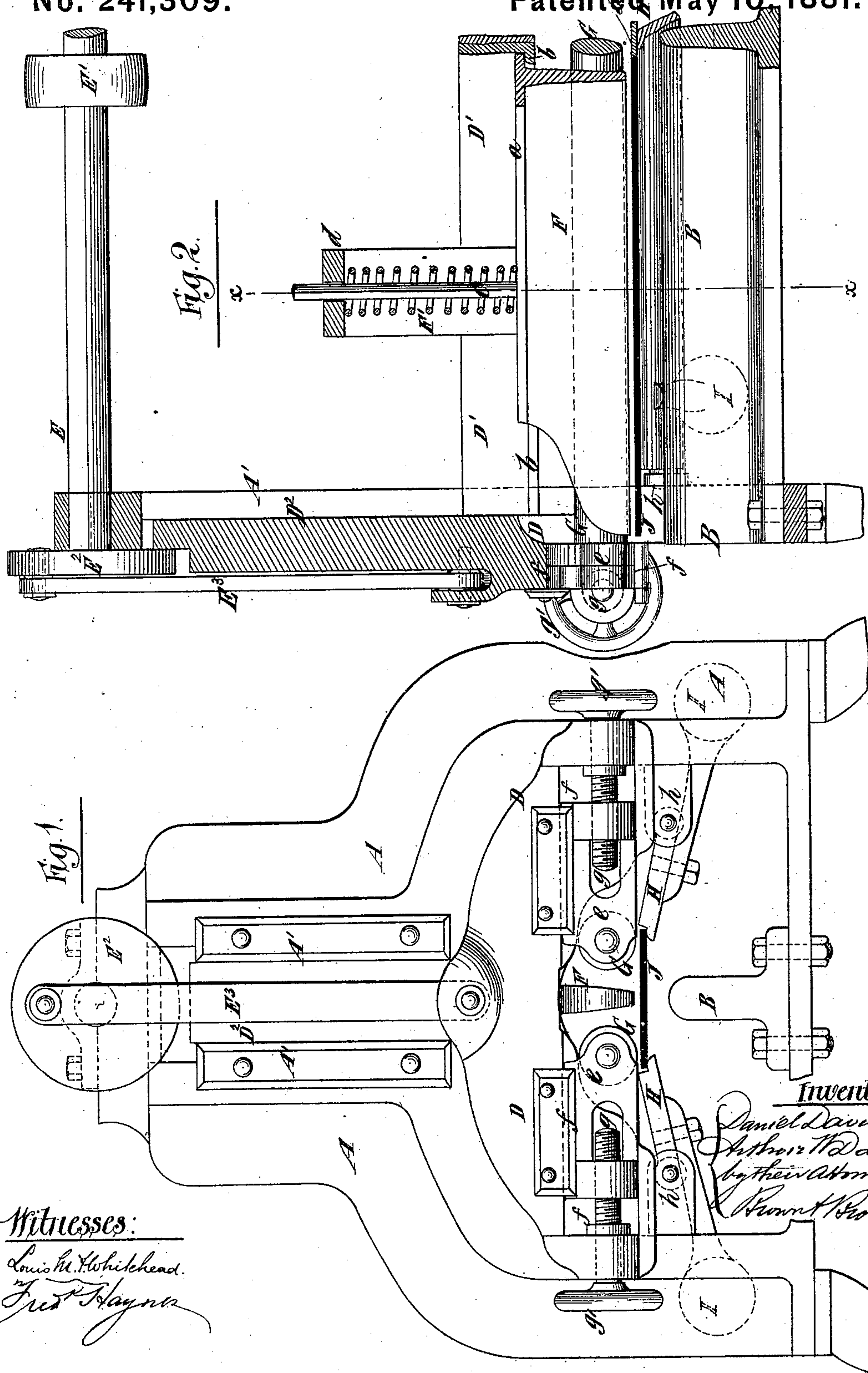
2 Sheets—Sheet 1.

D. & A. W. DAVIS.

Machine for Troughing Metal Plates for the
Manufacture of Fellies.

No. 241,309.

Patented May 10, 1881.



Witnesses:

Louis M. Whitehead.

Fred. H. Hays.

Inventor:—

Daniel Davis
Arthur W. Davis
by their Attorneys
Robert Brown

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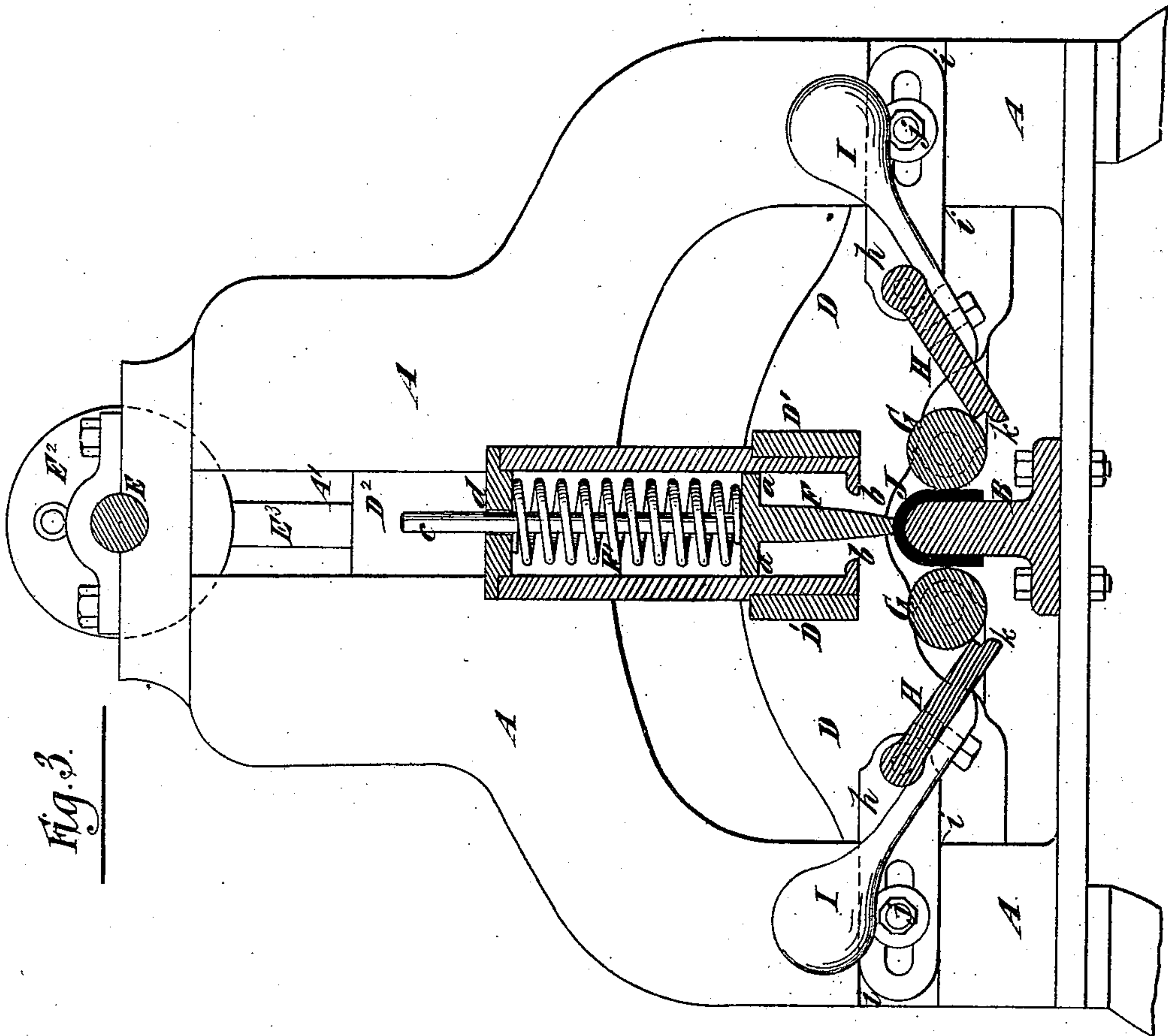


Fig. 3.

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UNITED STATES PATENT OFFICE.

DANIEL DAVIS AND ARTHUR W. DAVIS, OF ELMIRA, NEW YORK, ASSIGN-
ORS TO THE DAVIS IRON WAGON COMPANY, OF SAME PLACE.

MACHINE FOR TROUGHING METAL PLATES FOR THE MANUFACTURE OF FELLIES.

SPECIFICATION forming part of Letters Patent No. 241,309, dated May 10, 1881.

Application filed November 24, 1880. (No model.)

To all whom it may concern:

Be it known that we, DANIEL DAVIS and ARTHUR W. DAVIS, both of Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Machines for Troughing Metal Plates for the Manufacture of Fellies and for other Purposes, of which the following is a specification.

10 The object of our invention is to provide a more convenient and desirable machine for bending narrow metal plates transversely, so as to present a U-shaped or other trough-like transverse section, the machine being more especially designed for bending plates from which iron fellies for wagon-wheels are to be formed.

15 To this end our invention consists in the combination of a stationary former of proper transverse section to give the desired form to the plate, a carriage movable in guides, and carrying rollers, which as the carriage descends pass down upon opposite sides of said former, and a presser which is also carried by and has a yielding connection with said carriage, and by the movement thereof is brought down upon the plate to be operated upon, to hold it upon the former while the continued movement of said carriage carries the rollers down upon the plate on each side of the former and thus bends the plate, to cause it to assume a similar transverse section to that of the former. We preferably employ springs placed between the carriage and the presser, and the power of said springs increasing as the carriage moves downward exerts a constantly-increasing pressure upon the plate, and prevents the middle portion of the plate from rising up from the top of the former as the side portions of the plate are bent inward against the sides of the former.

20 Our invention also consists in the combination with the roller-carriage, former, and presser, above described, of straighteners, which consist of bars arranged parallel with and upon each side of said former, and which preferably have at their edges adjacent to each other lips or ledges upon which the plates are placed, and by which they are held in position parallel

with and above the former. These straighteners serve as supports for the plates, and are pivoted at their ends so as to swing or turn down to permit of the plate which they hold being carried down by the presser and rollers, and said straighteners are preferably counter-balanced so they will hold the plate stationary until it is carried down by said presser and rollers.

Our invention also consists in the combination, with the former, roller-carriage, presser, and straighteners, of bearings for said straighteners, which provide for adjusting them toward and from each other to adapt the machine for operating upon different thicknesses of metal, and also for adapting the machine for use in connection with formers of different transverse sections.

In the accompanying drawings, Figure 1 represents an end view of a machine embodying our invention. Fig. 2 represents a longitudinal section through one half of said machine, the other half being a counterpart of that here shown; and Fig. 3 represents a transverse section upon the dotted line *x x*, Fig. 2.

Similar letters of reference designate corresponding parts in all the figures.

The frame of the machine is composed of the upright end frames, A, which are connected by a longitudinally-extending former, B, and by suitably-arranged stretchers or rods, the former B in this instance being of a transverse section to impart a trough-like U-shaped transverse section to the plates. The former may be connected to the end frames, so that it may be removed and one of different transverse section substituted, if desirable.

The machine may be arranged with one end toward the furnace in which said plates are heated, so that they may be passed directly into the end of the machine.

The roller-carriage is composed of heads or end pieces, D, connected by parallel stretchers or bars D', and at each end thereof is an upwardly-extending slide, D², which fits in a suitable slideway or guide, A', in the end frame, A, and guides said carriage during its upward and downward movements.

Motion may be imparted to said carriage by

any suitable mechanism. That here represented consists of a shaft, E, mounted in suitable bearings at the top of the end frames, A, and receiving a rotary motion from a belt over a pulley, E', or in any other suitable manner. Upon each end of the shaft E, outside the end frames, A, is a crank, E², which, through a connecting-rod, E³, imparts motion to the roller-carriage.

Arranged immediately over the former B and parallel therewith is a presser, F, which fits between the stretchers or bars D' of the roller-carriage, and is adapted to move vertically independently of said carriage, it having a yielding connection therewith. The presser F is provided near its upper edge with laterally-projecting flanges a, and the stretchers or bars D' are constructed with inwardly-projecting lips b, which project under said flanges a and support the presser.

Fixed in the said presser are upwardly-projecting rods c, which work in guides d, attached to and projecting above said stretchers or bars D', and F' designates spiral springs arranged between said guides and presser and exerting a constant pressure upon said presser, but permitting the roller-carriage to move down without carrying said presser when in operation. Springs of other form might be employed, if desirable, and if the pressers were made of great weight the springs might be entirely dispensed with in some cases.

Arranged parallel with the former B and presser F, and upon opposite sides thereof, are rollers G, which are supported at each end in bearings e, which fit in guides or slideways f in the end pieces or heads, D, of the roller-carriage, and are adapted to be adjusted by means of screws g, provided with hand-wheels g', to move the rollers toward or from each other, to permit of their being nicely adjusted to operate upon metal of different thicknesses, which, when bent upon a former of a given size, would form troughs of different external widths, or to operate in connection with formers of different transverse sections. When made of considerable length the rollers G might, with advantage, be provided at about the middle of their length with supports to hold them rigidly to the plates upon which they operate and prevent their springing.

In order to provide for straightening the plates as they are placed in the machine—that is to adjust them centrally over the former and exactly parallel therewith—we employ straighteners, consisting of bars or pieces H, arranged parallel with the presser F and former B, and one upon each side thereof. These straighteners are pivoted at each end in bearings h, which fit in guides i upon the back of the end frames, A, and which are adapted to be adjusted to move the two straighteners toward and from each other to suit plates of different widths. The bearings h are held in place by means of bolts j passing through slots therein, and by tightening up said bolts they may be rigidly secured in different positions to which they may be adjusted.

The straighteners H serve also as supports

for the plates, and at their edges adjacent to each other are preferably constructed with projecting lips, ledges, or flanges k, upon which the heated plate is placed, and in order to hold the plate stationary and prevent it from carrying down the straighteners by its weight we prefer to provide the straighteners with counter-balances I, which are sufficient to balance the weight of the heated plate and the straighteners themselves.

In describing the operation of our machine we will presume that the roller-carriage is in its highest position, as shown clearly in Fig. 1, and the straighteners H will also be retained in their highest position by their counter-balances I. The heated plate J is now withdrawn from the furnace and inserted between the straighteners, its opposite edges being supported by their lips or flanges k, and it being by said straighteners adjusted into and held in a position exactly parallel with the former B. As the roller-carriage commences its downward movement the rollers G bear upon the straighteners H and carry them and the plate downward.

It will be here observed that the edges of the straighteners, owing to the arcs which they describe, approach each other as they move downward, producing a powerful pressure upon the edges of the plate, and hence the plate J is perfectly straightened, even if when first inserted it is not wide enough to fill the space between the shoulders at the edges of the straighteners.

From the previous description it will be clearly understood that the springs F' hold the presser F in its lowest position in the roller-carriage, and the roller-carriage and presser move together until the plate J rests upon the top of the former B. The presser is then held against further movement, while the carriage-frame, continuing its downward movement, carries the rollers G down upon opposite sides of the former and bends the sides of the plate inward until they touch the sides of the former and the parts have arrived at the position shown in Fig. 3, with the roller-carriage at its lowest point.

It will be observed that as the roller-carriage moves downward after the presser has ceased moving the pressure exerted upon the plate by the springs F' acting through the presser is constantly increased, and hence the middle portion of the plate is prevented from bulging up or rising above the top of the former, as it might do if an insufficient pressure were exerted upon the middle portion of the plate.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a machine for troughing metal plates, the combination of a stationary former, a frame comprising upright guides, a carriage movable in said guides, rollers mounted in bearings on said carriage and arranged on opposite sides of said former, and a presser, also carried by said carriage and having a yielding connection therewith, substantially as specified.

2. In a machine for troughing metal plates,

the combination of a stationary former, a roller-carriage movable in upright guides, a presser, also carried by said carriage, and straighteners pivoted one on each side of said former and serving as supports for the plates, substantially as specified.

3. In a machine for troughing metal plates, the combination of a former, a roller-carriage movable in guides, a presser carried by and having a yielding connection with said carriage, and straighteners pivoted one on each side of said former and serving as supports for the plates, substantially as and for the purpose specified.

4. The straighteners H, pivoted at their outer edges, having at their inner edges lips k, for supporting the plates, and adapted to be moved downward with the plates, substantially as specified.

5. In a machine for troughing metal plates, the combination of a former, a roller-carriage movable in guides, a presser carried by and having a yielding connection with said carriage,

straighteners pivoted one on each side of said former, and having at the edges adjacent to each other projecting lips or flanges upon which the plates are to be placed, and counter-balances for said straighteners, substantially as specified.

6. In a machine for troughing metal plates, the combination of a former, a roller-carriage movable in guides, a presser carried by but having a yielding connection with said carriage, straighteners pivoted one upon each side of said former and provided at their edges, which are adjacent to each other, with projecting lips or flanges, and bearings for said straighteners, which are capable of being adjusted to move the straighteners toward or from each other, substantially as specified.

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