No. 638,829. Patented Dec. 12, 1899.

G. WOOLSEY.

APPARATUS FOR TREATING METAL SHEETS.

(No Model.) (Application filed Apr. 3, 1899.) 4 Sheets—Sheet 1.

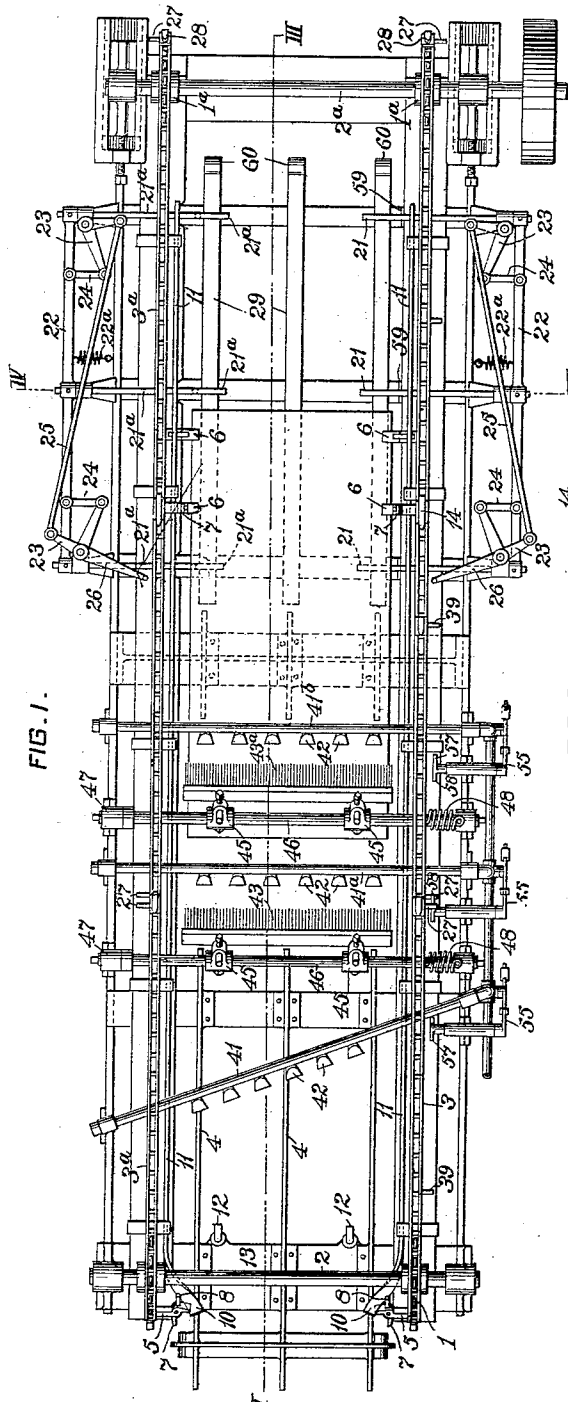


FIG. 1.

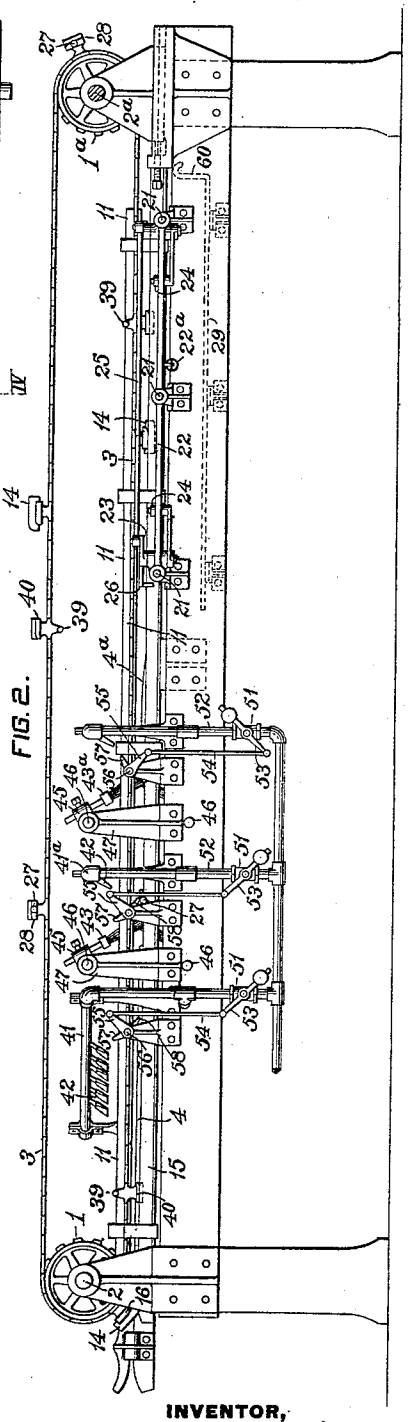


FIG. 2.

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APPARATUS FOR TREATING METAL SHEETS.

(No Model.) (Application filed Apr. 3, 1899.) 4 Sheets—Sheet 2.

FIG. 3.

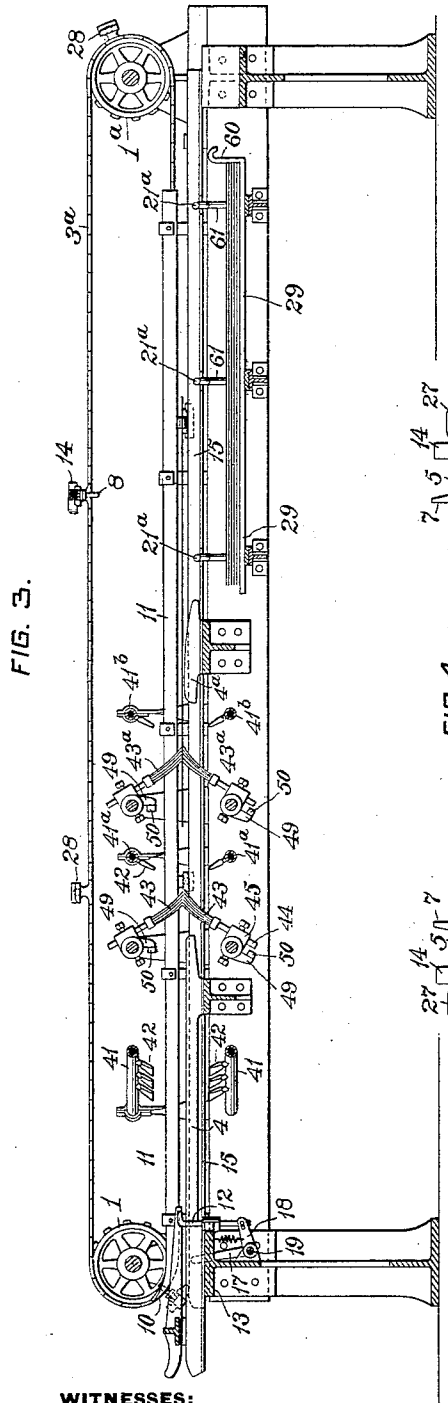
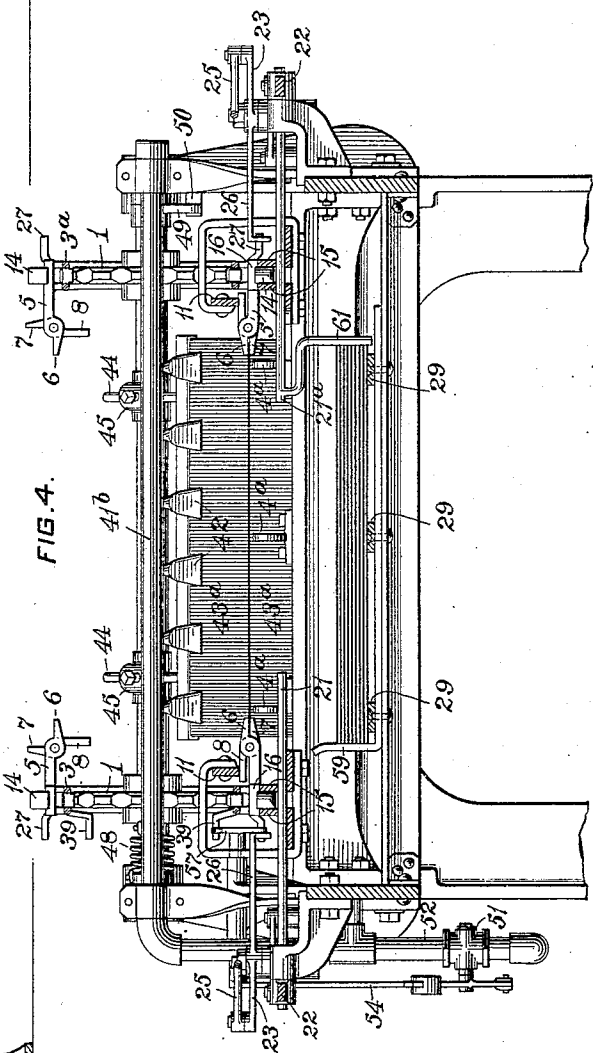


FIG. 4.



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APPARATUS FOR TREATING METAL SHEETS.

(Application filed Apr. 3, 1899.)

(No Model.) 4 Sheets—Sheet 3.

FIG. 5.

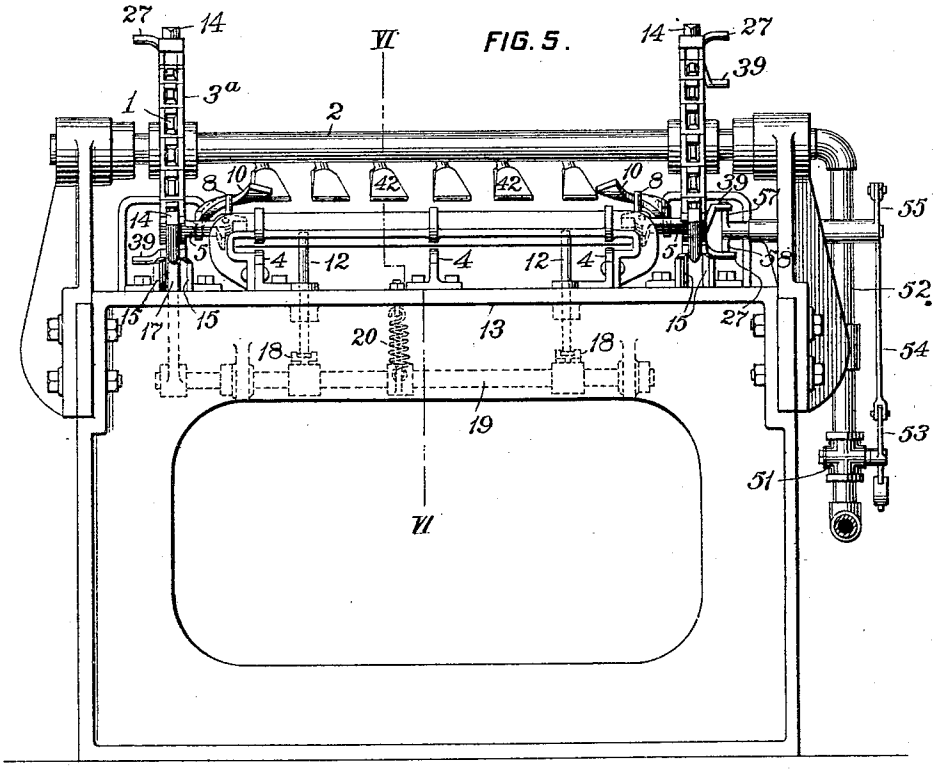


FIG. 6.

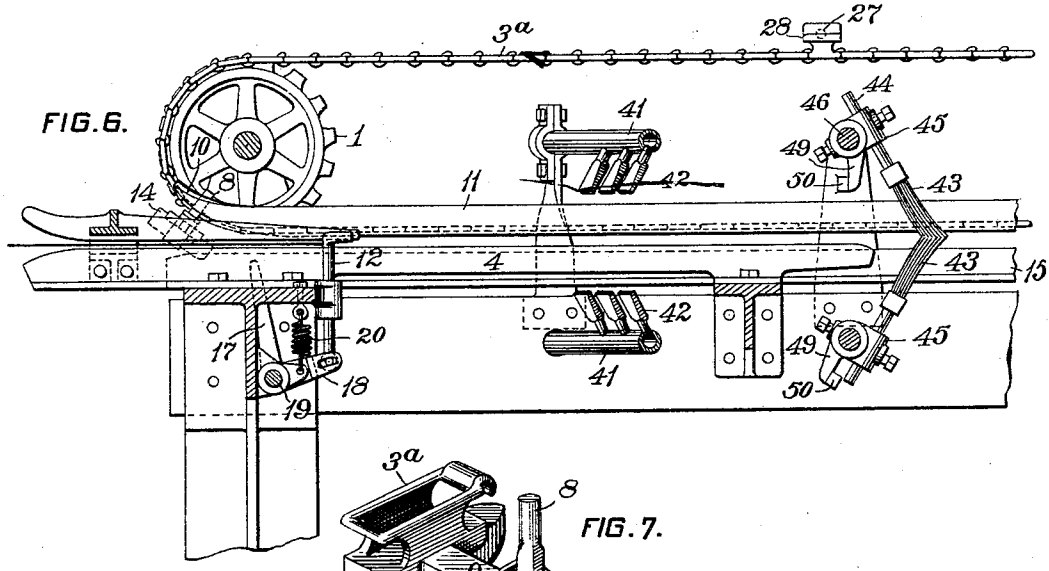


FIG. 7.

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(No Model.) (Application filed Apr. 3, 1899.) 4 Sheets—Sheet 4.

FIG. 8.

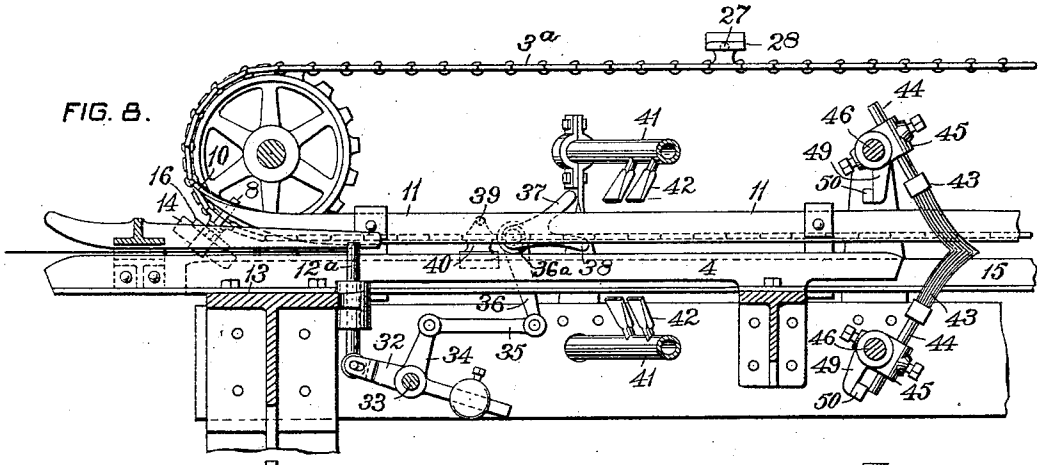


FIG. 9.

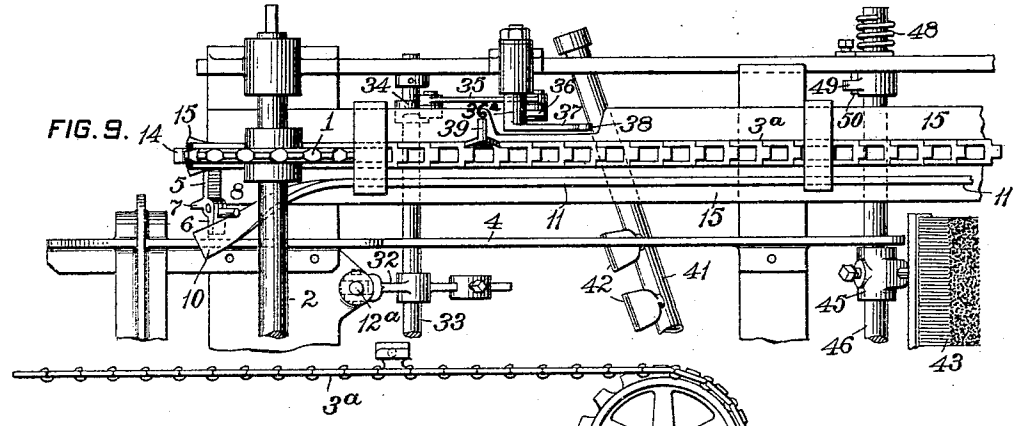


FIG. 10.

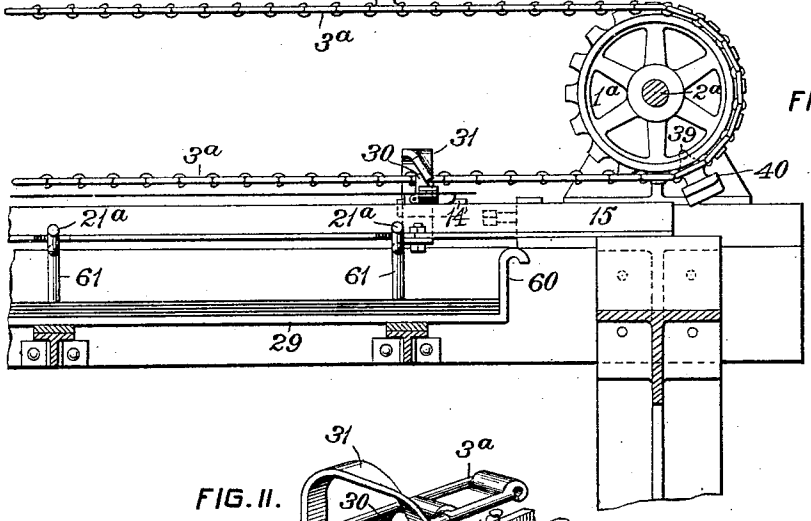
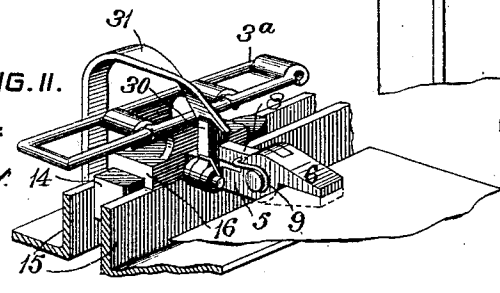


FIG. 11.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TREATING METAL SHEETS.

SPECIFICATION forming part of Letters Patent No. 638,829, dated December 12, 1899.

Application filed April 3, 1899. Serial No. 711,615. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WOOLSEY, a citizen of the United States, residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Apparatus for Treating Metal Sheets, of which improvements the following is a specification.

The invention described herein relates to certain improvements in machines for treating sheet metal; and the invention has for its object the provision of a feed mechanism for the sheets which will effect a continuous movement thereof through the machine without contact with any portion of the sheets except adjacent to the edges and at one end, thereby avoiding any injury to the surfaces of the body of the sheet.

It is a further object of the invention to provide suitable apparatus for carrying out certain steps in the process of manufacturing planished sheet metal, as described in Letters Patent No. 294,559, dated March 4, 1884.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a top plan view of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional elevation, the plane of section being indicated by the line III III, Fig. 1. Fig. 4 is a transverse section, the plane of section being indicated by the line IV IV, Fig. 1. Fig. 5 is an elevation of the front end of the machine. Fig. 6 is a sectional elevation of a portion of a front part of the machine, the plane of section being indicated by the line VI VI, Fig. 5. Fig. 7 is a detail view, on an enlarged scale, of one of the grippers of the feed mechanism. Fig. 8 is a view similar to Fig. 6, illustrating a modified construction of a portion of the feed mechanism. Fig. 9 is a top plan view of a portion of the machine shown in Fig. 8. Fig. 10 is a sectional elevation of a portion of the machine at the rear end thereof; and Fig. 11 is a perspective view, on an enlarged scale, of a modification of the gripping mechanism and its operating parts.

In the practice of my invention sprocket-wheels 1 and 1^a are secured upon the shafts 2 and 2^a, which are mounted upon suitable bearings arranged at the ends of the frame of the machine, as clearly shown in Figs. 1 and 2, or at the points between which the sheets are to be carried. Around these sprocket-wheels are passed chains 3 and 3^a, to which are secured the grippers for the metal sheets, as hereinafter described. The sprocket-wheels are so mounted on the shafts and the latter are so supported by their bearings that the lower members or parts of the chains will pass approximately in the same plane as supporting-bars 4 and 4^a, which are arranged intermediate of the sides of the frame of the machine and serve to hold the metal portions of the sheets at a uniform level while carried along by the grippers. To each of the chains 3 and 3^a is secured any suitable form of gripping mechanism—such, for example, as that shown in Figs. 4, 5, and 7. This gripping mechanism consists of a stem 5, secured to one of the links in the chain at its inner end and provided with a jaw 6. The opposite jaw 7 is pivotally attached to the jaw 6 at or near its inner end and is provided with a stem 8, which when held down against the stem 5 will hold the jaws in closed position upon the sheet. The jaws 6 and 7 are normally held open by any suitable means, as a spring 9, attached to the pivot-pin of the jaws and bearing against the stems 8, as shown in Figs. 7 and 11. As clearly shown in Figs. 1 and 4, these gripping mechanisms are arranged in pairs on the chains 3 and 3^a, the members of each pair being directly opposite each other. As the gripping mechanisms are carried around the front sprocket-wheels 1 the stems 8 will strike against and move along the curved or cam-shaped portions 10 of the rails 11. By the operation of these cam-shaped portions on the stems 8 the jaws 7 will be raised up and clamp a sheet against the stationary jaws 6, which, as the grippers pass along, move on top of the sheet, as shown in Fig. 4. In order that the grippers may catch the sheet at its front end, movable stops 12 are mounted on the front cross-brace 13 of the machine, as shown in Figs. 1, 3, 5, and 6. The individual sheets are placed upon the supporting-rails 4, with their front ends against the stops 12, which are so located with refer-

ence to the cam-shaped portions of the rails 11 that the grippers will be close onto the sheet at the front end thereof or very closely adjacent thereto. The gripping mechanisms are preferably attached to blocks 14, which are secured in any suitable manner to the chains. The blocks 14 pass between the vertical side rails 15 on the frame of the machine, thereby insuring the straight movement of the gripping mechanisms. These blocks are also provided with supporting-shoulders 16, resting upon the edges of the rails 15, so as to prevent any sagging or dropping down of the lower portions of the chains. As soon as the sheet is caught by the grippers one of these blocks 14 will shift a lever 17, as shown in Figs. 3, 5, and 6, and thereby depress or pull down the stops 12, so as to permit the onward movement of the sheets. The lower ends of the stops or pins 12 are connected to arms 18 on a shaft 19, to which is also secured the shifting lever 17. After the passage of the blocks 14 beyond the lever 17 the stop mechanism is shifted to normal position by springs 20.

By the onward movement of the gripping mechanisms the sheets are carried along to the rear end of the machine or point of delivery. In order to provide for the automatic release of the sheets from the gripping mechanisms and their removal from the path of movement of following sheets, a series of rods 21 21^a are passed through the sides of the frame of the machine below the plane of movement of the blocks 14 and the sheets carried by the grippers. These rods project sufficiently far inside of the side frames as to support the opposite edges of the sheets, as clearly shown in Fig. 4. The outer ends of the rods 21 and 21^a are connected to bars 22, so that the fingers may be moved simultaneously. The bars are adapted to be shifted by means of bell-crank levers 23, having one end connected by links 24 to the bars 22 and their opposite ends connected by a rod 25, so as to insure the simultaneous movement of both bell-cranks and the equal outward movement of the rods. One of the bell-cranks, and preferably the front one on each side of the machine, is provided with a third or operating arm 26, adapted to be shifted by pins 27, carried by the chains 3 and 3^a. These pins are preferably secured to blocks 28, which in turn are attached to links of the chains, as shown in Figs. 5 and 6. These blocks, as regards contour and transverse dimensions, are similar to the blocks 14 and move along between the guiding and supporting rails 15. The blocks 28 are attached to the chains in such relation to or at such a distance from the gripping mechanisms as to engage and shift the supporting-rods outwardly just as the stems 8 on the movable jaws of the gripping mechanisms pass from under the rear ends of the holding-rails 11, which serve to hold the gripping mechanisms in closed position. The return or inward movements of the supporting-rods are effected by springs 22^a, as shown in Fig. 1. By the withdrawal of the rods 21 21^a and the automatic opening of the gripping mechanisms the sheets are allowed to drop onto a supporting-frame 29, as shown in Figs. 3 and 4.

In lieu of making the holding-rails 11 continuous the entire length of the machine or apparatus the jaws 7 of the gripping mechanisms may be held in closed position by a spring-catch 30, mounted on the stem 6 of the jaw 5 and adapted to catch over the stem 8 when the latter has been closed down against the stem 6 by the cam-shaped portion 10 at the front end of the machine, as shown in Fig. 11. In order to shift the catch 30 so as to permit the jaw 7 to be moved to its open position by the spring 9, fingers 31 are attached to the frame of the machine near its rear end in such position as to strike and shift the dog 30 when the sheets have reached the desired position for release, as shown in Figs. 10 and 11.

In lieu of the stop mechanism shown in Figs. 1, 3, 5, and 6 the construction shown in Figs. 8 and 9 may be employed. In this construction the pins 12^a are connected at their lower ends to arms 32 on the shaft 33, on which is also secured an arm 34, connected by a link 35 to an arm 36 on the rock-shaft 36^a. On this shaft are also secured fingers 37 and 38, which are adapted to be shifted so as to rotate the shaft 36^a by the pins 39 and 27. The former will so shift the shaft by striking the finger 37 as to pull down stop-pins 12^a and is therefore secured to the chains ahead of the gripping mechanisms, while the pins 27 will strike the arms 38 and rotate the shaft in the opposite direction, and thereby raise the pins 12 to operative position. The pins 39 are secured to blocks 40, similar to the blocks 28, but on opposite sides of the chain, so that the pins 27 and 39 will move in different horizontal planes, as clearly shown in Fig. 2.

While the feed mechanism hereinbefore described is adapted and is intended to be used in connection with any form or construction of apparatus employed for operating upon sheets of metal or as a transfer mechanism for shifting sheets from point to point, as required, the mechanism is especially designed for use for carrying the sheets between a series of steam-jets and brushing and scrubbing devices for the purpose of effecting the steps of the process recited in the patent hereinbefore referred to. To this end steam-pipes 41 and 41^a are arranged at suitable points along the path of movement of the sheets above and below the plane of movement thereof and are provided with a series of nozzles 42, so as to direct jets of steam or other fluid against the surfaces of the sheets. The front pair of steam-pipes is preferably arranged diagonally across the path of movement of the sheets, so that any dirt or foreign material which may be on such surfaces will be swept off of one side rather than di-

rectly off the rear end of the sheet, as clearly shown in Fig. 1. Intermediate of the pairs of steam-pipes are arranged pairs of brooms 43 and 43ª above and below the plane of movement of the sheets. The handles or stems 44 of these brooms are secured in blocks 45, which in turn are secured to the shafts 46, mounted in suitable bearings 47, attached to the frame of the machine. These shafts are adapted to be angularly shifted by springs 48, so as to cause the brooms to bear with greater or less pressure upon the surfaces of the sheets. As the brooms are flexible and might be so deflected or bent as to pass around under the shafts by the tension of the springs, the shafts 46 are provided with arms 49, which would bear against stops 50, and thereby limit the movement of the brooms.

In order to prevent the escape of steam from the nozzles 42 except during the passage of sheets, valves 51 are arranged in the steam-supply pipes 52. The stems of these valves are provided with arms 53, having their outer ends connected by links 54 with arms 55 on the rock-shafts 56. These shafts are provided with fingers 57 and 58, arranged in the paths of movement of the pins 27 and 39 on the chain 3. As the pins 27 are arranged in advance of the gripping mechanisms, they will shift the fingers 57, so as to open the valves 51, which will be closed by the pins 39 in the rear of the gripping mechanisms striking the fingers 58.

By reference to Figs. 1, 4, and 10 it will be seen that the receiving-frame 29, onto which the sheets drop when released from the gripping mechanisms, is provided on one side and at its rear end with upright posts or stops 59 and 60. The posts 60 at the rear end of the frame 29 are so located with reference to the point at which the sheets are released from the gripping mechanisms that the momentum of the sheets will cause their ends to strike the posts 60, thereby alining the sheets in one direction. As shown in Figs. 3, 4, and 10, the supporting-rods 21ª on one side of the machine are provided with downward-projecting fingers 61, which when the rods 21 21ª are shifted inward to normal position by the springs 22ª the fingers 61 will strike against one edge of the sheet and force the opposite edge against the posts 59, thereby alining the sheets transversely.

I claim herein as my invention—

1. In an apparatus for treating metal sheets, the combination of an endless carrier, gripping mechanism connected to said carrier, means for closing the gripping mechanism at the receiving-point, means for opening the gripping mechanism at the delivery-point, supports for the sheets arranged at or adjacent to the delivery-point, and means for shifting said supports to and from operative position, substantially as set forth.

2. In an apparatus for treating metal sheets, the combination of an endless carrier, gripping mechanism connected to said carrier, means for closing the gripping mechanism at the receiving-point, means for opening the gripping mechanism at the point of delivery, supports for the sheets at or adjacent to the point of delivery, and means controlled by the carrier for shifting the supports to and from operative position, substantially as set forth.

3. In an apparatus for treating metal sheets, the combination of two independent parallel endless carriers, a series of gripping-jaws constructed to open automatically and arranged in pairs on the carriers, cams located at the receiving-point for closing said jaws, and rails extending from the receiving-point to the point of delivery for holding the jaws in closed position, substantially as set forth.

4. In an apparatus for treating metal sheets, the combination of an endless carrier, gripping mechanism connected to said carrier, means for closing the gripping mechanism, stops arranged adjacent to the point of closing the gripping mechanism and means controlled by the carrier for shifting the stops, substantially as set forth.

5. In an apparatus for treating metal sheets, the combination of an endless carrier, gripping mechanism connected to the carrier, means for opening the gripping mechanism at the point of delivery, supports for the sheets at the point of delivery, means controlled by the carrier for shifting to and from operative position, and means operated by the supports for shifting the sheets laterally, after their release from the gripping mechanism, substantially as set forth.

6. In an apparatus for treating metal sheets, the combination of an endless carrier, gripping mechanism connected to the carrier, one or more pairs of fluid-supply pipes provided with nozzles arranged transversely of the line of movement of the carrier, one or more valve mechanisms controlling the flow of fluid through said pipes, and means controlled by the carrier for opening and closing said valve mechanisms, substantially as set forth.

7. In an apparatus for treating metal sheets, the combination of an endless carrier, gripping mechanism connected to the carrier, one or more pairs of brooms, the members of each pair being arranged on opposite sides and transversely of the plane of movement of the sheets as shifted by the carrier, and means for causing the brooms to bear yieldingly on the sheets, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEORGE WOOLSEY.

Witnesses:
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G. I. HOLDSHIP.