

No. 733,385.

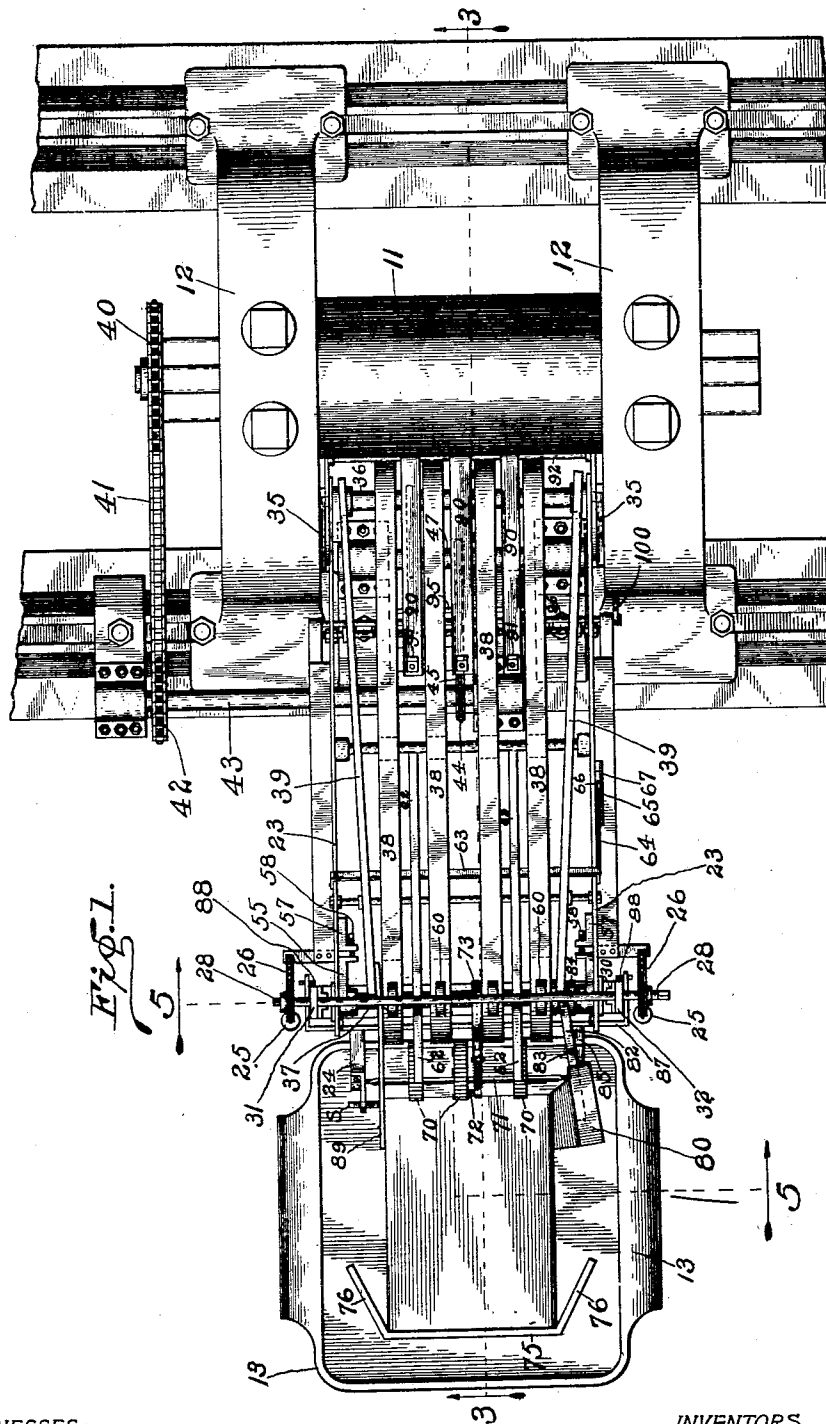
PATENTED JULY 14, 1903.

B. GOLDSMITH & C. W. BENNETT.  
MACHINE FOR PILING METAL SHEETS.

APPLICATION FILED DEC. 4, 1901.

NO MODEL.

5 SHEETS—SHEET 1.



WITNESSES:  
*C. S. Frye*  
*A. S. Gearing*

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6 SHEETS—SHEET 2.

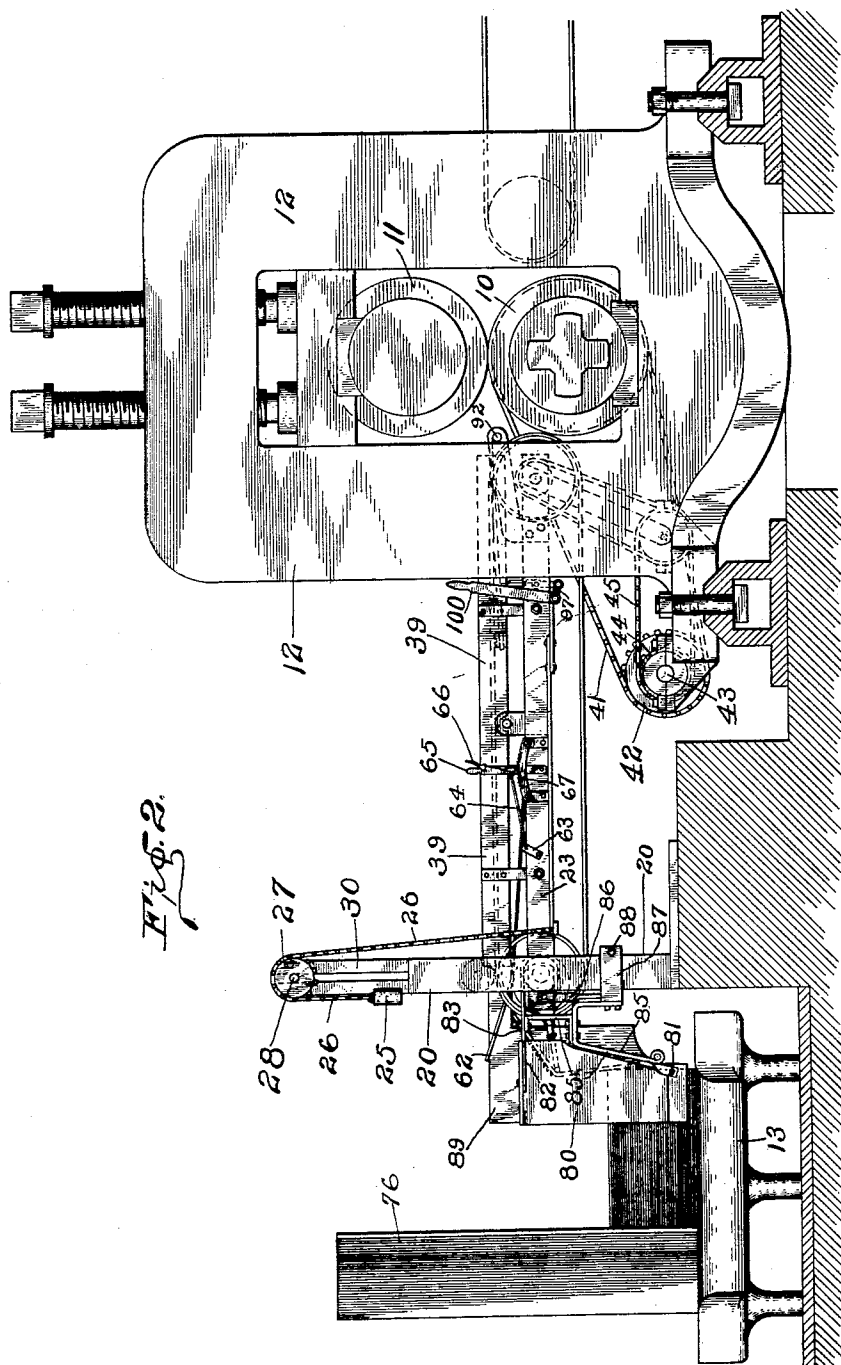


Fig. 2.

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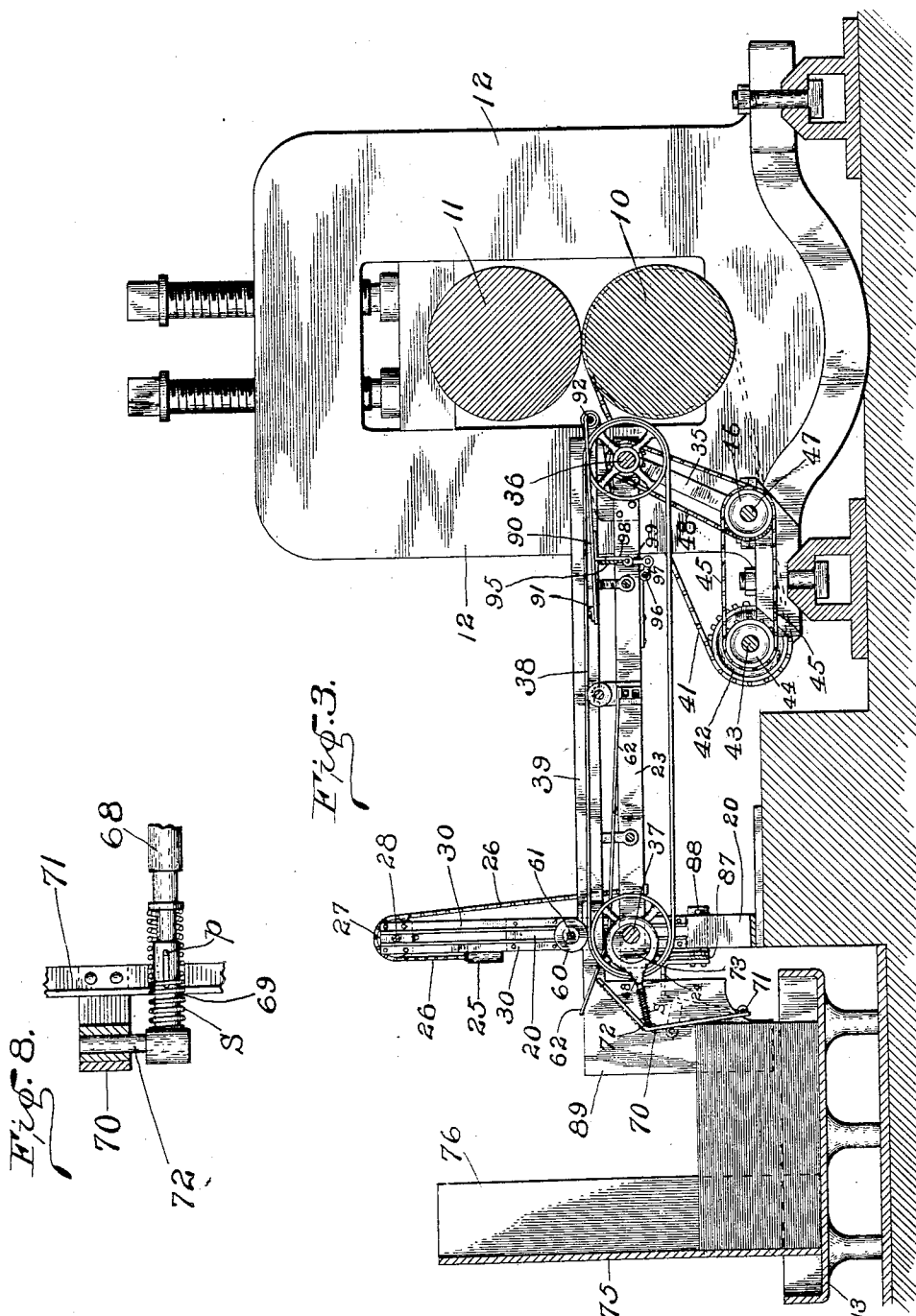
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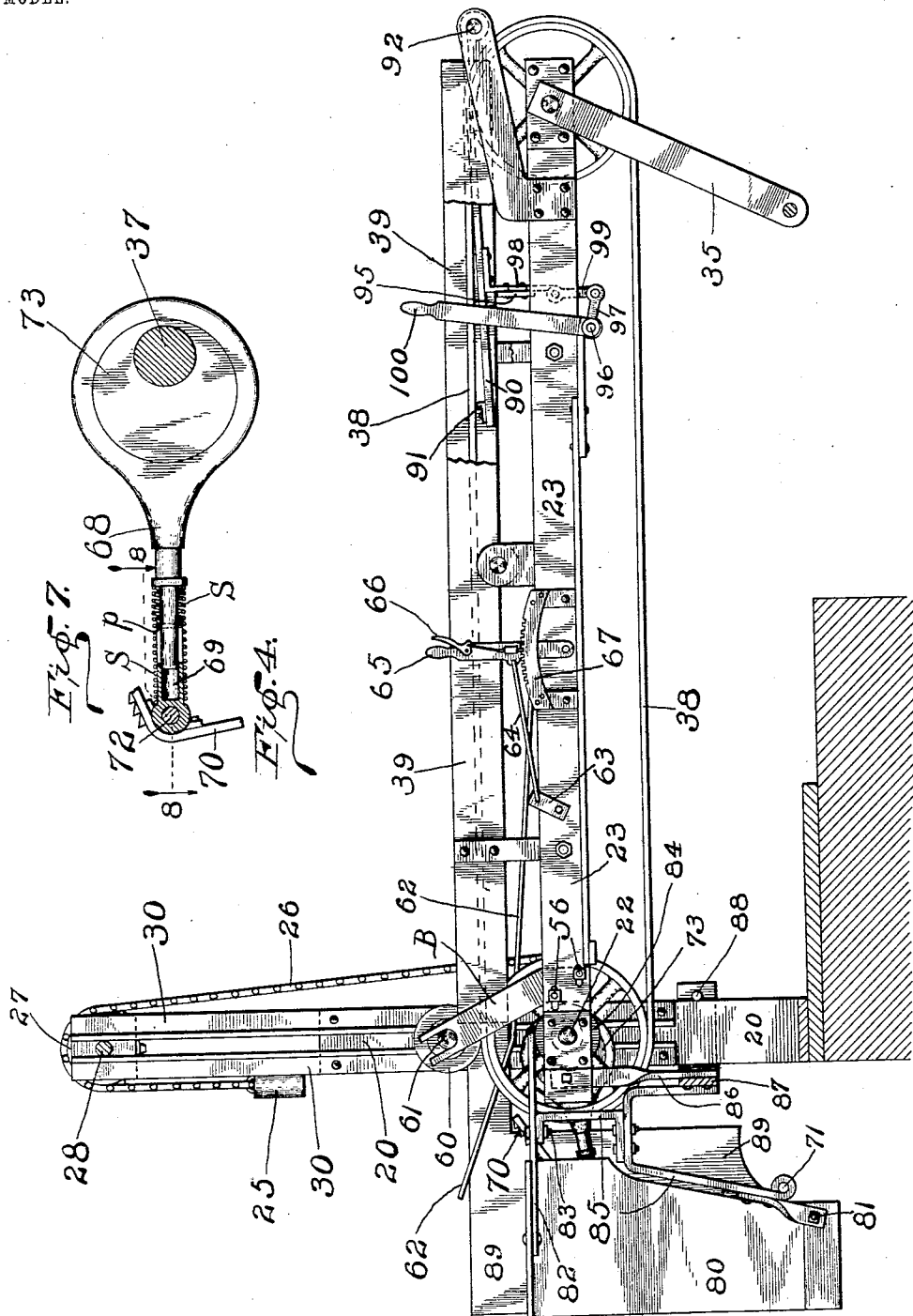
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5 SHEETS—SHEET 4.



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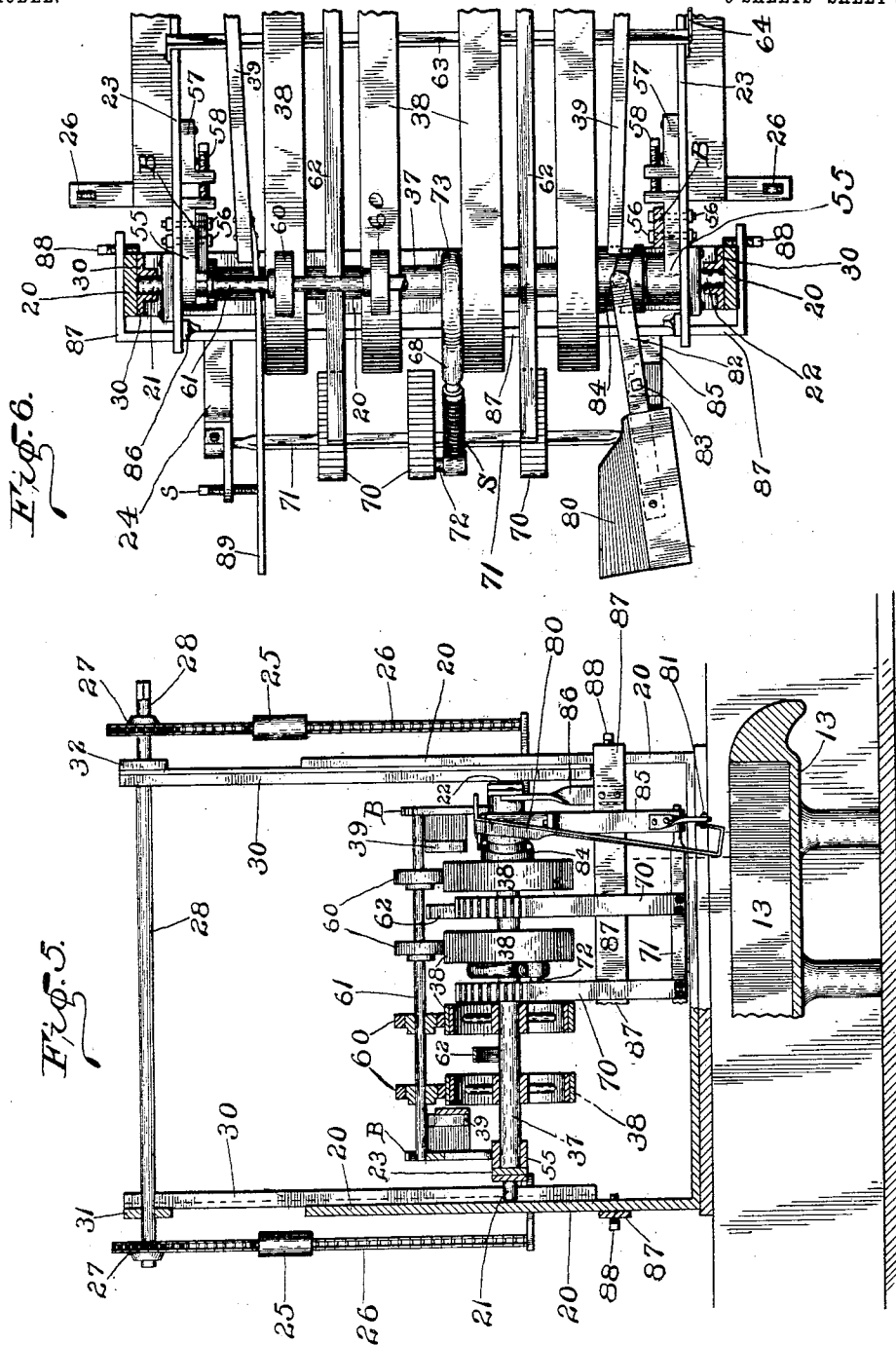
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5 SHEETS—SHEET 5.



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# UNITED STATES PATENT OFFICE.

BERTHOLD GOLDSMITH AND CHARLES W. BENNETT, OF ELWOOD, INDIANA,  
ASSIGNORS TO AMERICAN TIN PLATE COMPANY, OF NEW YORK, N. Y.,  
A CORPORATION OF NEW JERSEY.

## MACHINE FOR PILING METAL SHEETS.

SPECIFICATION forming part of Letters Patent No. 733,385, dated July 14, 1903.

Application filed December 4, 1901. Serial No. 84,665. (No model.)

*To all whom it may concern:*

Be it known that we, BERTHOLD GOLDSMITH and CHARLES W. BENNETT, citizens of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Machines for Piling Metal Sheets, of which the following is a specification.

The metal sheets from which tin-plate is made after being otherwise prepared are passed through a pair of cold-rolls, then piled in an annealing-box, and annealed preparatory to the finishing operations. The piling and other handling of these sheets after coming from such rolls have heretofore generally been done by hand.

It is the object of our invention to provide machinery to supersede this heavy and laborious work, and said invention consists in a suitable carrying-off table adapted to receive the plates or metal sheets as they come from the rolls and deliver the same to an annealing box or flask and adjust them properly therein, as will hereinafter be more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a top or plan view of a set of rolls, an annealing-box, and the carrying-off table and adjusting mechanism, whereby the metal plates or sheets are taken from the one and delivered to and adjusted in the other, embodying our invention; Fig. 2, a side elevation thereof; Fig. 3, a longitudinal vertical sectional view thereof, as seen from the point indicated by the dotted line 3 3 in Fig. 1; Fig. 4, a detail elevation of the carrying-off and adjusting mechanism separately, on an enlarged scale, similar in most respects to a part of Fig. 2, but with some portions broken away; Fig. 5, a transverse vertical sectional view, as seen when looking in the direction indicated by the arrows from the dotted line 5 5 in Fig. 1; Fig. 6, a detail plan view, on an enlarged scale, similar to a portion of Fig. 1, but with some parts broken away; Fig. 7, a detail view of the pitman for operating the packer-arms; and Fig. 8, a detail plan view as seen from the dotted line 8 8 above Fig. 7.

The rolls 10 and 11, the frame 12 therefor, and the means for mounting, adjusting, and operating the same are or may be of any usual or desired construction and are such as are usually employed at this stage of the work in the manufacture of tin-plate. The annealing box or receptacle 13 is or may be also of the usual or any appropriate form. These parts, therefore, not being peculiar to our invention, will not be further described here-in except incidentally in describing said invention.

At a suitable distance from the roll-frame 12 we place suitable standards 20, which have suitable guideways in or upon the sides which face each other, and into these guideways gudgeons or arms 21 and 22 extend out from the frame 23 of our carrier-table. This table, as will be presently described, is adapted to be positioned at various elevations as the work of loading the annealing-box with sheets progresses, and it is guided in this movement by the arms or gudgeons which extend into the guideways, while the desired elevation is easily maintained by means of counterbalancing-weights 25, carried by chains 26, which run over wheels 27, mounted on a suitable shaft 28, carried by suitable bearings at the upper ends of the guide-irons 30 on the standards 20, and which chains run down to the standards 20, and which connect with the table-frame. The guideways are shown as composed of angle-irons 30, and these extend above the sides 20 and carry bearings 31 and 32 for the shaft 28. At the other end, next the rolls 10 and 11, the table or frame 23 is carried by the swinging frame 35, (having suitable pivot-gudgeons,) it being necessary that the support at this end should be capable of permitting the table a slight endwise movement, such a movement being occasioned by the vertical adjustment (at the delivery end) up and down the standards 20. The table carries the shafts 36 and 37, over which the traveling carriers 38 run, by means of which the plates or metal sheets are transported from the rolls and delivered to the annealing-box. Converging guides 39 are arranged on the table in position to guide the sheets to a central position on the table at the delivery end thereof, as

best shown in Fig. 1. The shaft 36 is driven from the shaft of one of the rolls, as 10, by suitable power connections. For this purpose we prefer to use sprocket-wheels, counter-shafts, and chain belts, and therefore have shown a sprocket-wheel 40 on the shaft of the roll 10, a chain belt 41 running therefrom to a sprocket-wheel 42 on a counter-shaft 43, a second sprocket-wheel 44 on said counter-shaft, a second chain belt 45 running therefrom to a sprocket-wheel 46 on a second counter-shaft 47, and a third chain belt 48 running from a sprocket-wheel 49 thereon to a sprocket-wheel 50 on the shaft 36. By means of these various shafts, wheels, and chain belts or other equivalent or suitable power connections we are enabled to give flexibility of movement to the table and at the same time bring the carrier chains or belts on said table into close proximity with the main rolls 10 and 11, so that the plates or sheets can be delivered immediately thereonto.

For the purpose of tightening the carriers 38 we make the shaft 37 adjustable. The bearings 55, in which said shaft 37 is mounted, are connected to the frame of the table by bolts 56, the holes through which said bolts pass being elongated somewhat, as best shown in Fig. 4. Brackets 57 are rigidly secured to the table-frame just behind the bearings 55 and carry adjusting-screws 58. In effecting the adjustment we loosen the bolts 56, move the bearings 55 to the desired extent, (by means of the adjusting-screws 58,) and retighten the bolts 56.

As before stated, the sheets or plates are transported, by means of the carriers 38, from the rolls 10 and 11 to the annealing-box 13. At the outer end of the table 23 and just above said carriers we provide a roll or rollers 60 on a shaft 61, which rollers serve to hold the sheets into forcible contact with the carriers 38, so that said sheets are driven forward with a positive motion until they pass completely off said carriers. Brackets B are shown as the supports or bearings for the shaft 61, which is an idle shaft. In order to hold the plates or sheets up to their proper position as they are discharged from the table, we provide the arms 62, which are secured at their rear ends about midway of the table, while the outer or free ends project (to the extent desired) beyond the table and the rollers 60. These arms are supported at an intermediate point by means of a swinging bar 63, and this is operated through a link 64 from a lever 65, said lever being preferably provided with a latch 66, adapted to engage with suitable catch-notches formed for that purpose in a segment 67. As the plates escape from the carriers 38 and rollers 60 the forward ends thereof fall down onto the pack in the annealing-box and then said plates or sheets are moved to exact position and squared up ready for the annealing operation. This is accomplished first by the vibrating packer-

arms are operated by a suitable pitman, which in turn is actuated by a cam 73 on the shaft 37. These arms 70 incline backwardly from about the point where the pitman is connected thereto, and this backwardly-inclined portion on each of said arms is serrated, the serrations being adapted to engage with the edge of the sheet and push it forward to position in the annealing-box until finally the edge of such sheet falls down to the position shown (especially in Fig. 3) behind the substantially vertical portion of the arms, which portions finally complete the work of "packing" or forcing said sheets into position. The pitman is yielding or elastic in construction, being preferably composed of two telescopic parts 68 and 69, so united by a spring S as that the part 69 will slide over the part 68, as best shown in Fig. 7, separation being prevented by the pin p, which is carried by one of said parts and engages with a slot in the other, as best shown in Fig. 8. Said pitman connects with the adjacent packer-arm 70 by means of a pivot-lug 72, entering a suitable bearing in said arm. The annealing-boxes are provided with vertical walls 75, having flaring wings 76, and by this means said sheets are not only stopped at the proper point on their outward movement, but the distance between the wings being exactly the same as the width of the sheets said sheets are brought into exact registry laterally. At the ends nearest the carrier-table the sheets are brought into registry by the vibrating plate 80, which is supported by a suitable pivot 81 at the lower end and is operated by the arm 82, connected to its upper end, which arm is mounted at a central point on a pivot 83 and engages at its rear end with a cam-groove in a cam-wheel 84, which wheel is preferably mounted on the shaft 37. The pivots 81 and 83 are upon a bracket 85, which is supported by bar 86 from the table-frame and is held from horizontal or lateral movement by a sliding connection with the standards 20. This sliding connection is formed by a transversely-extending bar or beam 87, upon the ends of which are suitable bearings to embrace said standards. These bearings we have shown as formed by bending back the ends of said bar 87 and inserting at the proper points just behind the standards 20 suitable bolts or screws 88. When it is desired to detach this part, it can readily be done by removing said screws or bolts. Alongside the pile of sheets as they are delivered from the table at a point opposite the vibrating plate 80 we place a guiding-wall 89, against which the edges of the sheet on that side are to come in contact and whereby the pile of sheets is made square and true. This wall 89 may be adjusted to exact position by any suitable means, as by an adjusting-screw s, carried by an adjacent frame portion 24. By means of these several guiding-walls, wings, and plates we are enabled to "pack" or assemble the sheets in an even square

pile, having no projecting edges, by the automatic operation of the mechanism and without hand labor. As the filling of the annealing-box progresses the outer end of the table 5 is raised from time to time by turning the shaft 28, which draws up the chains 26, as previously stated. When one annealing-box has been filled or loaded to the desired extent, it is removed and another placed in position to receive the succeeding sheets or 10 plates. The outer end of the table is then lowered by revolving the shaft 28 in the opposite direction, as will be readily understood. When during the time of handling 15 these annealing-boxes or for any other reason it is desired to stop the delivery of the sheets as they come from the rolls, the arms 90, having stop-blocks 91 and which are pivoted at their rear ends on the rod or shaft 92, 20 are swung up, so that the stop-blocks project above the carrier-belts 38 into the path of the sheets as they are carried by said belts, and thus a limited number of said sheets will be arrested in their movement, 25 giving sufficient time for removing the loaded annealing-box (by means of a suitable crane or otherwise) and replacing it by an empty one or performing any other operation taking but a small amount of time without 30 stopping the operation of the machine as a whole. These arms 90 are connected together by a transverse bar 95, and said bar is connected to a rock-shaft 96 by suitable arms 97 and 98 and a link 99. On the outer 35 end of said rock-shaft 96 is a lever 100, by means of which the devices are manipulated.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

40 1. The combination, with a set of rolls for performing the final rolling operation preparatory to annealing sheets of metal, and the annealing-box for receiving such sheets, said box being provided with a wall extending 45 upward from its bottom against which the sheets may be arranged, of a mechanical transporting device consisting of a continuously-operating carrier arranged to engage the plates in succession and transfer them 50 directly from the rolls to the box, means for arranging said plates evenly in the box, and means for adjusting the continuously-operating carrier and the arranging means with relation to the annealing-box and parallel to 55 the wall thereof.

2. The combination, in a carrier-table for carrying sheets of metal from the rolls to the annealing-box, of suitable carrier devices, 60 arms arranged below said carrier devices provided with stops independent of the carrier, and a lever connected to said arms and adapted to throw the same up to position where the stops will extend into the path of the traveling sheets, whereby the travel of said 65 sheets on the carrier may be temporarily interrupted and the carrier allowed to continue beneath the sheets, substantially as set forth.

3. The combination, in a carrying-off table for metal sheets, of a suitable table-frame, a traveling carrier thereon, and an auxiliary 70 delivering device at the delivery end of said table arranged to receive the sheets as they come from the traveling carrier and complete the delivery thereof to exact position, comprising swinging arms and a pitman for operating the same. 75

4. The combination, in a carrier for transporting sheets of metal from the rolls to the annealing-box, of a suitable carrier-frame, shafts at the ends of said frame, an endless 80 carrier passing over said shafts, a swinging frame supporting one end of said carrier-frame, a shaft at the end of said swinging frame, suitable power connections from the shaft in the carrier-frame to the shaft at the 85 opposite end of the swinging frame and thence to the source of power, rigid vertical standards at the opposite end of the carrier-frame, suitable connections from said carrier-frame to said standards, and means for moving said 90 carrier-frame up and down said standards, whereby the delivery end of the carrier may be adjusted as the work of piling the sheets in the annealing-box progresses, substantially as set forth. 95

5. The combination in a carrying-off table for metal sheets, of the table-frame, the traveling carrier mounted thereon, suitable devices for holding said sheets into contact with the delivery end of said carrier until said 100 sheets have passed completely beyond said carrier, and adjustable arms extending out beyond said carrier-table for supporting the sheets until they have completely escaped from said carrier, substantially as set forth. 105

6. The combination of a carrying-off table, suitable standards arranged at one end of said table and having suitable ways, bearings on said table adapted to run on said 110 ways, a shaft carried by said standards above said table, suitable on said shaft, weights for counterbalancing the table, and flexible connections running from said weights over said wheels to suitable points of attachment on the table-frame, whereby said table is adapted 115 to be adjusted vertically at its delivery end as the pile of articles being delivered thereby varies in height, substantially as set forth.

7. The combination, in an apparatus for 120 transporting sheets of metal to and delivering the same into a suitable receptacle, of a traveling carrier, means for holding the metal sheets into contact therewith until said sheets have passed beyond said carrier, arms extending out beyond the traveling carrier for 125 supporting the sheets until they have escaped therefrom, a swinging bar arranged below said arms upon which they rest, and means for moving said bar and thus adjusting said 130 arms, substantially as set forth.

8. The combination, in an apparatus for transporting sheets of metal from the rolls to the annealing-box and for piling and adjust-

ing such sheets in such box, of a suitable table-frame, means for adjustably positioning said frame vertically relatively to said box, a traveling carrier mounted on said frame, and movable adjusting devices for assembling the sheets evenly in said box, substantially as set forth.

9. The combination, in an apparatus for transporting sheets of metal to and delivering the same into a suitable receptacle, of a mechanical transporting device for said sheets, and means for receiving the same therefrom and packing the same evenly into the receptacle, consisting of vibrating arms having inclined serrated surfaces, and suitable means for actuating said arms.

10. The combination of a carrying-off table for metal sheets, and devices for adjusting the sheets on the pile to which they are delivered, said devices consisting of a stop-plate having diverging wings set opposite the delivery end of the table, an adjustable wall (stationary in operation) arranged at one side of said pile of sheets, a vibrating plate arranged at the other side of said pile of sheets adapted to move said sheets (as delivered) against said stationary wall, and swinging arms operated by a yielding pitman for pushing the sheets closely against the stop-plate having the diverging wings and between said wings, substantially as set forth.

11. The combination, in a carrying-off table for metal sheets, of a suitable table-frame, a traveling carrier thereon, and an auxiliary delivering device at the delivery end of said table adapted to receive the sheets as they come from the traveling carrier and complete the delivery thereof to exact position, comprising swinging arms and a pitman for operating the same, said pitman embodying a yielding construction.

12. A mechanical transporting and adjusting device, comprising a traveling carrier, means for holding the articles being transported into contact therewith, arms extending beyond the carrier for supporting said articles until they have escaped from said carrier, swinging packer-arms adapted to receive the articles and pack them evenly in the pile onto which they are being delivered in one direction, and a vibrating plate arranged at one side of the pile whereby said articles are squared up evenly in the other direction, substantially as set forth.

13. The combination of a rolling-mill, abutments disposed at an angle to each other, a longitudinally-movable follower, a transversely-movable follower, a conveyer arranged to receive metal plates from the rolls of a mill and discharge the same between the abutments and the followers, a driver, and driving connections between the driver and the followers, one of the rolls of the mill, and the conveyer.

14. The combination of a rolling-mill, coacting devices for adjusting metal plates into an even pile; one of said devices being movable, a conveyer arranged to receive metal plates from the rolls of the mill and discharge the same between the coacting devices, a driver, and driving connections between the driver and the movable coacting device, one of the rolls of the mill, and the conveyer.

In witness whereof we have hereunto set our hands and seals, at Elwood, Indiana, this 29th day of November, A. D. 1901.

BERTHOLD GOLDSMITH. [L. S.]  
CHARLES W. BENNETT. [L. S.]

Witnesses:

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