

Oct. 30, 1928.

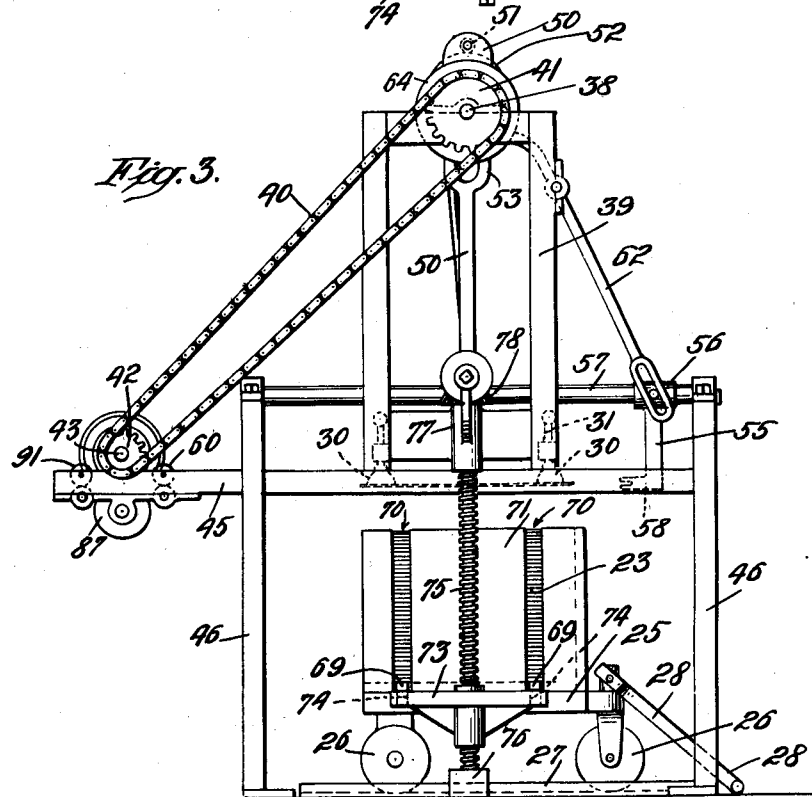
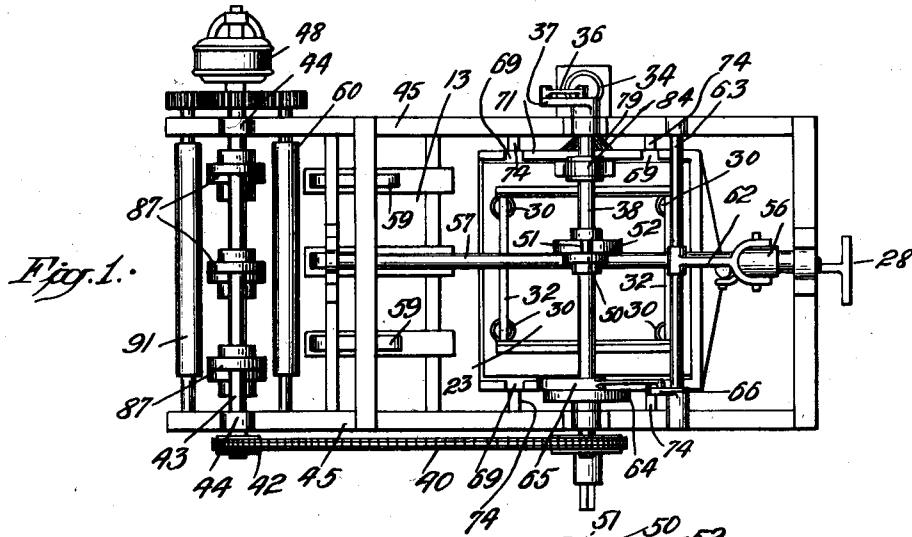
1,689,760

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APPARATUS FOR FEEDING SHEET METAL AND THE LIKE

Original Filed Aug. 4, 1926

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

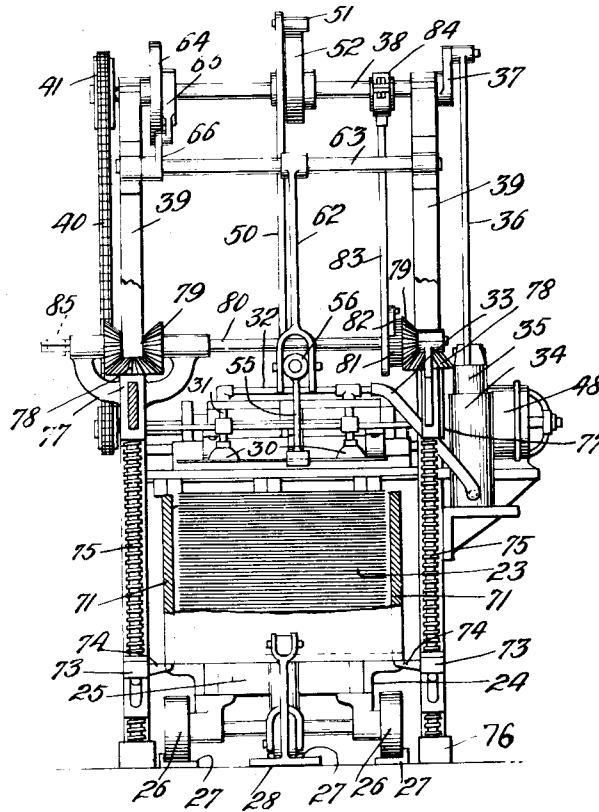


Fig. 4.

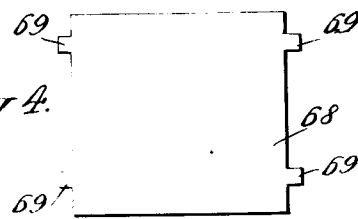


Fig. 5.

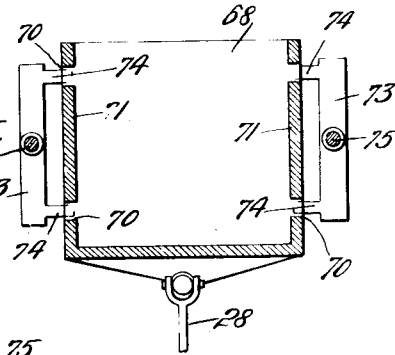
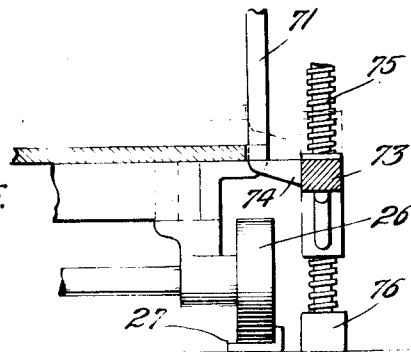


Fig. 6.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FEEDING SHEET METAL AND THE LIKE.

Original application filed August 4, 1926, Serial No. 126,990. Divided and this application filed August 19, 1927. Serial No. 214,130.

The invention relates to an improvement in apparatus for feeding or delivering to a cutting machine sheets of metal or the like. This application is a division of our copending application Serial No. 126,990, filed August 4, 1926.

The object of the invention is to provide an improved apparatus for feeding or delivering to slitting or cutting machines relatively large sheets of metal or other material. To the accomplishment of this object the invention consists in the improved sheet feeding apparatus hereinafter described and particularly pointed out in the appended claims.

The preferred form of the invention is illustrated in the accompanying drawings in which Fig. 1 is a top plan of the improved sheet feeding apparatus and showing its connection with a sheet slitting or cutting machine; Fig. 2 is a front elevation of the parts shown in Fig. 1; Fig. 3 is a side elevation of the sheet feeding apparatus disconnected from the cutting machine; Fig. 4 is a top plan of the movable bottom of the sheet carrying truck; Fig. 5 is a horizontal section through the sheet carrying truck; and Fig. 6 is a detail on an enlarged scale of a part of the sheet feeding devices.

The improved apparatus of the present invention is constructed and arranged to deliver sheets of metal and the like into a slitting or cutting machine, generally indicated at 13, by which the sheets are cut into the requisite size for subsequent treatment. It is assumed for the purposes of the present description that the sheets to be delivered into the cutting machine are tin plate intended to be formed into cans. The sheets 23 which are to be delivered into the cutting machine 13 are carried to the machine on a truck 24 which forms part of the sheet feeding apparatus. The truck comprises a body part 25 supported on the wheels 26 adapted to run on the tracks 27 which are in alignment with the mechanism which transfers the sheets from the truck into the cutting machine 13. The truck is manipulated and guided by means of the handle 28. By making the truck which carries the load of tin plate to the cutting machine a part of the sheet feeding apparatus, the cutting machine is enabled to run for a longer period of time without attendance than it is possible for similar machines provided

with sheet feeding mechanism as heretofore constructed.

The sheets are transferred from the truck and fed into the machine by means of the transfer mechanism comprising a plurality of inverted suction cups 30 mounted on the lower ends of the vertically arranged tubes 31 connected by the transverse pipes 32. A flexible tube 33 connects the transverse pipes 32 with the lower end of a vertical cylinder 34 of a vacuum pump by which a suction is created in the cups 30 sufficient to lift and hold a sheet of tin plate. In the cylinder 34 works a piston 35 to the upper end of which is pivotally connected the lower end of a rod 36 the upper end of which is connected with a crank arm 37 mounted on one end of a shaft 38 journaled in the upper ends of the uprights 39. The shaft 38 is driven by a chain 40 one end of which passes over a sprocket wheel 41 fixed on the shaft 38 and the other end of which passes over a sprocket wheel 42 fixed on the end of a shaft 43 mounted in bearings 44 supported on the longitudinal pieces 45 forming part of the frame work of the machine. The longitudinal pieces 45 are supported by the uprights 46. The shaft 43 is driven by the motor 48.

The suction cups 30 are lowered into contact with the uppermost sheet of the pile of sheets 23 on the truck, at which time the vacuum device operates to withdraw the air from the cups so that they will lift the sheet. The cups carrying the sheet are then raised and momentarily held stationary so that the sheet may be injected into the machine. The means for lowering and raising the suction cups comprises a vertically arranged rod 50 connected at its lower end with the supporting means for the cups 30 and carrying on its upper end a cam roll 51 which rides on a cam 52 mounted on the shaft 38. The rod 50 is guided in its vertical movements by bifurcating its upper end, as at 53, to straddle the shaft 38.

The means for feeding the raised sheet into the machine comprises a finger 55 extending downwardly from a head 56 mounted to slide on a longitudinally extending rod 57 supported at its ends in the upper ends of the uprights 46. The lower end 58 of the finger 55 is offset and extends rearwardly toward the cutting machine and is provided

with a recess which lies in the plane occupied by the sheet which is held raised by the cups 30. When the head 56 is suddenly moved rearwardly toward the machine the recessed lower end 58 of the finger 55 strikes the raised sheet (which is then released by the suction cups) and carries it over the guides 59 supported from the machine frame and into engagement with the feed rolls 60.

The means for reciprocating the head 56 on the rod 57 comprises an arm 62 the lower end of which is bifurcated to straddle the head 56 and the upper end of which is fixed on a shaft 63 journaled in one pair of the uprights 39.

The shaft 63 is oscillated by a cam 64 mounted on the shaft 38 and provided with a cam path (not shown) in which projects a pin carried by an arm 65 straddling at its upper end the shaft 38 and pivotally connected at its lower end with an arm 66 fixed on the shaft 63. The parts for raising the sheet of tin plate and for advancing it into position to be engaged by the feed rolls 60 are constructed and operate substantially as the corresponding parts in Patent 1,171,011, dated February 8, 1916.

The improvements in this sheet feeding mechanism forming part of the present invention comprise means for raising the pile of sheets from the truck so as to hold the upper end of the pile substantially on the same level until all the sheets have been fed into the cutting machine. For this purpose the truck 24 is provided with a movable bottom 68. Extending laterally from the bottom 68 are ears 69 by which the plate is guided in the vertical slots 70 formed in the side walls 71 of the truck. The means for lifting the bottom 68 of the truck comprises two elevating members 73 each of which is arranged parallelly with its corresponding side wall of the truck and is provided with two inwardly projecting fingers 74 which extend under the ears 69 of the truck bottom.

The elevating members 73 are raised and lowered by the jack screws 75 journaled at their lower ends in the base pieces 76, and at their upper ends in the bearings 77 forming part of the frame work of the sheet feeding mechanism. On the upper ends of the screws 75 are fixed the miter gears 78 which mesh with the miter gears 79 fixed on a shaft 80 journaled in arms extending from the brackets 77. On the shaft 80 is a ratchet wheel 81 adapted to be engaged by a pawl 82 carried by a vertically arranged rod 83 the upper end of which is formed as a strap and embraces an eccentric 84 mounted on the shaft 38. The eccentric 84 is arranged to work in timed relation with the cam 52 and the crank 37. Each actuation of the pawl 82 raises the pile of sheets 23 the thickness of one sheet. When the bottom 68 of the truck has been raised to present the last sheet resting thereon to the cups 30, it may be lowered onto the truck

again by means of a crank 85 mounted on the projecting end of the shaft 80.

When a fresh load of sheets 23 of tin plate is brought to the machine the truck 24 is moved along the rails 27 until the openings 70 in the sides 71 of the truck are in alinement with the fingers 74 of the elevating members. The operative will then turn the crank 85 until the fingers 74 are moved upwardly into engagement with the under surfaces of the ears 69 of the truck bottom 68. When the feeding mechanism is started in operation the frame carrying the suction cups 30 is lowered to bring them into contact with the uppermost sheet on the pile. Before the cups rise again the vacuum device operates to create a suction in the cups so that as the cups rise they carry with them the topmost sheet. Thereupon the finger 55 is actuated to kick or shove the sheet into position to be engaged by the feed rolls 60, the vacuum in the cups being broken as the finger 55 strikes the sheet. When all the sheets of tin plate have been delivered into the machine the operative turns the crank 85 to lower the fingers 74 to return the truck bottom to normal position.

The sheets of tin plate which are fed into the cutting machine 13 by the apparatus of the present invention are delivered by the feed rolls 60 to the rotary cutters 87 by which the sheets are slit and trimmed. The feed rolls 91 then deliver the pieces of tin plate to other mechanism or apparatus by which they are further acted upon.

Having thus described the invention what we claim as new is:—

1. A sheet feeding apparatus comprising, means for removing the top sheet of a pile of sheets, a truck mounted on wheels adapted to be brought into position under the sheet removing means, a movable bottom for the truck on which the pile of sheets rests, side walls for the truck having vertical slots therein, laterally extending fingers on the truck bottom adapted to travel in the slots in the walls, and means for engaging and raising the truck bottom to maintain the top of the pile of sheets at substantially a predetermined level.

2. A sheet feeding apparatus comprising, means for removing the top sheet of a pile of sheets, a truck on which the pile of sheets is brought to the machine and located under the sheet removing means, a movable bottom for the truck for supporting the pile of sheets, means for engaging and raising the truck bottom to maintain the top of the pile of sheets at substantially a predetermined level, and means on the truck for guiding the truck bottom in its vertical movements.

3. A sheet feeding apparatus comprising, means for removing the top sheet of a pile of sheets, a truck on which the pile of sheets is brought to the machine and placed in alinement with the sheet removing means, a mov-

able bottom on the truck for supporting the pile of sheets, means on the truck for guiding the vertical movements of the truck bottom, and means for raising the truck bottom to maintain the top of the pile of sheets at substantially a predetermined level consisting of two vertically arranged screws located on opposite sides of the pile of sheets, means connected with the screws adapted to engage with the under surface of the truck bottom, and means for actuating the screws.

4. A sheet feeding apparatus comprising, means for removing the top sheet of a pile of sheets, and means for raising the pile of sheets to maintain the top sheet thereof at substantially a predetermined level consisting of a truck for carrying the pile of sheets to the machine and locating them under the sheet removing means, a movable bottom on the truck for supporting the pile of sheets, the side walls on the truck having vertical slots, outwardly projecting ears on the mov-

able truck bottom adapted to travel in the slots of the side walls, vertically arranged screws located on opposite sides of the pile of sheets, lifting means through which the screws pass having provision for engaging the under surfaces of the projecting ears on the truck bottom, a shaft, gear connections between the shaft and the screws, and means for actuating the shaft.

5. A sheet feeding apparatus comprising, means for removing the top sheet of a pile of sheets, a truck on which the pile of sheets is brought to the machine and located under the sheet removing means, a movable bottom for the truck for supporting the pile of sheets, means for engaging and raising the truck bottom to maintain the top of the pile of sheets at substantially a predetermined level, and means for guiding the truck bottom in its vertical movements.

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