

Dec. 15, 1953

R. J. VAN SCHIE

2,662,648

SHEET METAL SEPARATING DEVICE

Filed Nov. 13, 1951

4 Sheets-Sheet 1

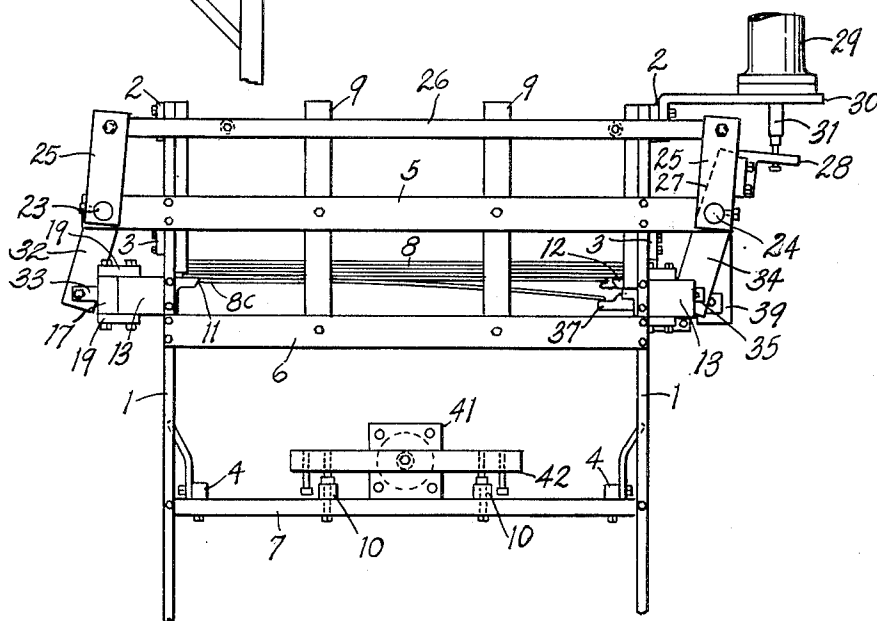
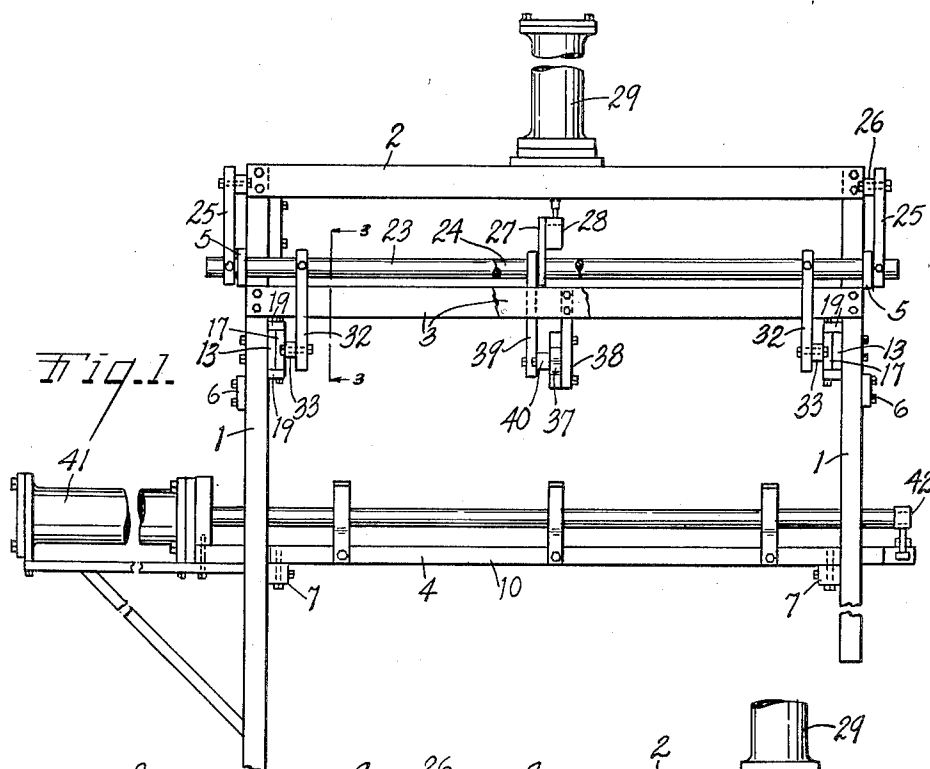


Fig. 2.

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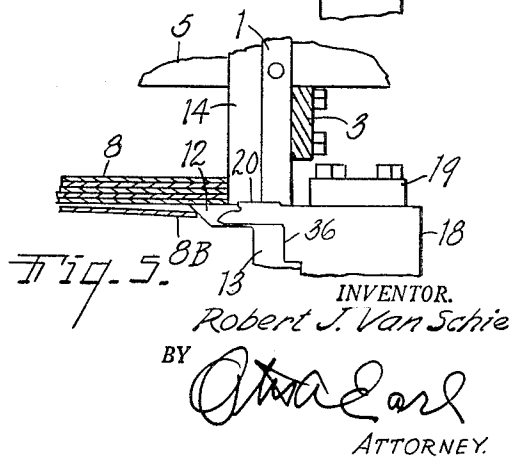
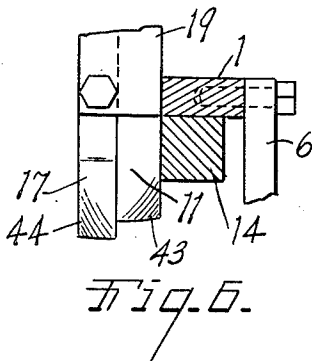
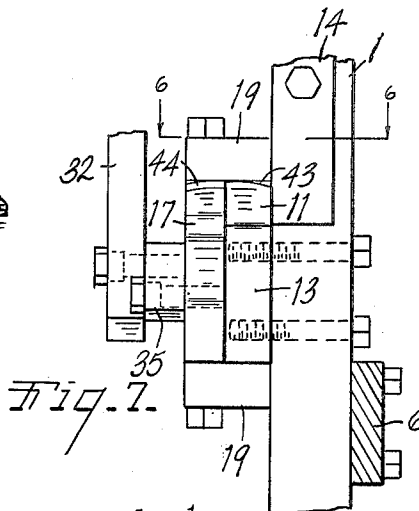
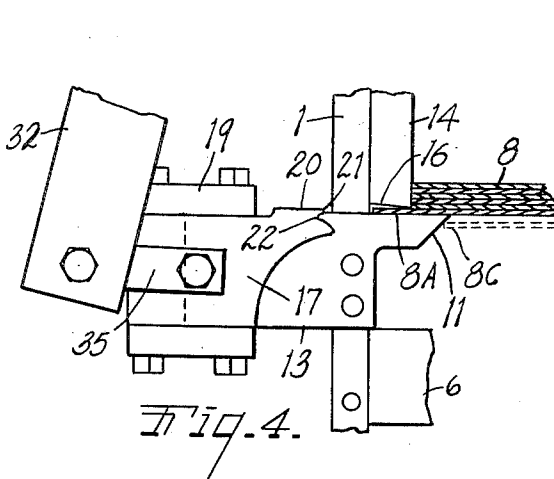
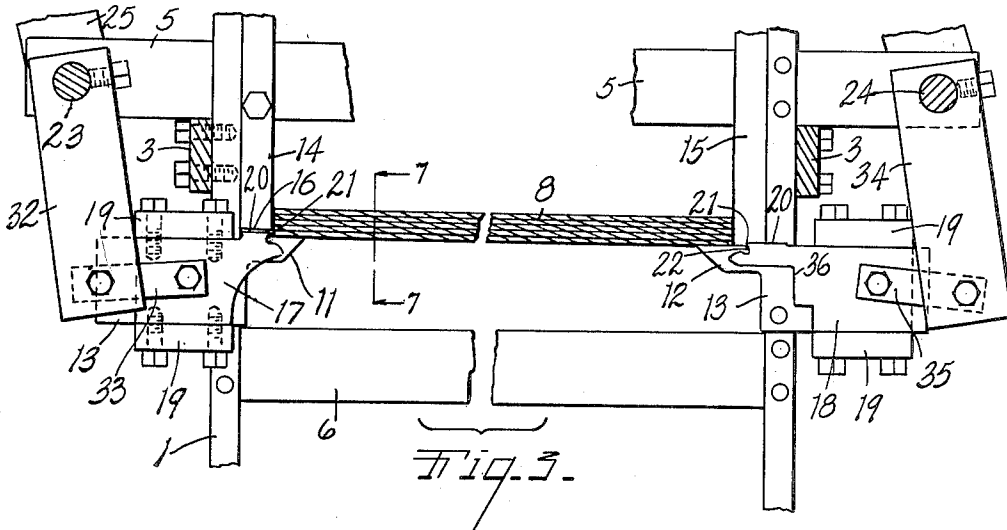
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4 Sheets-Sheet 3

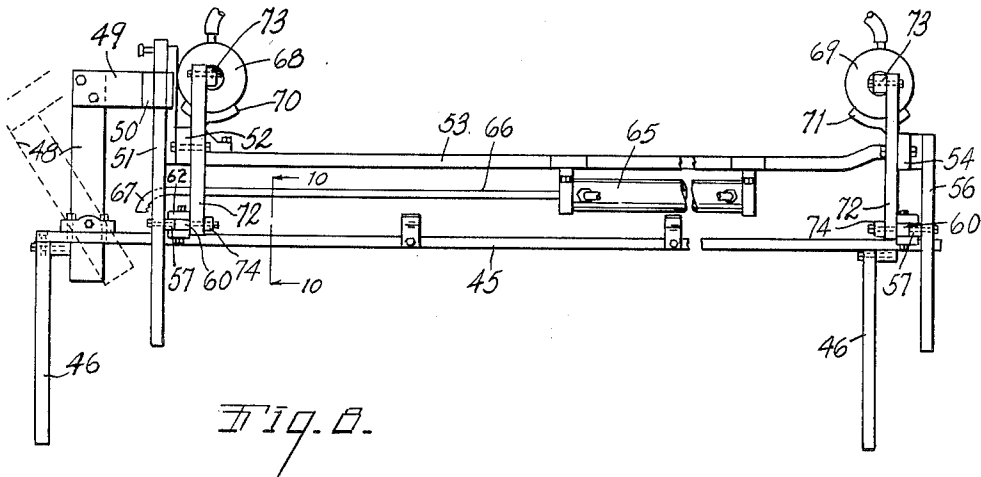


Fig. 8.

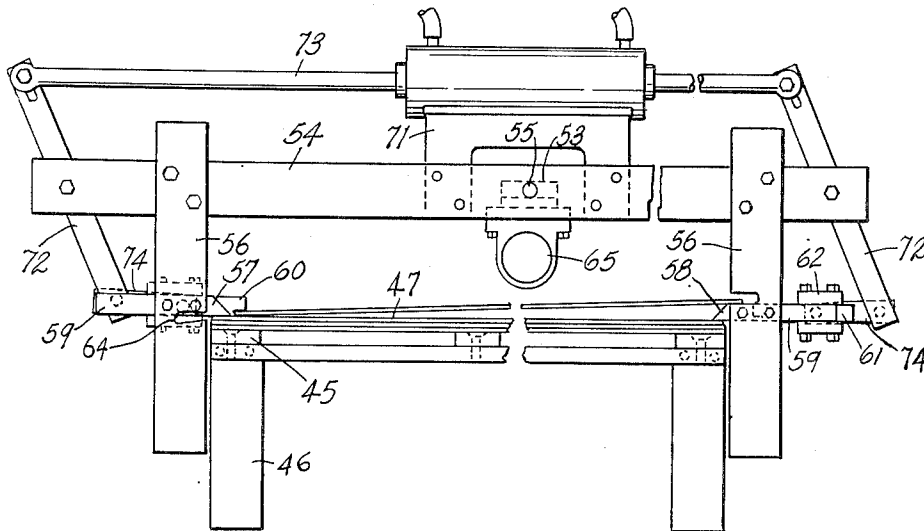


Fig. 9.

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SHEET METAL SEPARATING DEVICE

Filed Nov. 13, 1951

4 Sheets-Sheet 4

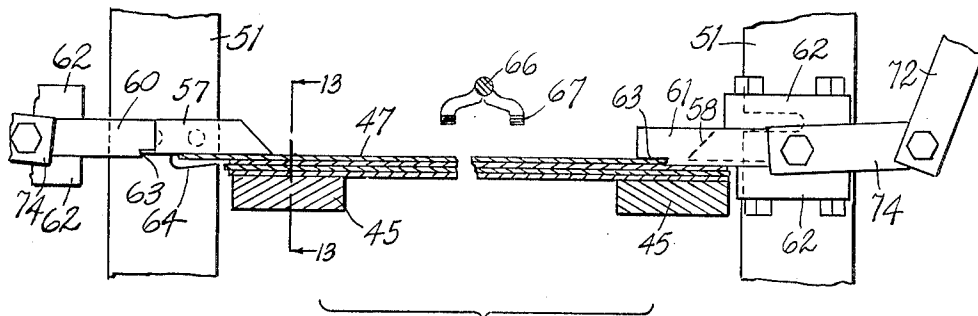


Fig. 10.

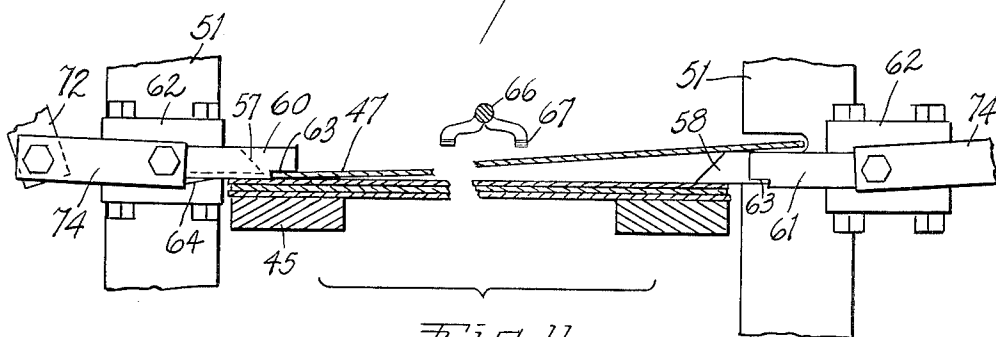


Fig. 11.

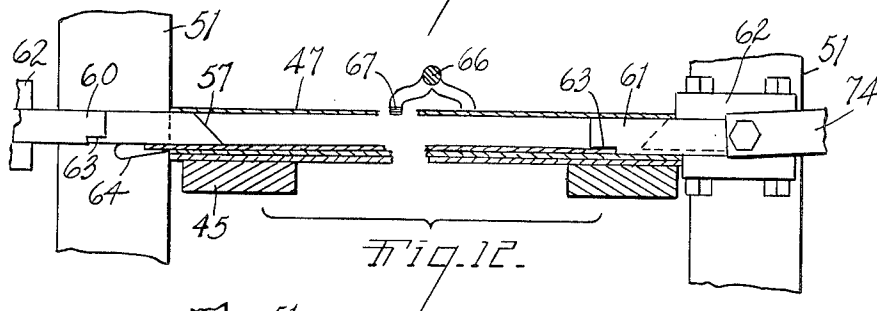


Fig. 12.

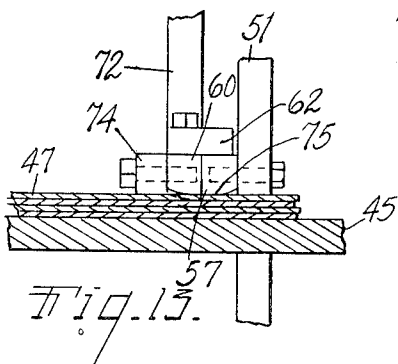


Fig. 13.

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2,662,648

SHEET METAL SEPARATING DEVICE

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Application November 13, 1951, Serial No. 255,951

28 Claims. (Cl. 214—8.5)

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This invention relates to improvements in a sheet metal separating device.

The principal objects of this invention are:

First, to provide a machine that will rapidly and consistently separate the end sheet from a stack of metal sheets without injury to the sheets and regardless of the tendency of the sheets to adhere to each other, due to oil or other materials forming a temporary bond between the sheets.

Second, to provide a sheet separating device which may be adapted for separating the top sheet from a stack of sheets and to move automatically downwardly as the stack of sheets diminishes.

Third, to provide a sheet separating device adapted to receive a stack of metal sheets and consecutively separate and deliver the bottom sheet of the stack for further handling.

Fourth, to provide a sheet separating mechanism in which the end sheet of a stack of sheets, either the top or bottom sheet, is retained vertically for engagement by a pair of opposed laterally shiftable jaws to shift the end sheet laterally and against wedge-shaped fingers which consecutively separate opposite sides of the sheet from the remainder of the stack.

Fifth, to provide a sheet separating device which is relatively simple and inexpensive and which is positive in its action in that a single sheet must be separated from the stack each time the device is actuated.

Other objects and advantages of my invention will be apparent from a consideration of the following description and claims. The drawings, of which there are four sheets, illustrate two highly practical forms of my sheet separating device, one form being adapted to separate and deliver sheets from the bottom of a stack while the other form is adapted to separate and deliver sheets from the top of a stack.

Fig. 1 is a side elevational view of a first form of my machine which is adapted to separate and deliver sheets from the bottom of a stack, portions of the machine being broken away to illustrate details of construction.

Fig. 2 is an end elevational view of the machine shown in Fig. 1.

Fig. 3 is a fragmentary vertical transverse cross sectional view taken along the plane of the line 3—3 in Fig. 1 and illustrating the machine in an unactuated starting position ready to commence a cycle of operation.

Fig. 4 is a fragmentary transverse vertical cross sectional view similar to the left end of the

structure shown in Fig. 3 but showing the structure in a first advanced position.

Fig. 5 is a fragmentary view illustrating the structure at the right end of Fig. 3 in a second retracted position in the cycle of operation of the machine.

Fig. 6 is a fragmentary horizontal view taken along the plane of the line 6—6 in Fig. 7 and illustrating in plan detail the supporting fingers and jaws of the machine.

Fig. 7 is an enlarged fragmentary elevational view of the inner ends of the supporting fingers and sheet moving jaws.

Fig. 8 is a side elevational view of a modified form of the machine adapted to separate the top sheet from a stack of sheets, portions of the machine being broken away.

Fig. 9 is an end elevational view of the machine shown in Fig. 8.

Fig. 10 is a fragmentary transverse cross sectional view taken along the plane of the line 10—10 in Fig. 8 and illustrating the machine in a first advanced position of its cycle of operation.

Fig. 11 is a fragmentary view similar to Fig. 10 but illustrating the machine in a second retracted position of its cycle of operation.

Fig. 12 is a view similar to Figs. 10 and 11 but illustrating the machine in a third advanced position at the end of one cycle of operation and beginning a second cycle of operation.

Fig. 13 is a fragmentary enlarged cross sectional view taken along the plane of the line 13—13 in Fig. 10 and illustrating in end elevation the supporting fingers and jaws of the modified form of the machine.

In many manufacturing operations sheet metal stamping presses have been developed that will operate at such a high rate of speed that it is difficult to supply single blank sheets of metal to the machine at a sufficiently rapid rate to permit the press to operate at full capacity. The delivery of individual sheets of sheet metal is complicated by the fact that blank sheets of metal piled in a stack tend to stick together because oil on the adjacent surfaces of the sheets forms a seal between the sheets and they are held together by atmospheric pressure. Generally my invention consists of presenting a series of rectangularly arranged fingers in abutting relation to the exposed surface of the sheet that is to be separated. The fingers have knife edges and beveled ends on their inner ends and also serve as guides for reciprocable jaws that successively engage the opposite edges of the first sheet of

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the stack to shift the sheet laterally and bring its opposite edges successively against the knife edges of the fingers and across the beveled ends of the fingers to forcibly separate the first sheet from the stack. The fingers may be held tightly against the end sheet of the stack either by supporting the stack on the fingers in which case the weight of the stack of sheets constitutes the holding force or by supporting the fingers and their connecting framework from the top sheet of the stack. In the latter case the weight of the framework, which connects the fingers, constitutes the holding force for retaining the fingers in engagement with the sheets.

In Fig. 1 I have illustrated a machine including a generally rectangular box-like framework having corner uprights 1. For convenience in description the machine may be considered as having a front illustrated in Fig. 1 with a back opposite. The corner uprights are interconnected by top side rails 2, intermediate side rails 3 and lower side rails 4. End rails 5, 6 and 7 interconnect opposite sides of the framework. It will be noted that the end rails 5 and 6 are mounted on the exterior of the corner uprights so that the interior of the framework forms an open hopper-like chamber adapted to receive a stack of sheets 8 to be separated. Desirably intermediate end uprights 9 retain the sheets longitudinally in the frame. The lower end members 7 support a series of slats 10 to form a receiving platform for individual sheets after they have been separated from the stack.

The stack of sheets 8 is supported within the frame by a plurality of fingers 11 and 12 secured to the inner sides of the corner uprights and projecting into the hopper-like frame from the front and back side respectively. The fingers 11 and 12 each have bar-like projections 13 that extend outwardly of the frame and form guide rails, as will be explained.

As is more particularly shown in Figs. 3 to 7, the inner opposed ends of the fingers 11 and 12 have sharp knife-like upper edges and downwardly and outwardly beveled ends. The fingers project inwardly a substantial distance beyond the edges of the stack of sheets 8. The sides of the stack of sheets 8 are laterally retained and guided by guide bars 14 and 15 secured to the corner uprights at the front and back sides of the machine respectively. The front guide bars 14 terminate, as at 16, slightly above the top surface of the front fingers 11 so that a slot is provided that will receive the front edge of the lowermost sheet. The rear guide bars 15 extend to or across the level of the top of the rear finger 12.

The outwardly projecting portions 13 of the fingers 11 and 12 have parallel upper and lower edges and flat sides to act as guides for front jaw members 17 and rear jaw members 18. Top and bottom plates 19 screwed to the top and bottom edges of the jaw members engage the top and bottom edges of the finger extensions 13 to retain and slidably guide the jaw members on the fingers and finger extensions. It will be noted that the upper edges of the jaw members 17 and 18 are slightly raised, as at 20, at the inner ends thereof to project slightly above the level of the fingers 11 and 12. The opposed inner ends of the jaw members 17 and 18 have inwardly opening sheet receiving notches 21 formed therein and the notches are slightly undercut or opened at the bottom, as at 22, to receive and accommo-

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date any burr that may be encountered on the edge of the sheets 8.

The jaw members 17 and 18 are arranged to be reciprocated simultaneously in the same direction on the finger extensions 13. For this purpose the upper end cross members 5 are extended transversely and form journal supports for a front rock shaft 23 and a rear rock shaft 24. Upstanding crank arms 25 on the ends of the rock shafts and transverse links 26 interconnect the rock shafts for simultaneous oscillation. An intermediate upstanding crank arm 27 (see Fig. 1) on the rear rock shaft 24 is provided with a rearwardly extending bracket 28. A pneumatic cylinder 29 or other fluid operated device is supported from the back top side rail by a bracket 30 and has its piston rod 31 operatively engaged with the bracket 28 to oscillate the rock shafts. Depending crank arms 32 on the front rock shaft 23 have their lower swinging ends connected to the front jaw members 17 by links 33. Depending crank arms 34 on the rear rock shaft 24 have their lower swinging ends connected to the rear jaw members 18 by links 35. It will thus be seen that actuation of the cylinder 29 or any equivalent driving mechanism will oscillate the rock shafts and reciprocate the jaw members with the back jaw members moving forwardly into the outline of the hopper as the front jaw members move forwardly away from the hopper, and vice versa. The sheet receiving notches 21 in the jaw members are spaced apart by a distance greater than the width of the sheets 8 so that the sheets are alternately engaged on opposite side edges.

With particular attention to Figs. 2, 3, 4 and 5, it will be noted that the first advancing motion of the rear jaw members 18 from the position shown in Fig. 3 will move the lower sheet forwardly into the slot below the front guide bar 14 as shown at 8A in Fig. 4. This movement permits the rear edge of the lower sheet to move inwardly beyond the knife edge of the rear fingers 12 and the weight of the stack of sheets immediately presses the second sheet tightly against the rear fingers 12. Upon the second or retracting motion of the jaw members, the front jaw members 17 push the lower sheet 12 rearwardly so that its rear edge is engaged by and forced downwardly along the beveled end of the rear fingers 12 as shown at 8B in Fig. 5. The retracting inward motion of the front jaw members 17 moves the front edge of the lower sheet inwardly past the knife edge of the front fingers 11 and the weight of the stack of sheets immediately presses the subadjacent sheet against the front fingers. At this time the bottom sheet 8 may fall from the bottom of the stack provided the sealing action between the surfaces of the sheets is not too great.

To absolutely insure that the bottom sheet will be separated from the stack, the second advancing motion of the rear jaw members 18 brings the vertical edges 36 of the rear jaw members into engagement with the lowered rear edge of the bottom sheet and forces the bottom sheet forwardly a second time and against the beveled end of the front fingers 11 as at 8C in Figs. 2 and 4. Both edges of the lower sheet having been separated forcibly from the subadjacent sheet the seal between the two sheets is broken and the lower sheet is free to fall to the receiving platform 10.

In order to temporarily support the rear edge of the lower sheet after it has been separated

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from the stack and before its front edge has moved rearwardly beyond the front fingers 11, I provide a temporary support finger 37 reciprocally supported on a bracket 38 from the intermediate side rail 3 at the back of the frame. This temporary support finger 37 is reciprocated in timed relationship with the jaw members by a crank arm 39 on the rear rock shaft and a link 40. It prevents the weight of the separated sheet from crimping the front edge of the sheet over the front support fingers 11. The finger 37 is retracted with the rear jaw members 18 and permits the bottom plate to fall to the receiving platform as soon as the front edge clears the front fingers 11.

The separated bottom sheet can be ejected from the receiving platform 10 by a number of mechanical devices. By way of example I have illustrated a second fluid operated cylinder and piston 41 supported from the left end of the frame and provided with a piston rod and pusher 42 which is reciprocable across the receiving platform to eject the separated plate.

Figs. 6 and 7 illustrate details of the supporting fingers and jaws that are desirable. It will be noted that the top surface of the finger is ground off slightly in an arc, as at 43, from the inner edge of the finger. The inner end of the jaw member is correspondingly ground off slightly in an arc, as at 44, about the same center as the arc 43 so that the adjacent edges of the coacting finger and jaw member tend to form a line support against which the lower sheet of the stack is pressed. This construction eliminates the possibility that a buckled sheet might rest on the finger in such a position that it would not be engaged by the notch in the jaw member.

It is pointed out that the second advancing operation of the rear jaw members 18 has a dual function. As previously described, this second advancing motion will press the lowermost sheet forwardly against the beveled ends of the front fingers and at the same time the notch 21 in the back jaw members will advance the second or subadjacent sheet into the slot beneath the front guide bar 14 in the beginning of a second cycle of operations. Successive cycles of the machine thus overlap and it is unnecessary for the mechanism to complete one cycle before starting a second. Due to the positively located positions of the bottom sheet of the stack and the jaw members 18, it is impossible for the machine to miss a sheet in any cycle of operation so that delivery of sheets from the stack is rapid and uniform.

The modified form of my machine is illustrated in Figs. 8 to 13 and is designed to deliver the top sheet from a stack of sheets. In this embodiment of my invention I provide a base or bed 45 that may be supported upon legs 46 to place it at a convenient level with respect to a press or other machine. The bed 45 is adapted to receive and support a stack of sheets 47 to be separated. Pivottally supported on one end of the base are uprights 48 having arms 49 projecting toward the opposite end of the machine. The arms 49 carry a crossbar 50 that is vertically fixed but swingable with the uprights. The ends of the crossbar 50 are provided with vertical guideways for vertical slide bars 51. The bars 51 are interconnected by a movable crossbar 52 so that the bars 51 and 52 can move downwardly as the height of the stack of sheets is diminished. The movable crossbar 52 carries a longitudinally extending beam 53 that extends to the opposite end of the base and is rotatably connected to a third

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crossbar 54, as at 55 (see Fig. 9). The crossbars 52 and 54 form the supports for the sheet separating structure as will be described.

The vertically extending slide bars 51 and corresponding vertical bars 56 secured to the crossbar 54 are adapted to depend or hang along the sides of the stack of sheets 47. The bars 51 and 56 constitute side guides for the sides of the stack and are supported from the top sheet of the stack by means of fingers 57 and 58 that project inwardly across the stack from the front and back sides thereof respectively. The inner opposed ends of the fingers have knife edges and upwardly and outwardly beveled surfaces in a reversal of the shape of the fingers in the first form of the invention. The outer ends of the fingers 57 and 58 form supporting guides 59 similar in function to the finger extensions 13 in the first form of the invention.

Slidably supported along the sides of the fingers 57 and 58 and the finger extensions 59 are front jaw members 60 and rear jaw members 61. Top and bottom plates 62 support and guide the jaw members on their respective fingers. The lower inner edges of the jaw members 60 and 61 are notched, as at 63, with the notch extending vertically across the lower edges of the fingers to engage the top sheet of the stack of sheets.

In order to permit forward sliding motion of the top sheet of the stack under the influence of a first advancing motion of the rear jaw members, the front vertical bars 51 and 56 are transversely slotted as at 64. The lower edges of the slots 64 constitute stops to prevent more than a single sheet being forced laterally from the body of the stack. Upon return motion of the top sheet by the second retracting motion of the front jaw members 60, the rear edge of the sheet is cammed upwardly over the rear fingers 58 and into slots in the rear vertical bars 51 and 56 as is illustrated in Fig. 11. The second advancing motion of the rear jaw members 61 moves the top sheet forwardly a second time over the beveled face of the front fingers with the top plate 62 on the rear jaw member forming the pushing surface. Simultaneously the second or subadjacent sheet of the stack is pushed forwardly into the slots 64 as is shown in Fig. 12.

The top sheet is thus separated from the stack and positioned upon the top edges of the fingers 57 and 58. From this position it can be easily ejected laterally by a variety of mechanisms. By way of example I have illustrated a pneumatic cylinder 65 mounted on the longitudinal beam 53 and provided with a piston rod 66 with a hook 67 on its end for ejecting the separated sheet.

The jaw members 60 and 61 are reciprocated by a pair of pneumatic cylinders 68 and 69 supported transversely above the stack by brackets 70 and 71 that connect the cylinders to the crossbars 52 and 54 respectively. The ends of the crossbars 52 and 54 pivottally support crank arms 72 and the ends of the piston rods 73 of the cylinders 68 and 69 are pivottally connected to the upper ends of these crank arms. The lower ends of the crank arms 72 are connected by means of links 74 to the jaws.

As is best illustrated in Fig. 13, the sheet engaging surfaces of the fingers and jaw members is desirably rounded, as at 75, to provide a line contact with the sheets similar to the first form of the invention. The pivotal connection of the uprights 48 to the base permits the entire mechanism to be tilted away from the base for easy loading of a stack of sheets on the base. As was previously described, the slidable connection of

the vertical bars 51 to the crossbar 50 permits the fingers 57 and 58 and the separating mechanism to move downwardly as the height of the stack decreases. The pivotal connection between the crossbar 54 and the longitudinal beam 53 permits the fingers and jaws at the right end of the machine to tilt slightly with respect to the jaws at the left end of the machine should the sheets of the stack be tilted or warped. This assures tight operative engagement of all of the fingers and jaws with the top sheet of the stack.

I have thus described two highly practical forms of my invention so that it is believed others may reproduce or adapt my invention as may be desired to varying circumstances. The disclosure is not intended as a definition of the limits of my invention as it is obvious that many variations in the details of the structure may be made without departing from the spirit and theory of my invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A sheet metal separating device comprising, a hopper having rectangularly positioned corner uprights connected by side and end horizontal rails and adapted to receive a stack of metal sheets through the top, support fingers secured to said uprights and projecting horizontally inwardly of the hopper from opposite sides thereof to support the bottom sheet of the stack, said fingers having downwardly and outwardly beveled inner ends whereby the upper edges thereof form sharp edges adapted to penetrate between adjacent sheets, the upper edges of said fingers being transversely and downwardly concavely rounded, guide bars secured to said uprights within said hopper and located on opposite sides of the hopper above said fingers, the guide bars on one side of the hopper being spaced above their associated fingers by a distance slightly greater than the thickness of the sheets to be separated to provide a single sheet receiving slot therebetween, sheet moving jaws reciprocally slidably supported on the sides of said fingers and having transversely curved upper edges concentric with said fingers, rock shafts pivotally mounted on each side of said hopper and interconnected for simultaneously rocking motion, crank arms connected between said rock shafts and said jaws on each side of said frame, means for oscillating said rock shafts whereby the jaws on one side of said hopper are projected inwardly of said guide members and fingers while the jaws on the other side of the hopper are retracted outwardly of the plane of the guide members on that side of the hopper, said jaws having sheet engaging notches positioned to move along the edges of said sheet supporting fingers to engage the bottom sheet of a stack supported on said fingers, a temporary supporting bar horizontally reciprocally mounted below the jaws and fingers on the other side of said hopper from said one side thereof, means connecting said supporting bar to the rock shaft on said other side of the hopper for reciprocation with the jaws on said other side of the hopper, the jaws on said other side of the hopper having lower vertically extending sheet engaging edges translatable against the edge of a sheet supported on said supporting bar, a receiving platform supported between said uprights below said jaws to receive individual sheets separated from said stack by said jaws, and a horizontally reciprocable sheet dis-

charge element mounted to move across said receiving platform to discharge sheets therefrom.

2. A sheet metal separating device comprising, a hopper having rectangularly positioned corner uprights connected by side and end horizontal rails and adapted to receive a stack of metal sheets through the top, support fingers secured to said uprights and projecting horizontally inwardly of the hopper from opposite sides thereof to support the bottom sheet of the stack, said fingers having downwardly and outwardly beveled inner ends whereby the upper edges thereof form sharp edges adapted to penetrate between adjacent sheets, guide bars secured to said uprights within said hopper and located on opposite sides of the hopper above said finger, the guide bars on one side of the hopper being spaced above their associated fingers by a distance slightly greater than the thickness of the sheets to be separated to provide a single sheet receiving slot therebetween, sheet moving jaws reciprocally slidably supported on the sides of said fingers, rock shafts pivotally mounted on each side of said hopper and interconnected for simultaneously rocking motion, crank arms connected between said rock shafts and said jaws on each side of said frame, means for oscillating said rock shafts whereby the jaws on one side of said hopper are projected inwardly of said guide members and fingers while the jaws on the other side of the hopper are retracted outwardly of the plane of the guide members on that side of the hopper, said jaws having sheet engaging notches positioned to move along the edges of said sheet supporting fingers to engage the bottom sheet of a stack supported on said fingers, a temporary supporting bar horizontally reciprocally mounted below the jaws and fingers on the other side of said hopper from said one side thereof, means connecting said supporting bar to the rock shaft on said other side of the hopper for reciprocation with the jaws on said other side of the hopper, the jaws on said other side of the hopper having lower vertically extending sheet engaging edges translatable against the edge of a sheet supported on said supporting bar, a receiving platform supported between said uprights below said jaws to receive individual sheets separated from said stack by said jaws, and a horizontally reciprocable sheet discharge element mounted to move across said receiving platform to discharge sheets therefrom.

3. A sheet metal separating device comprising, a hopper having rectangularly positioned uprights connected by side and end rails and adapted to receive a stack of metal sheets through the top, support fingers secured to said uprights and projecting horizontally inwardly of the hopper from opposite sides thereof to support the bottom sheet of the stack, said fingers having downwardly and outwardly beveled inner ends whereby the upper edges thereof form sharp edges adapted to penetrate between adjacent sheets, guide bars secured to said uprights within said hopper and located on opposite sides of the hopper above said fingers, the guide bars on one side of the hopper being spaced above their associated fingers by a distance slightly greater than the thickness of the sheets to be separated, sheet moving jaws reciprocally slidably supported on the sides of said hopper to slide alongside of said fingers, rock shafts pivotally mounted on each side of said hopper and interconnected for simultaneously rocking motion, crank arms connected between said rock shafts

and said jaws on each side of said hopper, means for oscillating said rock shafts whereby the jaws on one side of said hopper are projected inwardly of said guide members and fingers while the jaws on the other side of the hopper are retracted outwardly of the plane of the guide members on that side of the hopper, said jaws having sheet engaging notches positioned to move along the edges of said sheet supporting fingers to engage the bottom sheet of a stack supported on said fingers, a temporary supporting bar horizontally reciprocally mounted below the jaws and fingers on the other side of said hopper from said one side thereof, means connecting said supporting bar to the rock shaft on said other side of the hopper for reciprocation with the jaws on said other side of the hopper, the jaws on said other side of the hopper having vertically extending sheet engaging edges translatable against the edge of a sheet supported on said supporting bar, a receiving platform supported between said uprights below said jaws to receive individual sheets separated from said stack by said jaws, and a horizontally reciprocable sheet discharge element mounted to move across said receiving platform to discharge sheets therefrom.

4. A sheet metal separating device comprising, a hopper having rectangularly positioned uprights connected by side and end rails and adapted to receive a stack of metal sheets through the top, support fingers secured to said uprights and projecting horizontally inwardly of the hopper from opposite sides thereof to support the bottom sheet of the stack, said fingers having downwardly and outwardly beveled inner ends whereby the upper edges thereof form sharp edges adapted to penetrate between adjacent sheets, guide bars secured to said uprights within said hopper and located on opposite sides of the hopper above said fingers, the guide bars on one side of the hopper being spaced above their associated fingers by a distance slightly greater than the thickness of the sheets to be separated, sheet moving jaws reciprocally slidably supported on the sides of said hopper to slide alongside of said fingers, rock shafts pivotally mounted on each side of said hopper and interconnected for simultaneously rocking motion, crank arms connected between said rock shafts and said jaws on each side of said hopper, means for oscillating said rock shafts whereby the jaws on one side of said hopper are projected inwardly of said guide members and fingers while the jaws on the other side of the hopper are retracted outwardly of the plane of the guide members on that side of the hopper, said jaws having sheet engaging notches positioned to move along the edges of said sheet supporting fingers to engage the bottom sheet of a stack supported on said fingers, the jaws on said other side of the hopper having lower vertically extending sheet engaging edges translatable against the edge of a sheet stripped downwardly from the stack, a receiving platform supported between said uprights below said jaws to receive individual sheets separated from said stack by said jaws, and a sheet discharge element mounted to move across said receiving platform to discharge sheets therefrom.

5. A sheet metal separating device comprising, a hopper having supporting uprights connected by side and end rails and adapted to receive a stack of metal sheets through the top, support fingers secured to said hopper and projecting horizontally inwardly of the hopper from oppo-

site sides thereof to support the bottom sheet of the stack, said fingers having downwardly beveled inner ends whereby the upper edges thereof form sharp edges adapted to penetrate between adjacent sheets, guides within said hopper and located on opposite sides of the hopper above said fingers, the guides on one side of the hopper being spaced above their associated fingers by a distance slightly greater than the thickness of the sheets to be separated, sheet moving jaws reciprocally slidably supported on the sides of said hopper, rock shafts pivotally mounted on each side of said hopper and interconnected for simultaneously rocking motion, crank arms connected between said rock shafts and said jaws, means for oscillating said rock shafts whereby the jaws on one side of said hopper are projected inwardly of said guides while the jaws on the other side of the hopper are retracted outwardly of the plane of the guides on that side of the hopper, said jaws having sheet engaging notches positioned to move along the edges of said sheet supporting fingers to engage the bottom sheet of a stack supported on said fingers, the jaws on the other side of the hopper from said one side having lower vertically extending sheet engaging edges translatable against the edge of a sheet pushed laterally and downwardly along the beveled ends of the fingers on said other side of the hopper by the jaws on said one side of the hopper, a receiving platform supported between said uprights below jaws to receive individual sheets separated from said stack by said jaws, and a sheet discharge element mounted to move across said receiving platform to discharge sheets therefrom.

6. A sheet metal separating device comprising, a hopper having supporting uprights connected by side and end rails and adapted to receive a stack of metal sheets through the top, support fingers secured to said hopper and projecting horizontally inwardly of the hopper from opposite sides thereof to support the bottom sheet of the stack, said fingers having downwardly and outwardly beveled inner ends whereby the upper edges thereof form sharp edges adapted to penetrate between adjacent sheets, guides within said hopper and located on opposite sides of the hopper above said fingers, the guides on one side of the hopper being spaced above their associated fingers by a distance slightly greater than the thickness of the sheets to be separated, sheet moving jaws reciprocally slidably supported on the sides of said hopper, rock shafts pivotally mounted on each side of said hopper and interconnected for simultaneously rocking motion, crank arms connected between said rock shafts and said jaws, and means for oscillating said rock shafts whereby the jaws on one side of said hopper are projected inwardly of said guides while the jaws on the other side of the hopper are retracted outwardly of the plane of the guides on that side of the hopper, said jaws having sheet engaging notches positioned to move along the edges of said sheet supporting fingers to engage the bottom sheet of a stack supported on said fingers, the jaws on the other side of the hopper from said one side having lower vertically extending sheet engaging edges translatable against the edge of a sheet pushed laterally and downwardly along the beveled ends of the fingers on said other side of the hopper by the jaws on one side of the hopper.

7. A sheet metal separating device comprising, transversely spaced support fingers adapted to

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have a stack of sheets to be separated supported on their upper edges, the opposed inner ends of said fingers having knife edges and downwardly and outwardly sloping ends therebelow, guides extending from the top of the fingers on one side of said device to align the edges of sheets supported on said fingers, other guides positioned above the other fingers on the other side of the device to align the other edges of the sheets and having their lower ends spaced vertically above the top of the fingers associated therewith to provide slots capable of receiving the edge of the lower sheet of the stack, first stripping jaws reciprocally mounted on the fingers on said one side of the device and having notches in their upper edge engageable with the lower sheet of the stack of sheets to slide the sheet horizontally into said slots and beyond the inner ends of the fingers on said one side of the device, second stripping jaws reciprocally mounted on the fingers on said other side of the device and having inwardly facing notches engageable with the edge of said lower sheet to return the sheet from said slots and cammingly against the knife edges of the fingers on said one side of the device and beyond the ends of said other fingers on said other side of the device, said first stripping jaws having lower sheet engaging edges adapted on a second inward advancing motion of said first jaws to engage the edge of said lower sheet below the knife edges on the fingers on said one side of the device and move the lower sheet against the knife edges on said other fingers to complete the separation of the lower sheet from the stack as the notches in said first jaws advance the second sheet of the stack laterally in the first step of a second separating cycle, and means for reciprocating said jaws concurrently, said jaws having burr receiving grooves at the base of the sheet engaging notches therein.

8. A sheet metal separating device comprising, transversely spaced support fingers adapted to have a stack of sheets to be separated supported on their upper edges, the opposed inner ends of said fingers having knife edges and downwardly and outwardly sloping ends therebelow, guides extending from the top of the fingers on one side of said device to align the edges of sheets supported on said fingers, other guides positioned above the other fingers on the other side of the device to align the other edges of the sheets and having their lower ends spaced vertically above the top of the fingers associated therewith to provide slots capable of receiving the edge of the lower sheet of the stack, first stripping jaws reciprocally mounted on the fingers on said one side of the device and having notches in their upper edge engageable with the lower sheet of the stack of sheets to slide the sheet horizontally into said slots and beyond the inner ends of the fingers on said one side of the device, second stripping jaws reciprocally mounted on the fingers on said other side of the device and having inwardly facing notches engageable with the edge of said lower sheet to return the sheet from said slots and cammingly against the knife edges of the fingers on said one side of the device and beyond the ends of said other fingers on said other side of the device, said first stripping jaws having lower sheet engaging edges adapted on a second inward advancing motion of said first jaws to engage the edge of said lower sheet below the knife edges on the fingers on said one side of the device and move the lower sheet against the knife edges on said other fingers to complete the

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separation of the lower sheet from the stack as the notches in said first jaws advance the second sheet of the stack laterally in the first step of a second separating cycle, and means for reciprocating said jaws concurrently.

9. A sheet metal separating device comprising, transversely spaced support fingers adapted to have a stack of sheets to be separated supported on their upper edges, the opposed inner ends of said fingers having knife edges and downwardly and outwardly sloping ends therebelow, guides extending from the top of the fingers on one side of said device to retain the edges of sheets supported on said fingers, other guides positioned above the other fingers on the other side of the device to align the other edges of the sheets and having their lower ends spaced vertically above the top of said other fingers associated therewith to provide slots capable of receiving the edge of the lower sheet of the stack, first stripping jaws reciprocable alongside the fingers on said one side of the device and having notches in their upper edge engageable with the lower sheet of the stack of sheets to slide the sheet horizontally into said slots and beyond the inner ends of the fingers on said one side of the device, second stripping jaws reciprocable alongside said other fingers on said other side of the device and having inwardly facing notches engageable with the edge of said lower sheet to return the sheet from said slots and cammingly against the knife edges of the fingers on said one side of the device and beyond the ends of said other fingers on said other side of the device, said first stripping jaws having lower sheet engaging edges adapted on a second inward advancing motion of said first jaws to engage the edge of said lower sheet below the knife edge on the fingers on said one side of the device and move the lower sheet against the knife edges on said other fingers to complete the separation of the lower sheet from the stack, and means for reciprocating said jaws concurrently, each of said fingers and the jaw adjacent thereto having transversely rounded surfaces upwardly convex about a common center.

10. A sheet metal separating device comprising, transversely spaced support fingers adapted to have a stack of sheets to be separated supported on their upper edges, the opposed inner ends of said fingers having knife edges and downwardly and outwardly sloping ends therebelow, guides extending from the top of the fingers on one side of said device to retain the edges of sheets supported on said fingers, other guides positioned above the other fingers on the other side of the device to align the other edges of the sheets and having their lower ends spaced vertically above the top of said other fingers associated therewith to provide slots capable of receiving the edge of the lower sheet of the stack, first stripping jaws reciprocable alongside the fingers on said one side of the device and having notches in their upper edge engageable with the lower sheet of the stack of sheets to slide the sheet horizontally into said slots and beyond the inner ends of the fingers on said one side of the device, second stripping jaws reciprocable alongside said other fingers on said other side of the device and having inwardly facing notches engageable with the edge of said lower sheet to return the sheet from said slots and cammingly against the knife edges of the fingers on said one side of the device and beyond the ends of said other fingers on said other side of the device, said first stripping jaws having lower

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sheet engaging edges adapted on a second inward advancing motion of said first jaws to engage the edge of said lower sheet below the knife edge on the fingers on said one side of the device and move the lower sheet against the knife edges on said other fingers to complete the separation of the lower sheet from the stack, and means for reciprocating said jaws concurrently.

11. A sheet metal separating device comprising, transversely spaced support fingers adapted to lappingly engage the end sheet of a stack of sheets at opposite sides thereof, the opposed inner ends of said fingers having knife edges and outwardly sloping ends, guides extending transversely from the fingers on one side of said device to retain the side of said stack of sheets, other guides extending transversely of the fingers on the other side of the device to retain the other side of said stack and having their ends spaced from the sheet engaging surfaces of the fingers associated therewith to provide slots capable of receiving the edge of the end sheet of the stack, first stripping jaws reciprocable along the fingers on said one side of the device and having notches in their inner ends engageable with the end sheet of the stack of sheets to slide the sheet horizontally into said slots and beyond the inner ends of the fingers on said one side of the device, second stripping jaws reciprocable alongside said other fingers on said other side of the device and having inwardly facing notches engageable with the edge of said end sheet to return the sheet from said slots and cammingly against the knife edges of the fingers on said one side of the device and beyond the ends of the fingers on said other side of the device, said first stripping jaws having transversely extending sheet engaging edges adapted on a second inward advancing motion of said first jaws to engage the edge of said end sheet after the end sheet has been forced across the sloping ends on the fingers on said one side of the device and move the end sheet against the knife edges on said other fingers to complete the separation of the end sheet from the stack, and means for reciprocating said jaws concurrently.

12. A sheet feeding device comprising, a frame rectangular in outline and adapted to embrace a stack of sheets to be fed, fingers secured to opposite sides of said frame and having inner portions projecting inwardly of the outline of the frame for lapped engagement with the end sheet of a stack of sheets within the frame, the inner ends of said fingers being beveled away from said sheet to provide knife edges, the sheet engaging surfaces of said fingers being transversely rounded from one edge of the fingers, jaw members reciprocably mounted alongside of said fingers, said fingers constituting supporting guides for said jaw members, inwardly facing single sheet receiving notches on the inner ends of said jaw members and extending across the level of the sheet supporting edge of said fingers, said jaw members and the notches therein being spaced on opposite sides of said frame by a distance greater than the width of sheets receivable in said frame, the surfaces of said jaw members facing said sheets being transversely rounded from an edge adjacent said one edge of the finger adjacent to each jaw member, means mounted on said frame for simultaneously reciprocating said jaw members in the same direction, guide portions extending axially within the opening of said frame and positioned on the same sides thereof as said fingers to guide and retain the edges of sheets within the frame, the guide portions on one side

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of the frame forming slots slightly thicker than one sheet and disposed outwardly of the sheet engaging surfaces of the fingers on said one side of the frame whereby inward movement of the jaw members on the other side of the frame will slide the first sheet of the stack laterally into said slots until the other edge of the sheet engaged by the jaw members clears the knife edges of the fingers on said other side of the frame, said jaw members on said other side of said frame having sheet engaging edges extending axially of the opening of said frame and disposed outwardly of the notches in the jaw members and on the opposite side thereof from the notches and adapted to engage the other edge of said first sheet on the second advancing motion of said other jaw members after said first sheet has been forced back laterally outwardly along the beveled surface of the fingers on said other side of said frame by inward reciprocation of the jaw members of said one side of said frame past the inner ends of the fingers on said one side of the frame, a sheet ejecting element reciprocable transversely through said frame and along the opposite side of said fingers from said stack to engage and eject said first sheet after it has been separated from said stack by said jaw members and said fingers, and means for operating said ejecting element in timed relationship with said jaw members.

13. A sheet feeding device comprising, a frame rectangular in outline and adapted to embrace a stack of sheets to be fed, fingers secured to opposite sides of said frame and having inner portions projecting inwardly of the outline of the frame for lapped engagement with the end sheet of a stack of sheets within the frame, the inner ends of said fingers being beveled away from said sheet to provide knife edges, jaw members reciprocably mounted alongside of said fingers, inwardly facing single sheet receiving notches on the inner ends of said jaw members and extending across the level of the sheet supporting edge of said fingers, said jaw members and the notches therein being spaced on opposite sides of said frame by a distance greater than the width of sheets receivable in said frame, means mounted on said frame for simultaneously reciprocating said jaw members in the same direction, guide portions extending axially within the opening of said frame and positioned on the same sides thereof as said fingers to guide and retain the edges of sheets within the frame, the guide portions on one side of the frame forming slots slightly thicker than one sheet and disposed outwardly of the sheet engaging surfaces of the fingers on said one side of the frame whereby inward movement of the jaw members on the other side of the frame will slide the first sheet of the stack laterally into said slots until the other edge of the sheet engaged by the jaw members clears the knife edges of the fingers on said other side of the frame, said jaw members on said other side of said frame having sheet engaging edges extending axially of the opening of said frame and disposed outwardly of the notches in the jaw members and on the opposite side thereof from the notches and adapted to engage the other edge of said first sheet on the second advancing motion of said other jaw members after said first sheet has been forced back laterally outwardly along the beveled surface of the fingers on said other side of said frame by inward reciprocation of the jaw members of said one side of said frame past the inner ends of the fingers

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on said one side of the frame, a sheet ejecting element reciprocable transversely through said frame and along the opposite side of said fingers from said stack to engage and eject said first sheet after it has been separated from said stack by said jaw members and said fingers, and means for operating said ejecting element in timed relationship with said jaw members.

14. In a device for successively separating the end sheet from a stack of metal sheets, the combination of, interconnected guides engageable with opposite edges of the sheets of said stack, fixed fingers projecting inwardly of said guides in lapped relationship with the end sheet of said stack, the guide and finger on one side of said stack having a slot formed therebetween of such thickness as to receive the edge of said end sheet, the inner ends of said fingers being beveled sharply outwardly and away from the surface of said end sheet, jaw members mounted to reciprocate alongside of said fingers and having single sheet engaging notches in their inner ends partially overlapping the level of the sheet engaging edges of said fingers, said jaw members and the notches therein being spaced apart by a distance greater than the distance between said guide members, said fingers constituting supporting guides for said jaw members, and means for reciprocating said jaw members in the same direction to move the notches therein inwardly past the beveled inner end of the finger associated with each notch and outwardly at least an equal distance past the inner edge of the guide member associated with each jaw member, said jaw member on the opposite side of the device from said slot having a vertically extending sheet engaging edge positioned outwardly from the notch therein and on the opposite side of the jaw member from the sheet engaging edge of the finger associated therewith.

15. In a device for successively separating the end sheet from a stack of metal sheets, the combination of, interconnected guides engageable with opposite edges of the sheets of said stack, fixed fingers projecting inwardly of said guides in lapped relationship with the end sheet of said stack, the guide and finger on one side of said stack having a slot formed therebetween of such thickness as to receive the edge of said end sheet, the inner ends of said fingers being beveled sharply outwardly and away from the surface of said end sheet, jaw members mounted to reciprocate alongside of said fingers and having single sheet engaging notches in their inner ends partially overlapping the level of the sheet engaging edges of said fingers, said jaw members and the notches therein being spaced apart by a distance greater than the distance between said guide members, and means for reciprocating said jaw members in the same direction to move the notches therein inwardly past the beveled inner end of the finger associated with each notch and outwardly at least an equal distance past the inner edge of the guide member associated with each jaw member, said jaw member on the opposite side of the device from said slot having a vertically extending sheet engaging edge positioned outwardly from the notch therein and on the opposite side of the jaw member from the sheet engaging edge of the finger associated therewith.

16. In a device for successively separating the end sheet from a stack of metal sheets, the combination of, interconnected guides engageable with opposite edges of the sheets of said stack,

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fixed fingers projecting inwardly of said guides in lapped relationship with the end sheet of said stack, the guide and finger on one side of said stack having a slot formed therebetween of such thickness as to receive the edge of said end sheet, the inner ends of said fingers being beveled sharply outwardly and away from the surface of said end sheet, jaw members mounted to reciprocate alongside of said fingers and having single sheet engaging notches in their inner ends partially overlapping the level of the sheet engaging edges of said fingers, the notches in said jaw members being spaced apart by a distance greater than the distance between said guide members, and means for reciprocating said jaw members in the same direction to move the notches therein inwardly past the beveled inner end of the finger associated with each jaw and outwardly past the inner edge of the guide member associated with each jaw member, said jaw member on the opposite side of the device from said slot having a vertically extending sheet engaging edge positioned outwardly from the notch therein and on the opposite side of the jaw member from the sheet engaging edge of the finger associated therewith.

17. In a device for successively separating the end sheet from a stack of metal sheets, the combination of, interconnected guides engageable with opposite edges of the sheets of said stack, fixed fingers projecting inwardly of said guides in lapped relationship with the end sheet of said stack, the guide and finger on one side of said stack having a slot formed therebetween of such thickness as to receive the edge of said end sheet, the inner ends of said fingers being beveled sharply outwardly and away from the surface of said end sheet, jaw members having their major portion disposed on the opposite sides of the sheet engaging edges of said fingers from said stack and mounted to reciprocate transversely of said guides and having single sheet engaging notches in their inner ends partially overlapping the level of the sheet engaging edges of said fingers, the notches in said jaw members being spaced apart by a distance greater than the distance between said guide members, and means for reciprocating said jaw members in the same direction to move the notches therein inwardly past the beveled inner end of the finger associated with each jaw and outwardly past the inner edge of the guide member associated with each jaw member.

18. A sheet feeding device comprising, a base having a platform thereon adapted to support a stack of metal sheets, uprights pivotally supported on one end of said base and projecting above said platform, a crossbar carried by the swinging ends of said uprights and along one end of the stack of sheets, vertical bars slidably mounted on the ends of said crossbar to slide along the sides of said stack and said platform, a second crossbar connecting said vertical bars above said platform, a horizontal beam connected to and extending longitudinally from said second crossbar across said platform and the stack of sheets supported thereon, a third crossbar rotatably mounted on the opposite end of said horizontal beam, other vertical bars carried by the ends of said third crossbar and depending along the sides of said stack and said platform, finger elements secured to said vertical bars and projecting inwardly therefrom into overlapping relationship with said platform and into supported engagement on the top sheet of said stack, said finger

elements having upwardly and outwardly beveled inner ends terminating in knife edges, jaw members reciprocally mounted on said finger elements and having inwardly facing sheet engaging notches in their lower inner edges extending below the under surfaces of said finger elements, said jaw members and the notches therein being spaced apart by a distance greater than the width of the sheets in said stack, crank arms pivotally mounted on the ends of said second and third crossbars and having their lower ends link connected to adjacent jaw members, fluid actuated pistons carried by said second and third crossbars and having double ended piston rods extending transversely of said platform and connected to the upper ends of the crank arms supported on the same crossbar to reciprocate said jaw members, the vertical bars on one side of said platform having inwardly opening slots formed therein and extending below the level of the finger elements on said one side by a distance slightly greater than the thickness of said sheets whereby the top sheet of the stack may be slid transversely into the slots, the vertical bars on the other side of said platform having inwardly opening slots formed therein and positioned above the finger elements on said other side, and means including a fluid actuated piston carried by said longitudinal beam and having a reciprocable piston rod with a hook on its outer end adapted to eject single plates supported on top of said finger elements.

19. A sheet feeding device comprising, a base having a platform thereon adapted to support a stack of metal sheets, uprights pivotally supported on one end of said base and projecting above said platform, a crossbar carried by the swinging ends of said uprights and along one end of the stack of sheets, vertical bars slidably mounted on the ends of said crossbars to slide along the sides of said stack and said platform, a second crossbar connecting said vertical bars above said platform, a horizontal beam connected to and extending longitudinally from said second crossbar across the said platform and the stack of sheets supported thereon, a third crossbar mounted on the opposite end of said horizontal beam, other vertical bars carried by the ends of said third crossbar and depending along the sides of said stack and said platform, finger elements secured to said vertical bars and projecting inwardly therefrom into overlapping relationship with said platform and into supported engagement on the top sheet of said stack, said finger elements having upwardly and outwardly beveled inner ends terminating in knife edges, jaw members reciprocally mounted on said finger elements and having inwardly facing sheet engaging notches in their lower inner edges extending below the under surfaces of said finger elements, said jaw members and the notches therein being spaced apart by a distance greater than the width of the sheets in said stack, crank arms pivotally mounted on the ends of said second and third crossbars and having their lower ends connected to adjacent jaw members, fluid actuated pistons carried by said second and third crossbars and having double ended piston rods extending transversely of said platform and connected to the upper ends of the crank arms supported on the same crossbar to reciprocate said jaw members, the vertical bars on one side of said platform having inwardly opening slots formed therein and extending below the level of the finger elements on said one side by a distance

slightly greater than the thickness of said sheets whereby the top sheet of the stack may be slid transversely into the slots, the vertical bars on the other side of said platform having inwardly opening slots formed therein and positioned above the finger elements on said other side, and means adapted to eject single plates supported on top of said finger elements.

20. A sheet feeding device comprising, a base having a platform thereon adapted to support a stack of metal sheets, uprights pivotally supported on one end of said base and projecting above said platform, a crossbar carried by the swinging ends of said uprights and along one end of the stack of sheets, a framework slidably mounted on said crossbar to tilt therewith and including vertical bars positioned to slide along the sides of said stack and said platform, said vertical bars constituting guides depending along opposite sides of said stack and said platform, finger elements secured to said vertical bars and projecting inwardly therefrom into overlapping relationship with said platform and into supported engagement on the top sheet of said stack, said finger elements having upwardly and outwardly beveled inner ends terminating in knife edges, jaw members reciprocally mounted on said finger elements and having inwardly facing sheet engaging notches in their lower inner edges extending below the under surfaces of said finger elements, said jaw members and the notches therein being spaced apart by a distance greater than the width of the sheets in said stack, crank arms pivotally mounted on said framework and having their lower ends connected to adjacent jaw members, means carried by said framework connected to the upper ends of the crank arms and operative to reciprocate said jaw members, the vertical bars on one side of said platform having inwardly opening slots formed therein and extending below the level of the finger elements on said one side by a distance slightly greater than the thickness of said sheets whereby the top sheet of the stack may be slid transversely into the slots, the vertical bars on the other side of said platform having inwardly opening slots formed therein and positioned above the finger elements on said other side, and means carried by said framework adapted to eject single plates supported on top of said finger elements.

21. A sheet feeding device comprising, a base having a platform thereon adapted to support a stack of metal sheets, uprights pivotally supported on one end of said base and projecting above said platform, a crossbar carried by the swinging ends of said uprights and along one end of the stack of sheets, a framework slidably mounted on said crossbar to tilt therewith and including vertical bars positioned to slide along the sides of said stack and said platform, said vertical bars constituting guides depending along opposite sides of said stack and said platform, finger elements secured to said vertical bars and projecting inwardly therefrom into overlapping relationship with said platform and into supported engagement on the top sheet of said stack, said finger elements having upwardly and outwardly beveled inner ends terminating in knife edges, jaw members reciprocally mounted on said framework to slide alongside said finger elements and having inwardly facing sheet engaging notches in their lower inner edges extending below the under surfaces of said finger elements, said jaw members and the notches therein being

spaced apart by a distance greater than the width of the sheets in said stack, crank arms pivotally mounted on said framework and having their lower ends connected to adjacent jaw members, means carried by said framework connected to the upper ends of the crank arms and operative to reciprocate said jaw members, the vertical bars on one side of said platform having inwardly opening slots formed therein and extending below the level of the finger elements on said one side by a distance slightly greater than the thickness of said sheets whereby the top sheet of the stack may be slid transversely into the slots, and means carried by said framework adapted to eject single plates supported on top of said finger elements.

22. A sheet feeding device comprising, a base having a platform thereon adapted to support a stack of metal sheets, a framework pivotally supported on one end of said base and projecting above said platform, said framework being vertically slidable relative to said platform and including vertical bars positioned to slide along opposite sides of said stack and said platform, finger elements secured to said vertical bars and projecting inwardly therefrom into overlapping relationship with said platform and into supported engagement on the top sheet of said stack, said finger elements having upwardly and outwardly beveled inner ends terminating in knife edges, jaw members reciprocally mounted on said framework to slide transversely of the stack and longitudinally of said finger elements and having inwardly facing sheet engaging notches in their lower inner edges extending below the under surfaces of said finger elements, said jaw members and the notches therein being spaced apart by a distance greater than the width of the sheets in said stack, means carried by said framework connected to reciprocate said jaw members, one side of said framework forming stops coacting with the under surfaces of the finger elements on said one side to form slots extending below the level of the finger elements on said one side by a distance slightly greater than the thickness of said sheets whereby the top sheet of the stack may be slid transversely into the slots, the other side of said framework forming other stops extending continuously below the finger elements on said other side, and means carried by said framework adapted to eject single plates supported on top of said finger elements.

23. A sheet feeding device comprising, a base having a platform thereon adapted to support a stack of metal sheets, a framework projecting above said platform, said framework being vertically slidable relative to said platform and including vertical bars positioned to slide along opposite sides of said stack and said platform, finger elements secured to said vertical bars and projecting inwardly therefrom into overlapping relationship with said platform and into supported engagement on the top sheet of said stack, said finger elements having upwardly and outwardly beveled inner ends terminating in knife edges, jaw members reciprocally mounted on said framework to slide transversely of the stack and longitudinally of said finger elements and having inwardly facing sheet engaging notches in their lower inner edges extending below the under surfaces of said finger elements, said notches being spaced apart by a distance greater than the width of the sheets in said stack, and means carried by said framework connected to reciprocate said jaw members, one side of said framework forming

stops coacting with the under surfaces of the finger elements on said one side to form slots extending below the level of the finger elements on said one side by a distance slightly greater than the thickness of said sheets whereby the top sheet of the stack may be slid transversely into the slots, the other side of said framework forming other stops extending continuously below the finger elements on said other side.

24. A sheet separating device comprising, a platform adapted to support a stack of sheets to be separated, a framework adapted to be positioned over said stack and including vertical bars positioned at longitudinally spaced points along opposite sides of the stack, means tiltably connecting said framework to said platform, said connecting means including a slidable connection to said framework whereby the framework can slide downwardly as the height of the stack decreases, finger elements carried by said vertical bars and projecting inwardly into supporting engagement on top of said stack, the inner ends of said finger elements having knife edges and upwardly and outwardly beveled surfaces, jaw members supportingly guided by said finger elements and having inwardly facing sheet engaging notches in their inner ends translatable along the planes of the lower edges of said finger elements, the vertical bars on one side of said framework having inwardly opening slots extending below the bottoms of the finger elements on said one side and adapted to receive the edge of the top sheet of said stack, fluid actuated means for reciprocating said jaw members in the same direction, and means reciprocable longitudinal of said platform and adapted to engage and eject a single sheet supported upon the tops of said finger elements.

25. A sheet separating device comprising, a platform adapted to support a stack of sheets to be separated, a framework adapted to be positioned over said stack and including vertical bars positioned on opposite sides of the stack, means tiltably connecting said framework to said platform, said connecting means including a slidable connection to said framework whereby the framework can slide downwardly as the height of the stack decreases, finger elements carried by said framework and projecting inwardly from said opposite sides into supporting engagement on top of said stack, the inner ends of said finger elements having knife edges and upwardly and outwardly beveled surfaces, jaw members supportingly guided by said finger elements and having inwardly facing sheet engaging notches in their inner ends translatable along the planes of the lower edges of said finger elements, the vertical bars on one side of said framework having guide portions extending below the bottoms of the finger elements on said one side and spaced below the finger elements by the thickness of one sheet to form slots adapted to receive the edge of the top sheet of said stack, and means for reciprocating said jaw members in the same direction.

26. A sheet separating device comprising, a platform adapted to support a stack of sheets to be separated, a framework adapted to be positioned over said stack and including vertical bars positioned on opposite sides of the stack, finger elements carried by said framework and projecting inwardly from said opposite sides into supporting engagement on top of said stack, the inner ends of said finger elements having knife edges and upwardly and outwardly beveled sur-

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faces, jaw members reciprocatingly carried by said framework and having inwardly facing sheet engaging notches in their inner ends translatable along the planes of the lower edges of said finger elements and parallel thereto, the vertical bars on one side of said framework having guide portions extending below the bottoms of the finger elements on said one side and spaced below the finger elements by the thickness of one sheet to form slots adapted to receive the edge of the top sheet of said stack, and means for reciprocating said jaw members in the same direction.

27. A sheet separating device comprising, a framework adapted to be positioned over a stack of metal sheets and including vertical bars positioned to transversely oppose opposite sides of the stack, finger elements carried by said vertical bars and projecting inwardly into supporting engagement on top of said stack, the inner ends of said finger elements having knife edges and upwardly and outwardly beveled surfaces, jaw members supportingly guided by said finger elements and having inwardly facing sheet engaging notches in their inner ends translatable along the planes of the lower edges of said finger elements, the vertical bar on one side of said framework having an inwardly opening slot therein extending below the bottom of the finger element on said one side and adapted to receive the edge of the top sheet of said stack, and means for re-

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ciprocating said jaw members in the same direction.

28. A sheet separating device comprising, a framework adapted to be positioned over a stack of metal sheets and including vertical bars positioned to transversely oppose opposite sides of the stack, finger elements carried by said framework and projecting inwardly into supporting engagement on top of said stack, the inner ends of said finger elements having knife edges and upwardly and outwardly beveled surfaces, jaw members reciprocatingly supported by said framework and having inwardly facing sheet engaging notches in their inner ends translatable along the planes of the lower edges of said finger elements, the vertical bar on one side of said framework having an inwardly opening slot therein extending below the bottom of the finger element on said one side and adapted to receive the edge of the top sheet of said stack, and means for reciprocating said jaw members in the same direction.

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