

W. J. PHELPS.

BLANK FEEDING MECHANISM FOR CAN BODY MACHINES.

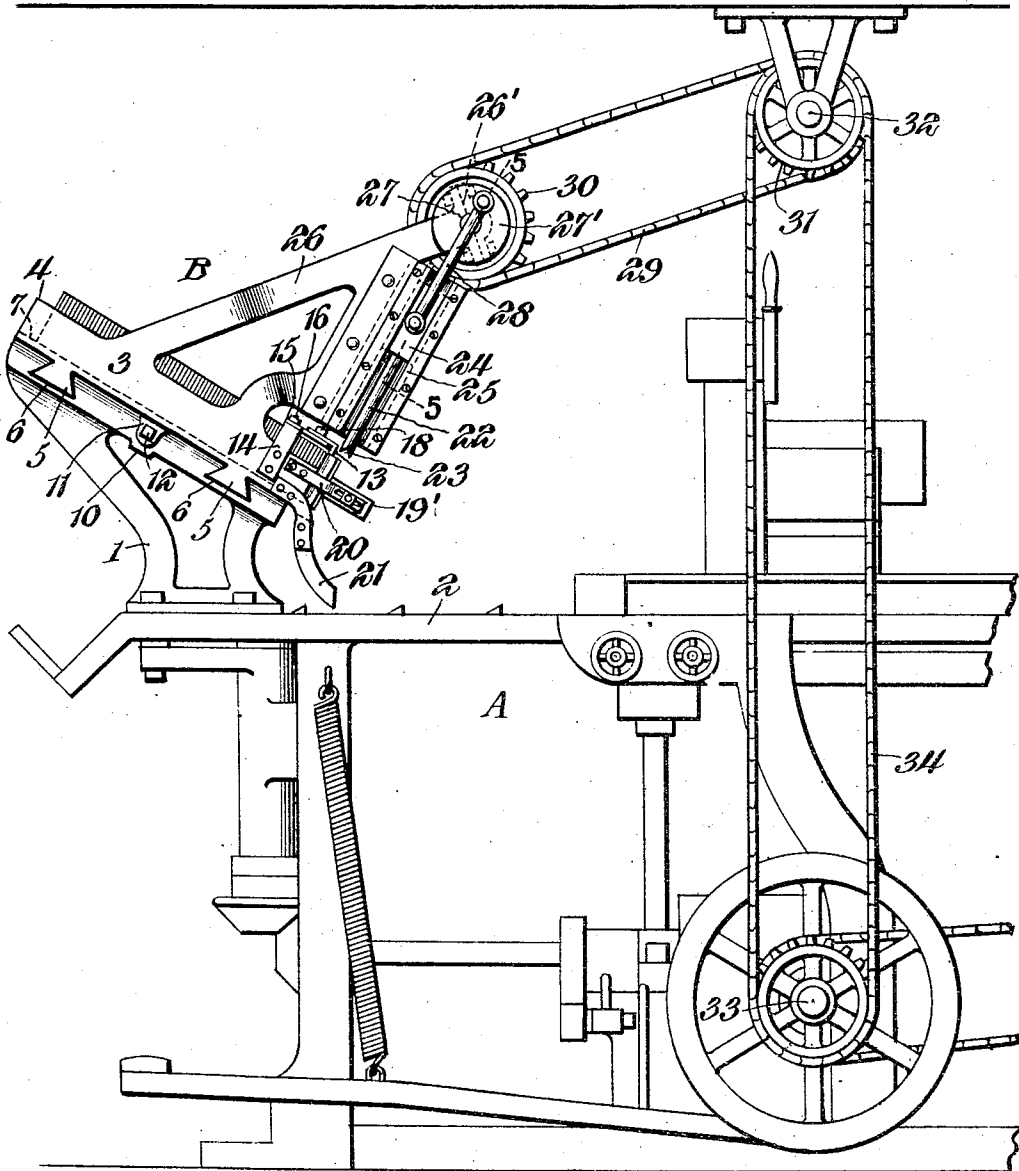
APPLICATION FILED SEPT. 17, 1909.

1,058,258.

Patented Apr. 8, 1913.

3 SHEETS—SHEET 1.

*Fig. 1.*



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3 SHEETS—SHEET 2.

Fig. 2.

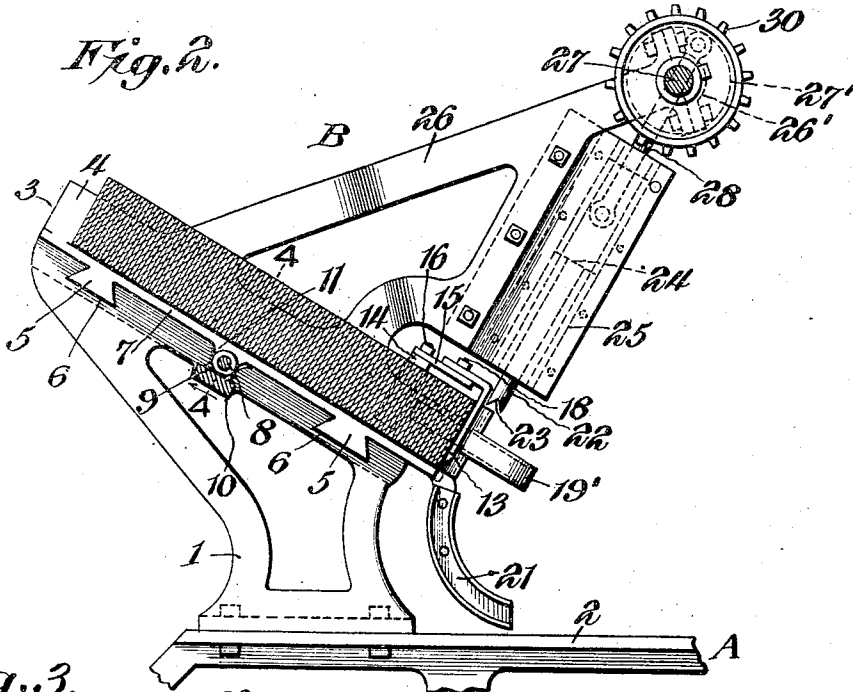


Fig. 3.

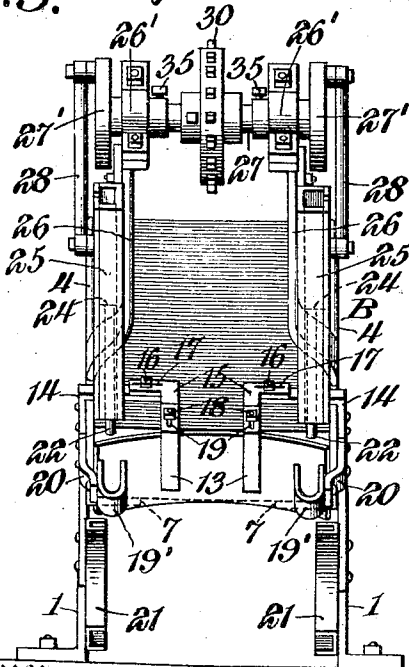
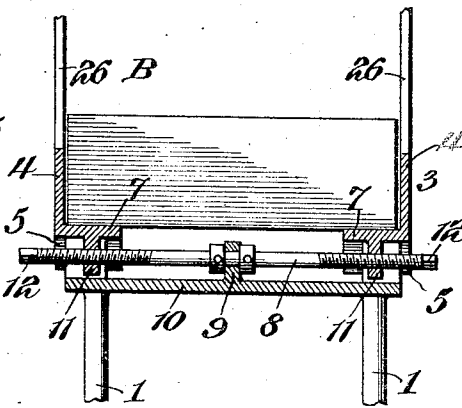


Fig. 4.



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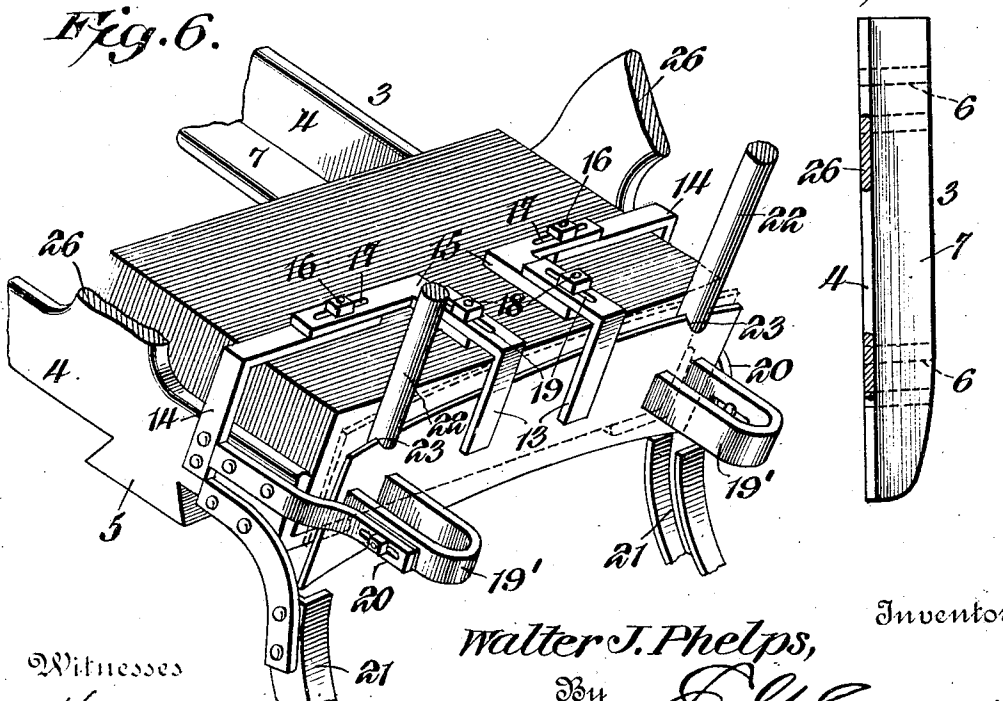
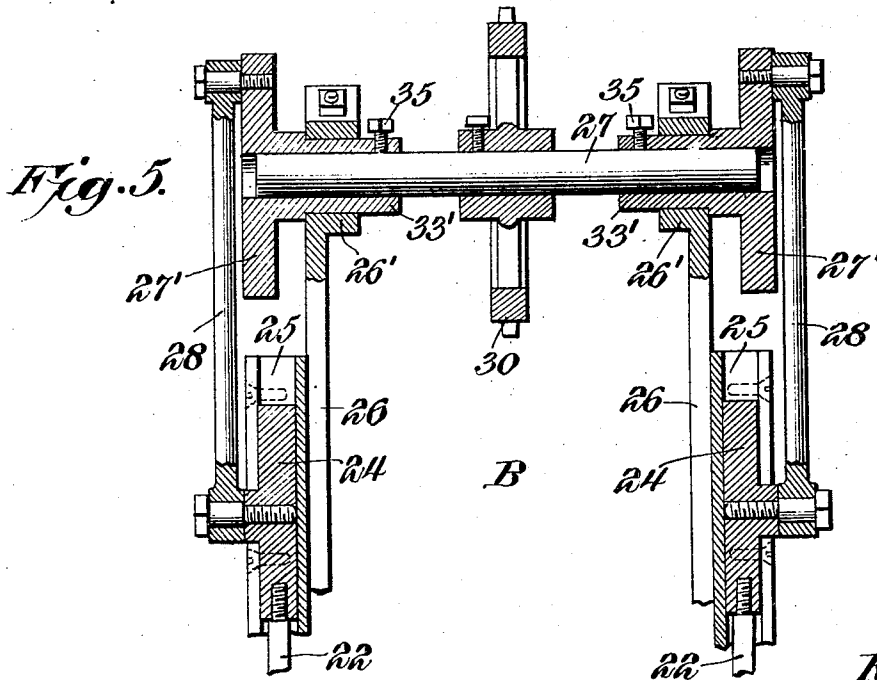
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3 SHEETS-SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WALTER J. PHELPS, OF BALTIMORE, MARYLAND.

BLANK-FEEDING MECHANISM FOR CAN-BODY MACHINES.

1,058,258.

Specification of Letters Patent.

Patented Apr. 8, 1913.

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*To all whom it may concern:*

Be it known that I, WALTER J. PHELPS, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented a new and useful Blank-Feeding Mechanism for Can-Body Machines, of which the following is a specification.

This invention relates to feeding mechanism designed more especially for use in feeding sheet metal blanks successively to a can body machine, although it is not necessarily limited to this use.

The invention has for one of its objects to provide a blank feeding mechanism in which the lower or outermost blank is segregated from the pile in the blank holder by initially flexing the ends of the blank outwardly from the juxtaposed blank so as to enable an ejecting device to engage such outwardly flexed ends to discharge the blank from the holder. To accomplish the flexing of the ends of the outermost blank, any suitable means capable of producing attractive force may be employed, such for instance, as magnets or suction devices.

A further object of the invention is the provision of a mechanism of this character which is of comparatively simple and inexpensive construction, reliable and efficient in use, adjustable for blanks of different sizes, and capable of ejecting blanks in rapid succession.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a front view of the blank-feeding apparatus shown attached to a body-forming machine. Fig. 2 is a vertical longitudinal section of the blank-feeding attachment. Fig. 3 is a view of the delivery end of the attachment. Fig. 4 is a transverse section on line 4-4, Fig. 2. Fig. 5 is an enlarged sectional view on line 5-5, Fig. 1. Fig. 6 is a perspective view of the blank flexing or bending device and blank ejector, the outermost blank being shown partially ejected. Fig. 7 is a sectional view of one of the side members of the blank holder or chute.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawings, A designates a portion of a body-forming machine of any approved character, on the blank-receiving end of which is mounted the feeding attachment designated generally by B, which has its operating parts connected in any suitable manner with the drive shaft or some moving part of the body-forming machine so as to be driven thereby. While I prefer to show the attachment applied to a can-forming machine, it is to be understood that it may be used with other machines where blanks are to be successively fed thereto.

In the present instance, the attachment is designed to hold a pile of blanks in such a manner as to feed by gravity to ejecting position so as to avoid the use of a pile-moving device. The attachment comprises a base or supporting frame 1 which is bolted or otherwise suitably secured to the table 2 of the machine A. This frame 1 supports a blank holder 3 which is composed of side members 4 that have dove-tail projections engaging in correspondingly-shaped grooves 6 in the base frame 1, so that the side members can be moved toward or away from each other for changing the width of the holder, according to the length of the blanks. These side members have inwardly-extending bottom flanges 7 which constitute a bottom support on which the blanks slidably rest. The holder constitutes a supporting surface for sustaining the pile of blanks which are held by their weight flat against each other in a position normal to said surface. The side members can be adjusted and held in fixed position in any suitable manner, as for instance, by a right and left hand screw 8 which is rotatably mounted at its center in a bearing 9 on a cross bar 10 and has its threaded portions engaged in depending lugs 11 on the side members of the plate holder or chute, the ends 12 of the screw being non-circular for receiving an operating crank or key, whereby the screw can be turned. It will thus be seen that the turning of the screw will move the side members toward or away from each other to alter the width of the holder.

The pile of blanks is prevented from sliding out of the lower end of the holder by a

suitable fixed abutment so arranged as to engage the middle portion of the lower or outermost blank of the pile to thus permit the ends of such blank to be flexed laterally to afford engagement of the ejecting device with such ends. In the present instance, this fixed abutment is composed of a pair of spaced fingers 13 which extend parallel with the blanks and are rigidly secured to the side members of the blank holder. On the side members are upstanding L-shaped brackets 14 that have their upper arms extending inwardly over the pile of blanks for adjustably supporting the restraining fingers 13. These brackets carry L-shaped connecting members 15 which are adjustable inwardly or outwardly on the brackets 14 by bolts 16 on the latter passing through slots 17 in the members 15. The restraining fingers 13 are adjustable on the members 15, longitudinally of the pile of blanks by bolts 18 on the members 15 passing through slots 19 in the upper laterally-bent portions of the fingers. By this means, the fingers can be moved inwardly or outwardly to engage the outermost blank at the most desirable points from the ends of the blank to afford the best flexing or bending action, this adjustment being provided by the slot and bolt connections between the brackets 14 and members 15. The fingers can be also adjusted inwardly or outwardly in a direction longitudinally of the blank holder, according to the thickness of the blanks, to permit but one blank at a time to pass off the lower ends of the blank supporting webs 7 of the blank holder. By supporting the blanks in this manner, the outermost one is capable of being readily removed from the pile by successively acting suction or attractive devices and ejecting means, the said devices serving to flex the ends of the outermost blank away from the pile to permit the ejector to engage the ends and move the blank edgewise from the pile. In the present instance, the devices for flexing the ends of the blank are shown as permanent magnets 19' supported in front of the lowermost blank of the pile in fixed relation to the side members of the blank holder so as to be adjustable back and forth therewith in changing the width of the holder, this manner of supporting the magnets being accomplished by outwardly-extending brackets 20 fastened to the magnets and to the side members of the blank holder or chute. The pole faces of the magnets are suitably spaced from the outer face of the lowermost blank at such a distance as to remove the attracted ends of the blank from the adjacent superimposed blank of the pile to permit the ejecting means to engage the top edge of the flexed ends of the blank, as clearly shown in Fig. 6. It has been found, in practice, that magnets employed in this manner will attract but a

single blank at a time. By flexing the ends of the blank in this manner, the tendency to attract the next blank at the same time the outermost blank is flexed, is overcome, and in this respect the present method of operation differs from that wherein the outermost blank is bodily removed from the pile, in which case the air pockets or the like between the contacting plates causes the same to adhere together. With the present device, if, for any reason, the second blank should adhere to the outermost blank during the flexion of its ends, the adhesion would be of short duration and only during the first part of the bending of the outer blank, because the relative longitudinal or sliding movement of the blanks destroys the adhesion, this relative longitudinal movement being caused by the bending of the blanks about a common point, namely, the outer edges of the fingers 13. Thus, with comparatively strong magnets, only the outermost blank will be flexed to its full extent. By bending the ends of the blank in the manner described, the blank will be supported by the fingers 13 and also by the attraction of the magnets, and in removing the flexed blank from the pile, the same slides over the pole faces of the magnets and along the restraining fingers 13 at one side, and the pile of blanks at the opposite side. Disposed under the blank holder are arcuate tracks 21 in which the ends of the ejected blank travel in dropping upon the blank feeding device or carrier of the can-forming machine A.

The means for ejecting the blanks from the holder comprises a pair of ejectors 22 in the form of reciprocatory rods disposed in the plane of the lowermost blank and having notches 23 at the lower ends forming seats for engaging the upper edge of the blank, as clearly shown in Fig. 6. These rods are connected with slides 24 mounted to move back and forth in guides 25 carried by upstanding brackets 26 on the side members 4 of the blank holder. The upper ends of the brackets are provided with aligned bearings 26' in which rotates a horizontal shaft 27, the ends of which carry crank disks 27' which connect, respectively, by rods 28, with the slides 24, so that the rotation of the shaft will reciprocate the slides and raise and lower the ejecting elements 22. The shaft is driven in any suitable manner, as for instance, by a sprocket chain 29 that passes around a sprocket wheel 30 on the shaft 27 and also around the sprocket wheel 31 on the counter-shaft 32 which is, in turn, actuated from the drive shaft 33 of the machine A, through a sprocket chain 34. The crank disks 27' have cylindrical hub extensions 33' which rotate in the bearings 26', and these hub extensions carry set screws 35 which fasten the crank disks to the shafts

27. By loosening these set screws, the side members 4 of the blank holder can be moved inwardly or outwardly, together with the brackets 26 and the ejector operating connections between the shaft and ejector elements 22. After the blank holder is adjusted to the proper width, the set screws 35 are tightened for operatively connecting the shaft 27 with the ejecting elements. The ejecting elements are reciprocated to deliver the blanks as fast as the body-forming machine can handle them, and the magnets are constantly active to present the lowermost blank of the pile in coöperative relation to the ejecting elements. It will thus be seen that the blanks can be effectively segregated from the pile to permit the regular feed of blanks to the forming machine.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

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

1. The combination of a holder for supporting a pile of blanks held by their weight flat against each other in a position normal to the supporting surface, means acting upon an end portion of the outermost blank to flex such portion while leaving the unflexed portion of the said blank bearing flat against the next adjacent blank of the pile, and means independent of the flexing means acting upon the flexed portion of the outermost blank for removing it individually from the pile.

2. The combination of an inclined holder for supporting a pile of blanks held by their weight flat against each other in a position normal to said holder, means acting upon an end portion of the outermost blank to flex such portion while leaving the unflexed portion of the outermost blank bearing flat against the next adjacent blank of the pile, said unflexed portion being held by the weight of the pile from flexing, and means acting upon the edge of the flexed portion of the outermost blank, while it is held flexed by the first-mentioned means, to remove it individually from the pile.

3. The combination of an inclined holder for supporting a pile of blanks by their weight flat against each other, a device arranged at the delivery end of the holder for

preventing the pile from discharging bodily therefrom and for holding the outermost blank in engagement with the next adjacent blank of the pile, means acting upon an end portion of the outermost blank to flex such portion out of contact with the next adjacent blank while the unflexed portion of the blank is held by said device, and means acting upon the flexed portion of said outermost blank while it is in a flexed position though still a part of the pile to remove it individually from the pile.

4. The combination of an inclined holder supporting a pile of blanks to feed by gravity, devices fixed with respect to the holder and arranged to act on and flex separate portions of the lowermost blank out of contact with the adjacent blank while the rest of the blank remains in contact with the latter, and an ejector for removing the flexed blank from the holder.

5. The combination of an inclined holder supporting a pile of blanks to feed by gravity, fixed attractive devices supported at the lower end of the holder and arranged to flex portions of the lowermost blank out of contact with the adjacent blank, and an ejector movable into engagement with the flexed portions of the blank for sliding the latter downwardly on the adjacent blank and out of the holder from a position between the latter and said devices.

6. The combination of an inclined holder for a pile of blanks, an abutment arranged at the lower end of the holder for engaging the middle portion of the lowermost blank, means for flexing the free extremities of the lowermost blank, and an ejector arranged to engage the flexed extremities for sliding the said blank from between and remaining pile of blanks.

7. The combination of an inclined holder for a pile of blanks, an adjustable abutment arranged at the lower end of the holder for engaging the middle portion of the lowermost blank, means for flexing the free extremities of the lowermost blank, said abutment being arranged to prevent bodily movement of the lowermost blank from the pile by the said means and to yieldingly hold the unflexed portion of the flexed blank against the adjacent blank to slide thereon during ejection, and an ejector arranged to engage the flexed extremities for sliding the said blank from between the adjustable abutment and remaining pile of blanks.

8. The combination of a holder for a pile of blanks, an abutment at the discharge end of the holder arranged to engage the outermost blank, means for flexing a portion of the blank beyond the abutment and from the adjacent blank while the rest of the flexed blank remains in engagement with the latter, and an ejector movable into engagement

with the flexed portion of the blank for removing the latter edgewise from between the abutment and remaining pile of blanks.

9. The combination of a holder for a pile of blanks, an abutment at the discharge end of the holder arranged to engage the outermost blank for retaining the same in position, said abutment comprising members adjustable toward or away from each other, stationary attractive devices arranged to flex the portions of the outermost blank beyond the abutment from contact with the adjacent blank while the abutments hold the unflexed portion of the blank in its original position, and ejector means for engaging the flexed portions of the blank to slide the latter on the abutment and eject it from the holder.

10. The combination of a holder arranged to support a plurality of blanks side by side, restraining fingers mounted in fixed relation to the holder and adjustable longitudinally and transversely to engage the outermost blank in the holder and arranged to extend across the outermost blank to prevent flexing of the middle portion thereof and to form the sole means for preventing the pile of blanks from dropping out of the holder, devices arranged to flex the extremities of the outermost blank away from the adjacent blank, and ejecting means arranged to engage the said extremities while held in flexed position for removing the blank from the holder.

11. The combination of a holder for a pile of blanks, an abutment arranged to engage the outermost blank, means for bending a portion of the outermost blank from the holder and out of contact with the adjacent blank while the abutment on one side and the pile of blanks on the other retain the outermost blank in position, and an ejector movable into engagement with the flexed portion of the outermost blank for removing the same from between the abutment and remaining pile of blanks, said abutment being so related to the holder and blank-flexing means that the unflexed portion of the blank has one face engaged by the abutment and the other face engaged by the adjacent blank to slide between the latter and abutment.

12. The combination of an inclined holder for a pile of flexible metallic blanks, means at the lower end of the holder for engaging a portion only of the lowermost blank to permit the remaining portion or portions to be flexed out of contact with the adjacent blank, magnetic means for flexing the said portion or portions, both means being fixed and engaging, respectively, the flexed and unflexed portions of the blank and an ejector for engaging the flexed portion or portions of the blank for removing the same from the holder and the sphere of influence of the magnetic means.

13. The combination of a holder for a pile of blanks arranged to permit the same to feed by gravity, an abutment arranged to engage the middle portion of the lowermost blank, magnets arranged at opposite sides of the abutment to attract the extremities of the lowermost blank out of contact with the adjacent blank while the abutments prevent complete separation of the blanks, and an ejector for engaging the said attracted extremities for moving the blank away from the holder and magnets.

14. The combination of a holder for a pile of blanks mounted to permit the pile to feed by gravity, restraining fingers movable longitudinally and transversely of the holder to engage the outermost blank, magnets supported at the discharge end of the holder for flexing the extremities of the outermost blank, and ejecting elements arranged to simultaneously engage the flexed extremities for moving the outermost blank from the holder and magnets.

15. The combination of a holder for a pile of blanks, restraining fingers arranged to engage the outermost blank, means for adjustably supporting the fingers for adjustment toward or away from the extremities of the blanks, attractive devices arranged to move the extremities of the outermost blank out of contact with the adjacent blank, an ejector comprising members for simultaneously engaging one edge of the blank at the extremities for removing the blank from between the fingers and remaining pile by movement coincident with the plane of the blank.

16. The combination of a holder for a pile of blanks, an abutment for engaging the middle portion of the outermost blank, adjustable magnets arranged to flex the extremities of the blank from the adjacent blank, and means for engaging the flexed extremities for removing the outermost blank from the holder to permit the pile to move forwardly toward the abutment for bringing the succeeding outermost blank into the attractive range of the magnets.

17. The combination of a holder for a pile of blanks, brackets on the holder, restraining fingers, connecting members adjustably connected with the brackets and to which the fingers are adjustably connected, said fingers being arranged to engage the outer face of the outermost blank, means for flexing the extremities of the outermost blank from contact with the adjacent blank, and an ejector movable into engagement with the flexed ends of the outermost blank for removing the same from the holder.

18. The combination of a holder for supporting a pile of blanks flat against each other, an abutment arranged at the delivery end of the holder for engaging a portion of the outermost blank and holding it in en-

gement with the next adjacent blank of the pile, means acting upon an end portion of the said blank for flexing such portion while the unflexed portion is held by said abutment, and means acting upon the flexed portion of the outermost blank for sliding said blank from between the abutment and the remaining pile of blanks and while it is in contact with both.

19. In combination with a holder for a pile of blanks, said holder including a bottom support for the blanks and an abutment, means for flexing both ends of the outermost blank from the next adjacent blank and freeing said flexed ends from the bottom support while the unflexed portion is held by the abutment, and means acting upon the flexed ends of the outermost blank to remove it individually from the pile by sliding it from between the abutment and the remaining pile of blanks.

20. The combination of an inclined holder for a pile of blanks, ejecting members having seats for engaging one of the edges of the outermost blank at the end thereof, means for moving the ends of the outermost blank into the path of the said elements, and devices located at the discharge end of the holder adjustable laterally toward or from the path of the said elements and inwardly and outwardly with respect to the discharge end of the holder.

21. The combination of a holder for a pile of blanks mounted in inclined position to permit the pile to feed by gravity, an abutment for engaging the outermost blank, magnets disposed in front of the outermost blank for attracting portions thereof away from the adjacent blank, said abutment being arranged to hold the pile in the holder and to maintain the unattracted portion of the outermost blank yieldingly engaged with the next blank, and ejecting elements arranged to engage the top edge of the outermost blank while attracted by the magnets for moving the blank downwardly from between the abutment and remaining piles of the blank.

22. The combination of a holder for a pile of blanks, a fixed device spaced from the holder and acting on the outermost blank for flexing a portion thereof away from the adjacent blank, a reciprocatory ejector movable between the holder and device and mounted to engage the flexed portion of the blank during the first part of its movement and to remove the blank from the holder during the remaining part of its movement in one direction, and an operating means for the ejector.

23. The combination of a holder for a pile of blanks comprising spaced supporting members adjustable toward and away from each other to vary the width of the holder, means mounted on the members for flexing

the ends of the outermost blank from the adjacent blank of the pile, separate ejectors arranged to engage the flexed ends of the outermost blank for removing the same from the holder, and a common actuating means for the ejectors.

24. The combination of a holder for a pile of blanks comprising spaced supporting members adjustable toward and away from each other to vary the width of the holder, means mounted on the members for flexing the ends of the outermost blank from the adjacent blank of the pile, separate ejectors arranged to engage the flexed ends of the outermost blank for removing the same from the holder, guides on the members in which the ejectors slide, a driving shaft carried by the members, and operating connections between the shaft and ejectors for moving the same simultaneously.

25. The combination of a holder for a pile of blanks consisting of spaced members adjustable toward and away from each other, an abutment carried by the holder to engage the middle portion of the outermost blank, devices on the holder for attracting the extremities of the outermost blank to flex said extremities from the adjacent blank, reciprocatory ejecting elements mounted to engage the flexed ends of the outermost blank, guides on the holder in which the ejectors reciprocate, a rotary shaft mounted over the holder, and crank and pitman connections between the shaft and ejectors.

26. In combination with a holder for a pile of blanks, said holder including a bottom support for the blanks, means for flexing a portion of the outermost blank from the adjacent blank and freeing it from the bottom support, and means acting upon the flexed portion of the blank while it is held in its flexed position for driving the flexed blank from the holder.

27. In combination with a holder for a pile of blanks, said holder including a bottom support for the blanks, means for flexing the outermost blank from the adjacent blank and freeing it from the bottom support, and means for driving the flexed blank from the holder, said means operating against the top edge of the blank.

28. The combination with an inclined holder for supporting a pile of blanks held by their weight flat against each other in a position normal to said holder, said holder including a bottom support for the blanks and an abutment, means acting upon the outermost blank for flexing a portion away from the next adjacent blank of the pile and freeing said portion from the bottom support while the unflexed portion is held in contact with said adjacent blank by said abutment, and means operating after the blank has been flexed to remove it individually from the pile by sliding it from between

the abutment and the remaining pile of blanks, said means acting upon the flexed portion of the blank.

29. In combination with a holder for a  
5 pile of blanks, said holder including a bottom support and an abutment for the blanks, means for flexing the ends of the outermost blank from the adjacent blank and freeing  
10 it from the bottom support but allowing the intermediate portion of the flexed blank to be held in contact with the said adjacent

blank, and means for driving the flexed blank from the holder, said means operating against the flexed ends of the blank simultaneously at each side of the abutment. 15

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WALTER J. PHELPS.

Witnesses:

JOHN H. SIGGERS,

E. G. SIGGERS.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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