Feb. 14, 1933. H. S. LABOMBARDE 1,897,484

MECHANISM FOR FEEDING BLANKS

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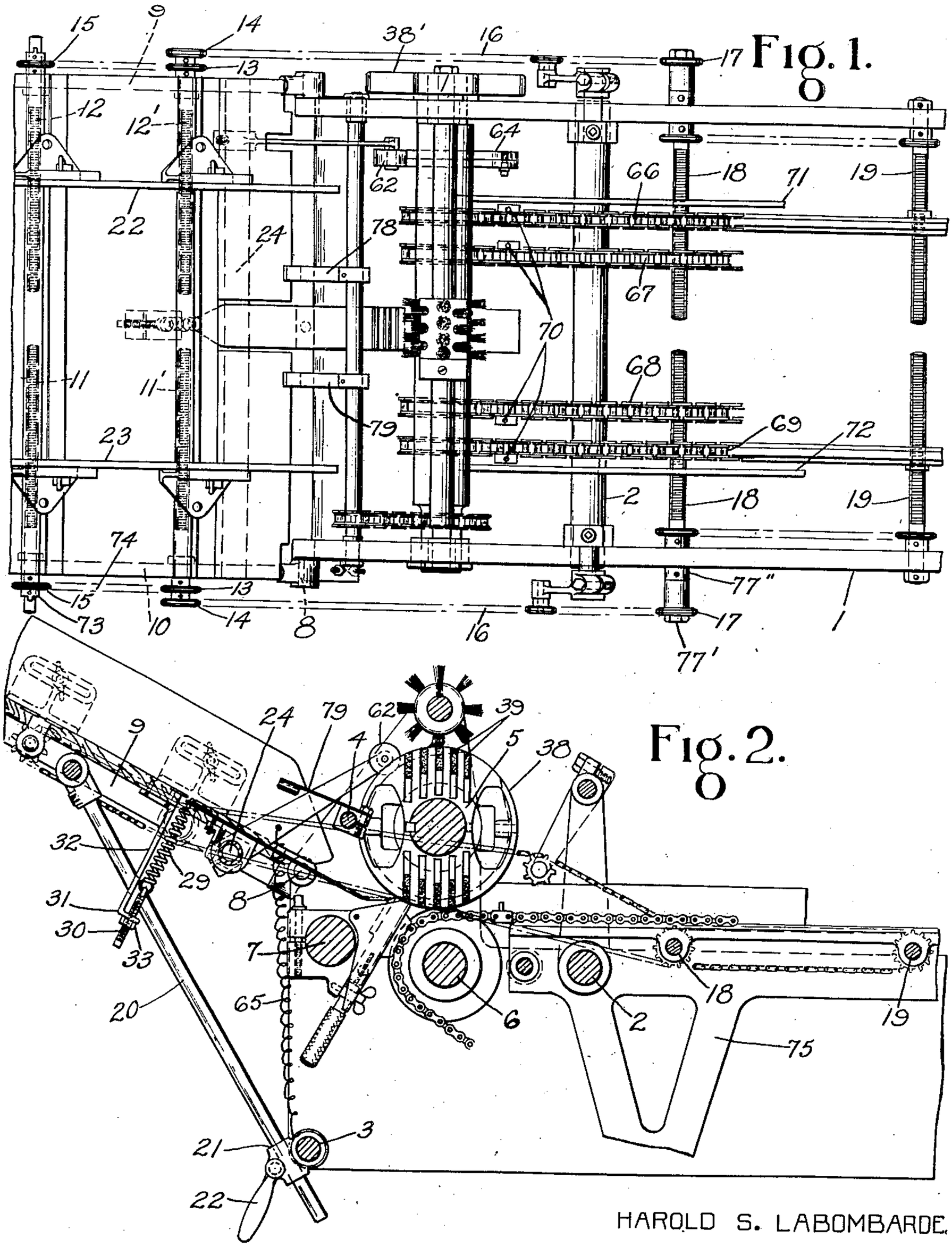

Fig. 1.

Fig. 2.

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Fig. 3

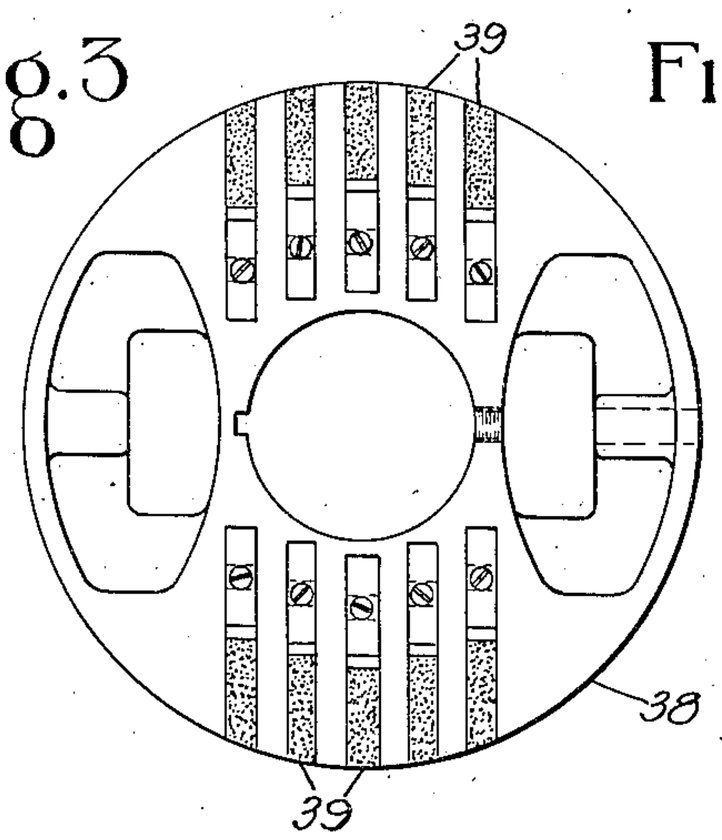
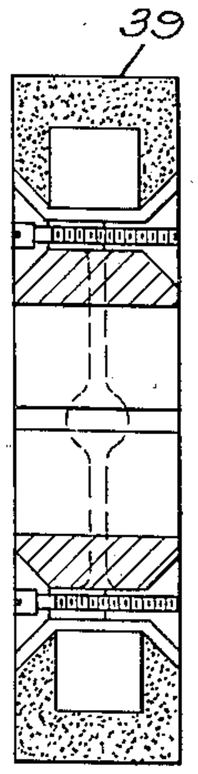


Fig. 4



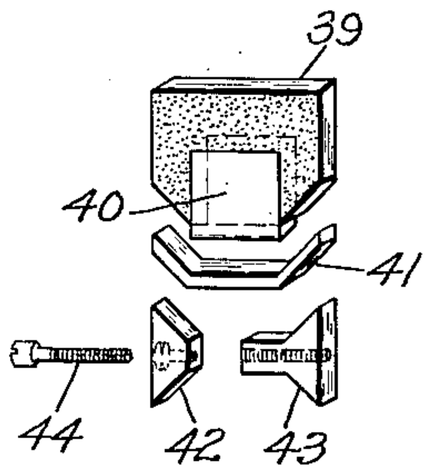


Fig. 5

Fig. 6

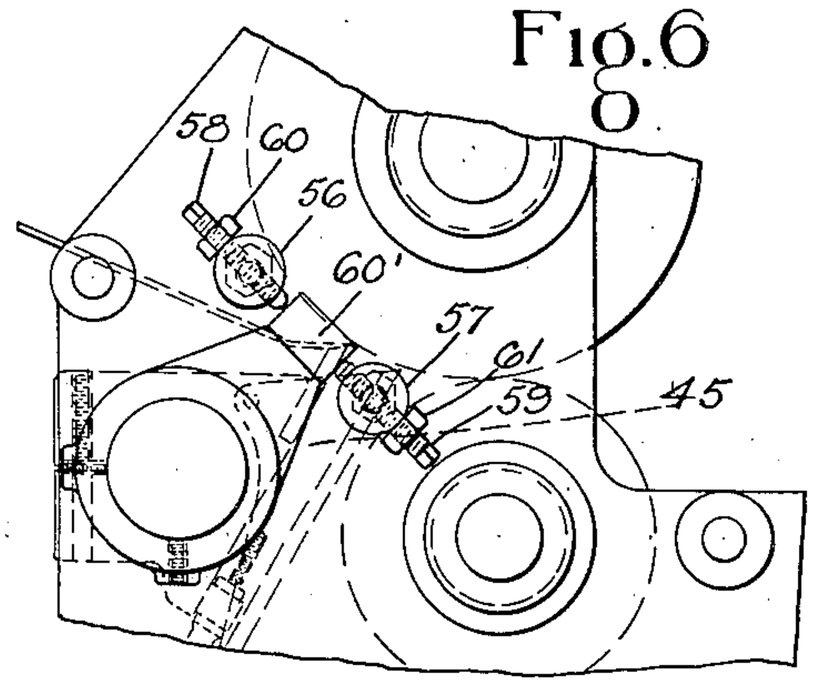


Fig. 7

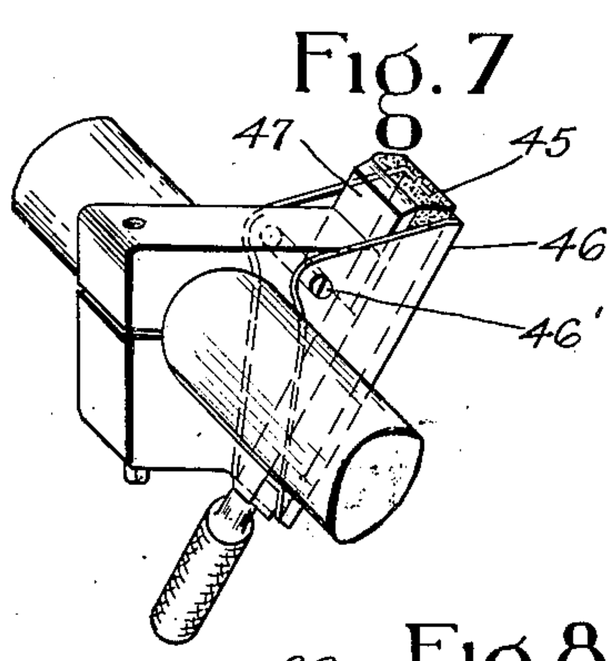


Fig. 8

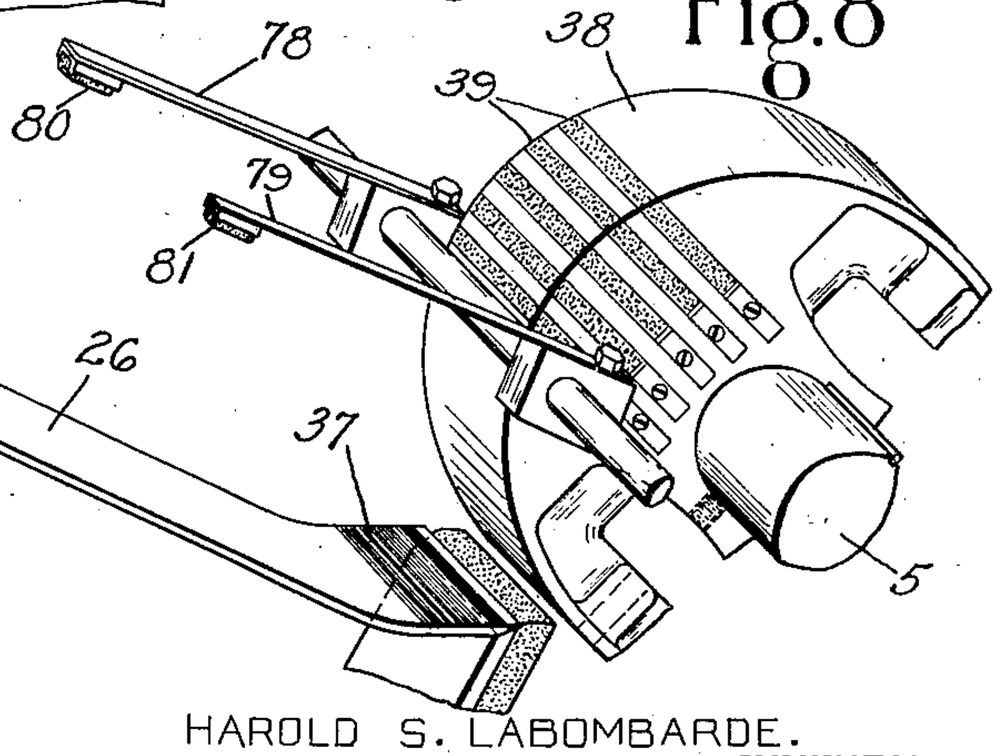


Fig. 9

Fig. 10

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Fig. 11

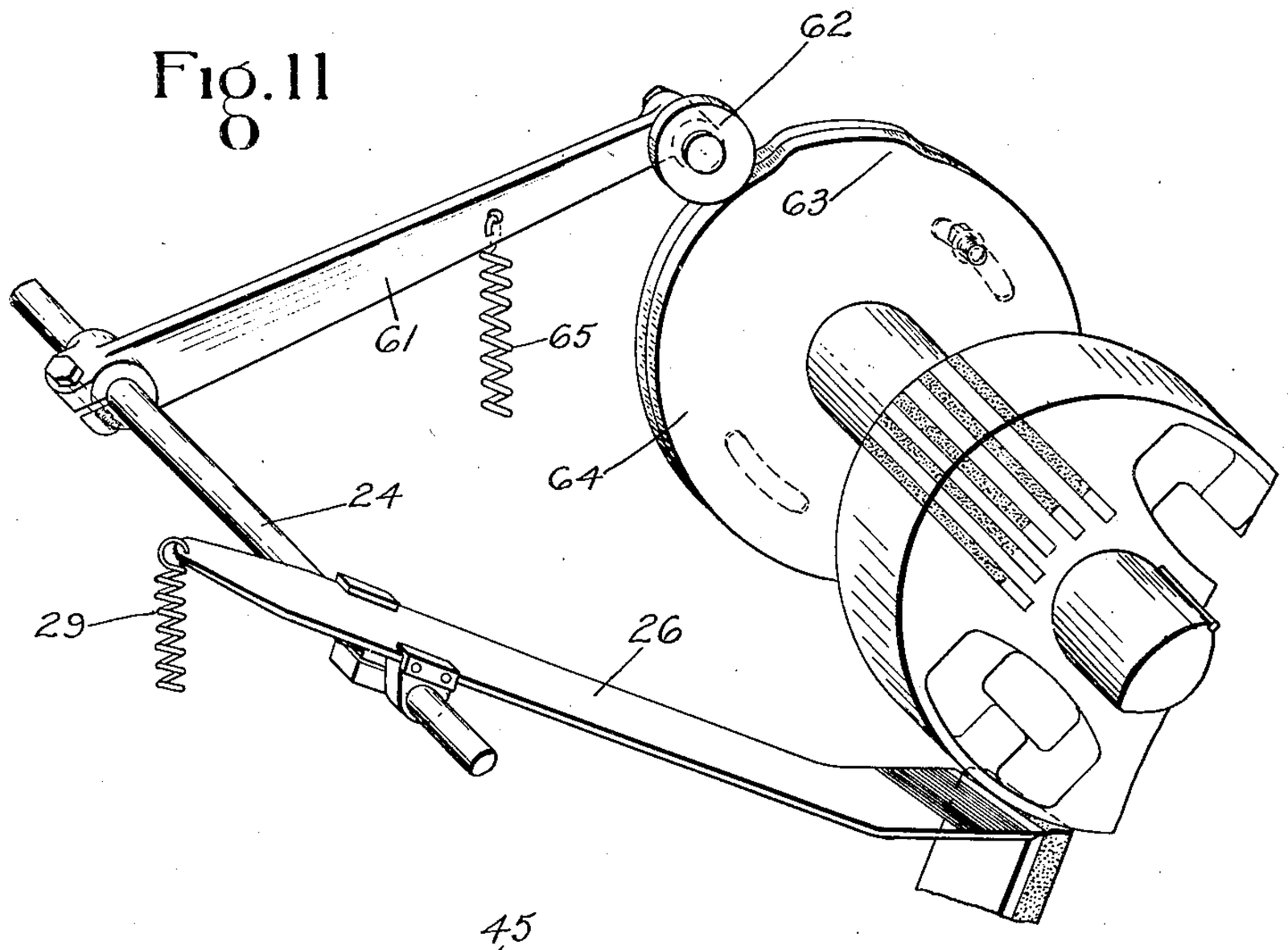

Fig. 12

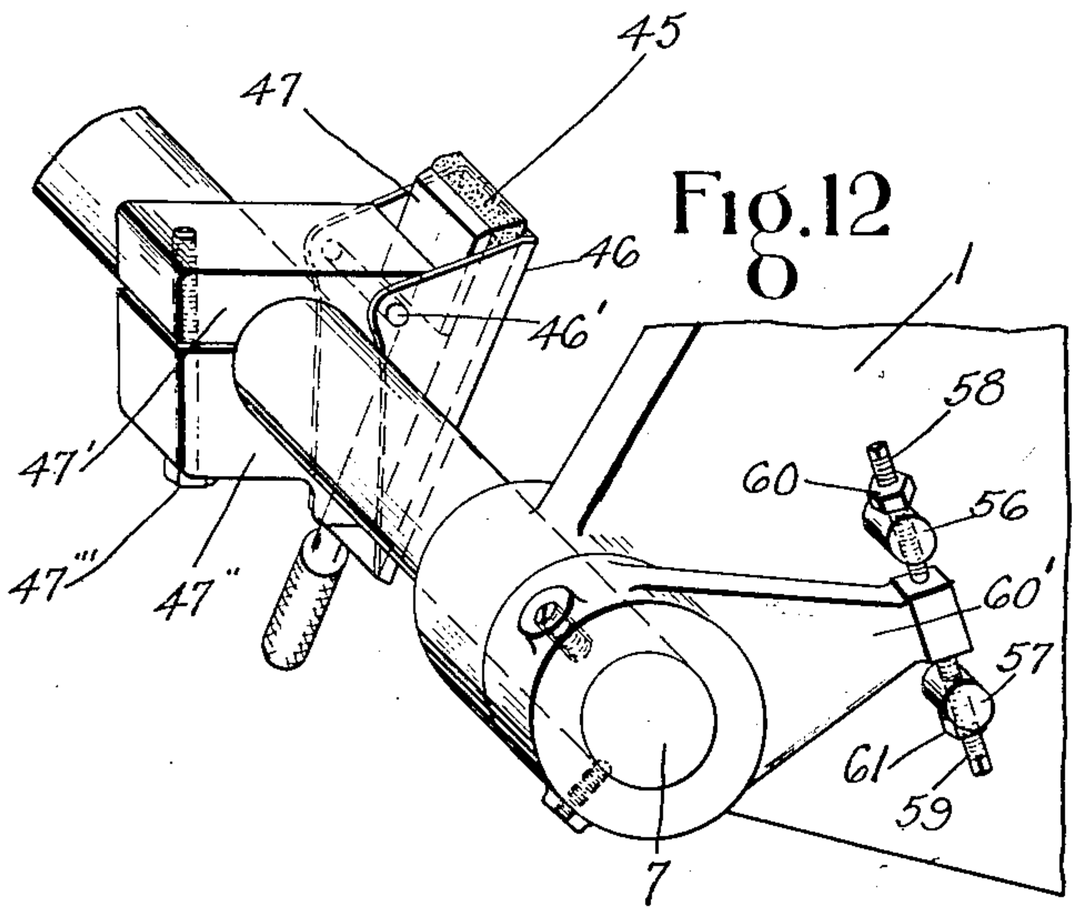

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Fig. 13

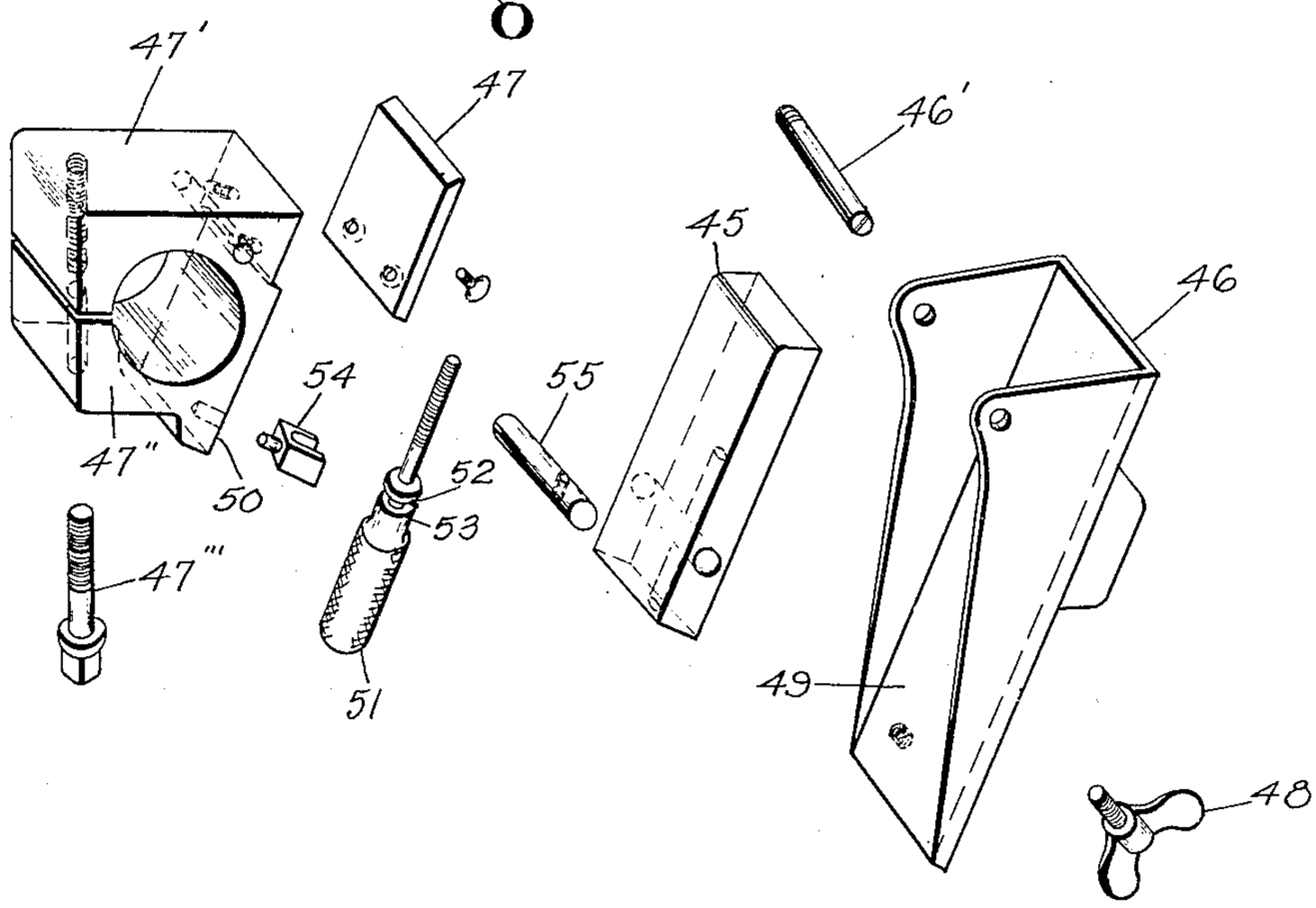
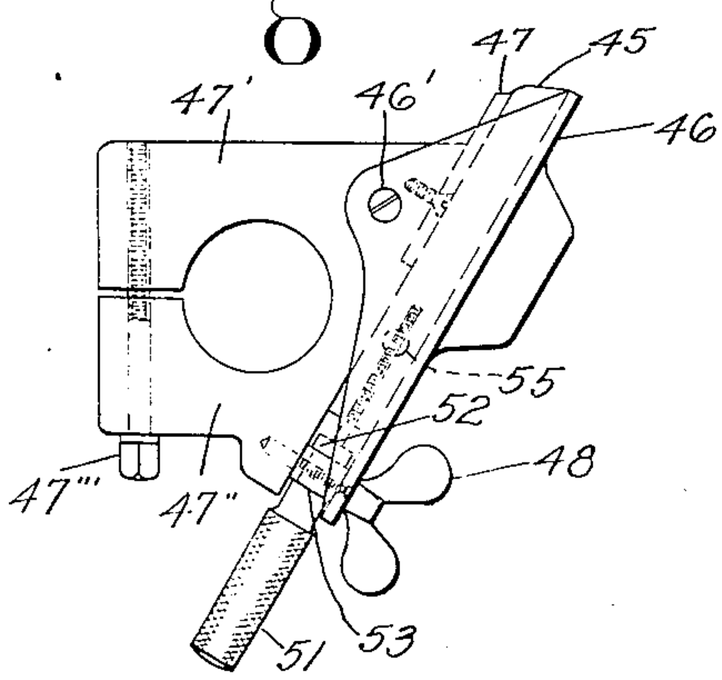


Fig. 14



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UNITED STATES PATENT OFFICE

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MECHANISM FOR FEEDING BLANKS

Application filed May 29, 1929. Serial No. 366,906.

The principal object of my invention is to provide a mechanism for feeding blanks which includes a rotary feed member which is so combined with other elements that there is no wedging action, this being particularly important in feeding very thin blanks such as envelope blanks, and especially when the blanks are fed successively from the top of a pile. The wedging action occurs because the pile wedges in between the pile support and the periphery of the rotary member. The objections, among others, to this wedging are that the several shafts are likely to spring and permit the feed of more than one blank at a time; that the rubber gauge may hog into the rotary member and cause peeling of the blank or, if the gauge is set a little loose to overcome this, the gauge may permit the passage of more than one blank; that if the machine is run without blanks the gauge will grind up the rubber portions projecting from the periphery of the rotary member if such rubber portions are used; and that when the pile of blanks is raised in the hopper to insert additional blanks some of the blanks immediately above the newly-inserted blanks are pushed ahead of the blanks at the top and the blanks so pushed may be fed ahead of their turn or fed simultaneously with the top blank.

Other objects of my invention will be referred to below.

A feature of my invention is that the frictional rotary feeding member engages the topmost blank near the edge only thereof in order to start removal of the blank from the pile.

Another feature is a supporting member for the pile, which member has preferably an oscillating motion to press the forward edge of each blank into feeding engagement with the rotary member, said member being preferably a guide as well as a presser.

Another feature is a gauge extending in a direction described below with reference to the rotary member and being specially formed for several reasons, one being that it will not have any wedging or feeding tendency, and preferably I use a novel adjusting means, described below, for said gauge.

Another feature is the provision of adjustable rubber portions projecting from the periphery of the rotary member and preferably extending clear across said periphery.

Another feature is such a coupling of the hopper, guides and the feeding means in advance of the gauge as will permit simultaneous adjustment of two or more thereof.

Another feature is that engagement by the feed wheel at the front edge only of the blank will prevent buckling at the time of feed, particularly on very thin paper.

Other features will be pointed out below.

In the drawings

Figure 1 is a plan of a blank feeding mechanism embodying my invention;

Figure 2 is a vertical section thereof on line 2—2 of Figure 1;

Figure 3 is an enlarged elevation of the feed wheel;

Figure 4 is a section of said wheel on line 4—4 of Figure 3;

Figure 5 is a perspective of certain parts of said feed wheel;

Figures 6 and 7 are enlarged details of the gauge and its mounting;

Figure 8 is an enlarged perspective detail of the feed wheel;

Figures 9 and 10 are enlarged perspective details of the oscillating pressure and its mounting;

Figure 11 is an enlarged perspective of the cam mechanism and feed wheel;

Figure 12 is an enlarged perspective of the gauge and its mounting;

Figure 13 is an enlarged perspective of the several disassembled elements of the gauge and its mounting; and

Figure 14 is an enlarged elevation of the gauge and its mounting.

Frame 1 has suitable tie rods, such as 2 and 3, and is a support for the shafts 4, 5, 6 and 7, shafts 4 and 6 having sprocket wheels fixed to them. The frame supports also the studs 8 upon which are pivoted the arms 9 and 10 which carry screws 11, 11′, 12 and 12′, sprocket wheels 13 and 14 being being fixed to shafts 11′ and 12′ and sprocket wheels 15 being fixed to screws 11 and 12. Sprocket 14 drives, by means of chains 16, friction sprock-

ets 17 mounted on screws 18 connected by chains with screw 19. Rod 20 has pivotal connection with arm 9 and slides in bearing 21 pivoted to tie rod 3. Rod 20 is clamped by handle 22 in the desired position so as to give the desired inclination to arm 9. A similar rod and clamp are provided at the other side of the machine to cooperate with arm 10. Walls 22 and 23 form the sides of the feed hopper and are adjustable. Arms 9 and 10 carry shaft 24 upon which may swing carrier 25, which carries the presser member 26, the latter being held in position on carrier 25 by lugs 27 and 28 secured to carrier 25 as shown in Figures 9 and 10. Coiled spring 29 is connected at one end to the presser 26 and at its other end to threaded pin 30, the latter extending through a perforation in portion 31 of bracket 32, which is suitably held to feed platform 32′. Nut 33 engages the threading of pin 30 and may be used to adjust the position of the pin with relation to portion 31 and consequently adjust the tension on spring 29 which tends to swing downwardly that end of presser member 26 which is at the left in Figure 9 and this adjustment may be readily made even while the machine is running and adjusts the amount of pressure exerted by the presser.

Member 34 is fixed to shaft 24 and is provided with an adjustable threaded stop pin 35 and nut 36, the stop pin limiting in one direction the swinging movement of carrier 25.

The presser 26 is provided with friction means 37 to act on the lower surfaces of the forward ends of the blanks to retard them into line, this retarding means, in the form shown, being a milled surface.

The feed wheel 38 is mounted on shaft 5 and is operated by gear 38′ on shaft 6 and is provided with rubber portions 39 to engage and feed the blanks, these rubber portions extending into the wheel and clear across the periphery of the wheel, as shown in Figure 4. Each of these rubber portions 39 is partially encased by a U-shaped metal receptacle 40, the latter being engaged by member 41, which, in turn, is engaged by interiorly threaded wedge members 42 and 43 which are engaged by screw 44, rotation of which will draw the wedge members together and force outwardly members 41, 40 and 39 so that very quick, simple and accurate adjustment of the rubber portions may be had when the latter become worn. The receptacle 40 has just enough surface to allow the rubber to be adjusted outwardly and still leaves enough rubber in contact with the slot in the wheel to prevent the rubber from being pulled out by the feeding action.

The gauge or retard 45 is made of rubber, preferably soft rubber, and of about the frictional capacity of the rubber in the feed wheel. It extends substantially radially of the feed wheel 38 and is clamped between two steel pieces 46 and 47, the latter being beveled to prevent curling back of the blanks. The gauge protrudes slightly from the steel pieces and is rounded to prevent curling back of the blanks. The bevel and the rounding just referred to will not produce any wedging or feeding tendency. Steel piece 46 is in the form of a yoke pivoted at 46′ to part 47′ which is integral with part 47″, these parts 47′ and 47″ forming clamping jaws clamped by screw 47‴ to shaft 7. Screw 48 acts to press apart walls of yoke 46 and 47″ and consequently presses said walls above the pivot 46′ close together to bind the rubber gauge in close proximity to the feeding point to minimize the yielding of the rubber.

In order to push the rubber gauge outwardly I provide screw 51 which has two shoulders 52 and 53 between which is located yoke 54 pinned to part 47″, the threading of the screw engaging a steel insert 55 pressed into the rubber gauge 45.

In order to vary the distance between the gauge and feed wheel and provide an extremely fine adjustment I provide two bosses 56 and 57 fixed to the frame 1, screw 58 being threaded to boss 56 and screw 59 being threaded to boss 57. By loosening the nuts 60 and 61 the desired movement of the screws 58 and 59 may be had in order to swing the arm 60′ which is fixed to shaft 7 and consequently the shaft 7, to which are fixed parts 47′ and 47″, will move said parts and the gauge for the extremely fine adjustment above referred to.

Carrier 25 is loosely mounted on shaft 24 to which is clamped an arm 61 carrying cam roll 62 which rides on cam surface 63 of cam 64, this mechanism providing for positively moving downwardly the milled end of member 26, the spring 29 acting against pin 35 to force upwardly said milled end. Spring 65 tends to hold the cam roll 62 against cam 64.

The blanks are fed in advance of the gauge by chains 66, 67, 68 and 69 provided with pins 70, guides 71 and 72 being provided to guide the blanks during the feeding by said chains. In order to preserve proper alignment, and to do so with speedy set-up, I adjust simultaneously the hopper wall 23, the guide 72 and the chain 69, this being done by a suitable tool engaging the projection 73 on screw 11. Rotation of screw 11 will adjust wall 23 and through a chain 74 will rotate sprocket 13 and screw 11′ to adjust wall 23 at another point as indicated. Said rotation of screw 11 will also rotate sprocket 14, which, through chain 16, operates sprocket 17 to rotate screws 18 and 19, which adjust the chain-support casting 75. The wall 22, guide 71 and chain 66 are similarly simultaneously adjusted at the other side of the machine.

Guide 72 is suitably mounted on chain-

support casting 75 and guide 71 is similarly mounted at the other side.

Feeding chains 67 and 68 having feeding pins and mounted on suitable supports are also provided in case it is desired to feed by four chains.

Nut 77′ and collar 77″ bind between them the sprocket member 17 and if nut 77′ is loosened then screws 11 and 11′ may be rotated without rotation of screws 18 and 19.

If it is desired to use my feed for large heavy work the presser 26 and its operating mechanism may be removed and shaft 4 may be rotated. Fixed to this shaft are spring members 78 and 79 each carrying a suitable pad such as 80 and 81. These revolving pads engage the top blank of the pile and urge it and the blanks underneath it through friction and vibration down to the gauging point and into position to be grasped by the rubber of the feed wheel. These rotary members 80 and 81 ensure the prompt starting of large heavy work and still do away with the wedging feature of the customary top feed and allow the use of a gauge type of retard with relatively very little wear and trouble.

In using my feeding mechanism for thin blanks, the blanks are placed, preferably fanned, in the hopper and are jogged forward by the oscillating presser which is not only a presser but a jogger and a guide to the feeding point. When the lowest blank has been jogged to the feeding point by the presser the front edge of the blank is pressed against one of the rubber portions of the feed wheel, which rubber portion engages said front edge and feeds the blank past the gauge, this engagement being the first engagement between the feed wheel and blank. As soon as the rubber portion starts to feed the blank the presser is lowered to remove any load on the feed wheel and to prevent any dragging-in tendency on the second blank with the result that the retard gauge does not have to be set up tight. The gauge extends preferably substantially radially of the feed wheel and consequently all wedging tendency is avoided, which, among other things, results in the certainty that plural feeding of blanks simultaneously will be avoided. In placing additional blanks in position there is a tendency for lower blanks to get a trifle ahead of the top blank and I prevent this by providing the top forward part of the jogging presser with a frictional surface to retard the lower blanks sufficiently to make them take their proper turn in feeding.

Two blanks can not pass the friction gauge simultaneously because as they approach the feeding point the lower one meets more and more resistance as it enters the gauge until the friction between the two blanks is less than the friction of the gauge on the lower blank and then the top blank only is fed by the feed wheel.

With my arrangement of a radially extending gauge it is feasible to use a softer rubber with consequently higher friction and this construction further removes the tendency to feed two blanks simultaneously and still the gauge does not need to be set closer to the feed wheel than the thickness of one blank and my construction is especially practical in view of the very fine adjustment which I have described above.

What I claim is:

1. A mechanism for feeding blanks from the top of a pile comprising a gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a presser to press each blank into feeding engagement with said wheel; means to adjust the presser; and means to oscillate the presser.

2. A mechanism for feeding blanks successively from the top of a pile comprising a wheel having a frictional feeding periphery and a friction gauge, the frictional capacity of said gauge and of said periphery being substantially equal.

3. A mechanism for feeding blanks comprising a feed wheel having a recess leading from its periphery; a receptacle within said recess and having side walls; a friction member in said receptacle and projecting from said periphery, said side walls being located between said friction member and the walls of said recess; and means to adjust said receptacle and thereby adjust the projection of said yielding member.

4. A mechanism for feeding blanks comprising a feed wheel having a recess leading from said periphery; a receptacle within said recess and having side walls; a yielding member in said receptacle and projecting from said periphery, said side walls being located between said friction member and the walls of said recess; and a wedge to adjust said receptacle and thereby adjust the projection of said yielding member.

5. A mechanism for feeding blanks comprising a feed wheel; a yielding radial gauge to cooperate with said wheel; a shaft supporting said gauge; and means to adjust said shaft and said gauge as a unit on a single pivot.

6. A mechanism for feeding blanks singly from the top of a pile comprising a rotary member to frictionally engage successively the forward edge of the top blank of the pile to remove such blank from the pile, the periphery of the rotary member being spaced from the pile until the forward edge of the top blank is in position for engagement with the rotary member; a support for the pile of blanks movable to press the forward edge of each top blank successively into feeding engagement with said rotary member; a gauge cooperating with the periphery of said ro-

tary member to prevent the feeding of more than one blank at a time; and means to operate said support to advance said edges into said feeding engagement.

7. A mechanism for feeding blanks singly from a fanned pile comprising a feed wheel; frictional members movably mounted in said wheel and extending clear across the periphery of said wheel and projecting from said periphery to engage and feed blanks successively from the pile, said members being spaced apart circumferentially of the periphery; a support for said pile; and a gauge cooperating with said periphery to prevent the feeding of more than one blank at a time; and means to adjust said frictional members with relation to said wheel.

8. A mechanism for feeding blanks comprising a hopper for a pile of blanks; means to feed the blanks successively from the pile; a gauge to cooperate with said feeding means to prevent the feeding of more than one blank at a time; means to feed the blanks successively in advance of said gauge; a guide for the blanks during the latter feeding; and means to adjust simultaneously said hopper and said guide.

9. A mechanism for feeding blanks comprising a hopper for a pile of blanks; means to feed the blanks successively from the pile; a gauge to cooperate with said feeding means to prevent the feeding of more than one blank at a time; means to feed the blanks successively in advance of said gauge; a guide for the blanks during the latter feeding; and means to adjust simultaneously said means and said guide.

10. A mechanism for feeding blanks comprising a hopper for a pile of blanks; means to feed the blanks successively from the pile; a gauge to cooperate with said feeding means to prevent the feeding of more than one blank at a time; means to feed the blanks successively in advance of said gauge; guides for the blanks during the latter feeding; and means to adjust simultaneously said hopper and said means.

11. A mechanism for feeding blanks comprising a hopper for a pile of blanks; means to feed the blanks successively from the pile; a gauge to cooperate with said feeding means to prevent the feeding of more than one blank at a time; means to feed the blanks successively in advance of said gauge; a guide for the blanks during the latter feeding; and means to adjust simultaneously said hopper, said means and said guide.

12. A mechanism for feeding blanks from the top of a pile comprising a gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a presser to press each blank into feeding engagement with said wheel; and means to adjust the amount of pressure exerted by the presser.

13. A mechanism for feeding blanks from the top of a pile comprising a gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a presser to press each blank into feeding engagement with said wheel; means to oscillate said presser; and means to adjust the amount of pressure exerted by the presser.

14. A mechanism for feeding blanks from the top of a pile comprising a gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a presser to press each blank into feeding engagement with said wheel; means to oscillate said presser; and means to adjust, while the mechanism is operating, the amount of pressure exerted by the presser.

15. A mechanism for feeding blanks comprising a feed wheel; a friction gauge cooperating substantially radially with said wheel; and means to clamp the gauge in close proximity to the fed blank.

16. A mechanism for feeding blanks comprising a feed wheel; a non-wedging friction gauge cooperating substantially radially with said wheel; and means to clamp the gauge in close proximity to the fed blank.

17. A mechanism for feeding blanks comprising a feed wheel; a gauge of yielding material to cooperate with said wheel and yieldable substantially radially with relation to said wheel; and means to clamp the gauge in close proximity to the fed blank.

18. A mechanism for feeding blanks from the top of a pile comprising a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a presser to press each blank into feeding engagement with said wheel; and means including a cam to oscillate the presser in one direction and means to oscillate the presser in the other direction.

19. A mechanism for feeding blanks from the top of a pile comprising a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a yielding presser to press each blank into feeding engagement with said wheel: and means including a cam to oscillate the presser in one direction; and means to oscillate the presser in the other direction.

20. A mechanism for feeding blanks comprising a hopper having an opening to receive supplies of blanks continuously while the mechanism is operating; means for feeding blanks from the top of a pile in said hopper; a stationary gauge to prevent the feeding of more than one blank at a time; and a feed wheel to feed blanks successively past said gauge, the portion of the gauge engaged by each blank extending substantially radially to the portion of the periphery of said

wheel in feeding engagement with the blank so as to avoid wedging.

21. A mechanism for feeding blanks having a hopper provided with an opening to receive supplies of blanks continuously while the mechanism is operating; and means for feeding blanks successively from the top of a fanned pile in said hopper comprising a feed wheel and a rubber gauge cooperating with said wheel, the direction of yielding of said gauge being downward, and with relation to the periphery of the wheel at the feeding point, being substantially radial or forward.

22. A mechanism for feeding blanks from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a presser to press each blank into feeding engagement with said wheel; and means to oscillate said presser.

23. A mechanism for feeding blanks from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; a member to guide each blank to the point of feeding engagement with the wheel and to press such blank into such feeding engagement; and means to oscillate said member.

24. A mechanism for feeding blanks singly from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a rotary member to frictionally engage successively the forward edge of the top blank of the pile to remove such blank from the pile, the periphery of the rotary member being spaced from the pile until the forward edge of the top blank is in position for engagement with the rotary member; a support for the pile of blanks movable to press the forward edge of each top blank successively into feeding engagement with said rotary member; a stationary gauge cooperating with the periphery of said rotary member to prevent the feeding of more than one blank at a time, the first feeding engagement of said periphery with each blank being substantially at the gauge; and means to operate said support to advance said edges into said feeding engagement.

25. A mechanism for feeding blanks successively from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; and means to urge each blank against the feed wheel at the time of feed.

26. A mechanism for feeding blanks successively from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; and means acting intermittently to urge each blank against the feed wheel at the time of feed.

27. A mechanism for feeding blanks successively from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a stationary gauge; a feed wheel to feed blanks successively past said gauge; and means to guide each blank to the point of feeding engagement with the wheel, said means being provided with a retarding surface.

28. A mechanism for feeding blanks successively from the top of a fanned pile comprising a hopper for said pile, the bottom of the hopper being inclined downwardly and forwardly; a stationary gauge; a feed wheel to feed blanks successively past said gauge; and means to guide each blank to the point of feeding engagement with the wheel and to press such blank into feeding engagement, said means being provided with a retarding surface to engage the bottom edge of the pile.

29. A mechanism for feeding blanks from the top of a fanned pile comprising a hopper whose bottom is inclined downwardly and forwardly; a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; and means in advance of the gauge and cooperating with said wheel to feed the blanks past said gauge.

30. A mechanism for feeding blanks from the top of a fanned pile comprising a hopper whose bottom is inclined downwardly and forwardly; a stationary gauge to prevent the feeding of more than one blank at a time; a feed wheel to feed blanks successively past said gauge; means in advance of the gauge and cooperating with said wheel to feed the blanks past said gauge; and means to operate said advance means intermittently for each blank.

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