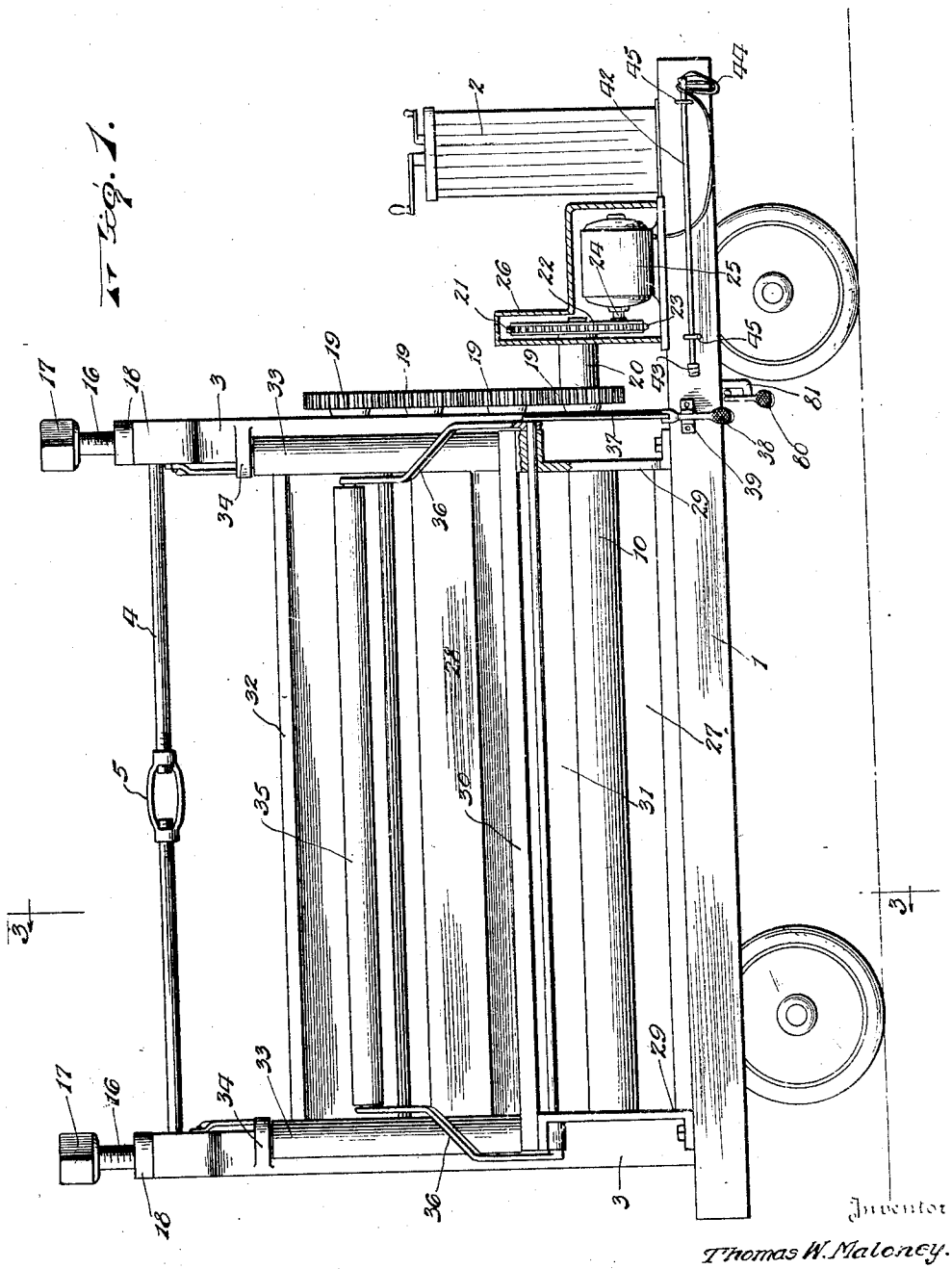
Sept. 23, 1924. 1,509,602

T. W. MALONEY

STICKER PULLER FOR TIN MILLS

Filed April 27, 1922 4 Sheets-Sheet 1

Fig. 1.



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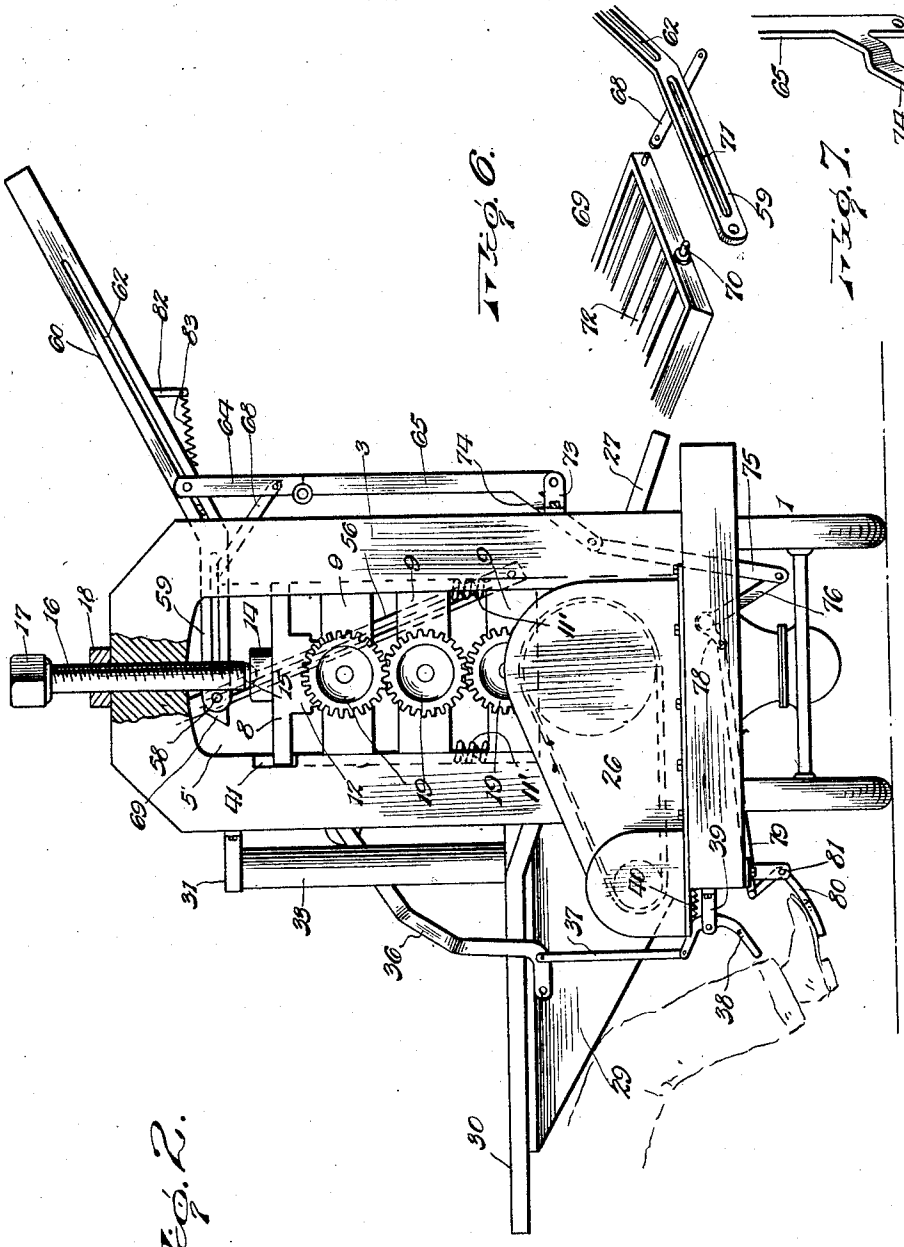


Fig. 2.

Fig. 6.

Fig. 7.

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Fig. 3.

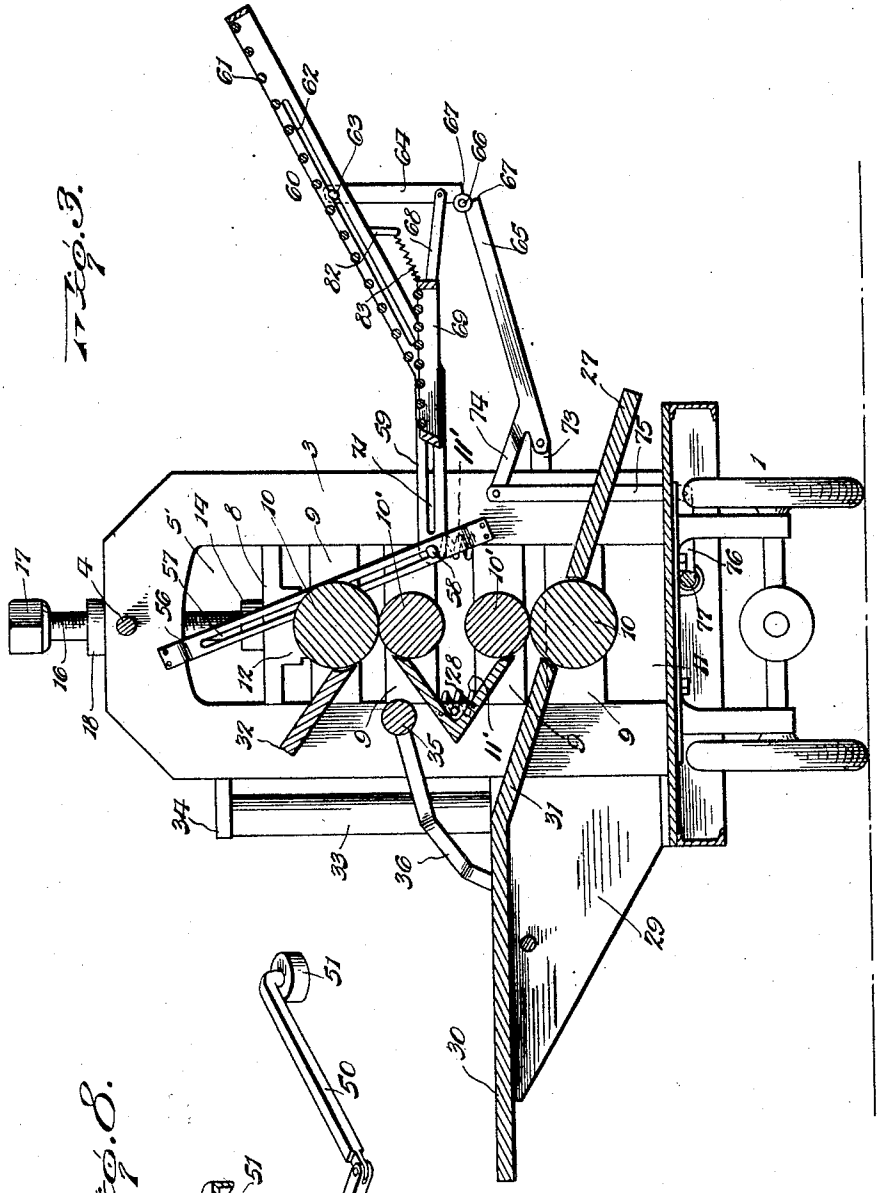
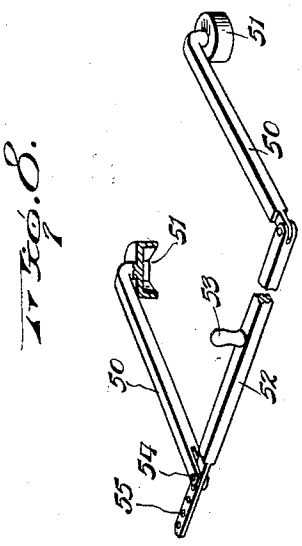


Fig. 8.



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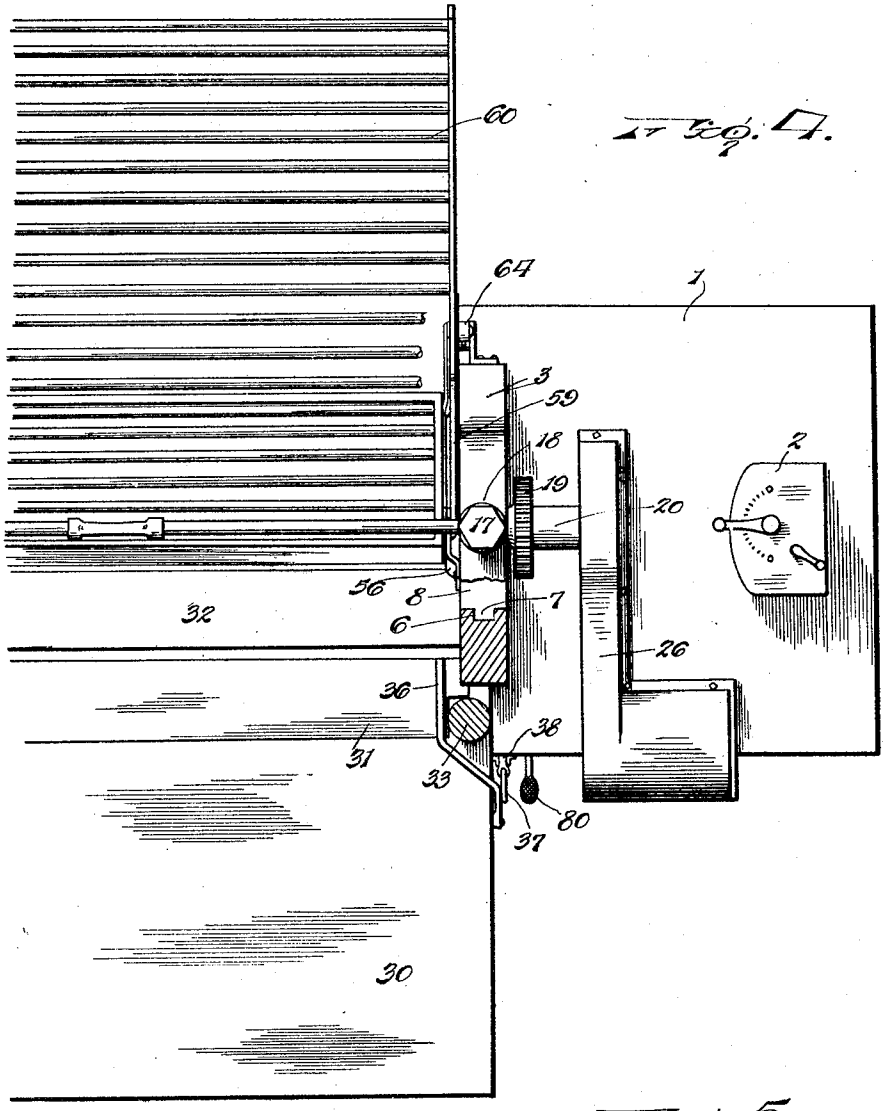


Fig. 4.

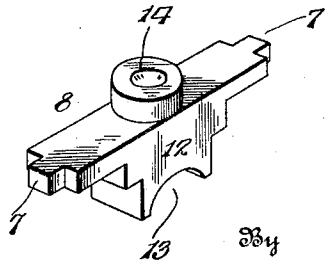


Fig. 5.

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Patented Sept. 23, 1924. 1,509,602

UNITED STATES PATENT OFFICE.

THOMAS W. MALONEY, OF NEW CASTLE, PENNSYLVANIA.

STICKER PULLER FOR TIN MILLS.

Application filed April 27, 1922. Serial No. 556,980.

To all whom it may concern:

Be it known that I, THOMAS W. MALONEY, a citizen of the United States, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Sticker Pullers for Tin Mills, of which the following is a specification.

In the production of sheets of tin, the tin is rolled and leaves the hot rolls in a form known as "block plate," each block plate containing a plurality of sheets which are rolled tight and constitute a pack. The pack is subsequently cut into sizes according to order and the sheets then separated. Frequently, the workman whose duty is to separate the sheets or open the pack finds a pack in which the sheets are stuck together so tight that he cannot open them without unduly delaying the work upon the remaining packs. He, therefore, casts to one side the pack which he cannot readily open and this discarded pack is known in mill parlance as a "sticker." Another workman is employed to separate the sheets of the sticker, the work being slow, laborious and costly. One object of my invention is to provide an apparatus by the use of which the sheets of a sticker may be readily separated at a very low cost, and another object is to provide means for returning to the feeding side of the machine those sheets which require further treatment or are to be discarded thereby relieving the workman of the necessity of walking around the machine. These stated objects and other objects which will hereinafter appear, I accomplish by the use of such a mechanism as is illustrated in the accompanying drawings, the invention residing in certain novel features which will be particularly pointed out in the claims following a detailed description.

In the drawings—

Figure 1 is a rear elevation of an apparatus embodying my improvements;

Fig. 2 is an end elevation of the same partly broken away;

Fig. 3 is a tranverse section thereof on the line 3—3 of Fig. 1;

Fig. 4 is a plan view of one end of the apparatus, partly broken away and in section;

Fig. 5 is a detail perspective view of a cap;

Figs. 6 and 7 are detail perspective views of parts of the sheet-returning mechanism;

Fig. 8 is a perspective view of a wrench for adjusting the pressure-regulating screws.

In carrying out my invention, I preferably employ a truck 1 so that the machine may be readily transported from point to point in the mill. This truck may be one of the trucks now commonly employed in mills and factories, operated by a storage battery and controlled by a workman standing upon the front end of the truck and manipulating a controller 2. It will be understood, of course, that if portability is not desired, the apparatus may be erected upon the floor of the workroom and fixed in a stationary position, any desired number of the machines being provided according to the capacity or requirements of the mill.

Upon the truck I erect housings or standards 3 which are spaced apart, as shown, so as to accommodate the working parts of the apparatus, and these standards or housings are connected at their upper ends by a brace bar or beam 4 consisting of two sections connected at their opposed ends by a turn buckle 5 whereby the bar may be properly adjusted to maintain the standards or housings in an upright position and at the required distance apart. The standards are preferably hollow or provided with openings 5′ therethrough and in the vertical side walls of these openings, I form grooves 6 slidably receiving tongues 7 on the ends of a cap 8 and of bearing blocks 9. The bearing blocks are disposed within the standards or housings and a like number of bearing blocks is provided in each housing. Extending between and journaled in corresponding bearing blocks are rolls 10 and 10′ which are adapted to engage the plates fed thereto and pull them through the machine. The bearing blocks carrying the intermediate rolls 10′ may be yieldably held apart by springs 11′ interposed between the ends of the blocks. It will be readily understood that, when no sheets are being passed between the rolls, the force of gravity tends to hold the upper roll 10 down upon the upper roll 10′ and likewise holds the lower roll 10′ against the lower roll 10, the upper pair of rolls being in the same manner under a tendency to approach the lower pair of rolls. When sheets are being passed between the rolls, the sheets themselves force the rolls apart and the springs 11′ will permit the approach of the inner rolls 10′ sufficiently to maintain the pressure upon the plates but the use of the springs is not com-

pulsory, and the upper roll 10′ may be supported upon a shoulder or other fixed rest on the standards. The lowermost bearing block may be of such vertical dimension as to rest upon the truck 1 or it may rest upon a base 11 interposed between it and the truck. The cap plate 8 is provided on its under side with a depending lug or block 12 having a concave recess 13 in its under side to engage the journal of the uppermost roll 10 so that pressure exerted upon the said cap will act upon the rolls to prevent excessive vertical movement thereof. On the upper side of the cap 8 is a cup 14 which receives the tapered lower end 15 of a screw 16 which extends through the upper end of the respective housing and is equipped with an angular head 17 whereby it may be readily engaged by a turning tool, as will be understood. The screw 16 may play freely in the upper end of the housing but has a bearing in a nut or collar 18 fixed upon the housing so that rotation of the screw will effect longitudinal vertical movement thereof. By properly adjusting the screw, therefore, the required pressure may be exerted upon and through the rolls so as to insure the proper operation of the machine upon the sheets. At one end of the machine, each roll 10 has its end extended beyond the standard or housing 3 and is equipped with a gear 19, each gear meshing with the gears respectively above and below the same. The lowermost roll has its bearing portion extended or it may be equipped with a coupling sleeve 20 whereby it may be connected with a driving sprocket 21, around which is trained a chain 22 which extends to and around a sprocket 23 on the shaft 24 of a motor, indicated conventionally at 25. This motor 25 is preferably an electric motor and it, as well as the gearing by which it is connected to the shaft of the lower roll, is enclosed within a gear casing 26, as clearly shown.

Extending downwardly and forwardly from the lowermost roll 10 at the front of the machine is a delivery plate or chute 27 and upon the rear side of the machine, I provide means for guiding the sheets to the rolls and separating them into upper and lower single sheets or pluralities of sheets as they are fed to the rolls. It will be understood, of course, that the rolls 10 and 10′ operate in pairs and any desired number of pairs may be provided, but in the present drawings I have shown two pairs which may be conveniently referred to as the upper pair and the lower pair, respectively. Secured rigidly to and extending between the housings or standards 3 is a divider 28 consisting of a substantially V-shaped block, plate or bracket having its apex in the horizontal plane of the space between the lower roll of the upper pair of rolls and the upper roll of the lower pair of rolls, and the side members of this divider extend, respectively, to the lower roll of the upper pair and the upper roll of the lower pair, as clearly shown in Fig. 3, so that material riding upon this divider or the diverging faces of the same will be directed to the upper and lower pair of rolls, respectively. I also secure to the rear sides of the standards or housings 3 and to the truck, braces 29 which support a feed table 30 which extends the entire width of the machine and may, of course, be of any desired depth, the forward portion of this feed table being extended downwardly and forwardly, as shown at 31, so that material passing thereover will be fed to the lower pair of rolls. Above the divider and inclined downwardly and forwardly toward the upper pair of rolls is a guiding plate 32 which is also secured rigidly to and extends between the standards or housings 3. With the use of my apparatus, the workman who is now employed to open the sticker will be called upon merely to partly separate the sheets at one corner or edge and the sticker consisting of these partly separated sheets will be placed upon the feed table 30 and pushed over the same so that the separated edges may be engaged by the divider 28, the upper sheets being then guided upwardly to the upper pair of rolls and the lower sheets being guided downwardly to the lower pair of rolls. The rolls will be obviously positively rotated and, once the edges of the sheets enter the bights of the rolls, they will be engaged and gripped by the rolls so that the continued rotation of the rolls will then draw the sheets through the machine, the divider 28 continuing to separate the sheets.

The tension screws 16 will be adjusted to permit necessary play of the rolls but prevent excessive play so that the required pressure will be exerted upon the sheets at all times. In Fig. 8, I have shown a wrench especially adapted for adjusting the tension screws. This wrench comprises a pair of levers 50 each having a socket 51 at one end to engage over the head of a screw in an obvious manner. The ends of the levers remote from the sockets are pivoted to a connecting bar 52 provided with a handle 53, this arrangement effecting simultaneous rotation of the two screws when the connecting bar is shifted endwise as will be readily understood. Should one screw be more worn than the other screw, the wrench may be adjusted to compensate for the inequality by engaging the pivot pin 54 of one lever in the proper opening 55 of the connecting bar.

To guide the stickers to the rolls and prevent damage to the standards and to the stickers by contact of the stickers with the standards, I provide the vertical idler

guiding rollers 33 upon the rear edges of the standards or housings 3, said rolls being mounted in suitable bearings in the feed table or the braces 29 at their lower ends and journaled at their upper ends in brackets 34 projecting from the standards. These rollers, of course, are so positioned that a plate or sheet bearing against the roller will be out of contact with the inner side of the standard, as will be readily understood upon reference to Fig. 1, and they will also permit a sticker to be advanced to the divider so as to present a corner thereto and then turned as it advances so that before it is engaged by the rolls, its edge will be presented thereto and will be held out of contact with the standards.

It sometimes happens that the rear end of the sticker or sheet, as it passes to the rollers, exhibits a tendency to curl, and, to prevent such curling, I provide the pressure roll 35 which is carried by the swinging arms 36 fulcrumed upon the braces 29 or the sides of the feed table. A link 37 is pivoted at its upper end to one of the arms 36 and at its lower end to the upper end of a foot lever 38 which is mounted in a bracket 39 upon the side of the truck and is normally held to the truck by a spring 40, as will be readily understood upon reference to Fig. 2. By pressing downwardly upon the foot lever, the arms 36 are swung downwardly so that the roller 35 will be caused to bear upon the plates passing over the upper side of the divider 28 and the pressure exerted through the said roller will prevent curling of the rear end of the plate.

To facilitate the placing of the bearing blocks 9 and the cap 8 in position within the housings or standards, I provide in one side of each standard a recess 41 which leads directly into the groove 6 so that the tongues 7 may be readily brought into position to engage the grooves. The removal of a broken bearing block and the substitution of a new one therefor is thus facilitated.

With the machine constructed as thus far described, if one of the sheets to be separated should be imperfect so that it should be discarded, it would be necessary for the workman to temporarily stop the machine after these sheets had been passed therethrough, and walk around the machine so as to separate the imperfect sheet from those having commercial value. It also frequently happens that packs containing more than two sheets are to be passed through the machine. In order to separate all the sheets of such a pack, it is necessary to pass the unseparated sheets through the machine a plurality of times, and it is necessary, of course, to employ a second workman or else have the operator of the machine stop the machine and walk around the same to obtain the unseparated sheets after each operation. I provide means whereby this additional labor by the operator is rendered unnecessary and the imperfect sheets or the sheets to be again passed through the machine may be returned to the feeding table quickly and without stopping the operation of the machine. This mechanism comprises a receiving rack disposed at the delivery side of the machine and means for adjusting said rack so as to receive the sheets passing between the upper rolls and then discharge said sheets over the upper rolls so that they may be at once returned to the feeding table. Secured to the inner sides of the standards in an inclined position and extending from a point approximately in the plane of the upper roll of the lower pair of rolls to the upper arch or bridge of the standard are guiding brackets 56 which are slightly offset inwardly from the standards and are constructed with slots 57, as shown in Figs. 2 and 3. The slots 57 are engaged by the headed studs or pins 58 at the forward ends of arms or extensions 59 projecting from an inclined rack or holder 60 which is disposed in an upwardly inclined position at the delivery side of the machine, as clearly shown. This rack consists of side bars and a plurality of rollers 61 fitted in and extending between the side bars so that a plate received upon the rack will be permitted to move easily downwardly thereon. The side bars of the rack are constructed with longitudinal slots 62 which receive pins or studs 63 at the upper extremities of upper toggle members 64. The lower ends of the toggle members or links 64 are pivotally connected to the upper ends of lower toggle links or members 65 and the pivot or hinge 66 is disposed eccentrically so that the ends of the respective links present shoulders 67 which, when the toggle is straightened, will abut and thereby limit the movement of the links. The upper toggle link also has pivoted thereto one end of a link or connecting rod 68 which extends toward the adjacent standard and is pivoted to the side of a shiftable rack 69 which is equipped on its sides with pins or studs 70 playing in slots 71 in the respectively adjacent extensions 59 of the upper rack. The rack 69 consists of a substantially rectangular frame having rotatable rods or rollers 72 extending between its sides, and it is obvious that this rack is supported in a horizontal position by the links or connecting rods 68 and the studs 70 playing in the slots 71. The toggle links 65 are pivoted at their lower ends upon the standards or upon brackets 73 projecting from the standards and they are provided upon their edges presented to the standards with angularly disposed arms or cranks 74. To the free ends of these cranks

or arms 74, I pivot the upper ends of links 75 which pass through the floor of the truck 1 and have their lower ends pivoted to the free ends of cranks 76 projecting from a rock shaft 77 journaled in suitable bearings upon the truck and having a shorter crank arm 78 disposed in angular relation to the cranks 76. The crank 78 is connected by a link 79 with a pedal or foot lever 80 which is fulcrumed in a bracket 81 secured to and depending from the front edge of the truck.

If the operator, when he picks up a pack to feed the same through the machine, notices that one of the sheets is imperfect, he will place the pack in such position that the imperfect sheet will be presented to the upper side of the divider and will also press downwardly upon the treadle 80, thereby rocking the shaft 77 so that the cranks 76 will be swung downwardly and this movement transmitted through the links 75 to the arm 74, so that the toggle will be partly straightened and the rack 69 pushed inwardly toward the rolls so that the sheet which issues from between the upper rolls will drop onto said rack. After the sheet has been completely passed between the rolls, a further pressure is exerted upon the treadle 80 and the toggles completely straightened so that they will assume the position shown in Fig. 2. In this position, the upper rack 60 is moved to a point above the uppermost roll and the rack 69 is projected to a position over said roll so that the sheet thereon may be easily grasped by the operator and withdrawn to be discarded if it is an imperfect sheet or to be again passed through the machine in the event that it is stuck to another sheet. The rack 69, when the apparatus is in the lowest position, is spaced from the rolls, as shown clearly in Fig. 3, so that the sheet may pass between the rolls and the inner end of the rack and assume a position upon the pile of treated plates or sheets, the action of the links 68 in projecting and retracting the rack 69 being supplemented by a spring 83 secured to the rack and to a bracket 82 on the upper rack 60, as will be readily understood, the dropping of the outer end of the rack 69 being thus avoided.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that I have provided a very simple compact apparatus whereby the sheets of a sticker may be readily and expeditiously separated at a low cost. The work also may be done much more rapidly than it is now performed by hand.

As hereinbefore stated, the truck may be operated by storage batteries in accordance with the present common practice. The motor 25, however, is preferably operated by current obtained through the power or light installation in the building and to enable the motor to be readily connected with such installation, I provide a conducting bar or rod 42 provided with a plug 43 at one end which is adapted to engage in a socket provided for that purpose or in any ordinary electric lamp socket. At the opposite end, the rod or bar 42 is connected by a flexible conductor 44 with the motor. When the truck is moving and the rod is not in use, it is supported upon hooks 45 provided on the side of the truck but when the motor 25 is to operate, the rod is lifted from these hooks and the plug 43 engaged in a socket in a well-known manner.

Having thus described the invention, what is claimed as new is:

1. In an apparatus for the purpose set forth, the combination of pulling rolls, a divider arranged adjacent said rolls, a presser roller arranged above the divider and adapted to bear upon a plate passing over the divider to the pulling rolls, and means for moving the presser roller toward and from the divider.

2. In an apparatus for the purpose set forth, the combination of pulling rolls, a divider arranged to co-operate with said rolls, and vertically disposed guide rollers arranged adjacent the ends of the divider.

3. In an apparatus for the purpose set forth, the combination of pulling rolls, a divider arranged adjacent said rolls, guides disposed above and below the divider and co-operating therewith, a presser roller arranged between the divider and the upper guide and means for moving the presser roller toward and from the divider.

4. In an apparatus for the purpose set forth, the combination of a support, a feed table on the support, pulling rolls mounted in the support, a divider arranged between the feed table and the pulling rolls, a presser roller arranged adjacent and above the divider, arms pivotally mounted upon the feed table and carrying said presser roller, a foot lever mounted upon the support, a connection between the foot lever and one of said arms, and means for holding the foot lever normally toward the support whereby the presser roller will be raised from the divider.

5. In a machine for the purpose set forth, the combination of a supporting frame, pairs of rolls mounted in said frame to act upon sheets fed thereto, an inclined rack arranged at the delivery side of the rolls, a supplemental rack supported by the lower portion of the first-mentioned rack and movable toward and from the rolls, means for movably supporting the first-mentioned rack upon the frame, and means for shifting the racks from a point below the upper rolls to a point above the same.

6. In a machine for the purpose set forth, the combination of a supporting frame, rolls

mounted therein to act upon sheets fed thereto, guiding brackets secured upon the frame adjacent said rolls, a sheet-receiving support slidably engaged with said brackets, a secondary sheet-receiving support slidably fitted upon the first-mentioned support, a yieldable connection between the secondary support and the first-mentioned support, a toggle having its lower member pivoted upon the supporting frame and having its upper member slidably engaged with the first-mentioned receiving support, means for bending and straightening said toggle, and a link connecting the toggle with the secondary sheet-receiving support.

7. In a machine for the purpose set forth, the combination of a supporting frame, rolls mounted therein to act upon sheets fed thereto, guiding brackets secured upon the frame adjacent said rolls, a sheet-receiving support slidably engaged with said brackets, a toggle having its lower member pivoted upon the supporting frame and having its upper member slidably engaged with the sheet-receiving support, and means for bending and straightening said toggle.

In testimony whereof I affix my signature.

THOMAS W. MALONEY. [L. S.]