

Oct. 1, 1935.

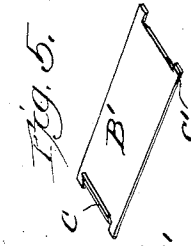
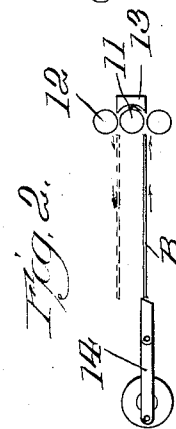
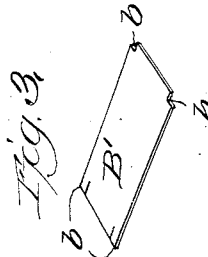
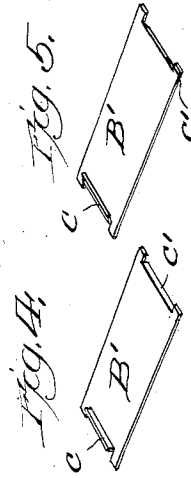
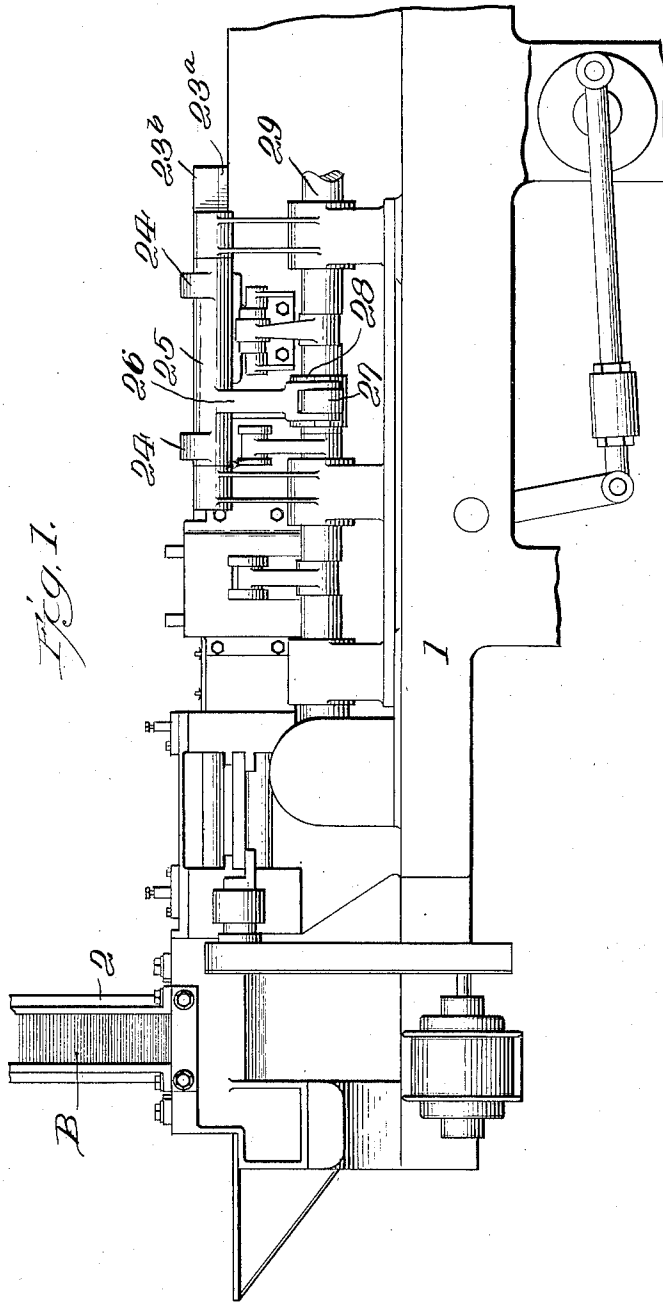
H. F. BAYER

2,015,987

FEEDING MECHANISM FOR CAN MAKING MACHINES

Filed Oct. 14, 1933

5 Sheets-Sheet 1



Inventor
H. F. Bayer
by *Sturtevant, Mason & Porter*
Attys.

Oct. 1, 1935.

H. F. BAYER

2,015,987

FEEDING MECHANISM FOR CAN MAKING MACHINES

Filed Oct. 14, 1933

5 Sheets-Sheet 2

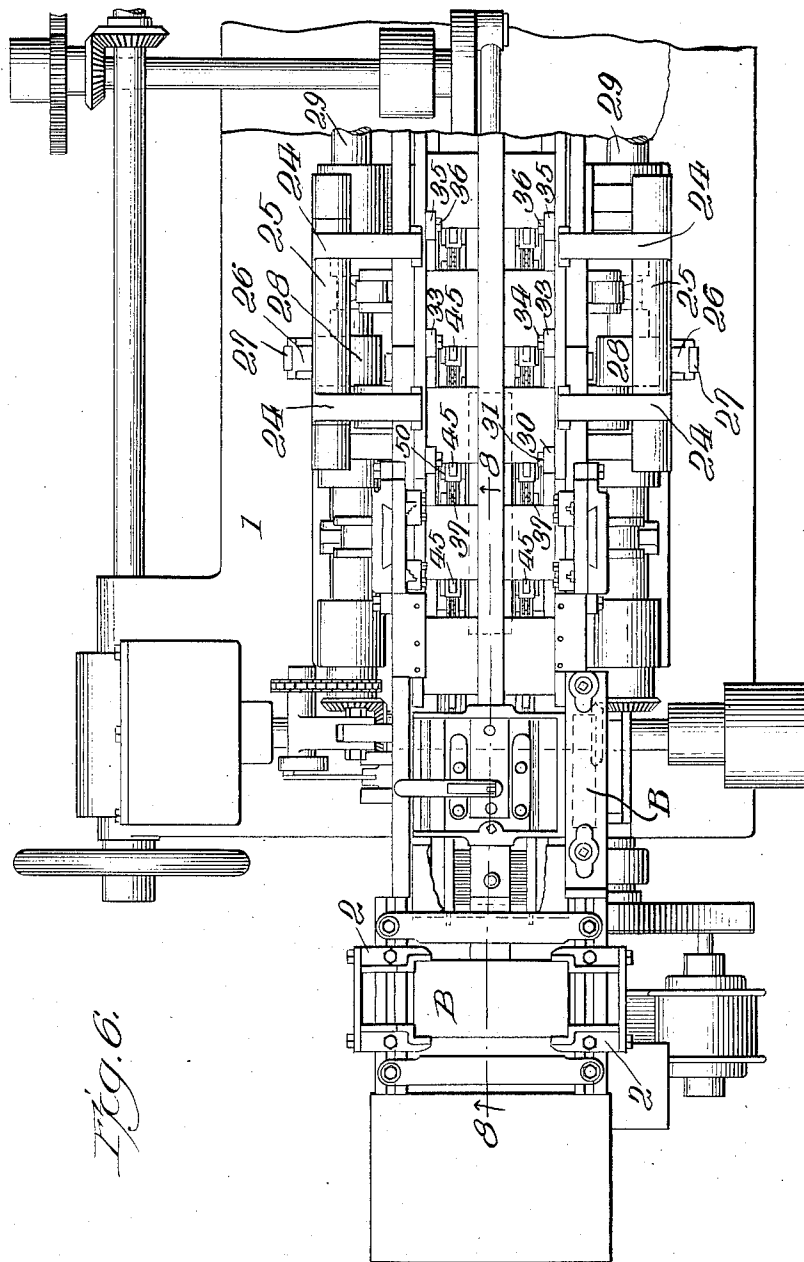


Fig. 6.

Inventor
H. F. Bayer
by Sturtevant, Mason & Porter
Attys

Oct. 1, 1935.

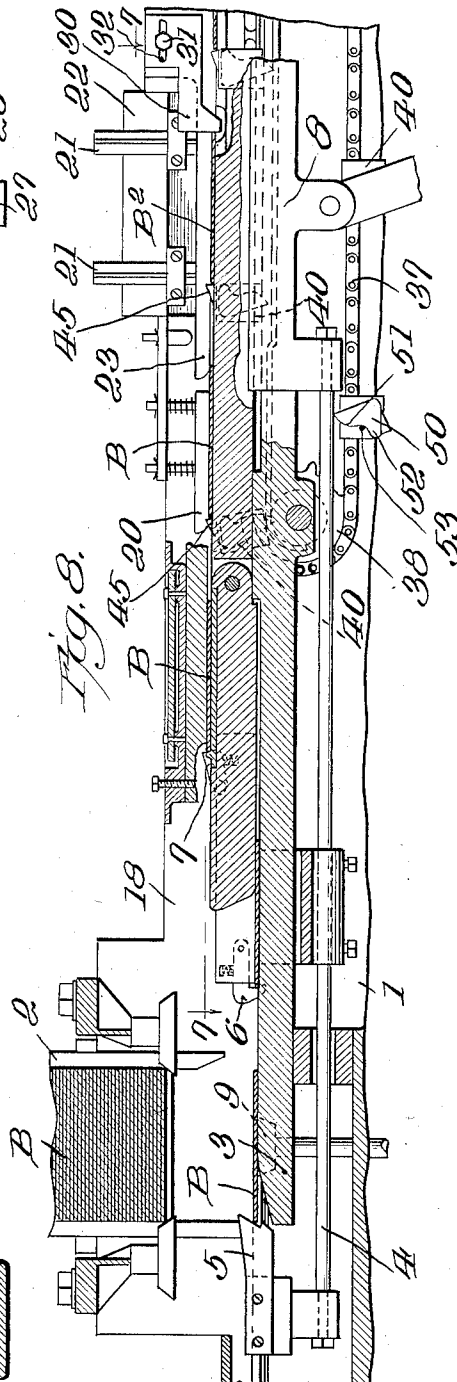
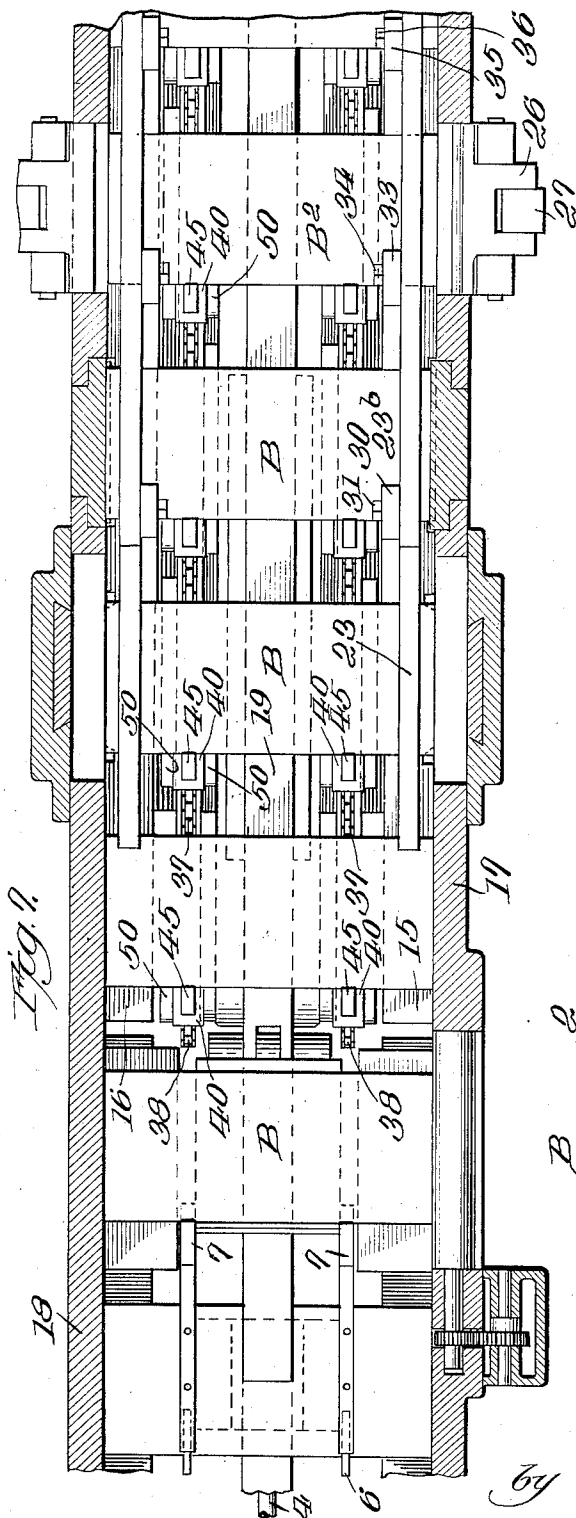
H. F. BAYER

2,015,987

FEEDING MECHANISM FOR CAN MAKING MACHINES

Filed Oct. 14, 1933

5 Sheets-Sheet 3



Inventor
H. F. Bayer
Sturtevant, Mason & Potter
attys.

Oct. 1, 1935.

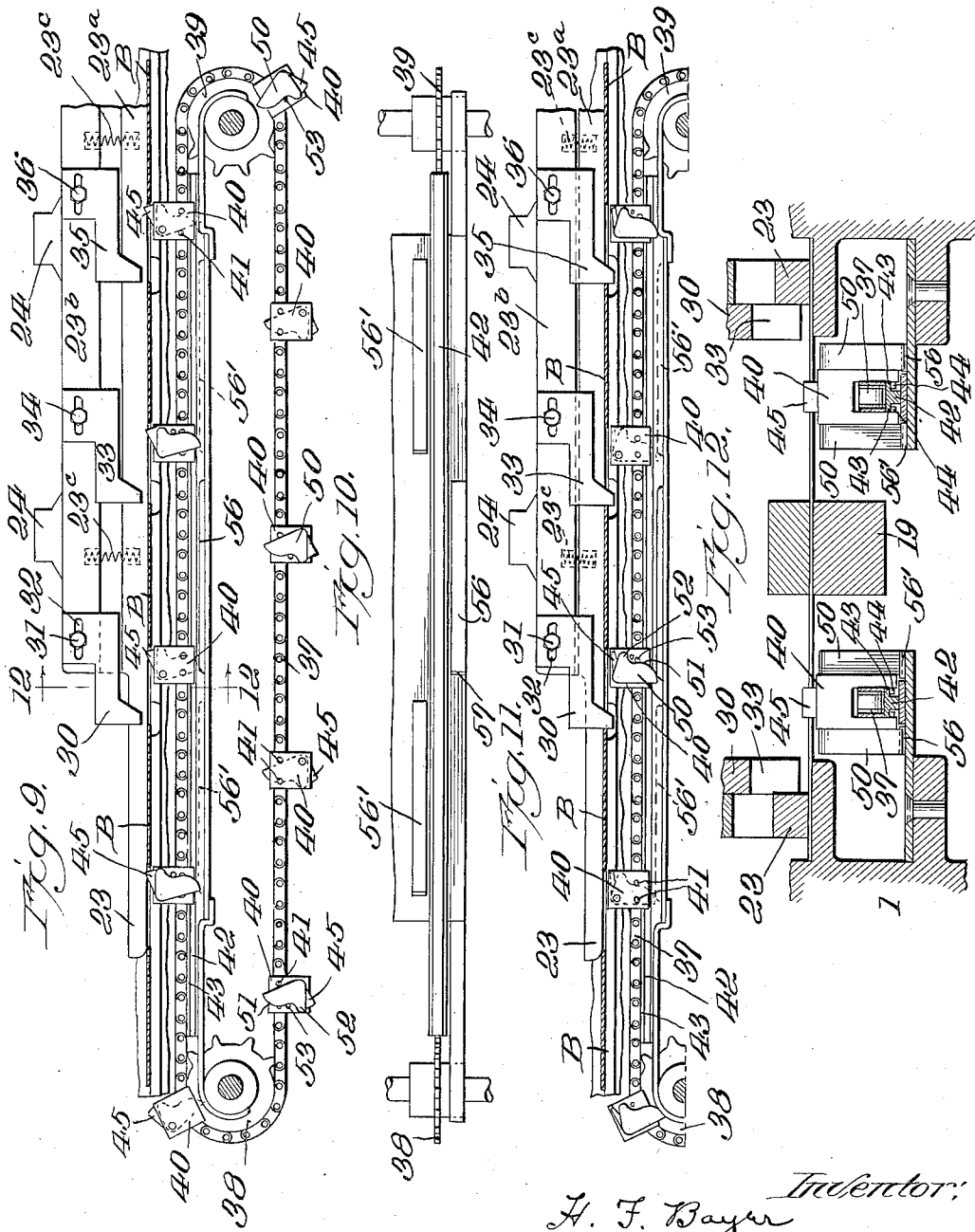
H. F. BAYER

2,015,987

FEEDING MECHANISM FOR CAN MAKING MACHINES

Filed Oct. 14, 1933

5 Sheets-Sheet 4



Inventor:
H. F. Bayer
Sturtevant, Mason & Porter
Attys

Oct. 1, 1935.

H. F. BAYER

2,015,987

FEEDING MECHANISM FOR CAN MAKING MACHINES

Filed Oct. 14, 1933

5 Sheets-Sheet 5

Fig. 13.

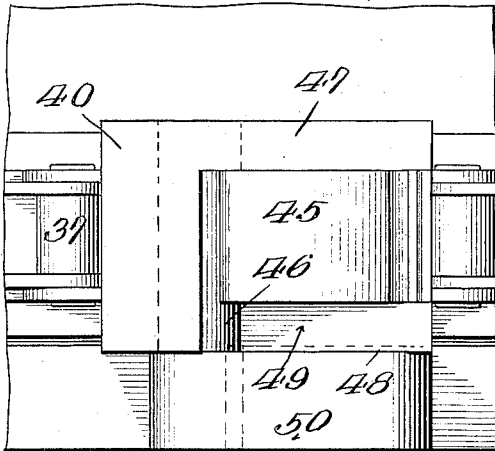


Fig. 14.

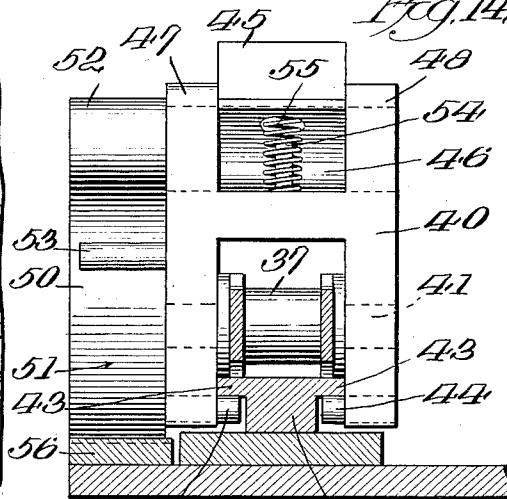


Fig. 15.

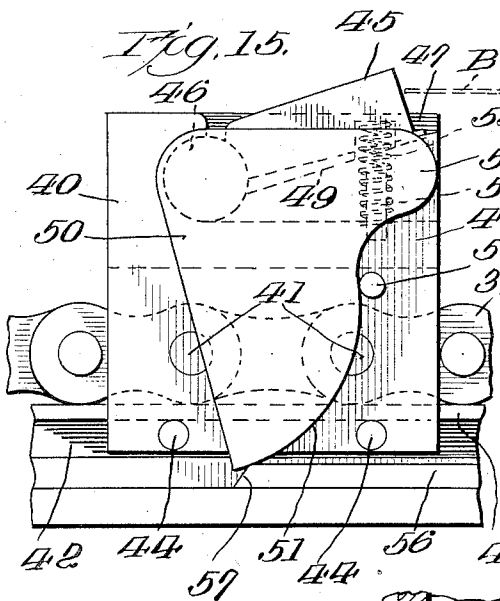


Fig. 16.

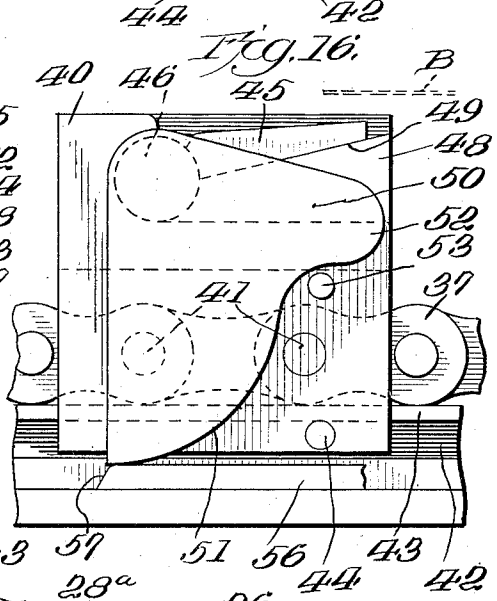
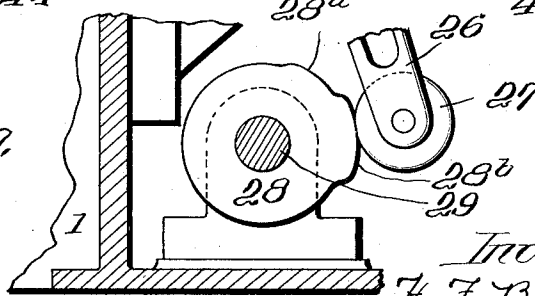


Fig. 17.



Inventor
H. F. Bayer

By Shuterant, Mason & Porter
Attys

UNITED STATES PATENT OFFICE

2,015,987

FEEDING MECHANISM FOR CAN MAKING
MACHINES

Hugo F. Bayer, La Grange, Ill., assignor to Continental Can Company, Inc., New York, N. Y., a corporation of New York

Application October 14, 1933, Serial No. 693,651

8 Claims. (Cl. 271—54)

The invention relates to new and useful improvements in a feeding mechanism for can making machines, and more particularly to a feeding mechanism for feeding blanks, from which can bodies are made, to and from an operating station.

It has been a common expedient in body making machines to feed the body blanks first to one operating station and then another by reciprocating feed bars carrying yielding feed dogs which engage each blank in turn and moves the same to an operating station, bringing said blank into contact with a stop which positions the same at the operating station. Reciprocating feed bars carrying feed dogs for this purpose, in high speed machines, develop lost motion which leads to inaccuracy in the placing of the blanks. Furthermore, reciprocating bars limit to a great extent the speed at which blanks may be fed to and from an operating station.

An object of the present invention is to provide a feeding mechanism for intermittently feeding blanks to and from an operating station, which feeding mechanism includes continuously traveling feed dogs operated upon by cam means for releasing said dogs from engagement with the body blanks as they are brought into engagement with the stops that position said blanks for operation.

In the drawings which show by way of illustration one embodiment of the invention—

Figure 1 is a portion of a side view of a body maker embodying the improvements;

Fig. 2 is a diagrammatic view showing the breaker rolls which are used in the machine;

Fig. 3 is a view showing a body blank having the edges thereof notched preparatory to the forming of a lock and lap seam can body;

Fig. 4 is a view showing the body blank as operated upon at the first edging station, where the edges are turned in opposite directions at substantial right angles to the plane of the blank;

Fig. 5 is a view showing the body blank as operated upon by the second edging station where the hooks are bent inwardly preparatory to the interlocking of the same for forming the side seam;

Fig. 6 is a plan view of a portion of the machine embodying the invention;

Fig. 7 is a horizontal sectional view through a portion of the machine showing the guideways for the body blanks and the body blanks at different operating stations, said view being taken on the line 7—7 of Fig. 8;

Fig. 8 is a sectional view on the line 8—8 of Fig. 6;

Fig. 9 is a view showing more or less diagrammatically the guides for the body blanks, the stops and the feeding mechanism at one side of the guideways for the body blanks;

Fig. 10 is a plan view showing the cams for releasing the feed dogs from engagement with the body blanks;

Fig. 11 is a view similar to Fig. 9, but showing the body blanks as having moved forward into engagement with the stops and positioned thereby at the operating mechanism;

Fig. 12 is a sectional view on the line 12—12 of Fig. 9;

Fig. 13 is an enlarged plan view of one of the feeding units;

Fig. 14 is a view in vertical section showing the front end of one of the feeding units;

Fig. 15 is a side view of one of the feeding units with the feed dog raised and in engagement with a blank for feeding the same;

Fig. 16 is a view similar to Fig. 15, but showing the feed dog as depressed and released from the body blank, and

Fig. 17 is a detail in side view of the cam for operating the stops.

The invention relates to a feeding mechanism for feeding metal blanks to an operating station. The invention is illustrated as applied to a machine for making can bodies in which the body blanks are taken from a magazine and are fed intermittently to operating stations where various operations are performed thereon preparatory to the shaping of the body blank into cylindrical form and the interlocking of the edge portions thereof. The machine includes guide rails forming a guideway along which the body blanks are moved to the various operating stations. At each operating station is a stop which is moved into a position for the body blank to contact therewith when it is brought to an operating station for the purpose of locating the blank in a correct position for operation thereon. Associated with the stops are presser bars which clamp the blank in position for operation thereon.

The present invention has to do particularly with the feeding mechanism which brings the blanks to an operating station. The feeding mechanism is in the form of traveling chains carrying feeding units, each of which includes a feed dog. There is a traveling chain at each side of the guideway for the blank so that a pair of dogs contact with the blank for the feeding of the same intermittently, first to one operating

station and then another. The chain travels continuously. There is a cam means associated with each chain which operates upon the feed dog for retracting the same from engagement with the body blank just prior to the blanks contacting with the stop, so that the inertia of the body blank will lay the same in contact with the stop. It is thought that the invention will be better understood by a detail description of the essential features of the body making machine and the manner of applying the improved feeding mechanism thereto.

In Figures 1 and 6 of the drawings, there is shown a portion of a body maker which includes a supporting frame 1. Mounted on said supporting frame is a magazine 2 in which the body blanks are stacked. The body blanks are indicated at B. These body blanks are stripped one at a time from the bottom of the magazine on to a supporting bed 3, and are fed along said bed by a reciprocating feed bar 4 carrying feed dogs 5, 6 and 7 (see Fig. 8). This reciprocating feed bar 4 is attached to a cross head 8 which in turn is connected to a suitable means for reciprocating the same back and forth. Suction cups, one of which is indicated at 9, are provided for stripping the blanks from the magazine on to the bed 3. The blanks are first fed to an operating station wherein the body blank is passed through breaker rolls for breaking the grain of the body blank. These breaker rolls are indicated at 11 and 12 in Fig. 2 of the drawings. Associated with these breaker rolls is a guide block 13. The blank is fed by the feed dog 7 into a position where a reciprocating feed dog 14 moves said blank laterally into the breaker rolls. The blank then passes through the breaker rolls and is inverted as shown in the broken line position in Fig. 2. This mechanism operating upon the blanks preparatory to the shaping of the same into cylindrical body form is shown and described in detail in the patent granted Nelson Troyer, August 12, 1930, No. 1,772,820.

The body blank after the grain has been broken therein is then fed forward along guideways, first to the edging station where the hooks are formed on the body blanks, and finally to the station where the body blanks are bent around a horn and the hooks interlocked and bumped. The body blank B' in Fig. 3, has been operated upon at a notching station and notches formed in the corners thereof as indicated at b. In Fig. 4, the body blank B' is shown as having been subjected to the first edging operation wherein the hook c is turned upward and the hook c' is turned downward, these hooks being placed substantially at right angles to the plane of the blank B'. In Fig. 5, the body blank B' is shown as having its hook c bent inwardly at an angle, and the hook c' also bent inwardly. This completes the formation of the hooks ready for the interlocking of the same at the bumping station.

The body blanks after they leave the station where the blank is passed through breaker rolls, are then moved on to guide rails 15 and 16 which are disposed adjacent the side frames 17 and 18, respectively. There is also a central guide rail 19. These guide rails and side frames form the guideway along which the body blank is moved as it is presented first to one operating station and then another. The body blank is fed on to these guide rails by the feed dogs 7, 7 which are reciprocated in timing with the feed dogs 5 and 6. Disposed above the guide rails 15 and 16 are yielding presser bars 20, 20, one at each side of

the guideway. The forward ends of these presser bars are upturned so that the body blank may be fed underneath the presser bars on to the guide rails. The notching station includes notching dies 21, 21 carried by a reciprocating head 22. There are notching dies at each side of the machine, and they are of the usual construction, and it is not thought necessary to describe the same in detail. The body blank B² is shown in Fig. 8 as positioned for notching. It is fed underneath presser bars 23, which as shown in Figures 9 and 11 are made in two sections. There is the lower section 23a which contacts with the blanks on the guide rails and the upper section 23b which is fixed to arms 24, 24. These arms 24, 24 are attached to a sleeve 25 (see Fig. 1) which is mounted on a rod carried in brackets which are attached to the frame of the machine. The sleeve 25 is provided with an arm 26 carrying a roller 27 which cooperates with the cams 28 on the shaft 29. There is a bar 23 at each side of the machine, and a similar operating mechanism therefor. Also a shaft similar to the shaft 29. This presser bar and the means for operating the same is similar in construction to that shown in the patent granted Mervyn B. Troyer, October 28, 1930, No. 1,780,049.

The cam 28 is shown as provided with an eccentric portion 28a and a portion 28b following the same which is of greater eccentricity. This cam is so designed that it moves the section 23a of the presser bar into contact with the body blanks with a comparatively light pressure. The two sections 23a and 23b are separated by springs 23c, 23c, and the first movement of the section 23b of the bar compresses these springs, slightly increasing the tension on the section 23a. After the blank is properly positioned for operation thereon, then the cam 28 will move the section 23b to the position shown in Fig. 11, and this will cause a firm clamping of the blanks against the guide rails, holding said blanks in a set position for the operations thereon.

Mounted on this section 23b of each presser bar is a stop 30. Said stop is adjustably attached to the presser bar by means of a bolt 31 passing through a slot 32 in the shank of the stop, and this permits the stop to be shifted endwise of the presser bar. This stop 30 is for the purpose of positioning the body blank at the notching station. The stop 33 adjustably secured to the section 23b of the presser bar by a bolt 34 serves to position the body blank for the first edging station. It is understood that there is a stop 33 carried by the presser bar at each side of the machine. Likewise, a stop 35 adjustably secured by a bolt 36 to the section 23b of the presser bar serves to position the body blanks for the second edging station. There may be stations intermediate these stations which we have just referred to, or additional stations where other operations are to be performed. The essential feature is that when the body blank is brought to a set position for operation thereon, it shall always be placed in a predetermined position relative to the operating mechanism. This is accomplished by these adjustable stops. The stops move up and down with the section 23b of the presser bar.

As shown in Fig. 9, they are in raised position, and the body blanks are free to pass underneath the same. The body blanks are indicated at B. In Fig. 8 of the drawings, the stop 30 is indicated and is shown as having moved downward to a position for the body blank B²

to contact therewith. In Fig. 11, the stops are all in their lower position with the body blanks in contact therewith and the presser bar 23 firmly clamping said blanks in their predetermined set positions for the various operations thereon.

The body blanks are brought into engagement with the stops by a feeding mechanism which includes a feed chain 37. Said feed chain 37 runs over a sprocket wheel 38 at the forward end of the machine and a sprocket wheel 39 at the other end of the operating section of the machine. There is a feed chain at each side of the machine, as shown in Fig. 7. The feed chain is provided with a series of feeding units. These feeding units are shown in detail in Figures 13 to 16. Each feeding unit includes a housing or support which is fixed to the feed chain. This housing or support is indicated at 40. Passing through the housing or support are pins 41, 41 which are the connecting pins joining the links of the chain. These two pins attach the housing or support to the chain so that it is supported thereby and caused to travel with the chain. The chain slides on a guide rail 42 as it passes through the operating stations, so that it is held from sagging and caused to travel in a straight line. This guide rail is provided with laterally projecting flanges 43, 43, and the housing or support 40 is provided with pins 44, 44 which project underneath the flanges and this insures that the chain shall travel in contact with the guide rail.

Pivotally mounted in each housing or support 40 is a feed dog 45. This feed dog 45 is preferably formed integral with a short shaft 46, and this short shaft 46 is journaled in bearings in the housing or support 40. Said housing or support is provided with spaced side members 47 and 48 forming a recess therebetween, and located in this recess is the feed dog 45. The side member 48 is cut away as indicated at 49, and this cut away portion leads into the opening which receives and forms a bearing for the shaft 46. The feed dog 45 is so dimensioned that the shaft may be moved endwise into this recessed bearing in the side members 47 and 48, and the feed dog passed over the upper wall of the cut-away portion 49 so that it may be placed in the recess and held from lateral movement through the engagement thereof by the side members 47 and 48. Rigidly attached to this shaft 46 is an arm 50 which is provided with a curved face 51. Said arm also has a laterally projecting portion 52. A stop pin 53 placed in the wall of the housing or support 40 serves to engage the curved face 51 and limit the upward movement of the feed dog 45. Mounted on the housing in the bottom of the recess for the feed dog is a guide pin 54. A spring 55 carried by said guide pin engages the under face of the feed dog and normally raises the feed dog to a position where the curved face 51 contacts with a stop pin 53. When the feed dog is in raised position, it is then so disposed relative to the guide rails on which the body blanks rest that it will contact with the body blank, as shown in Fig. 15 of the drawings. Means is provided for moving said feed dog 45 downward into the housing or support so as to release it from the body blank B as shown in Fig. 16. This releasing means is in the form of a cam bar 56. This cam bar 56 has a tapered end 57. This cam bar is stationary, and the feed chain carrying the feed unit supporting the feed dog brings the curved face 51

into contact with the cam bar, and the cam bar will cause said feed dog 45 to be lowered into the housing or support. This curved face 51 is so shaped that when it passes up on to the feed bar, it will ride along the same under the light tension of the spring 55 which tends to lift the feed dog. As soon as this arm 50 with the curved face 51 passes off the cam bar, then the feed dog 45 will be raised by the spring to the position shown in Fig. 15. The feed units carrying the feed dogs have what might be called right and left hand arrangements of the control arm 50 thereon. That is to say, the control arm on one unit is on the right, while the control arm of the next adjacent unit is on the left. The structures are exactly the same, except that the other side face of the housing or support 40 is cut away, and the control arm lies along the opposite side of the housing or support, as noted. The cam bars for operation upon the control arms are therefore placed alternately on opposite sides of the guide rail 42. The cam bar 56 operates upon the feed units which have the control arm at the right of the housing, and the cam bars 55', 56' operate upon the feed units wherein the control arm is on the opposite side of the housing. These cam bars for depressing the feed dogs are so disposed that when a blank is brought to a position almost in contact with the stop, the feed dog will be depressed to a point where it will be released from its engagement with the blank. The inertia or momentum of the blank will cause it to move on until it contacts with the stop. The blank is under the yielding presser bar at this time, which retards somewhat its movement, but there is a sufficient movement of the blank after the feed dog is released therefrom in order to cause said blank to contact with the stop and be properly positioned at the operating station.

The feed dog is held depressed while the arm is in contact with the cam bar, and the cam bar is of sufficient length so that when the feed dog is depressed and disengaged from the blank it will be held depressed and out of contact with the blank until the feed dog is moved to a position beyond the stationary blank which is being operated upon at the operating station. The feed dog will contact with the next blank in advance of the one which is brought to an operating station for taking said advance blank away from its operating station. In other words, one feed dog brings a blank to an operating station, and the next following feed dog will take it away from the operating station. The feed dogs are continually traveling in the same direction during their passage through the operating stations, and at the same time, they operate to intermittently feed the blanks to and from the operating stations.

While the invention is shown as applied to a body making machine, it is obvious that it may be applied to other types of can making machines where it is desired to feed blanks which are to be made into can parts to one operating station and then to another for successive operations thereon. Furthermore, it is understood that while the feeding mechanism is shown as applied to a specific type of body making machine, wherein the edges are notched and formed with hooks and interlocked, it will be obvious that it may be used in connection with other types of body makers. It is also obvious that changes in the details of construction of the feed dogs and the manner of mounting and op-

erating the same may be made without departing from the spirit of the invention as set forth in the appended claims.

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

1. A can making machine comprising a guideway along which metal blanks are fed to an operating station, stops for positively limiting the advancing movement of a blank at the operating station, a feeding mechanism for intermittently moving said blank to and from said operating station including continuously traveling feed dogs contacting with a blank for moving the same along the guideway, and cam means operating upon said dogs for retracting the same from engagement with a blank as said blank is brought to a position for contact with the stops.

2. A can making machine comprising a guideway along which metal blanks are fed to an operating station, stops for positively limiting the advancing movement of a blank at the operating station, means for retracting the stops to permit the feeding of the blank from the operating station, a feeding mechanism for intermittently moving said blank to and from said operating station including continuously traveling feed dogs contacting with the blank for moving the same along the guideway, and a cam means operating upon said dogs for retracting the same from engagement with a blank as said blank is brought to a position for contact with the stops.

3. A can making machine comprising a guideway along which metal blanks are fed to an operating station, stops for positively limiting the advancing movement of a blank at the operating station, a feeding mechanism for intermittently moving said blank to and from said operating station including a continuously moving feed chain, a series of feed dogs carried thereby adapted to contact with a blank for moving the same along the guideway, and cam means operating upon said dogs for retracting the same from engagement with a blank as said blank is brought to a position for contact with the stops.

4. A can making machine comprising a guideway along which metal blanks are fed to an operating station, stops for positively limiting the advancing movement of a blank at the operating stations, means for retracting the stops to permit the feeding of the blank from one operating station to another, a feeding mechanism for intermittently moving said blank to and from said operating stations each including continuously moving feed chains, a series of feed dogs carried by said chains adapted to contact with a blank for moving the same along the guideway, and cam means operating upon said dogs for retracting the same from engagement with a blank as said blank is brought to a position for contact with the stops.

5. A can making machine comprising a guideway along which metal blanks are fed to an operating station, stops for positively limiting an advancing movement of a blank at the operating stations, a feeding mechanism for intermittently moving said blank to and from said operating stations each including continuously traveling feed chains, a series of feeding units carried by said chains, each having a feed dog yieldingly raised into position for engagement with a blank for moving the same along the

guideway, stationary cam bars, and means connected to the feed dogs and operated upon by the cam bars for retracting the feed dogs from engagement with a blank as said blank is brought to a position for contact with the stops.

6. A can making machine comprising a guideway along which metal blanks are fed to an operating station, stops for positively limiting an advancing movement of a blank at the operating stations, a feeding mechanism for intermittently moving said blanks to and from said operating stations each including continuously moving feed chains, feeding units carried by said chains, each having a feed dog, means for yieldingly raising the feed dog for causing the same to contact with a blank for moving the blank along the guideway stationary cam bars, each feed dog being mounted on a shaft, an arm carried by said shaft and having a curved face adapted to contact with stationary cam bars for retracting the feed dogs, said stationary cam bar being disposed relative to said stops so as to disengage the feed dog from the blank as said blank is brought to a position for contact with the stops.

7. A can making machine comprising a guideway along which metal blanks are fed to a plurality of operating stations, stops associated with each station for positively limiting the advancing movement of the body blanks, means for retracting said stops to permit the body blanks to be fed from one operating station to another, a feeding mechanism for intermittently moving said blanks to and from said operating stations including a plurality of continuously traveling feed dogs adapted to engage the blanks for moving the same, and means for retracting said feed dogs when the blanks are positioned against the stops so that the feed dog may pass beneath the blank, said retracting means releasing the feed dog so that it is again projected for engagement with an advanced blank for moving the same away from the operating station to the next succeeding operating station.

8. A can making machine comprising a guideway along which metal blanks are fed to a plurality of operating stations, stops associated with each station for positively limiting the advancing movement of the body blanks, means for retracting said stops to permit the body blanks to be fed from one operating station to another, a feeding mechanism for intermittently moving said blanks to and from said operating station including a traveling feed chain extending along the guideways from in front of one operating station to a point in rear of the last operating station, a plurality of feed units carried by said chain, each including a feed dog yieldingly projected so as to engage a blank for moving the same along the guideway, a plurality of cam bars, means connected with each feed dog adapted to contact with the stationary cam bars for retracting the feed dogs, said cam bars being proportioned and disposed so as to retract the feed dog from engagement with the blank when it is brought to a position for contact with the stops, and holding said feed dogs retracted until they have advanced beneath the blank at the operating station, and for releasing a feed dog so that it will be projected to engage the blank at the next advanced operating station for conveying the same away from said station.

HUGO F. BAYER.