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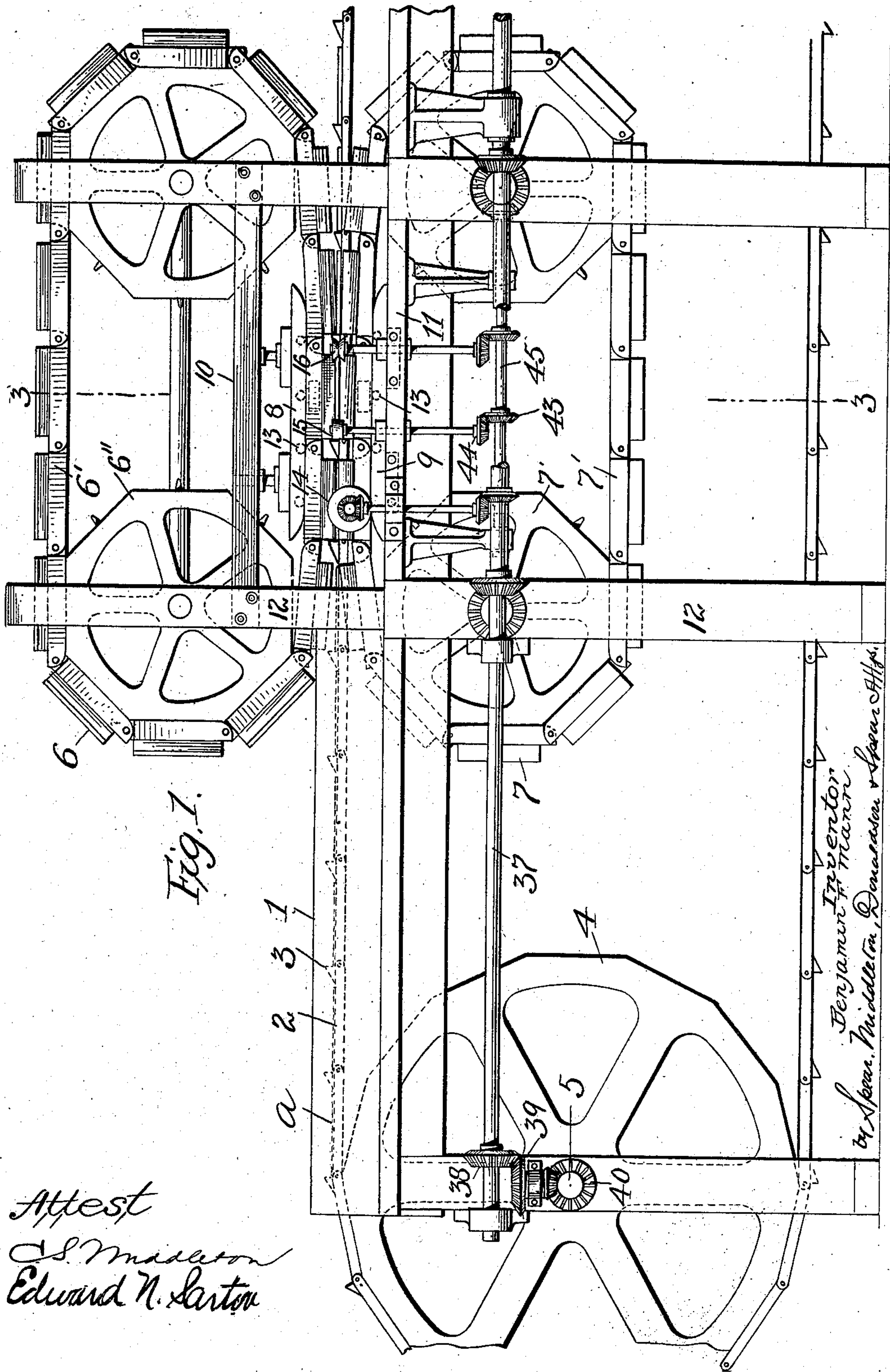
PATENTED MAR. 10, 1908.

B. F. MANN.

CAN MAKING MACHINE.

APPLICATION FILED SEPT. 24, 1906.

5 SHEETS—SHEET 1.



Attest  
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No. 881,326.

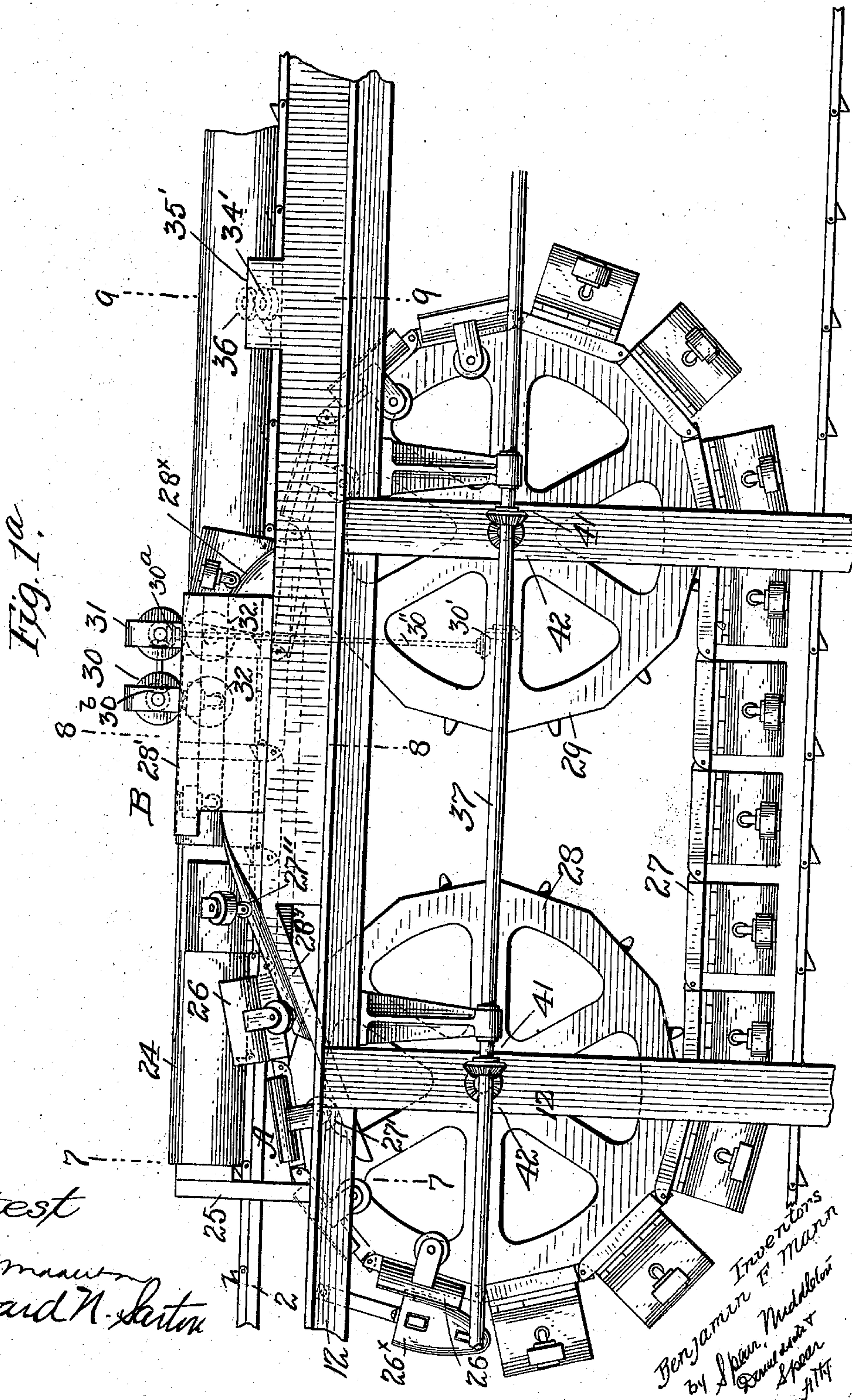
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5 SHEETS—SHEET 2.



Attest

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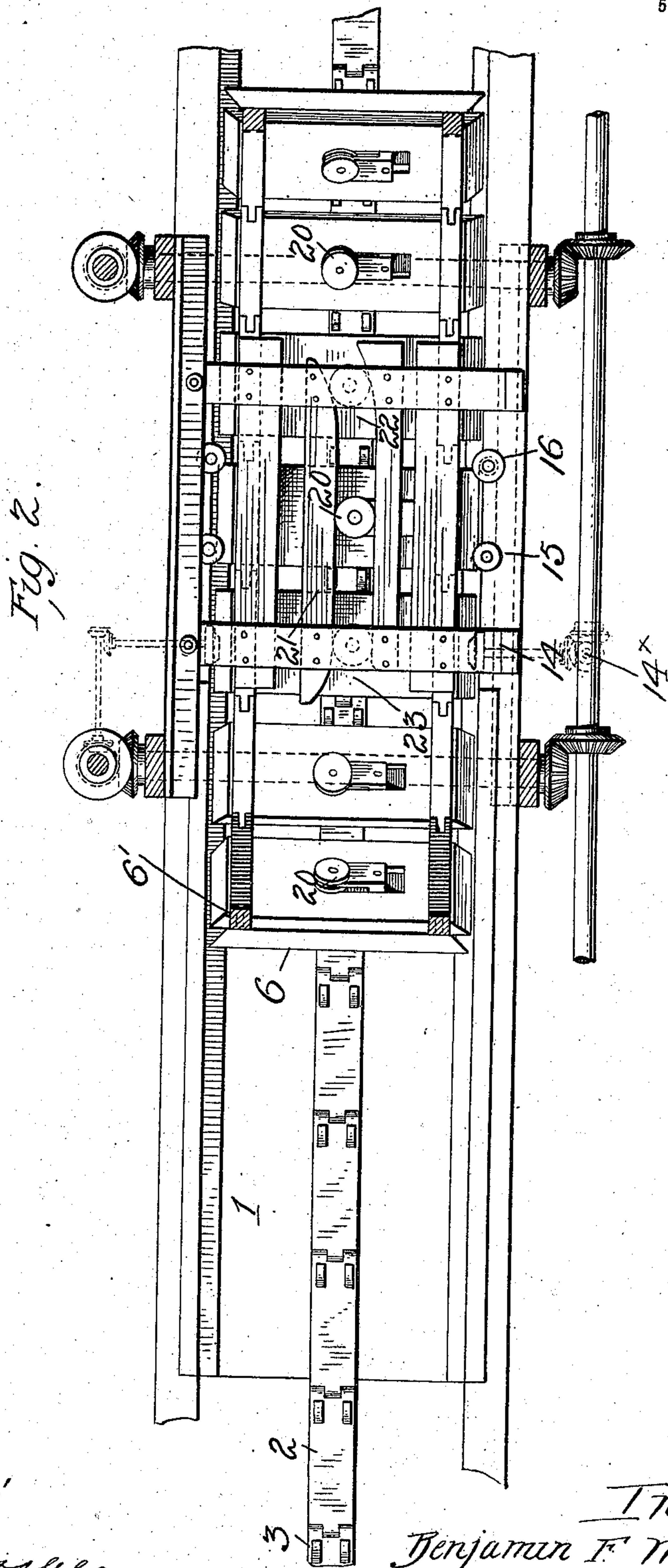


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5 SHEETS-SHEET 3.



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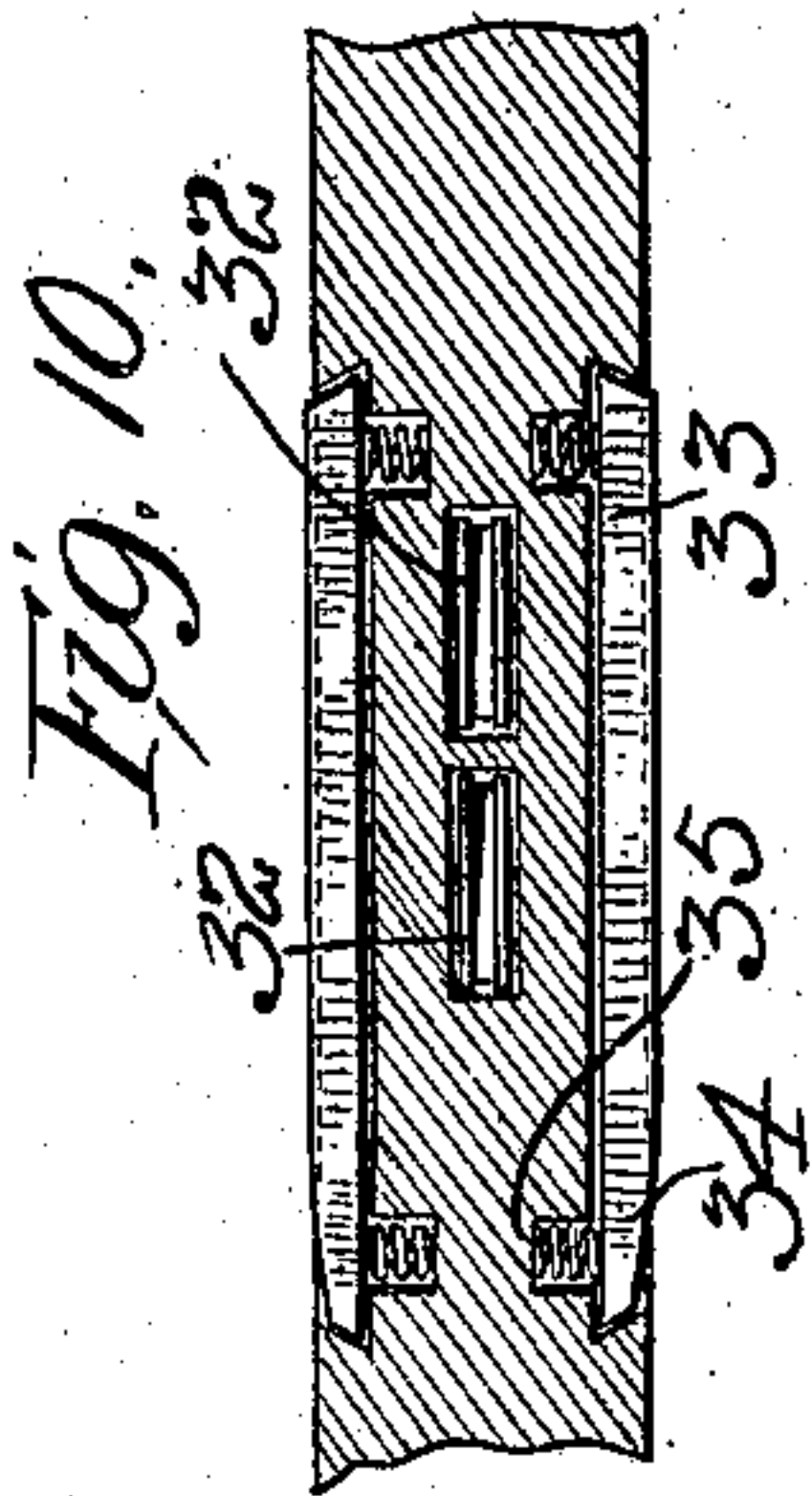
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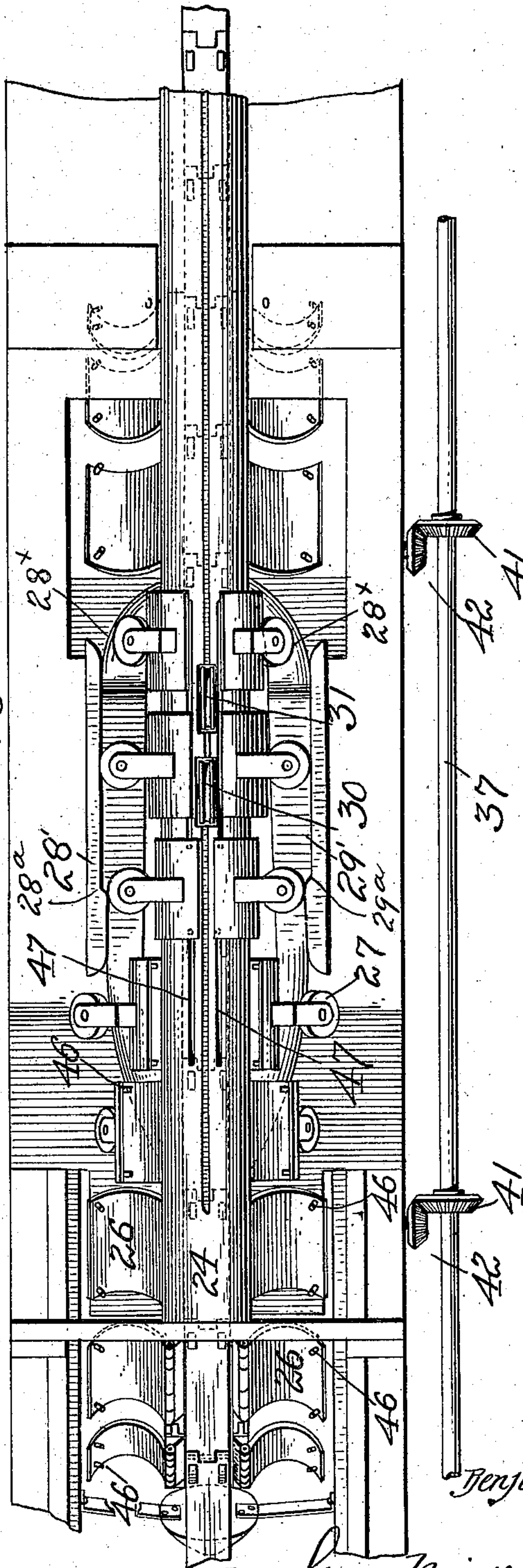
CAN MAKING MACHINE.

APPLICATION FILED SEPT. 24, 1906.

5 SHEETS—SHEET 4.



*Fig. 2a*



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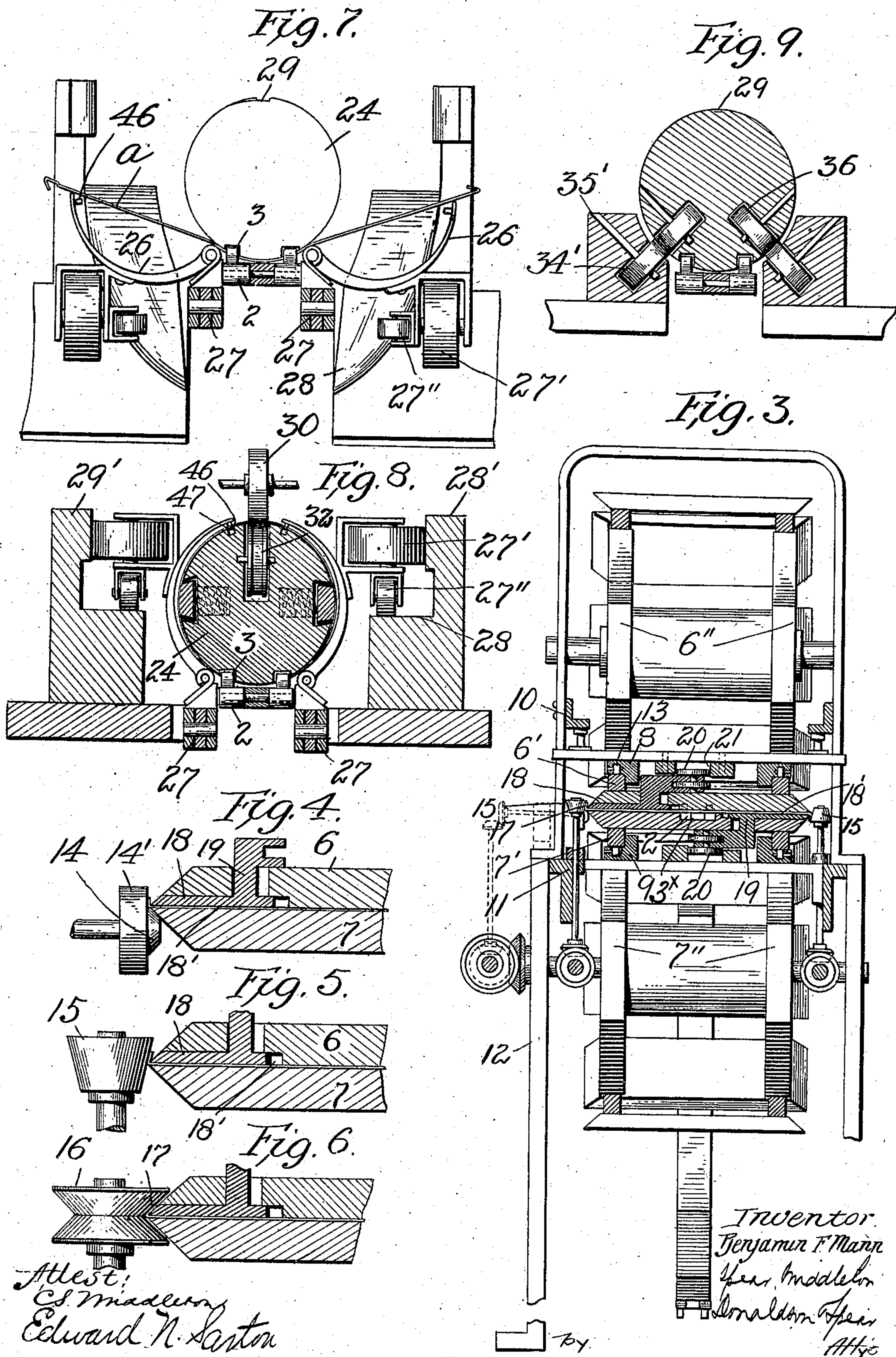
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CAN MAKING MACHINE.

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5 SHEETS—SHEET 5.





# UNITED STATES PATENT OFFICE.

BENJAMIN F. MANN, OF BALTIMORE, MARYLAND.

## CAN-MAKING MACHINE.

No. 881,326.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed September 24, 1906. Serial No. 335,905.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. MANN, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Can-Making Machinery, of which the following is a specification.

My invention relates to the manufacture of cans, and particularly to the machinery for making can bodies from previously cut blanks.

In carrying out my invention I design to provide a machine in which the blanks will be fed in flat form and will pass continuously through the machine and in said continuous passage the edges of the blanks will be bent or flanged so as to interlock, and then the said blanks will be shaped into cylindrical form and the edges interlocked and the seam compressed.

The invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the accompanying drawings,—Figure 1 is a side elevation of the left hand half of the machine, and Fig. 1<sup>a</sup> is a similar view of the right hand half of the machine. Fig. 2 is a plan view, with parts of the frame in section, of the left hand portion of the machine, and Fig. 2<sup>a</sup> is a view similar to Fig. 2 of the right hand portion of the machine. Fig. 3 is a vertical sectional view on line 3—3 of Fig. 1. Figs. 4, 5 and 6 are detail views showing the rollers for flanging the edges of the sheet metal blanks. Fig. 7 is a cross sectional view substantially on the line 7—7 of Fig. 1<sup>a</sup>. Fig. 8 is a vertical sectional view substantially on the line 8—8 of Fig. 1<sup>a</sup>. Fig. 9 is a vertical sectional view on the line 9—9 of Fig. 1<sup>a</sup>, and Fig. 10 is a horizontal sectional view through the horn or former at the point where the edges of the blank are interlocked to form the seam.

Referring to Figs. 1 and 1<sup>a</sup>, 1 indicates the feeding-in end of the machine at which the sheet metal blanks indicated at *a* are placed upon a carrying chain 2 having projections 3 to bear against the edges of the blanks, the said chain passing over a drum or wheel 4 journaled in the frame at 5, the said chain passing also over a similar drum or wheel not shown at the other end of the machine to the right of Fig. 1<sup>a</sup>. This chain is given a continuous movement and the blanks carried thereby pass between clamping blocks ar-

ranged in two series 6 and 7. Each series of clamping blocks or plates is carried by an endless chain 6' and 7' and these endless chains pass around the drums or wheels 6'', 7''. The clamping blocks or plates 6 are arranged to press upon the upper side of the blanks, while the blocks or plates 7 engage the underside thereof, and the movement of the parts is such that an upper and a lower clamping plate will meet each of the blanks as fed inwardly by the chain 2 and each of the blanks will be securely gripped between these clamping blocks or plates.

As shown in Figs. 3, 4, 5 and 6, the upper and lower clamping blocks or plates have their lateral edges beveled and the sheet metal blanks have their edges projecting slightly beyond these beveled edges of the clamping plates. The movement of the several endless chains is such that the clamping plates upon engaging and clamping a blank will move forward in the same direction therewith and at the same rate of speed, and in this movement the links of the chain carrying the clamping plates or blocks will move between cam tracks or ways 8—9. These cam tracks are supported by the cross beams 10 and 11 of the frame 12 in which the shafts of the drums or wheels 6'', 7'' are journaled. The cam tracks 8 and 9 are provided with antifriction rollers 13 to bear on the links of the chains for relieving the parts of friction. The cam tracks press the links of the chains 6' towards each other so that the blocks or clamping plates carried thereby may firmly grip the blanks, while the projecting ends or edges of said blanks are subjected to the bending or flanging action now to be referred to. In order to accomplish this bending action of the edges of the blank, which must be interlocked to form the seam, we provide a series of rollers on each side of the machine, as shown at 14, 15 and 16. These rollers are disposed in the order named in the direction of movement of the blanks so that the projecting edge of the blank at each side of the machine will be first subjected to the action of the rollers 14, then to the action of the rollers 15, and then to the action of the rollers 16, so that as shown in Figs. 4, 5 and 6, the edge of the blank will be gradually turned over and inwardly so as to be at an acute angle to the main body of the blank, as shown in Fig. 6 at 17. In order to accomplish this action the rollers 14, 15 and 16 are of different shapes, those marked 14 and 15



being conical, but at right angles in respect to each other, while the roller 16 has an angularly grooved periphery. The rollers 14 each have a flange 14'.

5 As will be seen from Fig. 3, the projecting edge at one end of the blank is turned upwardly, while the projecting edge at the other end of the blank is turned downwardly and the rollers at the opposite ends of the  
10 blanks are relatively arranged to accomplish this action. After the edges of the blank have been bent it is carried forward by the continuous movement of the feed chain 2 and at the point at the right of Fig. 1 where  
15 the chains 6' and 7' begin to pass around the right hand drums or wheels the clamps leave the bent or flanged blanks so that they may be continuously fed forward to the forming or bending mechanism. As, however, the  
20 bent edges of the blank overlies the beveled ends or edges of the clamping plates, special provision must be made in order to free the clamping plates from the blanks, and for this purpose each clamping plate as provided  
25 with a movable section or anvil portion 18, these anvil portions being beveled on their lateral edges to correspond with the bevel of the edges of the clamping plates and furnishing the surface upon which the edges of the  
30 blanks are bent. These anvil portions or plates are adapted to have sliding movement on their respective clamping plates, for which purpose they are arranged in recesses 18' in the clamping plates and have portions  
35 19 extending through the said clamping plates and overlying the same, these overlying portions being provided with rollers 20 adapted to run in cam tracks 21 carried by the frame, as shown in Figs. 2 and 3. These  
40 cam tracks are curved at 22 so that the anvil portions of the clamping plates will be retracted so as to release the bent edges of the blanks previous to the arrival of the clamping plates at the point where they begin to  
45 separate by reason of passing around the drums 6'', 7''. These anvil portions are returned to their normal or outer positions before the clamping plates which carry them reengage with the blanks, and this return of  
50 the anvil portions may be effected by spring members or by forming the forward portion of the cam plates 21, as shown at 23 in Fig. 3 so as to engage the rollers 20, and move the anvils outwardly.

55 Referring now to Fig. 1<sup>a</sup> which represents a continuation of the machine shown in Fig. 1, it will be seen that the feed chain 2 carries the blank with its edges bent or flanged from the breaking mechanism shown in Fig. 1 to  
60 the former and seaming mechanism shown in Fig. 1<sup>a</sup>. This former mechanism comprises a horn or former 24, suitably supported at one end by a standard 25 extending up from the frame 12, said former or horn  
65 being grooved on its underside as shown in

Figs. 7, 8 and 9, for the passage of the feed fingers 3. The flanged blank is fed beneath this former by the chain 2 and in its passage along the former it is subjected to the action  
70 of a series of folding wings 26 carried by an endless chain 27 passing around the wheels or drums 28—29, which are journaled in the frame of the machine. These wings are normally opened as they approach the left-hand  
75 end of the former or horn in Fig. 1<sup>a</sup>, and as they move towards the right they are gradually closed. The movement of the parts is such that the folding wings are timed to meet and cooperate with the links of the chain 2,  
80 each of which carries thereon a blank with its edges flanged. The folding wings begin to close at about the point A Fig. 1<sup>a</sup>, and this closing action is due to the roller 27' carried by the folding wings engaging a cam  
85 track 28' supported on the fixed frame of the machine. As the folding wings close a second roller 27'' comes into play and when the point B is reached by the folding wings the folding action is completed, and the  
90 flanged edges of the blank are in interlocking position. The final pressure of the folding wings is derived while they are passing between the upright cam surfaces 28'—29', Fig. 8.

The upper part of the former or horn is  
95 grooved in substantially the usual manner as at 29, Figs. 7 and 9, and the compression of the interlocked parts or edges to form the seam is effected as shown in Figs. 1<sup>a</sup> and 8 by rollers 30 journaled in frame parts 31 and  
100 rollers 32 journaled in the horn, the rollers 30 and 32 being arranged opposite each other as shown.

In order that the parts of the seam may be drawn into firm contact, we provide in the  
105 horn, plates or bars 33 having their forward edges beveled at 34 so as to lie within the surface of the former or horn, said plates or bars being pressed outwardly by springs 35. These plates, after the folding wings have  
110 folded the blanks and the edges are interlocked, press upon the inner walls of the blanks and force the same outwardly and thus draw the interlocked edges into firm contact, and in this position the seam is  
115 pressed down by the rollers 30—31—32. The cylindrical body is now forced along the horn by the action of the body feeding chain 2 and the folding wings begin to separate as they pass around the right-hand  
120 drum 29. The right-hand end of the horn or former is supported by angularly arranged rolls 34' supported in brackets 35' of the frame, said rolls 34' bearing upon  
125 rolls 36 journaled within the horn or former. This manner of supporting the horn does not interfere with the free passage of the cylindrical blank to the discharge end of the machine.

Any suitable driving mechanism may be 130



employed for the various parts and as a representative form I show a shaft 37 extending longitudinally of the frame, said shaft through a chain of beveled gears 38—39 and 40 driving the feed chain drum 4, and also through beveled gearing 41 and 42, driving the folding wing carrier drums 28—29. The drums of the chains 6', 7' may be driven through suitable beveled gearing and the flanging rollers.

15 and 16 are driven through gearing 43—44 from a countershaft 45 which is geared in any suitable manner to the shaft 37. The rollers 14 may be driven as shown in Fig. 2 through gearing 14<sup>x</sup>.

From the above it will be seen that the blanks are carried by a continuous motion through the machine and during their continuous passage therethrough they are flanged at their edges and they are then folded and their edges interlocked. These edges are then compressed to form the seam and the cylindrical bodies are then discharged from the machine.

In order to properly aline the blanks for the folding and seam forming operation, we provide the folding wings with projecting fingers or pins, 46, to engage the edges of the blanks and hold them in position. When the folding wings are closed these fingers or pins enter the grooves 47 in the horn.

It will be noticed from Fig. 3 that the upper faces of the lower clamps are provided with grooves 3<sup>x</sup> in which the links of the chain 2 lie.

By reference to Fig. 1<sup>a</sup> it will be seen that I employ an opening cone 26<sup>x</sup> located at the left of the horn and folding mechanism so as to open the folding wings before they arrive at the position where they engage the blanks. This cone is supported from the frame work in any suitable manner.

I do not limit myself to any particular means for interlocking the flanged edges of the blanks, but I prefer, as shown in Fig. 2<sup>a</sup> to form depressions at the points 28<sup>a</sup> and 29<sup>a</sup> in the cam surfaces 28'—29' so that after the folding wings have folded the blank the rollers of the folding wings will move backwardly when they reach the shoulders 28<sup>a</sup> under the action of the spring pressed plates or bars 33 and thus the interlocking effect is insured. I employ inclines 28<sup>x</sup> at the right of the cam surfaces 28' and 29' for the rollers of the folding wings to run upon. Crimping or pressure rollers 30—31 may be operated through any suitable connections, as for instance the gears 30', the shaft 30'', the gears 30<sup>a</sup> and 30<sup>b</sup>.

What I claim is:—

1. In combination in a can making apparatus, means for feeding the can blanks, means for clamping the said blanks, leaving their edges projecting, carrier means for the clamping means, and means for bending the

projecting edges, said clamping means moving to keep pace with the onward movement of the blank and the bending means performing its function while the blank is in motion, substantially as described.

2. In combination in can making machinery, a horn, means for feeding the can blanks along said horn comprising the endless chain and means independent of said chain for folding the can blanks and forming the seam as the said blanks are moving along the horn, said means comprising the endless chain of folding wings and the relatively fixed cam means for closing said wings, substantially as described.

3. In combination in can making machinery, a series of upper and lower clamps, independent carrier means for each of said series whereby said upper and lower clamps are caused to approach each other to clamp the blanks between them and then move in unison with the blanks so clamped, and means for bending the edges of the blanks projecting from the said clamps, said independent carrier means then causing the separating movement of the clamps to release the bent blanks, substantially as described.

4. In combination, the upper and lower series of clamps, the endless carrier for the upper clamps, the endless carrier for the lower clamps, and means for bending the projecting edges of the blanks as they are carried along past the bending means by the endless carriers, and while gripped by the said clamps, substantially as described.

5. In combination, the upper and lower clamps, endless carriers therefor, an endless carrier for the blanks, said carriers all moving in unison, and means for bending the edges of the blanks as they are carried along by the carriers, substantially as described.

6. In combination, the clamps, the carriers therefor, the cam tracks for pressing the clamps towards each other, and means for bending the projecting edges of the blanks as they are carried past the cam tracks and bending means, substantially as described.

7. In combination, in can making machinery, a pair of clamps to grip the blanks leaving the edges thereof exposed, means for bending the edges of the blanks and a retractable anvil portion carried by each member of the pair of clamps, said clamps having movement towards and from each other, and each anvil portion having movement towards and from the other, substantially as described.

8. In combination, in can making machines, traveling clamping means having retractable anvil portions movable in respect to said clamping means to free themselves from the bent edges of the blanks and means for bending the edges of the blanks, substantially as described.

9. In combination, two members for hold-

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ing the blank between them with the edges thereof projecting, means for bending said edges in opposite directions, said members lying upon opposite faces of the blank and  
5 have movement to clamp the blank and having also retracting movement in opposite directions independently of the clamping and unclamping movements, said retracting movement being substantially at right  
10 angles to the clamping movement in order to free themselves from the bent edges of the blank, substantially as described.

10. In combination, the traveling clamps having in addition to their traveling movement a movement toward and from each other, edge bending means for the blanks, means for moving the clamps, said clamps automatically releasing the blanks at their bent edges by withdrawing therefrom transversely, substantially as described.  
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11. In combination, the traveling clamps, means carrying the clamps, bending means for the blanks, retractable anvil portions carried by the clamps, and cam means for  
25 operating the anvil portions, as the clamps are carried past the same by the traveling movement of the clamps, substantially as described.

12. In combination, a horn, means for  
30 moving the blanks along the horn, and a series of folding wings with traveling carriers therefor to move the same along the horn in unison with the blanks, and means for giving a folding action to the folding wings, during  
35 their traveling movement, said moving means and the traveling carrier for the folding wings being independent of each other, substantially as described.

13. In combination with a horn, the folding wings, fixed cam means for giving pressure to  
40 the folding wings, means for pressing the blanks outwardly when folded to interlock the seam, said cams having depressions to allow the folding wings to recede, and traveling carrier means for the folding wings, said  
45 traveling carrier means carrying the folding wings past the cam means to be acted on thereby, substantially as described.

14. In combination in can making machinery, means for feeding the blanks  
50 through the machine, clamping means for clamping the blank with its edge exposed, traveling carrier means for the clamping means to keep pace with the onward movement of the blanks, bending means past  
55 which the blanks are carried while clamped, folding mechanism and seam forming mechanism, the said feeding means carrying the blanks from the bending and clamping means to the said folding and seam forming mechanism, substantially as described.  
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15. In combination, means for feeding the blanks, a series of clamps, endless carriers for the said clamps moving in unison with the feeding means, bending means for the  
65 edges of the blanks, and folding and seam forming mechanism, the said blank feeding means delivering the blanks with their edges bent from the clamping and bending means to the folding and seam forming mechanism.  
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In testimony whereof, I affix my signature in presence of two witnesses.

BENJAMIN F. MANN.

Witnesses:

GEORGE R. CREW,  
CHARLES W. MANN.