

(No Model.)

10 Sheets—Sheet 1.

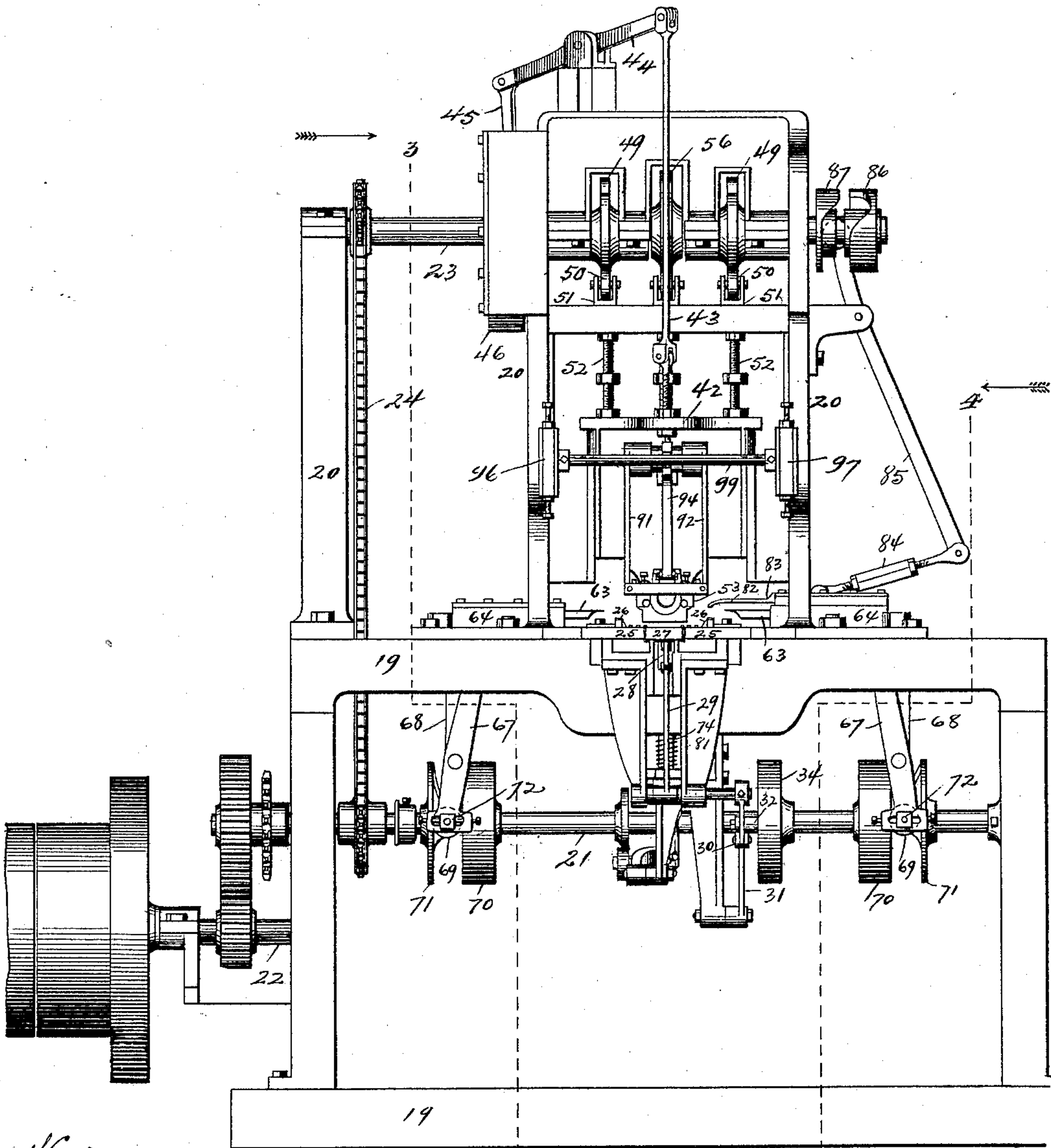
C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.

Fig. 1.



Witnesses,  
J. M. Mann,  
Frederick B. Goodwin

Inventor  
Charles F. Beaman  
By Offield & Towle, Attys.

(No Model.)

10 Sheets—Sheet 2.

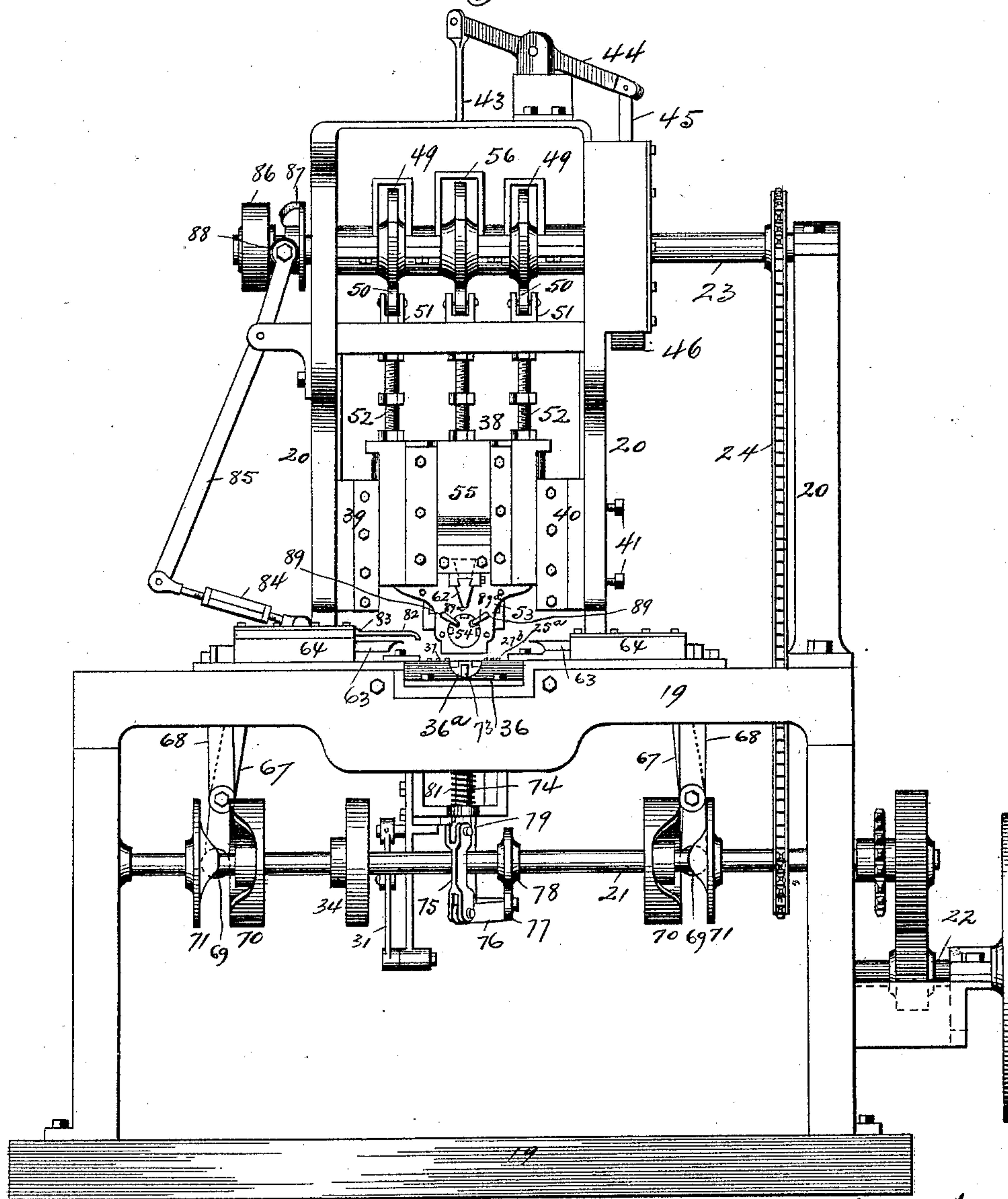
C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.

Fig. 2.



Witnesses,

J. J. Mann.  
Frederick Goodwin

Inventor

Charles F. Beaman

By Offield & Towle Attys.

(No Model.)

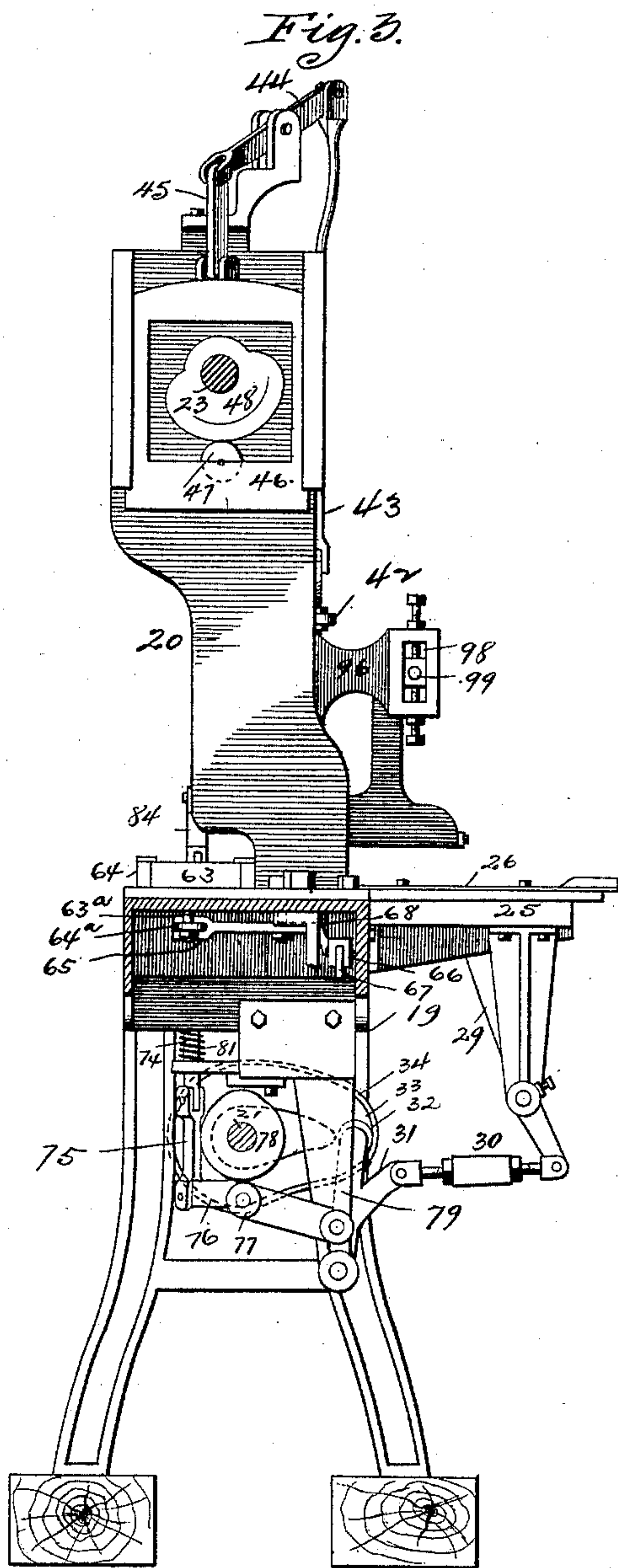
10 Sheets—Sheet 3.

C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.



Witnesses,

J. J. Mann.

Frederick & Goodwin

Inventor.

Charles F. Beaman

By Offield & Towle Attys.



(No Model.)

10 Sheets—Sheet 4.

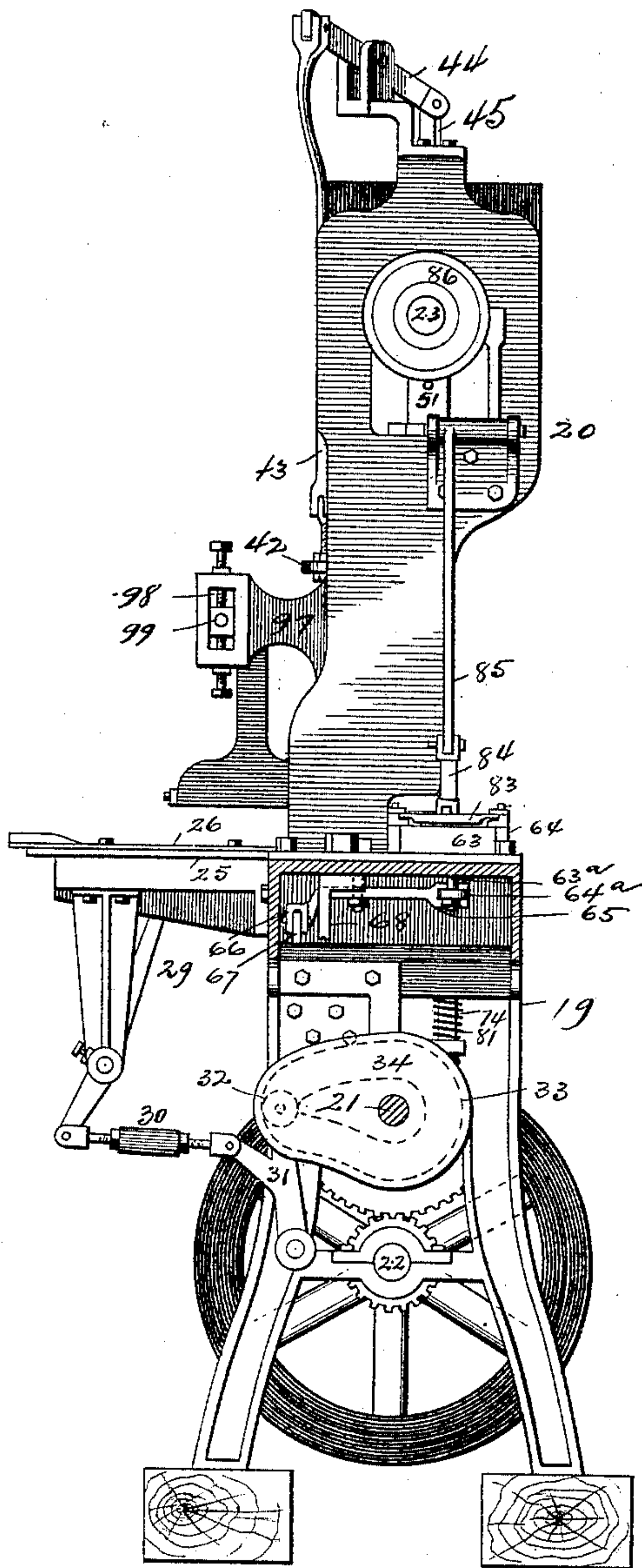
C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.

*Fig. 4.*



*Witnesses.*

*J. J. Mann,*  
*Frederick Goodwin*

*Inventor.*

*Charles F. Beaman*  
*By Offield & Torole*  
*Attys,*

(No Model.)

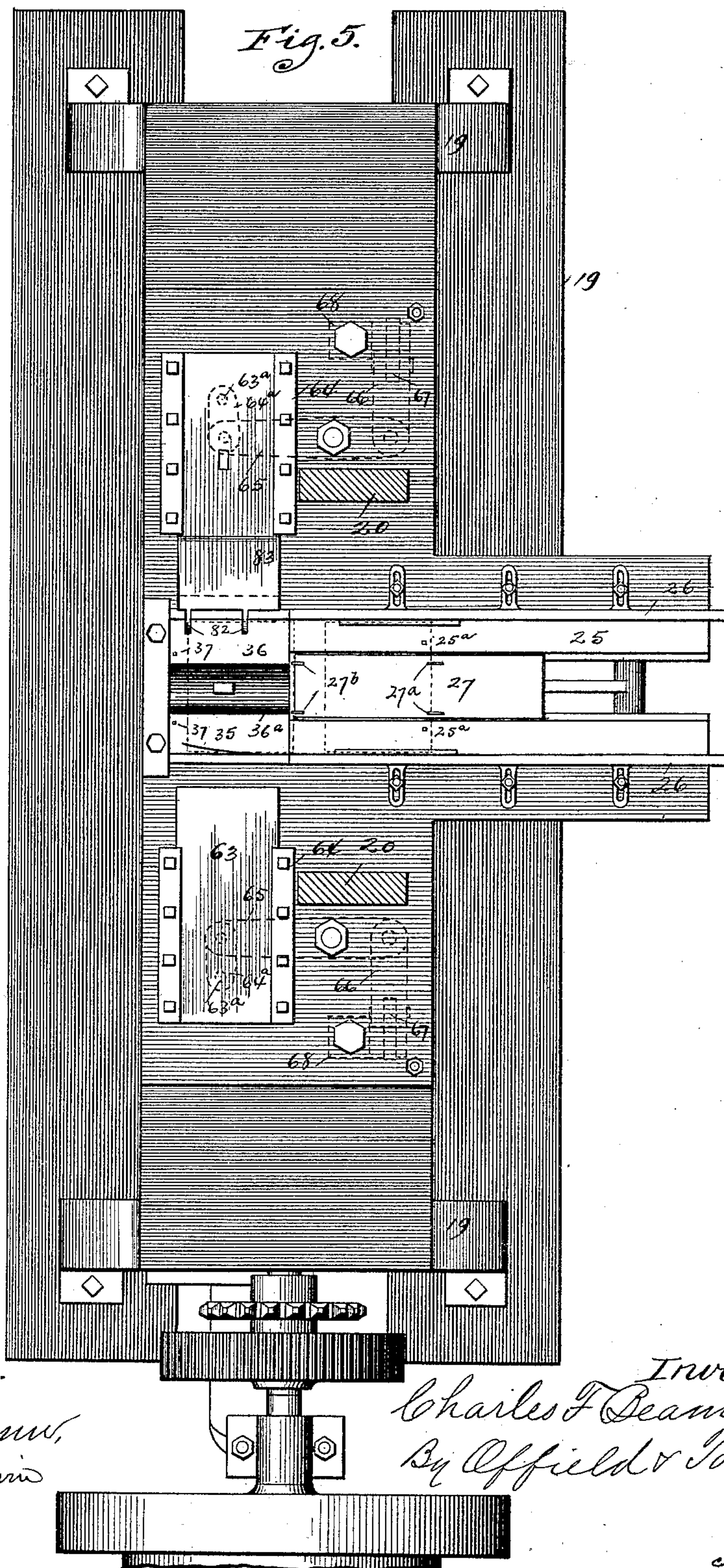
10 Sheets—Sheet 5.

C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.





(No Model.)

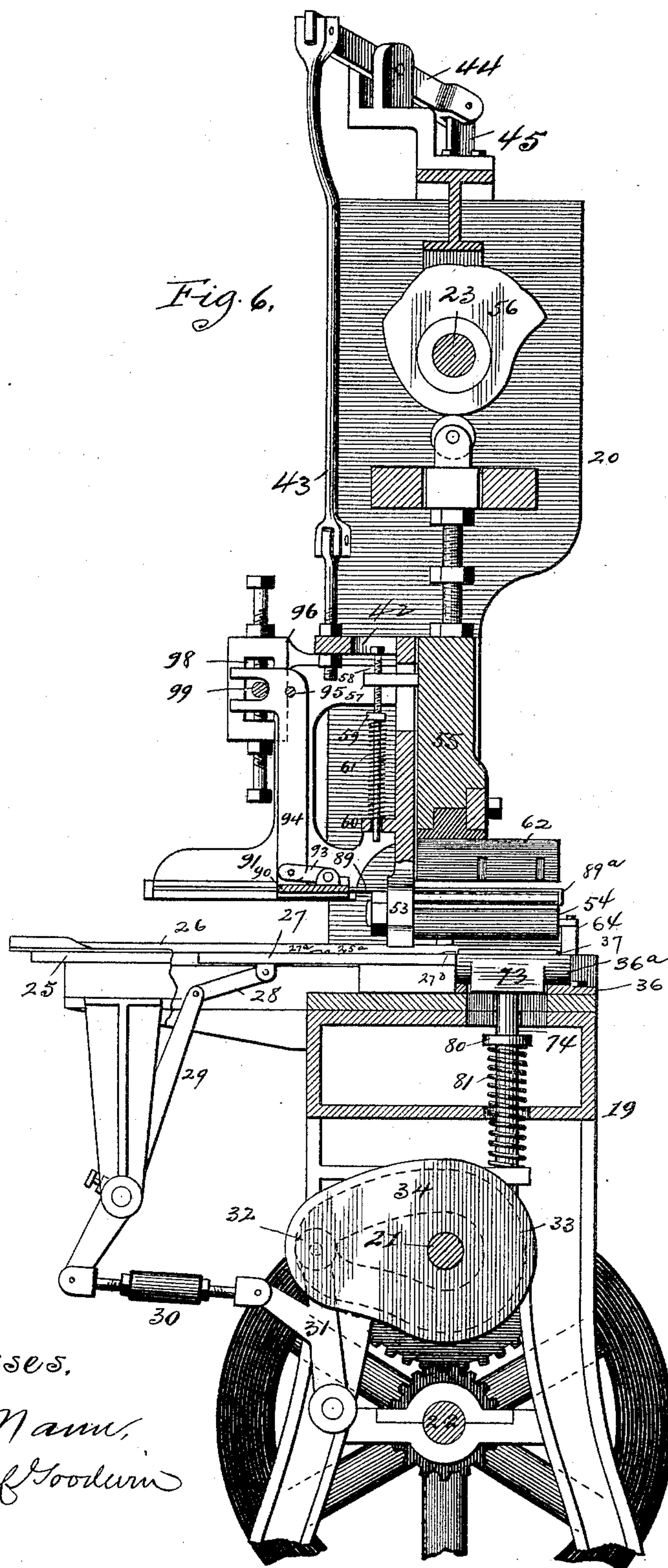
10 Sheets—Sheet 6.

C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.



Witnesses,

J. J. Mann,  
Frederick Goodwin

Inventors  
Charles F. Beaman.  
By  
Offield & Towle  
Attys

(No Model.)

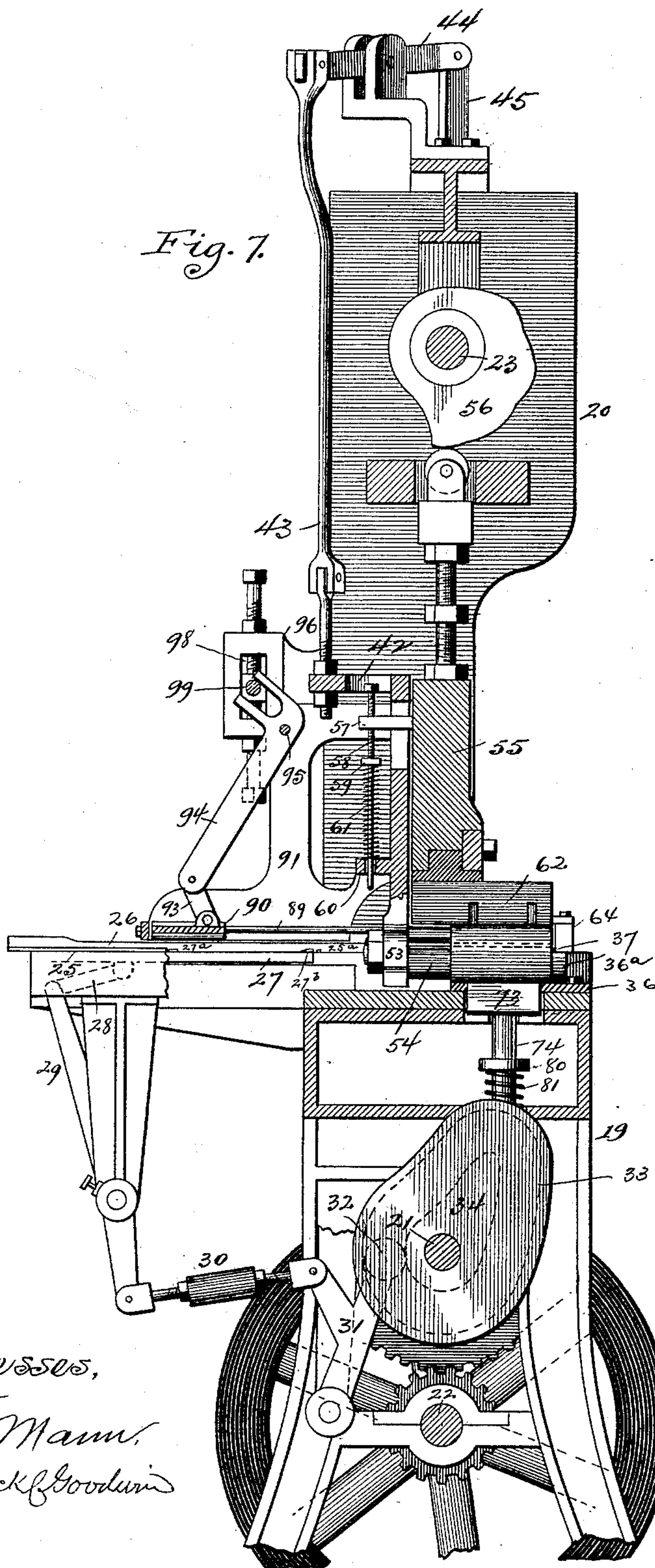
10 Sheets—Sheet 7.

C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.



Witnesses,  
J. J. Mann,  
Frederick Goodwin

Inventor,  
Charles F. Beaman  
By  
Offield & Fowle  
Attys.



(No Model.)

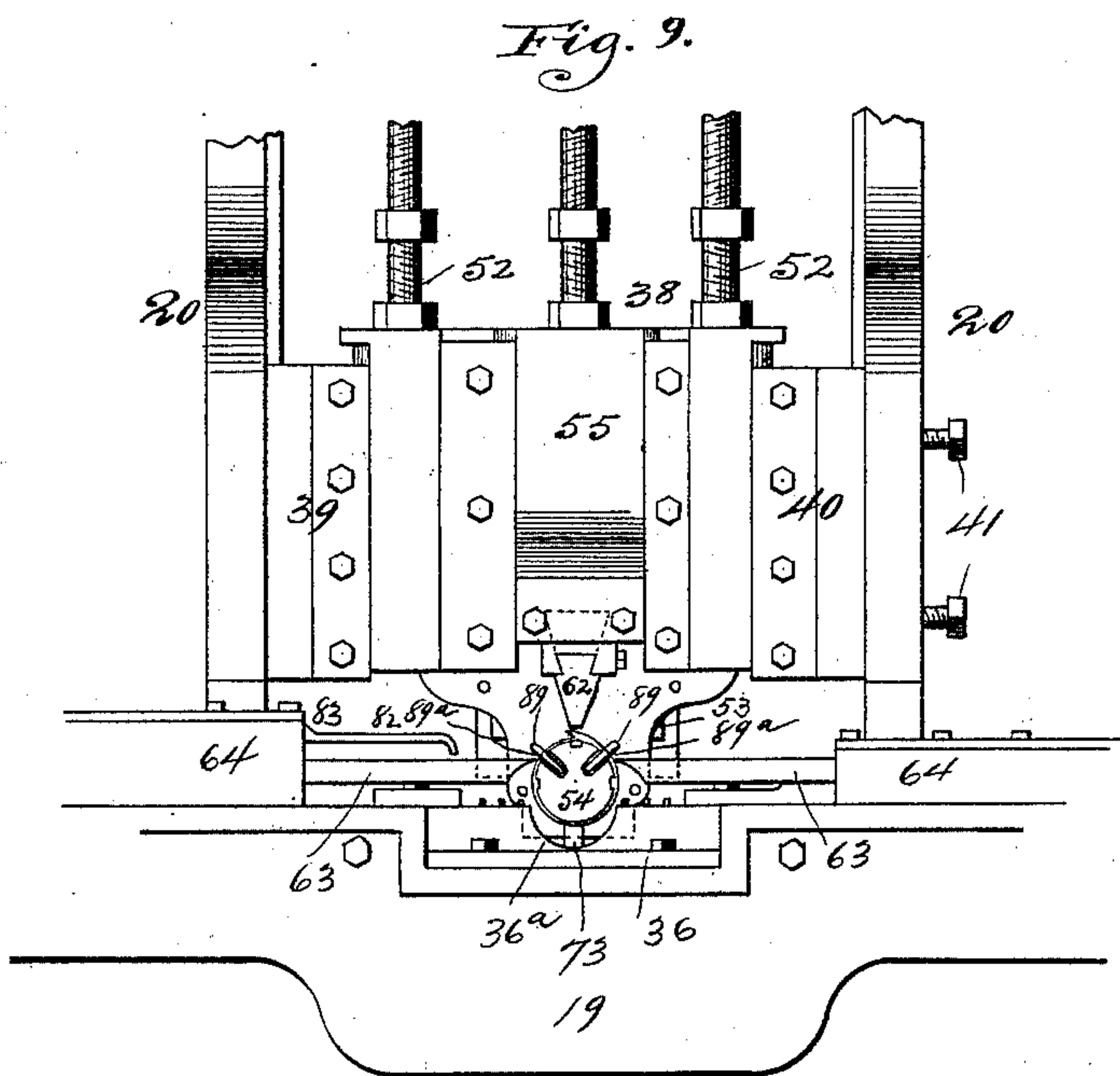
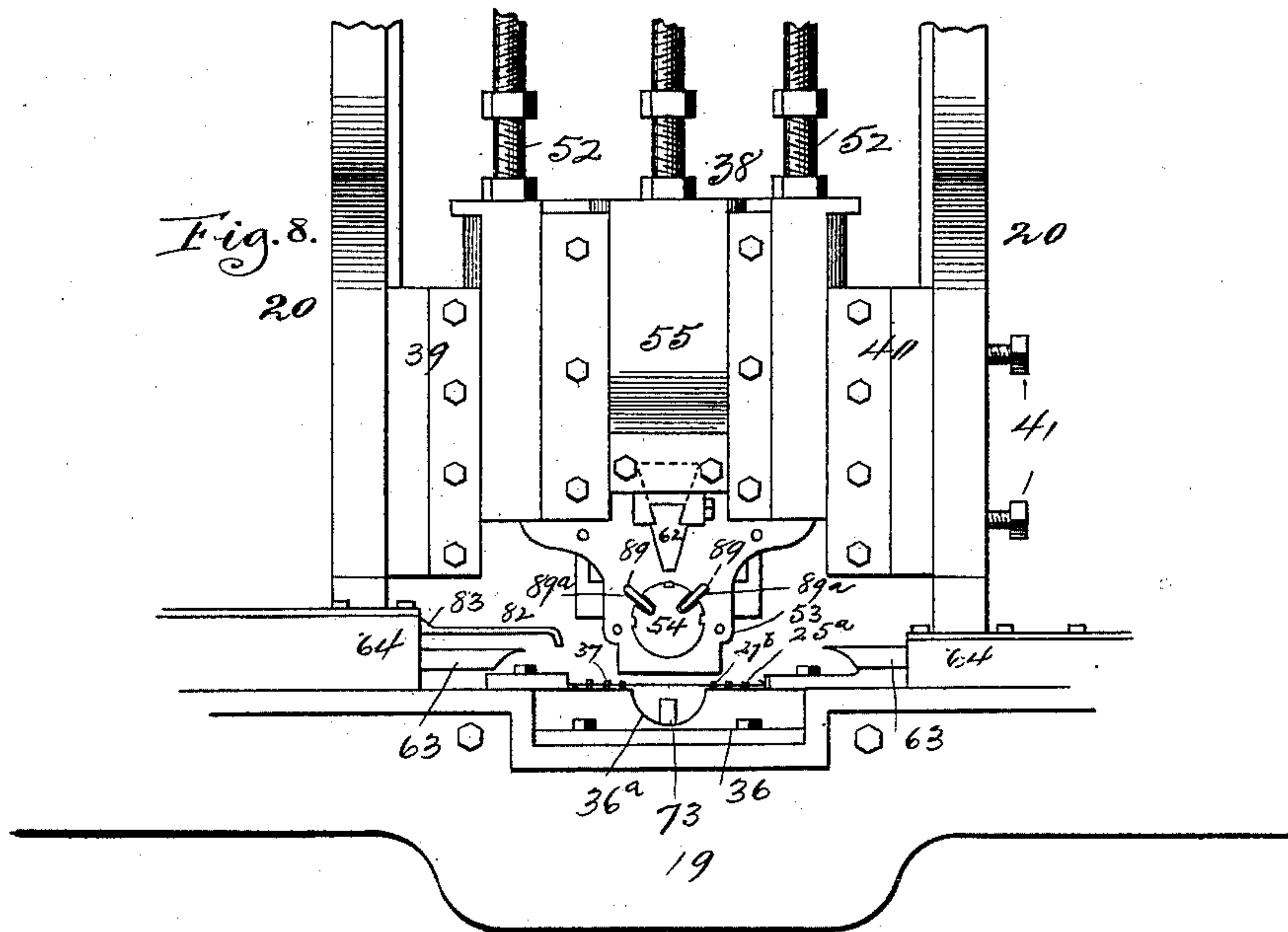
10 Sheets—Sheet 8.

C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

No. 434,908.

Patented Aug. 26, 1890.



Witnesses,  
*L. J. Mann,*  
*Frederick Goodwin*

*Inventor,*  
*Charles F. Beaman*  
*By Offield & Towle Attys.*



(No Model.)

10 Sheets—Sheet 9.

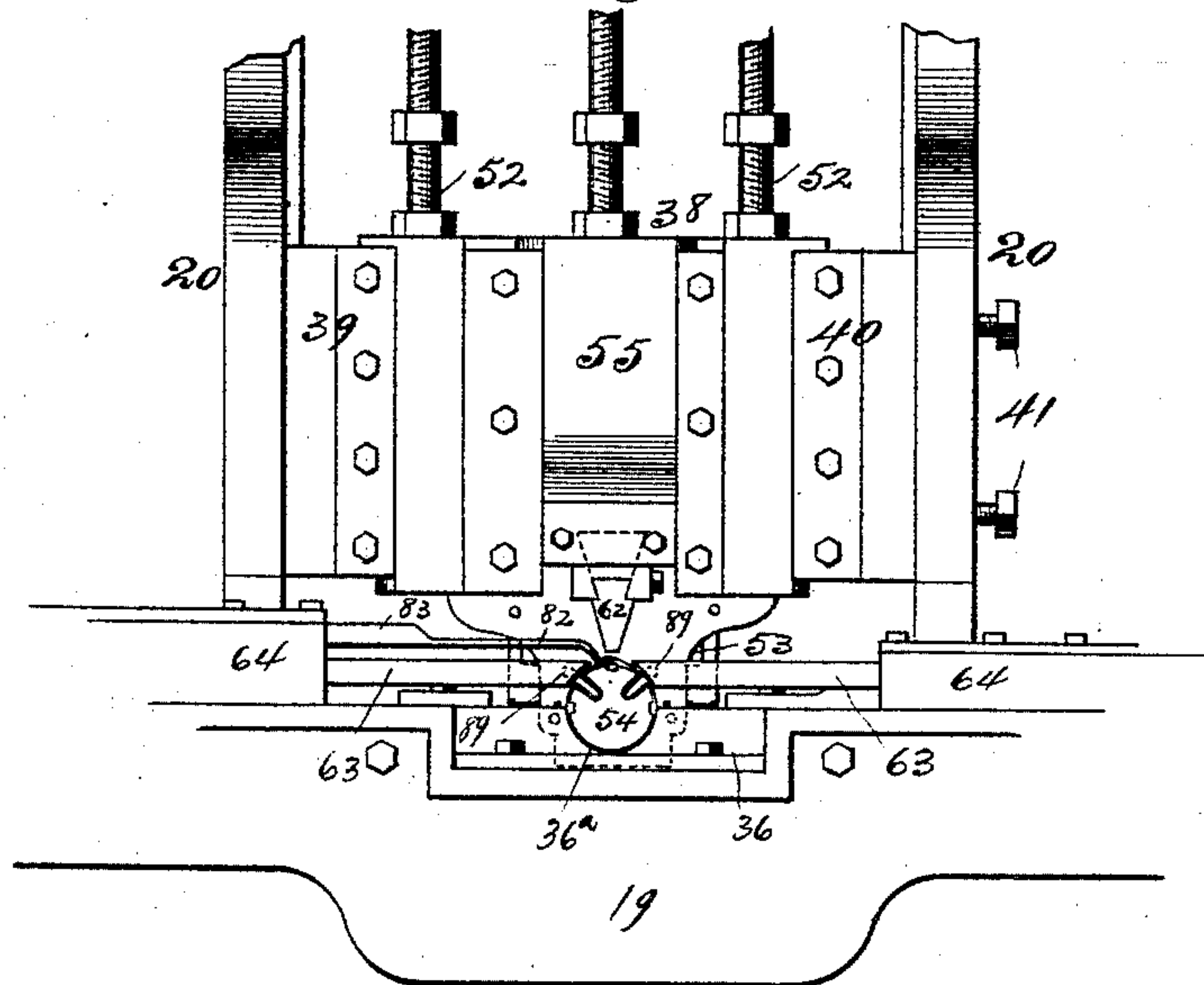
C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

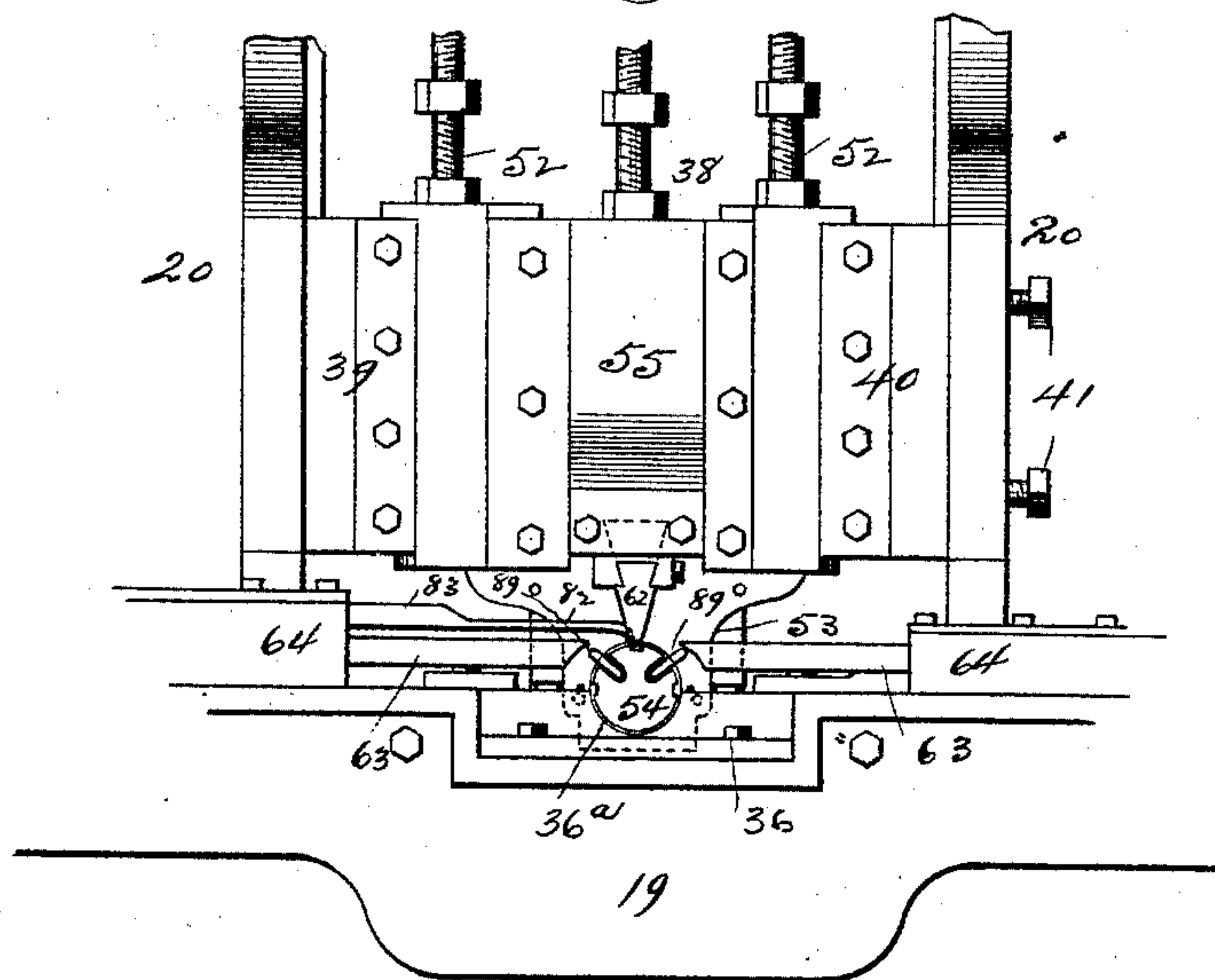
No. 434,908.

Patented Aug. 26, 1890.

*Fig. 10.*



*Fig. 11.*



Witnesses,  
J. J. Mann,  
Frederick Goodwin

Inventor,  
Charles F. Beaman  
By *Offield & Towle*  
Attys.

(No Model.)

10 Sheets—Sheet 10.

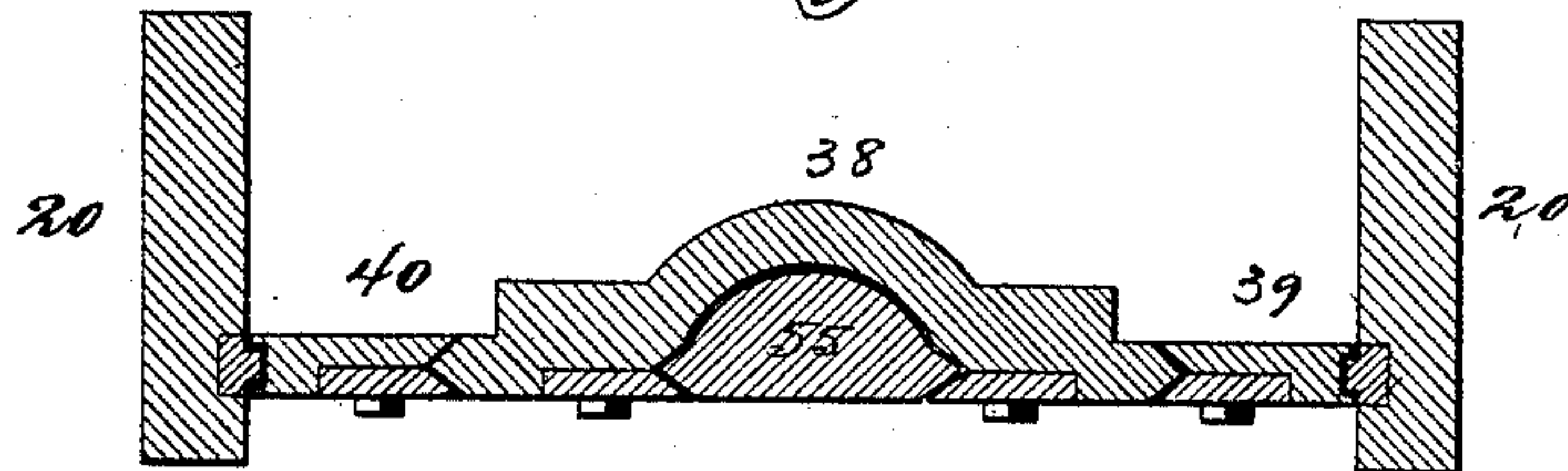
C. F. BEAMAN.

MACHINE FOR MAKING THE SEAMS OF SHEET METAL CANS.

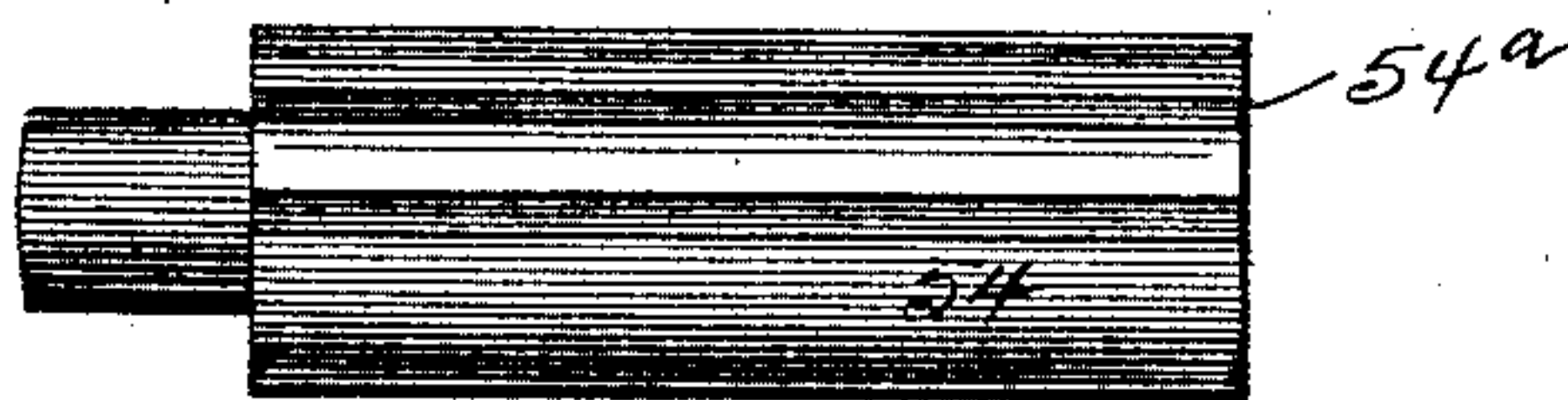
No. 434,908.

Patented Aug. 26, 1890.

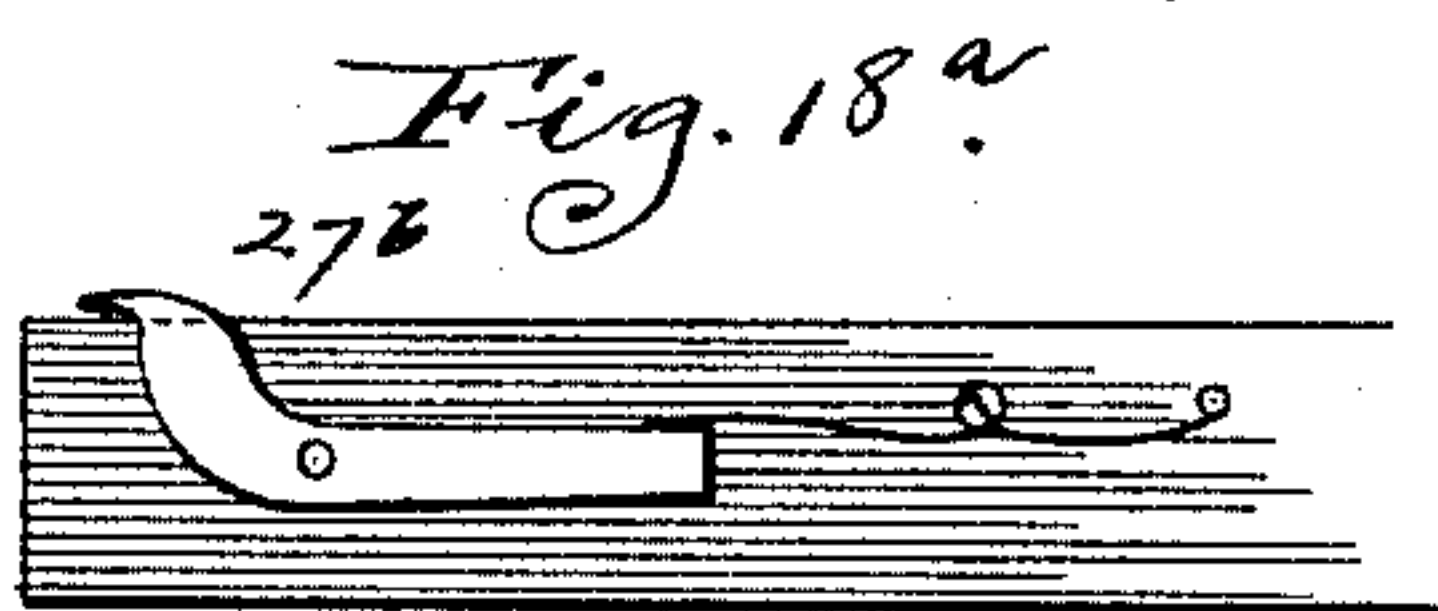
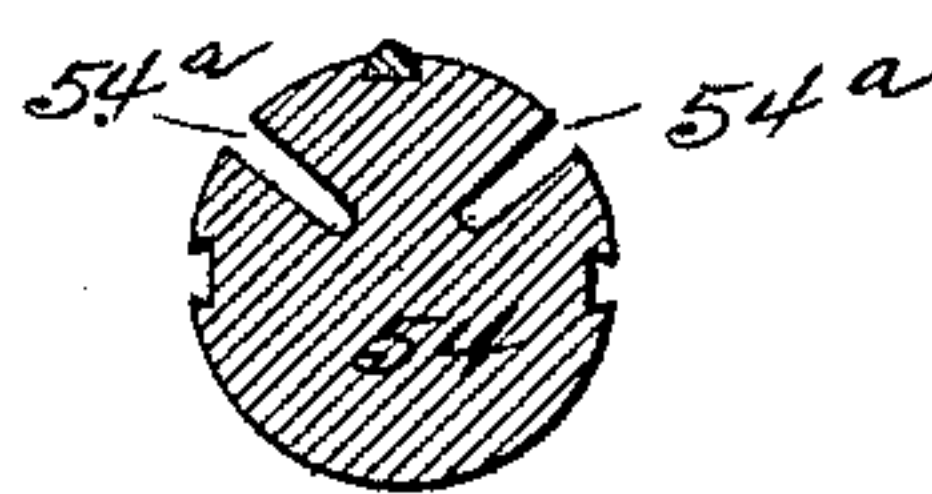
*Fig. 12.*



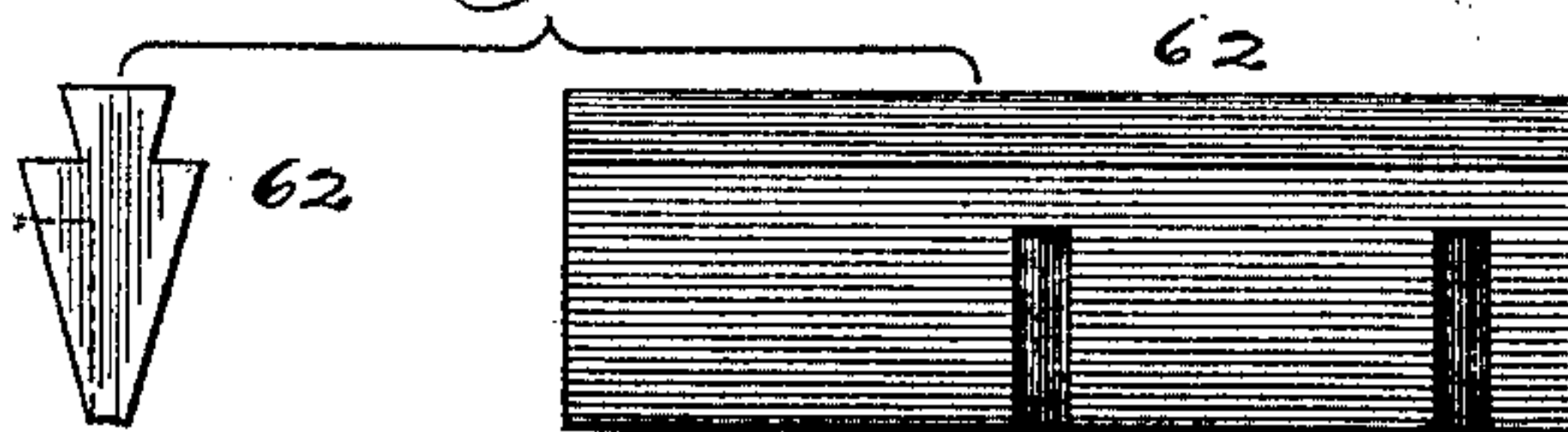
*Fig. 13.*



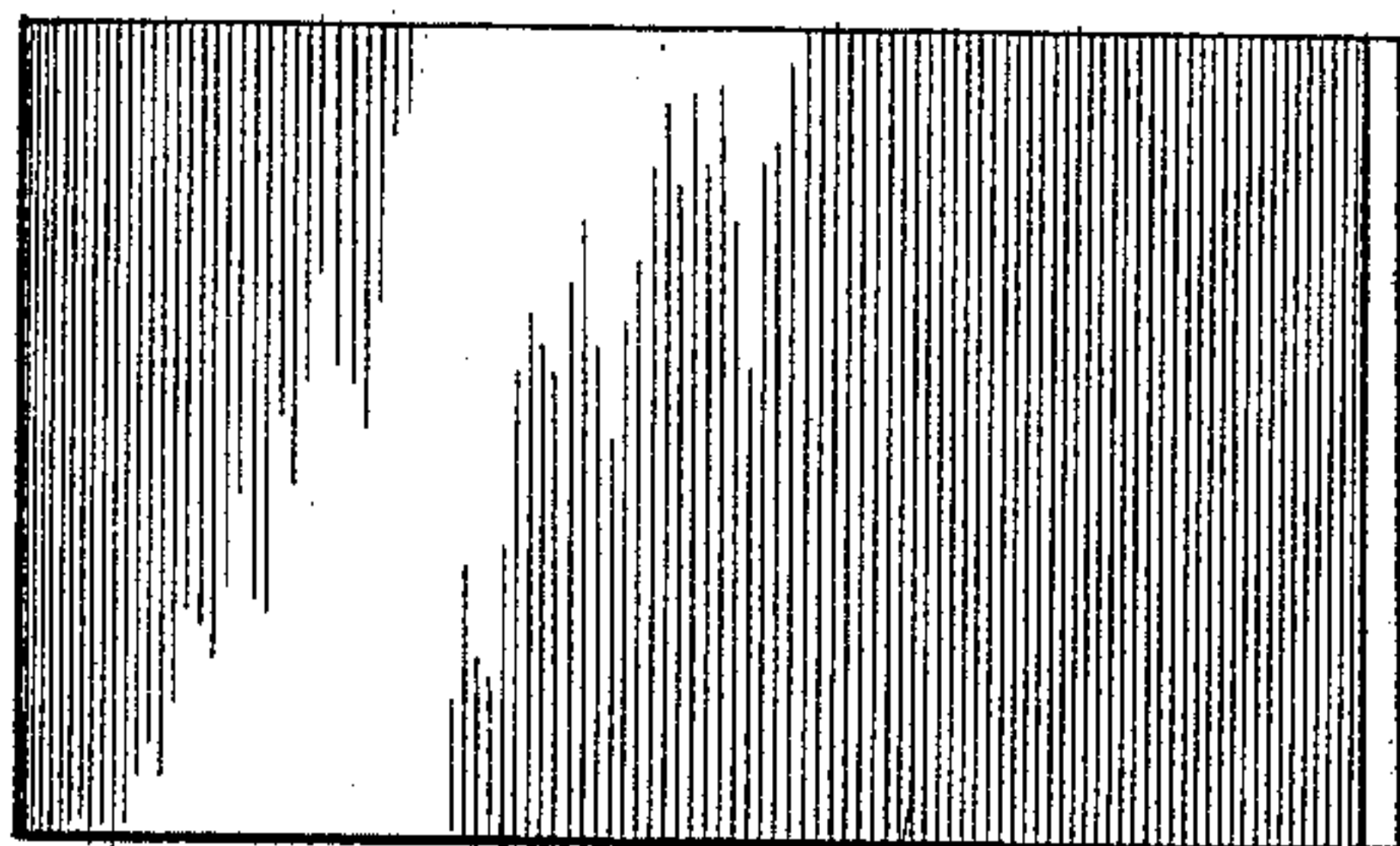
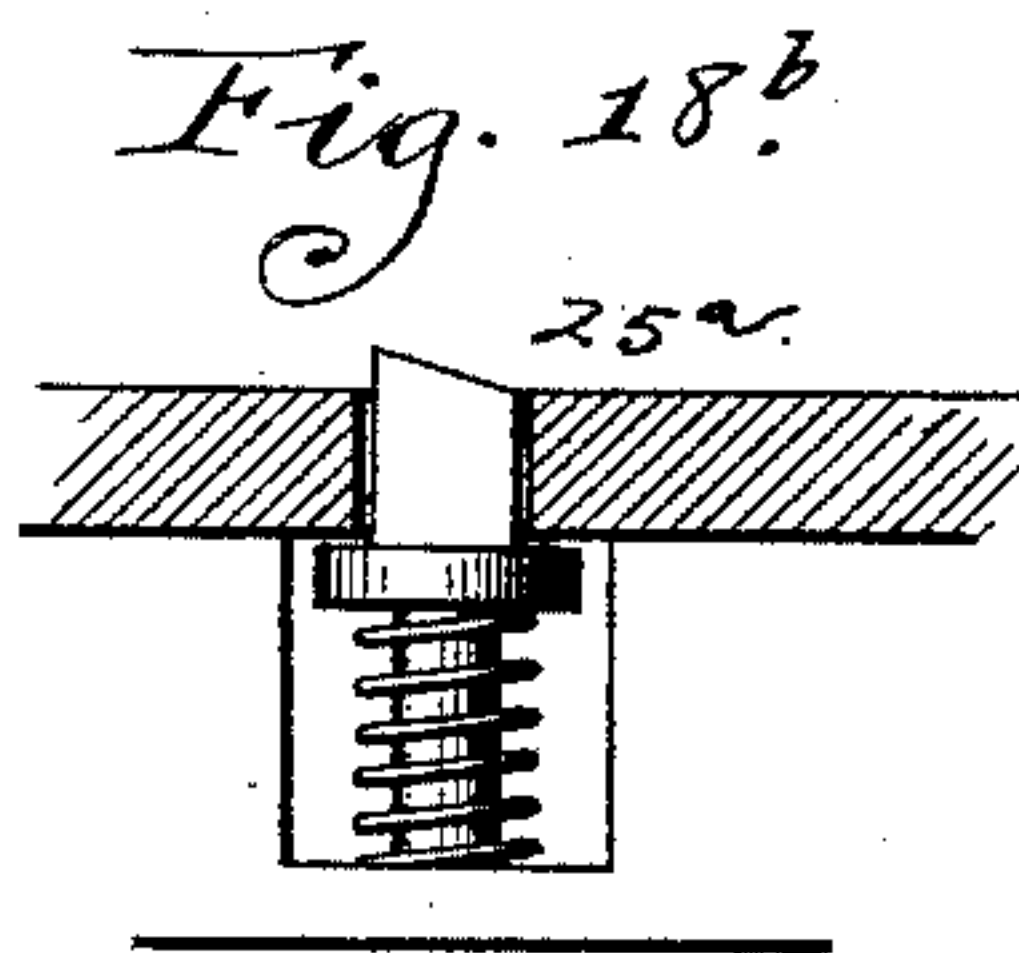
*Fig. 14.*



*Fig. 15.*



*Fig. 16.*



*Fig. 18.*



Witnesses,  
J. J. Mann,  
Frederick Goodman

Inventor,  
Charles F. Beaman  
By *Offield & Fowler*  
Attys.



# UNITED STATES PATENT OFFICE.

CHARLES F. BEAMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CHICAGO CAN COMPANY, OF SAME PLACE.

## MACHINE FOR MAKING THE SEAMS OF SHEET-METAL CANS.

SPECIFICATION forming part of Letters Patent No. 434,908, dated August 26, 1890.

Application filed October 1, 1889. Serial No. 325,644. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. BEAMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making the Seams of Sheet-Metal Cans, of which the following is a specification.

My invention relates to a machine for making the seams of sheet-metal cans; and my invention consists in certain devices and combinations of devices, hereinafter described, but particularly pointed out in the claims. The blank from which the can-body is to be formed is first cut to size required, and then has its opposite edges turned over, but in opposite directions, to provide for forming an interlocking joint. This work is done on a separate machine. The machine hereinafter described is designed to bend this blank to form a can-body cylindrical in shape, and make the joint and press the seam. In said machine the blank is placed upon a reciprocating table, which delivers it over a bed having a semi-cylindrical depression therein. A former, carried by a sliding head, is then depressed, forcing the blank into the concave depression, its side margins projecting above the top of the bed. While held in this position, two plates, acting from opposite sides, are thrust inwardly, their ends striking the margins of the blank and bending the same over around the former and causing the edges to overlap. During this latter movement a presser-foot is moved upwardly through a slot in the bottom of the concave bed and is brought to bear on the bottom of the blank, which by this time has assumed a cylindrical form, and which is thus held tightly upon the former. The next movement is to retract the plates, the presser-foot below holding the blank from revolving on the former. While in this position a reciprocating bar or finger is advanced from one side of the machine until its end impinges upon the upper of the folded edges of the blank. A reciprocating plunger, acting from above, is then caused to move down until it strikes the turned-over edges, locked, as before described, thus forcing said edges into close contact and pressing

the seam. A knock-off device, comprising one or more rods reciprocating within longitudinal grooves in the periphery of the former, is then brought into action, and by means of its engagement with the end of the can-body the latter is forced off the former, and the machine is ready to repeat the operation.

In the accompanying drawings, Figure 1 is a rear elevation of the machine. Fig. 2 is a front elevation. Fig. 3 is a sectional elevation on the line 3 3 of Fig. 1 looking in the direction of the arrow 3. Fig. 4 is a sectional elevation on the line 4 4 of Fig. 1 looking in the direction of the arrow 4. Fig. 5 is a plan view with parts removed and others in section. Fig. 6 is a transverse vertical section through the upper part of the machine, with some of the parts in elevation and a portion of the frame broken away. In this figure the machine is shown at that stage of the operation at which the blank has been carried forward over the bed, but before it has been operated upon. Fig. 7 is a view similar to Fig. 6, but showing the mechanism in position to press the seam in the body of the can. Figs. 8 to 18<sup>b</sup>, inclusive, are detail views of parts.

The base or lower part of the frame is indicated by the figure 19 and the upper part of the frame-work by 20. Rotatably mounted in the frame-work 19 is a shaft 21, which is driven through the intervention of suitable gearing from a driving-shaft 22. At the upper end of the frame-work 20 a counter-shaft 23 is rotatably mounted and the link-belt 24 transmits power to shaft 23 from shaft 21. The blanks to be operated upon are delivered upon a horizontal bed 25 between guideways 26. The central part of this bed (marked 27 and hereinafter called a "slide") is movable endwise, in order to feed the blanks to the forming mechanism. The movement of this part is effected by a series of levers 28, 29, 30, and 31, the latter having preferably a pin or roller 32, moving within a cam-groove 33 in a cam 34, secured to rotate with the shaft 21. In Fig. 6 the parts just described are shown in the position where the slide 27 is at the inner limit of its stroke, it having delivered a blank in position to be operated upon. It will be observed that the cam-track 33 describes a



true circle in a portion thereof, and from this it results that while the part 32 is passing through this portion of the track the slide will remain stationary, thus enabling the blank  
5 to be placed upon the outer end of the table by hand.

If desired, a machine for folding the edges of the blank may be so placed with reference to the end of the slide as to deliver the  
10 blanks thereon without manual operation. Taking the position of the parts as shown in Fig. 7, as the roller 32 moves out of the circular part of its track the pivoted arm 31 will be forced away from the shaft 21, thus rock-  
15 ing the arm 29 on its pivot, and by means of the link 28 forcing the slide 27 inwardly. The slide 27 has spring-catches 27<sup>a</sup>, Fig. 5, which engage the end of the blank, thus delivering it to a point on the bed 25 in the  
20 rear of the forming mechanism, where it will be caught by spring-stops 25<sup>a</sup>, set in the table 25, and then the slide will be drawn from beneath it to the starting-point to receive a second blank. At the next revolution of the  
25 shaft the blank, which has been advanced half-way and deposited as described, will be engaged by the projections 27<sup>b</sup> on the forward end of the slide and pushed into position to be operated upon, while the second  
30 blank will be deposited upon the table 25 at the half-way position. (See Figs. 18<sup>a</sup> and 18<sup>b</sup>.) In this manner at each revolution of the shaft  
35 21 a blank will be fed to the operating devices, and a second blank will be advanced to the half-way position to take its place. In order to hold the blank against lateral move-  
40 ment when it is placed under the forming mechanism, the flat spring 35 may have one of its ends secured to the frame of the machine and the other end left free to bear against one edge of the blank.

36 is a removable bed-plate having a semi-cylindrical depression 36<sup>a</sup> therein, said depression being of a width to conform to the  
45 size of can which it is desired to make. The stops 37 are placed on the surface of the bed-plate 36, against which the blank abuts.

38 is a head-block which moves vertically in ways formed by plates 39 40, which plates  
50 40 are also adapted to be adjusted by means of the set-screws 41 along the frame 20. This head-block has at the rear of the machine, as shown in Fig. 1, a yoke 42, to which is connected a rod 43, the upper end of which is  
55 pivotally connected to a beam 44, the latter having a link 45, which is connected to a frame 46. (See Figs. 3 and 7.) An anti-friction roller 47 is journaled in the lower side of this frame, which is of skeleton form, and a  
60 cam 48, which is mounted on shaft 23, is adapted to bear on said roller at one part of the revolution of the shaft, whereby to lift the head-block 38. This head-block is depressed by means of cams 49, mounted on the  
65 shaft 23, which cams impinge upon anti-friction rollers 50, journaled in the upper ends of blocks 51, carried by screw-shafts 52, which

have their ends oppositely threaded and adapted to threads in the blocks 51 and threads in the head-block 38, respectively. 70 By adjusting these screws, the length of the stroke of the head-block may be varied. The plate 53, projecting from the lower rear side of the head-block, carries the former 54, which is a metal cylinder of appropriate length pro- 75 jected parallel with the bed-plate 36, and is sustained directly over the depression 36<sup>a</sup> therein.

55 is a plunger which moves in ways in the head-block, (see Fig. 12,) and this plunger has 80 an adjustable stem similar to the stems 52 and bearing a like friction-roller at its upper end, which is engaged by a cam 56 on the shaft 23. It will be observed that the cam 56 is of greater diameter than the cams 49, and 85 consequently the plunger will have a longer movement than the head-block, for a purpose to be described hereinafter.

In order to effect the return of the plunger after it has performed its work, there is pro- 90 vided on its rear side a stud 57, which carries a screw 58, the lower end of which bears upon a headed bolt 59, one end of which is passed through an aperture in a lug 60 projected from the head-block. A coiled spring 61 is 95 interposed between the head of bolt 59 and the lug 60. This spring will be compressed during the descent of the plunger under the influence of the cam, and when the cam action is released the spring will effect the 100 return of the plunger to its normal position with reference to the head-block.

On the lower end of the plunger 55 a hammer 62 is mounted in any convenient way, the face of the hammer being in the same 105 vertical plane with the former 54. The function of this hammer is to press the seam, as hereinafter described. (See Fig. 15.)

The operation of the machine thus described is as follows: The blank having been ad- 110 vanced to position to be operated upon, Fig. 8, the head-block is depressed, carrying the former down until it strikes the plunger and drives its central portion into the cavity of the bed, the edges of the blank projecting up 115 by the sides of the cylindrical former, but at right angles to the surface of the bed. It is next necessary to bend these projecting edges over the former, and the mechanism for doing this work will now be described. 120

63 represents plates which slide in ways 64 on the frame, said plates preferably having their inner ends curved to conform to the surface of the former, as clearly shown in the drawings. These plates bear on their 125 lower sides a pin 63<sup>a</sup>, which is connected by a short link 64<sup>a</sup> to a pivoted bar 65, and the latter in turn is connected by a link 66 to the upper end of a lever 67, pivoted on a bracket 68 depending from the bed. The lower end 130 of the lever 67 carries an anti-friction traveler 69, which moves between the cam-disks 70 71, mounted on the shaft 21. The traveler 69 is mounted in an adjustable bearing 72,



so that the throw of the plates 63 may be regulated to cams of different diameters. The rotation of the shaft 21 will effect the reciprocation of the plates 63, and their movement will be timed so that they will engage the projected margins of the blank and bend them over upon the former, (see Fig. 9,) causing their edges to overlap at the proper time.

To prevent the blank from turning or twisting from any cause while it is being operated upon, I have provided a vertical moving presser-foot 73, which is projected upward through a vertical slot formed in the bottom of the bed 36. This presser-foot is mounted on the end of a stem 74, which is connected by link 75 to a bent arm 76, the latter carrying an anti-friction roller 77, which is engaged by a cam 78 on shaft 21. Arm 76 will be pivoted on a bracket 79 depending from the frame 19. Stem 74 will bear a collar 80, below which is confined a spring 81, the lower end of which is seated on a fixed part of the frame. When the blank is placed on the machine, the spring slides the presser-foot normally in contact with the lower side of the blank, thus preventing it from turning while it is being operated upon. (See Figs. 9 and 10.) After the can is formed it will be necessary to retract the presser-foot in order that the can may be stripped off the former, and the cam 78 is so arranged as to effect the withdrawal of the presser-foot at the proper time.

In order to insure the interlocking of the edges after they have been overlapped by the sliding plates 63, I have provided the fingers 82, which are connected to a sliding plate 83, moving in suitable ways on the frame and adapted to be moved by means of the link 84, pivoted lever 85, and cam-disks 86 and 87, between which is a traveler 88, carried by lever 85. As the shaft 23 rotates the cam-disks 86 87 will cause the inner movement of the fingers 82, which are adapted to strike the upper of the overlapping edges of the blank, thus locking the said edges securely together. (See Fig. 10.) In the operation the plunger, before described, will have descended with the seaming-hammer and formed a seam, while the fingers 82 still engage it. (See Fig. 11.) To permit this the hammer is notched, as shown in Fig. 15.

The knock-off device includes two stripper-rods 89, having bent ends 89<sup>a</sup>, which move in longitudinal grooves 54<sup>a</sup>, formed in the periphery of the former 54. These stripper-rods 89 are mounted in a sliding block 90, moving in ways formed by brackets 91 92, which are connected to the head 38. To the block 90 is connected a short link 93, which is pivoted at one end to the bell-crank lever 94, which latter is pivoted on a rod 95, secured in the brackets 91 92.

96 97 are brackets connected with the main frame of the machine, and ways 98 are formed therein, in which is adjustably mounted a rod 99, which is embraced by a bifurcation

in the short arm of the bell-crank lever 94. The reciprocation of the head-block will cause the rocking of the bell-crank lever 94 on its pivot, which in turn will cause the reciprocation of the block 90 and the movement forward of the stripper-rods, the bent ends of which will engage the end of the can-body and thus force the latter off the former.

It is apparent that some of the novel features hereinabove described may be used in a machine having equivalent mechanisms for some of the other parts, and therefore I do not intend to limit my invention of said novel features and combinations to a machine embodying all of said novel features and combinations. It is also apparent that by changing the form of the depression in the bed and substituting a former of different configuration can-bodies other than cylindrical may be made, and I do not therefore limit my invention to a machine for forming cylindrical cans.

I claim—

1. In a machine for making the seams of sheet-metal cans, the combination, with a bed-plate having a depression therein over which edged blanks are delivered, of a reciprocating head-block bearing a former, a pair of reciprocating plates adapted to be advanced from opposite sides of the blank and to overlap the edged margins thereof, a reciprocating finger or fingers adapted to engage and interlock the edged margins of the blank, and a plunger bearing a hammer adapted to be reciprocated, whereby to press the seam, substantially as described.

2. In a machine for making the seams of sheet-metal cans, the combination, with a bed-plate and means for forming the can, of a blank-delivering mechanism comprising a way and a slide moving horizontally along said way, said slide being actuated by a rotatable cam having an irregular groove in the side face thereof, a pivoted bell-crank lever having a stud adapted to travel in the cam-groove, a second lever intermediate the cam and the slide, and links connecting the ends of said second lever with the slide and the bell-crank lever, respectively, substantially as described, whereby to advance the blank part way during one revolution of the cam and to complete its delivery at the next succeeding revolution.

3. In a machine for making the seams of sheet-metal cans, the combination, with the can-forming mechanism, of a knock-off device comprising a pair of stripper-rods secured with a head-block and adapted to be reciprocated horizontally to engage the can-body, a bell-crank lever pivotally connected between its ends with a moving part of the machine and having its respective ends pivotally connected to said head-block and to a fixed part of the machine, whereby to reciprocate said rods, substantially as described.

4. In a machine for making the seams of sheet-metal cans, the combination, with a can-



forming mechanism, of a knock-off device comprising a pair of stripper-rods secured in a sliding head-block, a link connected to said block, a bell-crank lever connected pivotally  
5 with a moving part of the machine and having one arm thereof connected to said link and its other arm bifurcated to embrace a fixed part of the machine, whereby said stripper-rods are actuated to discharge the can-body, substantially as described.

CHARLES F. BEAMAN.

Witnesses:

FREDERICK C. GOODWIN,  
C. C. LINTHICUM.