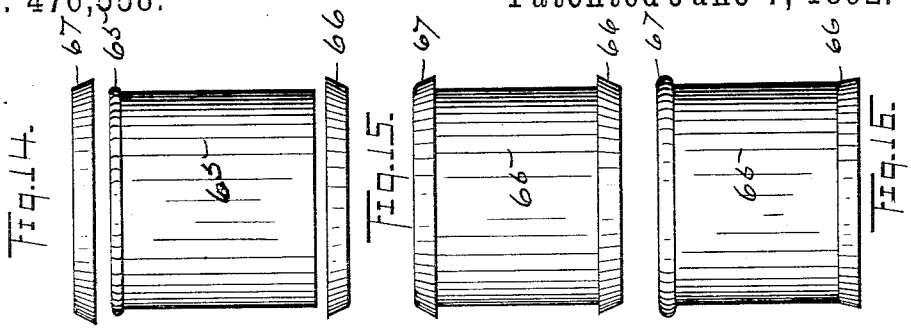
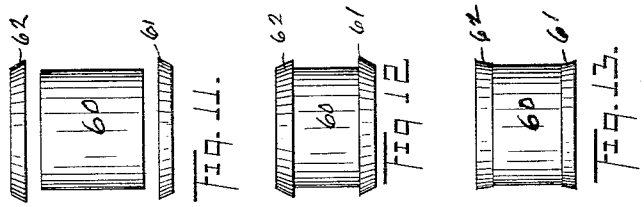
(No Model.) 3 Sheets—Sheet 1.

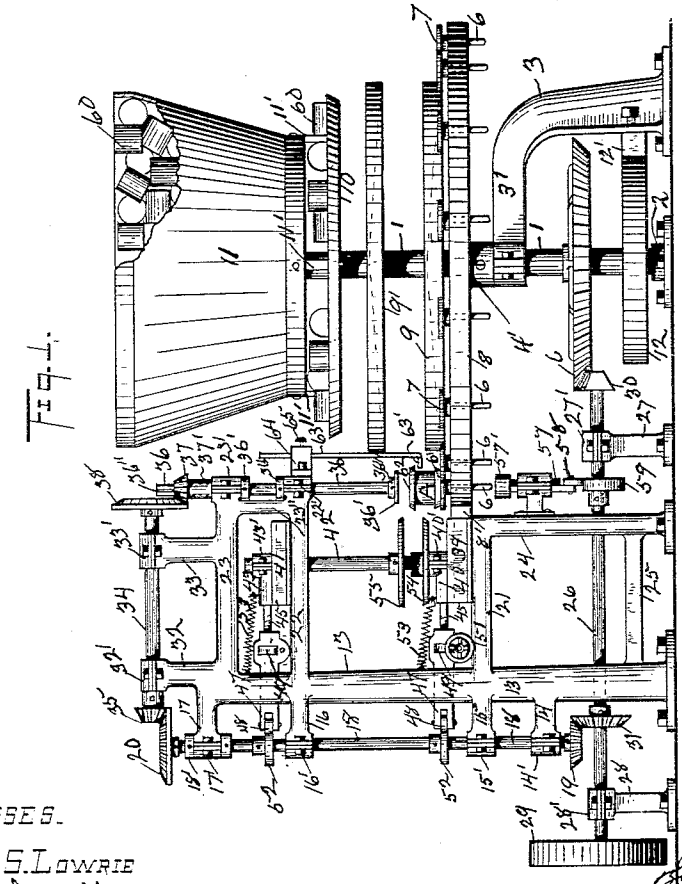
J. W. ROBERTS.

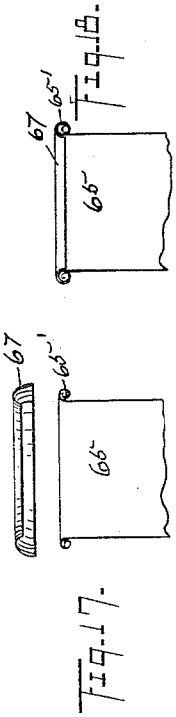
CAN CRIMPING MACHINE.

No. 476,558. Patented June 7, 1892.









WITNESSES.

Belle S. Lowrie

R. R. Buchwalter

INVENTOR.

John W. Roberts

By Osborne & Sanders

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 2.

J. W. ROBERTS.

CAN CRIMPING MACHINE.

No. 476,558. Patented June 7, 1892.

Fig. 2.

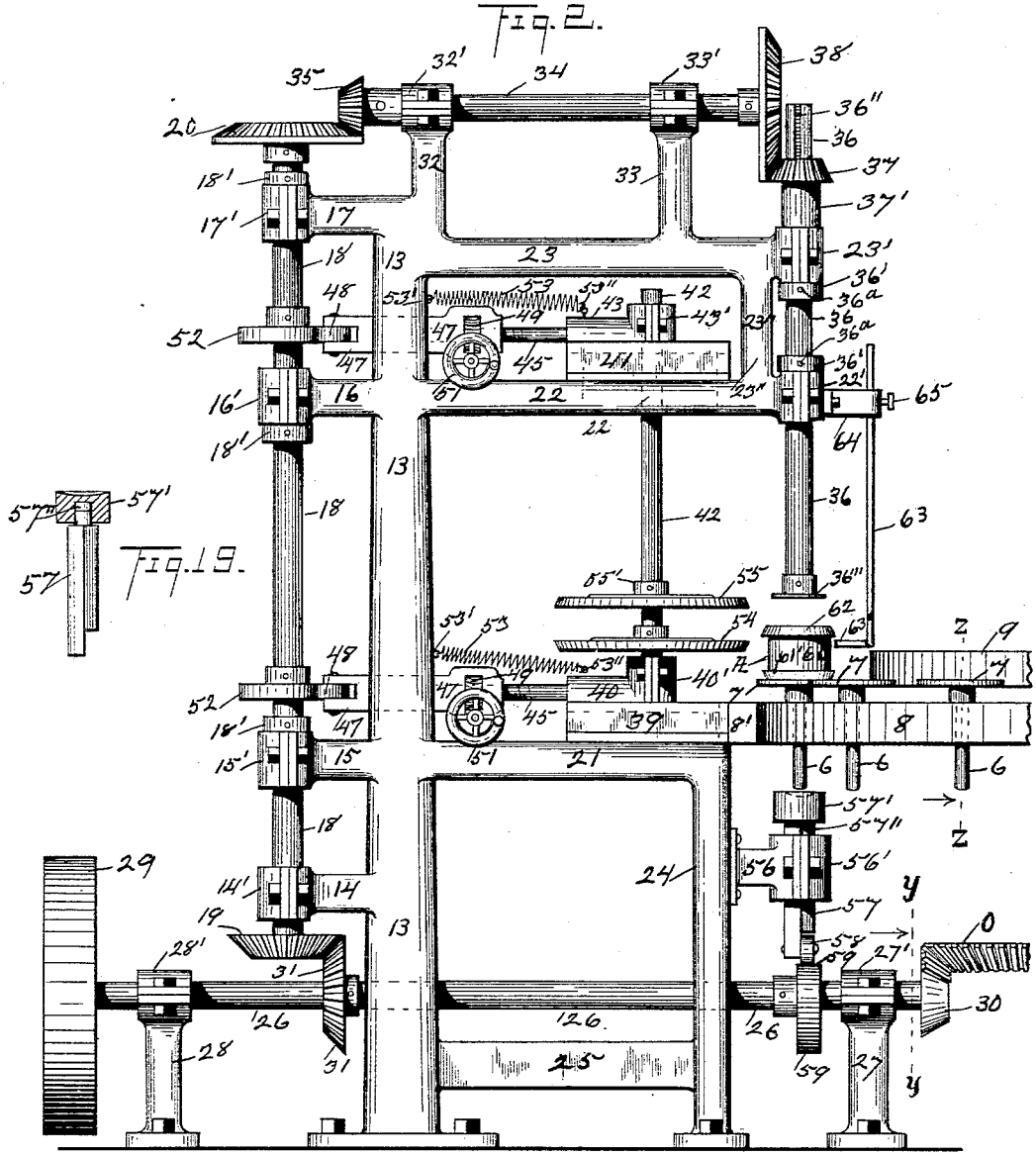
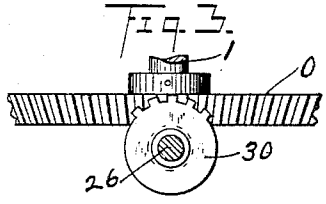


Fig. 19.

Fig. 3.



WITNESSES

Belle S. Lowrie.

R. C. Buchwalter

INVENTOR.

John W. Roberts

By Osborne & Sandus,

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 3.

J. W. ROBERTS.

CAN CRIMPING MACHINE.

No. 476,558. Patented June 7, 1892.

Fig. 4.

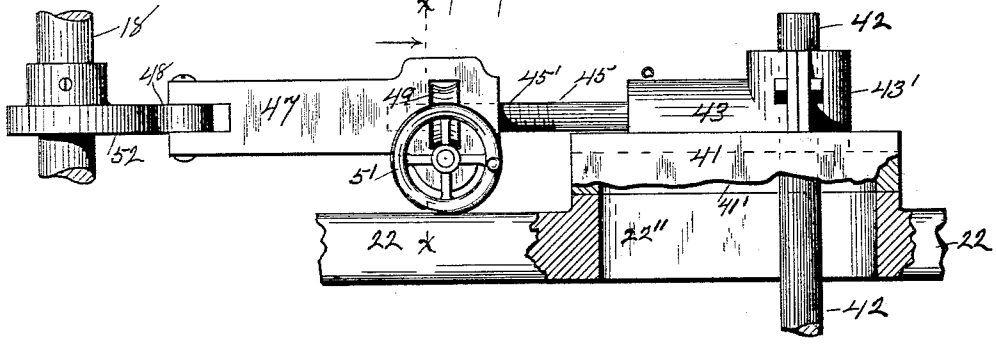


Fig. 5.

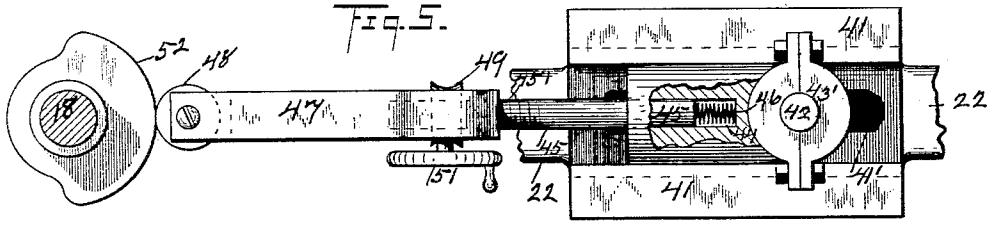


Fig. 6.

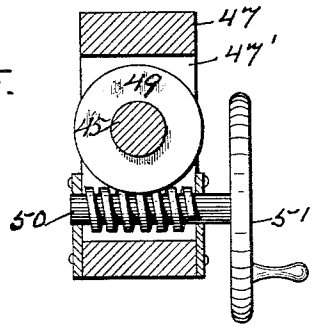


Fig. 7.

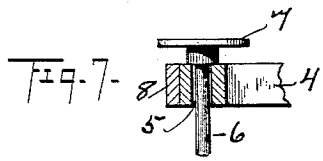


Fig. 8.

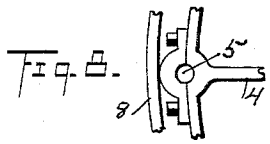


Fig. 9.

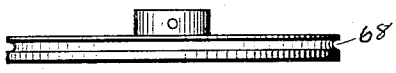
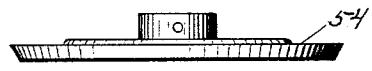


Fig. 10.



WITNESSES

Belle S. Lowrie.

R. B. Underwood

INVENTOR.

John W. Roberts

By Osborne & Sanders

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN W. ROBERTS, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO THE SHERWIN-WILLIAMS COMPANY, OF SAME PLACE.

CAN-CRIMPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 476,558, dated June 7, 1892.

Application filed January 29, 1892. Serial No. 419,720. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. ROBERTS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Can-Crimping Machines, of which the following, with the accompanying drawings, is a specification.

My invention relates to machines for crimping the ends upon the cylindrical part of tin packing-cans.

The object of my invention is a machine embodying a rotary can-carrier, mechanism which automatically grips the cans and crimps the ends upon the body part of the cans, and also rotary tables in conjunction with the rotary can-carrier.

My invention consists in the construction and combination of parts described herein and defined in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of my machine. Fig. 2 is an enlarged side elevation of the same, the rotary can-carrier and tables being broken away. Fig. 3 is a section of Fig. 2 on the line *y y*. Fig. 4 is an enlarged side elevation of the crimping-disk reciprocators, and Fig. 5 is a plan of the same, partly in section. Fig. 6 is a cross-section of Fig. 5 on the line *x x*. Fig. 7 is a section on the line *z z* of Fig. 2. Fig. 8 is an enlarged broken section of the circular rotary carrier-frame with friction-band. Fig. 9 is an enlarged edge view of my beading-disk. Fig. 10 is an enlarged edge view of the crimping-disk. Fig. 11 illustrates the parts of a can prepared for crimping. Fig. 12 shows the parts of a can put together ready to be crimped by my machine, and Fig. 13 is a view of the completed can after being operated upon. Fig. 14 illustrates the separate parts of a can prepared for beading one end of the can to give it the appearance of being wired. Fig. 15 is a view of the parts put together to be operated upon for beading, and Fig. 16 illustrates the beaded can after being operated upon. Fig. 17 is a reduced central vertical section of Fig. 14. Fig. 18 is a central vertical section of Fig. 15, and Fig. 19 is a central vertical section of the vertical plunger.

For the sake of clearness I first describe the rotary can-carrier and the tables that operate in conjunction therewith.

A vertical shaft 1 stands in a journal-block 2 and is supported laterally by the frame 3. A carrier-frame 4 is fixed upon the vertical shaft 1 above the frame 3, the hub 4′ of the carrier-frame 4 resting and turning upon the horizontal arm 3′ of the frame 3. Around the circumference of the rotary carrier-frame 4 is a series of journal-boxes 5, through which pass the spindles 6, carrying the can-carrier disks 7. Around this rotary can-carrier is a friction-face, which is preferably formed by a band 8, which bears against a yielding block 8′ to avoid vibration of the carrier. The block 8′ may be of rubber faced with wood or metal, or it may be a wood or metal block with springs back of it. Above the rotary carrier-frame 4 is a circular table 9, that is fixed to the vertical shaft 1, and above the circular table 9 is a like table 9′, fixed upon the shaft 1, and above the table 9′ is a similar circular table 10, fixed upon the vertical shaft 1 and having a hopper 11 supported therefrom by means of straps 11′. The table 9 is designed to carry loose tops of cans. The table 9′ is intended to carry loose bottoms of cans, and the table 10 and the hopper 11 are intended to carry the cylindrical or body parts of cans.

Upon the vertical shaft 1, below the horizontal arm 3′ of the frame 3, is fixed a drive-gear O, and below the gear O there is shown a friction-wheel 12, which bears against the friction-block 12′. The block 12′ is similar in construction to the block 8′, hereinbefore described.

The friction-wheel 12 and the friction-band 8 may be dispensed with, or the friction-wheel 12 may be fixed at a different place upon the shaft 1; but I prefer to use the friction-band 8, as illustrated.

In will now describe the gripping and crimping mechanism of my machine. The frame supporting this mechanism consists of a vertical standard 13, having lateral arms 14, 15, 16, and 17, which carry the vertical shaft 18, that turns in the journals 14′, 15′, 16′, and 17′. To the lower end of the vertical shaft 18 is fixed a bevel-gear 19 and to the top of said shaft 18 is fixed a bevel-gear 20. Collars 18′ are fixed upon the vertical shaft 18 to prevent

vertical movement of said shaft, one of said collars being above the journal 15′, another below the journal 16′, and another above the journal 17′. To the opposite side of the standard 13 are lateral arms 21, 22, and 23 for supporting other operative mechanism of the machine. The lateral arm 21 is strengthened and supported by the upright 24, and a cross-tie 25, extending from the standard 13 to the upright 24, gives greater rigidity to the frame, and the vertical tie 23″ stiffens and makes more rigid the lateral arms 22 and 23. The main horizontal shaft 26 passes through openings in the standard 13 and upright 24 and has its inner end supported by the bracket 27 and its outer end supported by the bracket 28. Said horizontal shaft 26 turns in the journals 27′ and 28′. Upon the outer end of the shaft 26 is fixed a drive-pulley 29, and a mutilated bevel-gear 30 is fixed to the inner end of said shaft 26. Said mutilated bevel-gear 30 meshes with the drive-gear O, that is fixed to the vertical shaft 1 of the rotary can-carrier. Upon the horizontal shaft 26, outside the standard 13, is fixed a bevel-gear 31, which meshes with the bevel-gear 19. An upright 32, supported from the top of the standard 13, and an upright 33, supported from the top of the lateral arm 23, carries the horizontal shaft 34. The horizontal shaft 34 turns in the journals 32′ and 33′. Upon the outer end of the horizontal shaft 34 is fixed a bevel-gear 35, which meshes with the bevel-gear 20. A vertical shaft 36 is carried in the journals 22′ and 23′ at the outer ends of the lateral arms 22 and 23. A collar 36′ above the journal 22′ and a like collar below the journal 23′ prevent vertical movement of the shaft 36. Said shaft is supported above the orbit of the can-carrying disks 7. To the top of the vertical shaft 36 is fixed a bevel-gear 37, to mesh with the bevel-gear 38, that is fixed upon the end of the horizontal shaft 34. An elongated boss 37′ of the gear 37 extends down to the journal 23′. The shaft 36 has vertical adjustment in the collars 36′ and the bevel-gear 37 for the purpose hereinafter described. This adjustment through the collars 36′ is secured by means of the set-screws 36^{a} and through a key upon the inside of the gear 37 and boss 37′, which fits loosely with the slot 36″, formed in the vertical shaft 36. While the shaft 36 is adjustable vertically, the gear 37 remains in one position, that it may always mesh with the gear 38. To the lower end of the shaft 36 is fixed a disk 36‴. Upon the lateral arm 21 is fixed a block 39, having gibbed sliding-ways, in which the slide-block 40 reciprocates, and upon the lateral arm 22 is fixed a block 41, having gibbed sliding-ways, in which the sliding block 43 reciprocates. A vertical shaft 42, having its lower end in the journal 40′, passes up through the slot 22″ in the lateral arm 22, through the slot 41′ of the slide-block 41, and through the journal 43′. The only difference between the blocks 39 and 41 is that block 41 is slotted, as illustrated and described, to allow the vertical shaft 42 to pass up through the block 41 and have a reciprocating movement therein, and the only difference between the lateral arms 21 and 22 is that the arm 22 is slotted, as illustrated and described, to allow the shaft 42 pass through it and have a reciprocating movement therein.

The other features of the crimping-disk reciprocators, which operate above the lateral arms 21 and 22, are alike, and therefore a description of the upper one only is given, it being illustrated by Figs. 4, 5, and 6, and the same reference-figures are placed to like parts of each reciprocator.

The slide-blocks 40 and 43 have a bore 44 therein, into which enters the rod 45. A spring 46 is placed in the bore 44 back of the rod 45. The opposite end of the rod 45 is threaded, as seen at 45′. The bar 47 has a bore in its front end, into which enters the threaded end of the rod 45. The entrance of the rod 45 into the bar 47 is shown by the dotted lines on the bar 47 in Figs. 4 and 5. Said bar 47 has a lateral opening 47′ through it, into which is placed a worm-wheel 49. The worm-wheel 49 is bored axially and threaded to screw upon the threaded portion of the rod 45. A worm-gear 50, turned by the hand-wheel 51, operates the worm-wheel 49. It will be seen that by turning the hand-wheel 51 the worm gear and wheel will lengthen or shorten the reciprocating apparatus, as desired. The bars 47 reciprocate in openings through the standard 13.

Instead of making the wheel 49 a worm-wheel, it may be made a plain wheel bored axially and threaded to screw upon the rod 45, and other means than the worm-gear employed to turn it. Various means for turning this wheel will readily suggest themselves to mechanics. I prefer, however, to use the worm-gear, as a finer adjustment can be secured therewith than by other means.

In the back end of the bar 47 is pivoted a friction-roller 48. Upon the vertical shaft 18 are fixed cams 52 to engage the friction-rollers 48. As the pressure of the cams 52 is brought against the friction-rollers 48 by the rotation of the shaft 18, the reciprocators are thrust forward, carrying the vertical shaft 42, and as the pressure of the cams 52 is released the retraction-springs 53 will withdraw the reciprocators to their extreme back-stroke.

Upon the vertical shaft 42 are fixed the crimping-disks 54 and 55. The disk 55 has vertical adjustment upon the shaft 42 by means of a set-screw 55′. Said disks are beveled, the lower one 54 to its under side and the upper one 55 to its upper side.

A bracket 56, carrying a journal 56′, is attached to the front side of the upright support 24. A rectangular plunger 57 works vertically in the box-journal 56′. The top 57′ of the vertical plunger is a cap fitted upon the plunger-bar 57 and is cupped out on top to receive the lower ends of the spindles 6.

A rubber block 57'' is interposed between the plunger-cap 57' and the top of the plunger-bar 57 to allow a slight yielding of the disks 7 and to cushion the bearing of the plunger against the spindles 6. A friction-roller 58 is pivoted to the lower end of the vertical plunger 57. Upon the lower horizontal shaft 26 is fixed a cam 59 to engage the friction-roller 58. The vertical plunger is below the orbit of the spindles 6, with their disks 7. When the carrier-frame 4 stops after each intermittent rotary movement, the vertical shaft 36, one of the spindles 6, and the plunger 57 are in a vertical line.

A throw-off 63, supported in the front of the machine by the bracket 64 and having vertical adjustment therein by means of the set-screw 65, operates to discharge cans from the machine after being operated upon as they are carried on and come into contact with the horizontal bent end 63' of the throw-off.

In the operation of my machine the parts of cans represented by 60, 61, and 62, Fig. 11, are first prepared and the cylindrical parts 60 are placed in the hopper 11 and on the table 10. The bottoms 62 are placed upon the table 9' and the tops are placed upon the table 9. The vertical shaft 42 and the disk 55 are adjusted vertically to the length of the cans to be operated upon, and the length of the reciprocators is adjusted to the diameter of the cans, as hereinbefore described. The operator takes the prepared parts of a can and puts them together, as illustrated by Fig. 12, and then sets the can top end down upon one of the can-carrying disks 7. The position of the cans upon the disks 7 is shown at A, Figs. 1 and 2. The mutilated gear 30 rotates the shaft 1 and can-carrying apparatus intermittingly and brings the disks 7 successively under the disk 36'''. As each disk 7 comes under the disk 36''' the cam 59 on the horizontal shaft 26 comes in contact with the friction-roller 58 on the vertical plunger 57 and raises it against the spindles 6, thus forcing the disk 7 up and gripping the can between the disks 7 and 36'''. The disk 36''' is constantly rotated by the driving power through the shaft 26, gears 31 and 19, shaft 18, gears 20 and 35, shaft 34, gears 38 and 37, and shaft 36. While gripped between the disks 36''' and 7 the can revolves with said disks 36''', and the spindle 6, carrying the disk 7, turns in the journal 5. The lower ends of the spindles 6 are rounded that they may turn easily on the cupped plunger-head 57'. The can A is raised high enough to bring the edges of the ends 61 and 62 opposite the edges of the crimping-disks 54 and 55. As the can A is gripped and while being revolved, as described, the cams 52 on the vertical shaft 18 come into contact with the friction-rollers 48 on the reciprocators and force the reciprocators in, thus bringing the edges of the disks 54 and 55 against the turned edges of the can ends 61 and 62. The turning of the can A causes the disks 54 and 55 to revolve. The can A makes several revolutions while the disks 54 and 55 are in operation against it. As the grip of the can is released by the turning of the cam 59, the cams 52 release their pressure and the springs 53 withdraw the reciprocators, and the mutilated pinion 30 rotates the can-carrier far enough to bring the next succeeding disk 7 under the disk 36''', when the operation described is repeated. As the cans are carried around after being operated upon they come into contact with the horizontal arm 63' of the throw-off 63 and are caused to fall into a chute or receptacle placed by the side of the machine to receive them.

The purpose of the springs 46 in the slide-blocks 40 and 43 back of the rods 45 is to provide a yielding bearing for said rods 45 and a yielding to the disks 54 and 55 to overcome any unevenness in the surface of cans operated upon and also to cushion the stroke of said disks against the cans.

Sometimes it is desirable to bead cans around the lower edge to give them the appearance of being wired. This is mostly done with the larger sizes of cans. To bead a can around one end to give it the appearance of being wired the cylindrical part 65, Figs. 14 and 17, is curled over upon its edge, as seen at 65'. The end 67 of the can is formed as illustrated in said figures. The parts are then put together by the operator, as illustrated by Fig. 15, and placed top down upon the carrier-disks 7, as already described for ordinary crimping. Instead of the beveled disk 55, I employ a disk having a rounded groove 68 around its periphery, as illustrated by Fig. 9. This will crimp the end over the turned edge 65' of the can-body 65 and bead it, giving it the appearance of being wired, as illustrated by Fig. 16.

The adjustment and operation of the machine for beading cans is the same as for crimping cans, as hereinbefore described.

It will be seen that my machine is very simple in construction and operation, and that the can-carrying apparatus intermittingly rotates to bring cans into position to be gripped, and that the gripping and crimping are accomplished automatically.

My machine may be used either with or without the tables, or any one or two of them, for carrying the loose parts of cans to be operated upon; but I prefer, as a matter of convenience to the person ending the cans, to use the tables.

If the machine be built to crimp but one-sized cans, the means for giving vertical adjustment to the vertical shaft 42 may be dispensed with and the means for adjusting the length of the crimping-disk reciprocators need not be employed; but as the capacity of the machine is so great it is advisable to use these adjusting devices, so that one machine may be made to operate upon cans of various sizes.

My invention may take on various modifications in details of construction, and I do

not, therefore, limit myself to the form and arrangement of parts as shown and described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a machine of the character described, of a vertical shaft having an intermittent rotary movement, a carrier-frame fixed upon the shaft, a series of disks having spindles journaled around the carrier-frame, a friction-face around the carrier-frame, and a friction-bearing for the friction-face with a friction-wheel mounted upon the vertical shaft and a friction-bearing for the friction-wheel, substantially as shown and described.

2. The combination, in a machine of the character described, of a carrier-frame having an intermittent rotary movement, spindles having disks on their tops, said spindles projecting through journals around the carrier-frame, a rotating disk above the orbit of the spindles having disks, a plunger below the orbit of the spindles, and a cam adapted to raise the plunger vertically as the spindles successively come over the plunger to grip a can between the disk on the spindle and the rotating disk above, substantially as shown and described.

3. The combination, in a machine of the character described, of a carrier-frame having an intermittent rotary movement, spindles having disks on their tops, said spindles projecting through journals around the carrier-frame, a rotating disk above the orbit of the spindles having disks, a plunger below the orbit of the spindles, said plunger consisting of a vertical bar having a cap on its top and a yielding bearing between the bar and cap, and a cam adapted to raise the plunger as the spindles successively come over the plunger, substantially as shown and described.

4. In a machine of the character described, a sliding block, a cam to reciprocate the sliding block, adjustable connection between the cam and sliding block, and a yielding bearing between said adjustable connection and sliding block, substantially as described.

5. The combination, in a machine of the character described, of a shaft carrying crimping-disks, sliding blocks having journals in which said shaft rotates, cams to reciprocate the sliding blocks and shaft, adjustable connection between the cams and sliding blocks, and yielding bearings between said adjustable connections and the sliding blocks, substantially as shown and described.

6. In a machine of the character described, a sliding block having a bore therein, a rod to enter said bore and having its opposite end threaded, a yielding bearing back of said rod within the bore of the sliding block, a bar having a bore into which the threaded end of the rod enters, a cross-opening in the bar, and a wheel in said cross-opening, the wheel being bored axially and threaded to screw upon said rod, substantially as described.

7. In a machine of the character described, a shaft carrying crimping-disks, sliding blocks having journals in which the shaft rotates, bores in the sliding blocks, rods entering said bores and having their opposite ends threaded, springs in the bores of the sliding blocks back of the rods, bars having bores into which the threaded ends of the rods enter, and cross-openings in the bars, worm-wheels in said cross-openings and bored axially and threaded, the worm-wheels being screwed upon the rods, and worm-gears to turn the worm-wheels, substantially as described.

8. The combination, in a machine of the character described, of sliding blocks, cams to reciprocate the sliding blocks, adjustable connections between the cams and sliding blocks, and yielding bearings between the adjustable connections and sliding blocks with means for gripping and revolving cans while being crimped, substantially as shown and described.

9. The combination, in a machine of the character described, of a shaft carrying crimping-disks, sliding blocks having journals in which said shaft rotates, cams to reciprocate the sliding blocks and shaft, and adjustable connection between the cams and sliding blocks with a carrier-frame having an intermittent rotary movement, spindles having disks journaled around the carrier-frame, a rotating disk supported above the orbit of the spindles having disks, a plunger below the orbit of the spindles, and a cam adapted to raise the plunger as the spindles successively come over the plunger, substantially as shown and described.

10. The combination, in a machine of the character described, of a shaft carrying crimping-disks, sliding blocks having journals in which said shaft rotates, cams to reciprocate said sliding blocks and shaft, any suitable connection between the cams and sliding blocks, and yielding bearings between said connection and sliding blocks with a carrier-frame having an intermittent rotary movement, spindles having disks journaled around the carrier-frame, a rotating disk supported above the orbit of the spindles having disks, a plunger below the orbit of the spindles, and a cam adapted to raise the plunger as the spindles successively come over the plunger, substantially as shown and described.

11. The combination, in a machine of the character described, of sliding blocks, cams to reciprocate the sliding blocks, adjustable connections between the cams and sliding blocks, and yielding bearings between said adjustable connections and sliding blocks with a carrier-frame that has an intermittent rotary movement, spindles having disks journaled around the carrier-frame, a rotating disk supported above the orbit of the spindles having disks, a plunger below the orbit of the spindles, and a cam adapted to raise the plunger as the spindles successively come over the plunger, substantially as shown and described.

12. The combination, in a machine of the

character described, of a supporting machine-frame, a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the driving-shaft and the vertical shaft having cams thereon, a vertical shaft rotated by driving connection between it and the vertical shaft having cams thereon, a vertical shaft carrying crimping-disks, and reciprocating connection between the vertical shaft carrying crimping-disks and the cams on the vertical shaft that is operated by the driving-shaft, substantially as shown and described.

13. The combination, in a machine of the character described, of a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the driving-shaft and the vertical shaft having cams thereon, a vertical shaft rotated by driving connection between it and the vertical shaft having cams thereon, a vertical shaft carrying crimping-disks, sliding blocks having bores therein and having journals in which the vertical shaft carrying crimping-disks rotates, rods having one end in the bores of the sliding blocks and the opposite end threaded, bars into which the threaded ends of the rods enter, and wheels bored axially and threaded to screw upon said rods, substantially as shown and described.

14. The combination, in a machine of the character described, of a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the horizontal driving-shaft and the vertical shaft having cams thereon, a vertical shaft that is rotated by driving connection between it and the vertical shaft having cams thereon, a vertical shaft carrying crimping-disks, sliding blocks having bores therein and having journals in which the vertical shaft carrying crimping-disks rotates, rods having one end in the bores in the sliding blocks and the opposite end threaded, yielding bearings within the bores of the sliding blocks back of the rods, bars into which the threaded ends of the rods enter, and wheels bored axially and threaded to screw upon the said rods, substantially as shown and described.

15. The combination, in a machine of the character described, of a vertical shaft carrying a carrier-frame, disks having spindles passing through journals around the circumference of the carrier-frame, means for giving said shaft and frame an intermittent rotary movement, and means for raising successively the disks having spindles as the shaft and carrier-frame stop after each intermittent movement with a supporting machine-frame, a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the driving-shaft and the vertical shaft having cams thereon, a vertical shaft rotated by driving connection between it and the vertical shaft having cams thereon, a vertical shaft carrying crimping-disks, and reciprocating connection between the vertical shaft carrying crimping-disks and the cams on the vertical shaft that is operated by the driving-shaft, substantially as shown and described.

16. In a machine of the character described, a vertical shaft carrying a carrier-frame, disks having spindles passing through journals around the circumference of the carrier-frame, a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the driving-shaft and the vertical shaft having cams thereon, a vertical shaft supported above the orbit of the disks having spindles, driving connection between said shaft and the vertical shaft carrying cams, a vertical shaft carrying crimping-disks, reciprocating connection between the vertical shaft carrying crimping-disks and the cams on the vertical shaft that is operated by the driving-shaft, a plunger below the orbit of the disks having spindles, means for raising the plunger to elevate the spindles having disks as they successively come over the plunger, and driving mechanism between the horizontal driving-shaft and the vertical shaft to which the carrier-frame is attached, said driving mechanism being adapted to give the carrier-frame and the vertical shaft upon which it is fixed an intermittent rotary movement, substantially as shown and described.

17. The combination, in a machine of the character described, of a vertical shaft carrying a carrier-frame, a friction-face around the carrier-frame, a friction-bearing for the friction-face of the carrier-frame, disks having spindles passing through journals around the circumference of the carrier-frame, means for giving said shaft and frame an intermittent rotary movement, and means for raising successively the disks having spindles as the shaft and carrier-frame stop after each intermittent movement with a supporting machine-frame, a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the driving-shaft and the vertical shaft having cams thereon, a vertical shaft rotated by driving connection between it and the vertical shaft having cams thereon, a vertical shaft carrying crimping-disks, and reciprocating connection between the vertical shaft carrying crimping-disks and the cams on the vertical shaft that is operated by the driving-shaft, substantially as shown and described.

18. In a machine of the character described, a vertical shaft carrying a carrier-frame, a friction-face around the carrier-frame, a friction-bearing for the friction-face of the carrier-frame, disks having spindles passing through journals around the circumference of the carrier-frame, a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the horizontal driving-shaft and the vertical shaft having cams thereon, a vertical shaft supported above the orbit of the disks having spindles, driving connection between said shaft and the vertical shaft carrying cams, a vertical shaft

carrying crimping-disks, reciprocating connection between the vertical shaft carrying crimping-disks and the cams on the vertical shaft that is operated by the driving-shaft, a plunger below the orbit of the disks having spindles, means for raising the plunger to elevate the spindles having disks as they successively come over the plunger, and driving mechanism between the horizontal driving-shaft and the vertical shaft to which the carrier-frame is attached, said driving mechanism being adapted to give the carrier-frame an intermittent rotary movement, substantially as shown and described.

19. In a machine of the character described, a vertical shaft carrying a carrier-frame, disks having spindles passing through journals around the circumference of the carrier frame, a supporting machine-frame, a horizontal driving-shaft, a vertical shaft having cams thereon, driving connection between the driving-shaft and vertical shaft, a horizontal shaft above the machine-frame, driving connection between the vertical shaft carrying cams and the horizontal shaft above the machine-frame, a vertical shaft rotated by driving connection between it and the upper horizontal shaft, a vertical shaft carrying crimping-disks, reciprocating connections between the vertical shaft carrying crimping-disks and the cams on the vertical shaft that is operated by the driving-shaft, a plunger below the carrier-frame carrying the spindles with disks attached, means for raising the plunger to elevate the spindles and disks as they successively come over the plunger, and driving mechanism between the horizontal driving-shaft and the vertical shaft that carries the carrier-frame, the driving mechanism being adapted to give the can-carrier and the vertical shaft upon which it is fixed an intermittent rotary movement, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 23d day of January, 1892.

JOHN W. ROBERTS.

Witnesses:
J. A. OSBORNE,
MARTIN W. SANDERS.