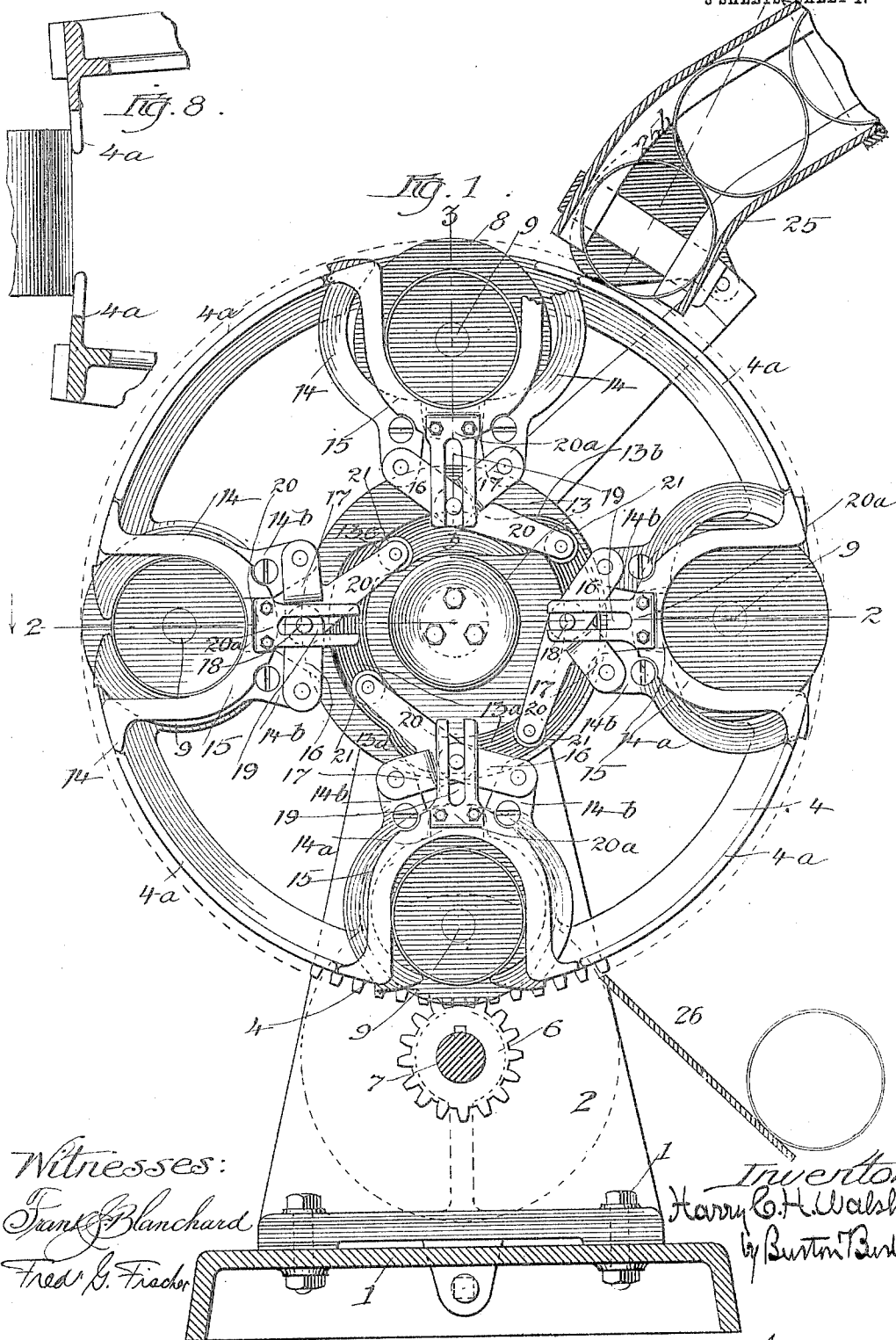


No. 804,642.

PATENTED NOV. 14, 1905.

H. C. H. WALSH.
CAN HEADING MACHINE.
APPLICATION FILED SEPT. 12, 1904.

3 SHEETS SHEET 1.



Witnesses:

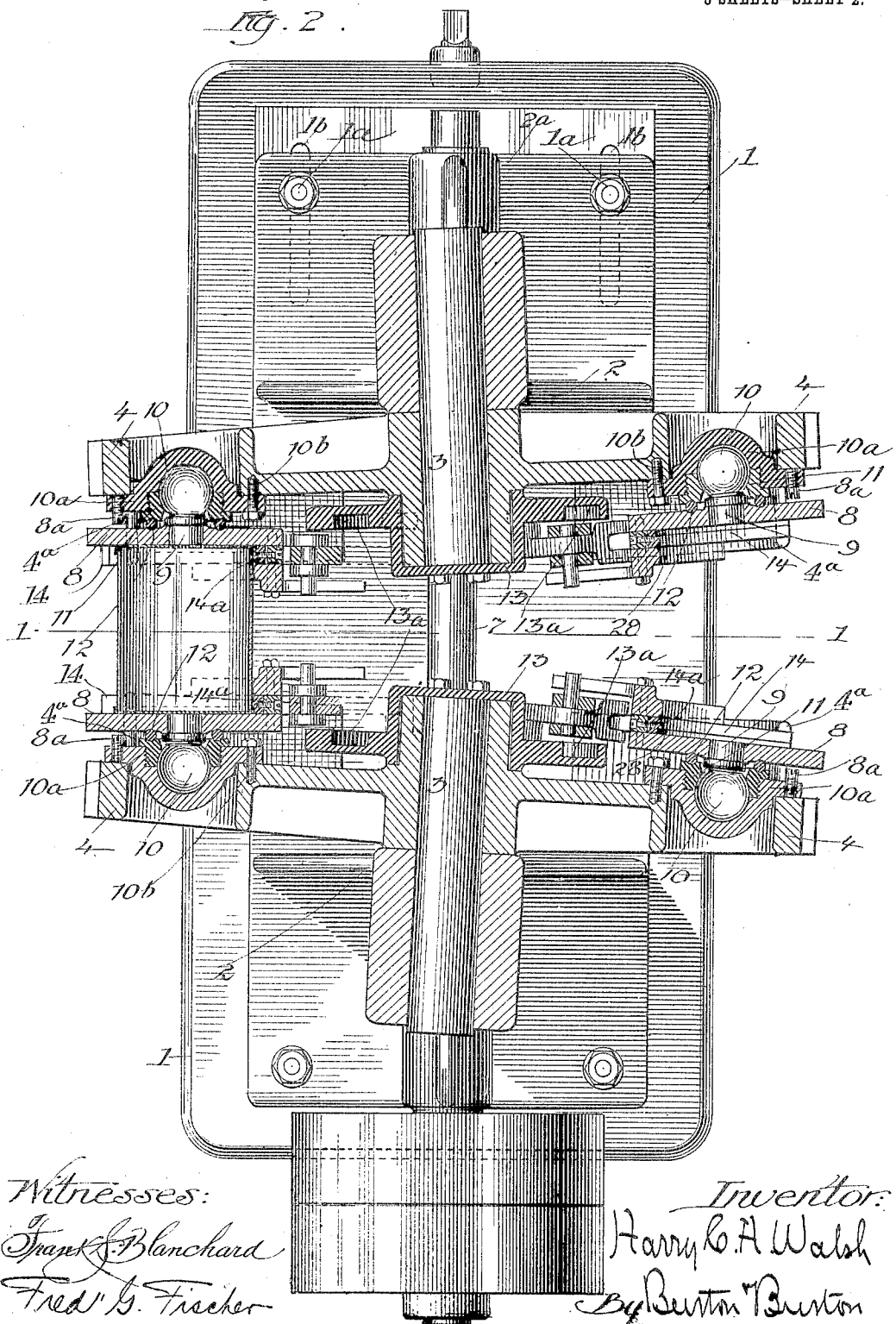
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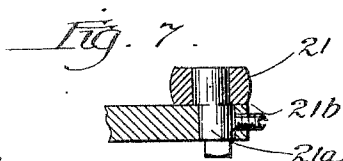
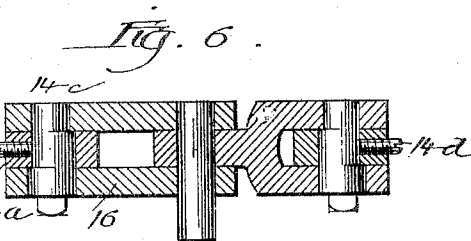
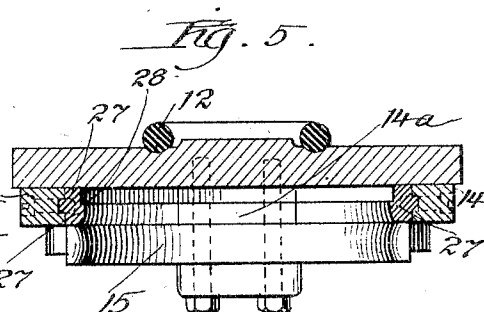
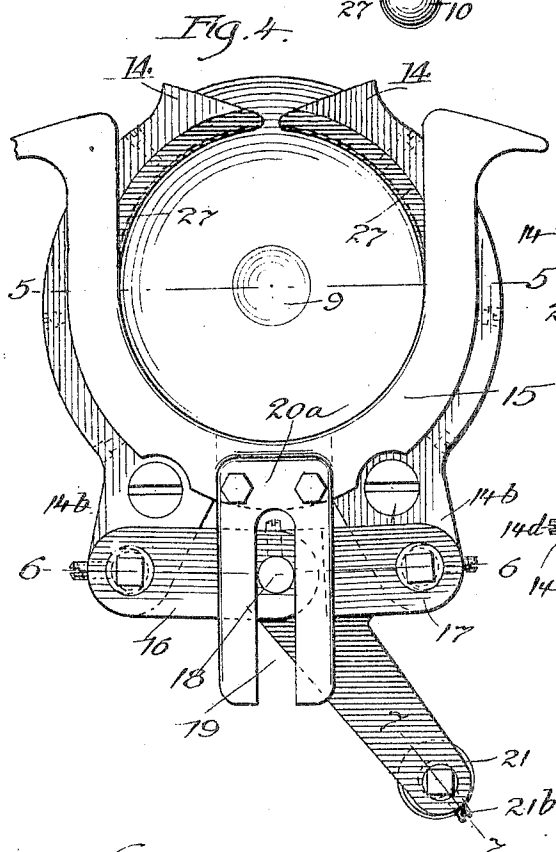
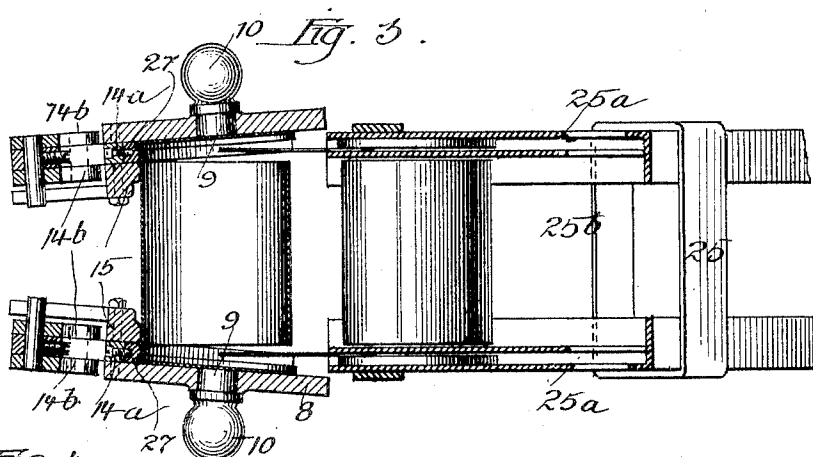
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3 SHEETS—SHEET 2.



H. C. H. WALSH.
CAN HEADING MACHINE.
APPLICATION FILED SEPT. 12, 1904.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HARRY C. H. WALSH, OF CHICAGO, ILLINOIS, ASSIGNOR TO CONSOLIDATED PRESS AND TOOL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CAN-HEADING MACHINE.

No. 804,642.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed September 12, 1904. Serial No. 224,175.

To all whom it may concern:

Be it known that I, HARRY C. H. WALSH, a citizen of the United States, residing at Chicago, Cook county, State of Illinois, have invented new and useful Improvements in Can-Heading Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved mechanism for applying the heads of cans to the bodies in an automatic manner—that is, so that neither the can bodies nor heads need to be handled from the time they are supplied into the machine until they are delivered fully assembled.

The invention consists in the features of construction of the machine which are set out in the claims.

In the drawings, Figure 1 is a section transverse to the axis of the operating-shafts between the two doors at the plane indicated by the line 1 1 on Fig. 2. Fig. 2 is a section at the line 2 2 on Fig. 1. Fig. 3 is a section at the line 3 3 on Fig. 1 when the parts are in position for receiving a can and heads. Fig. 4 is a detail elevation of the can-cradle and head-gripping jaws. Fig. 5 is a section at the line 5 5 on Fig. 4. Fig. 6 is a section at the line 6 6 on Fig. 4. Fig. 7 is a detail section at the line 7 7 on Fig. 4. Fig. 8 is a detail section radial with respect to the shaft through the can-receiving opening in the can-body flanges, showing the can-body thereon.

The machine shown in the above drawings comprises a base 1, having two standards or uprights 2 2, in which with axes in the same horizontal plane there are rigidly mounted stud-axes 3 3, slightly oblique to each other in such horizontal plane. These standards are relatively adjustable toward and from each other to adapt the machine to heading cans of different lengths, the adjustment being effected by the movability of one of the standards of the base, such standard being secured to the base by bolts 1^a, taking through slotted holes 1^b in the flange or foot-piece 2^a of the standard. On the axes 3 3 there are journaled header-gears 4 4, which, by reason of the obliquity of the axes, revolve in planes horizontally divergent, the divergence amounting to but a very few degrees, the two gears having their points of greatest separation and nearest approach in the horizontal diameter.

At the lower side they are both engaged and driven by equal pinions 6 6, fast on a horizontal shaft 7, mounted in standards 2 2. Preferably the header-gears 4 4 are made with their teeth direct spurs, the angle of divergence between their planes of rotation and those of their driving-pinions being provided for by the slight taper of the pinions only.

The header-gears carry on their proximate faces the opposing and corresponding members of four sets of heading devices. All of the eight members of these four sets are alike and description of one will suffice for all. They each comprise a disk 8, having a central stem 9, which has a terminal ball 10 for a ball-and-socket joint with the gear upon which the disk is mounted. These ball-and-socket joints permit adjustment of the disks, so that the opposite disks of each pair of headers shall be parallel at position of their nearest approach to each other, and when the header-gears 4 4 are adjusted on the base-frame so that the distance between the opposite disks 8 8 at this position of nearest approach is the exact length of the can when its heads are in place the disks of each pair would come into parallel position in accommodating themselves to the can, assuming the latter to have perfectly parallel heads and that the heads pass perfectly to their proper position on the body; but it is preferable to adjust the disks to their correct position of parallelism, and this is provided for by the adjusting-screws 8^a, set through the flange of the ball-seat 10^a, impinging on the gear-body and adapted to be screwed in and out when the corresponding securing-bolts 10^b are slacked, the latter being tightened after the proper adjustment is effected. Preferably the same provision for inaccuracy in the adjustment is provided by interposing between the outer side of the disk 8 and the cap 11 of the ball-and-socket bearing an annulus 12, which has slight capacity for yielding to pressure, the movement to which such yielding on one side or the other, may cause being accommodated by the ball-and-socket joint. To the end of such ball-and-socket joint there is secured rigidly a cam-plate 13, which is formed so as to cap the hub of the gear and which has its cam-track in a plane back of the end of the stud-axe. To the disk 8 there are pivoted the head-gripping jaws 14 14, which are adapted to pull over the face of the disk in their

opening and closing movement for gripping and releasing the heads, and between the jaws at the pivoted ends or side of the can-space there is a short annular segment 14^a, rigid with the disk, against which the jaws are stopped in their closing movement. Also rigid with the disk 8 there is a cradle member 15, in which one end of the can-body is lodged or cradled, as hereinafter explained, the two such cradle members, one in each of the two opposite headers, constituting together a complete cradle for the can-body. Each of the head-gripping jaws 14 has an ear 14^b, extending below its fulcrum on the plate, said ears on the two jaws diverging at closed position of the jaws. These ears are connected by two links 16 and 17, which are pivoted together at a point in a plane which bisects the can-cradle—that is, in a plane at right angles to that in which the pivots of the two jaws lie and bisecting the distance between said jaw-pivots. The pin or stud 18, which constitutes the pivotal connection of the two links 16 and 17, protrudes into a slot 19 in a stem 20^a, which is rigid with the cradle member 15 and which extends over the face of the link 16 for guiding the pivot 18 in the diametric plane mentioned. The link 17 has a lever-arm 20, which extends from the pivot 18 in a direction oblique to the link 17 and stands over the face of the cam-plate 13, having an abutment in the form of a stud and roll 21, taking into the cam track or groove 13^a.

It will be seen that the cam-plate 13 being fixed the rotation of the gear 4 will cause the lever 20, having its abutment following the course of the cam-track, to operate the two jaws 14 of the head-gripper similarly in opposite directions, causing them to approach and spread for gripping and releasing the heads, such action being made symmetrical about the plane diametrically through the can-cradle radial with respect to the axis of revolution of the gear 4 by the guidance of the pivot-stud 18 in the slot 19 of the stem of the body-cradle member 15. The form of the cam-track and the order and character of the movements of the head-clamping jaws which it is designed to produce will be hereinafter more particularly explained.

The gear 4 has a flange 4^a, of cylindrical character, interrupted at the proper point to accommodate each of the header members carried by the gear. Upon the standard there is supported a chute or guideway 25, having lateral ways 25^a 25^b for the can-heads, in which they roll on edge, the chute being sloped so that the heads may be delivered by gravity against the cylindrical flange 4^a of the gear, and between these lateral ways for the heads there is in the chute a body-way 25^b, in which the bodies are similarly delivered by rolling under the action of gravity against the flange 4^a, both bodies and heads being thus ready to enter between the header-gears 4 4 whenever

in the rotation of the gears a proper aperture is registered with the chute 25. It will be seen that by reason of the obliquity of the planes of rotation of the two gears and of their opposing faces to each other the body and the heads for the same being lodged in proper axial alinement between two opposed header members at a point in the circumference of the gears at which they are sufficiently separated to admit the body and heads thus will be forced toward each other, and the heads may be forced onto the bodies by the convergence of the opposed faces of the gears as they revolve synchronously in their slightly divergent planes of rotation and that the distances apart of the opposed members of the headers carried by the opposite gears at their nearest approach being suitably conformed to the longitudinal dimension of the can the heads may be forced completely onto the bodies at this point of nearest approach and that thereafter upon the continued rotation the divergence of the gears will permit the can thus completely assembled to be delivered. Preferably, as stated, the gears are mounted with their proximate point at one end of the horizontal axial plane, so that their point of widest separation is at the opposite side of the axis in the same horizontal plane, and the supply-chute 25 is located so as to deliver the can bodies and heads to the headers at a point considerably above the point of widest separation, and there is provided at a corresponding point below the horizontal plane a chute or inclined way 26, onto which the completely-assembled cans are delivered. The cam-track and jaw-operating devices are arranged so that the jaws are wide open ready to admit the can bodies and heads when the headers come opposite the discharge-mouth of the feeding-chute 25. The bodies roll onto the cradle members 15 15, which support said bodies at the two ends, and these cradle members are made with their outer or upper periphery, which affords the lodgment for the can-bodies, curved to conform to the size of the can, and said cradle members are made readily removable, so that others of suitable dimensions in this respect may be substituted in changing from one size of can to another.

The header-jaws and the intermediate annular segment 14^a are provided with facing or lining pieces 27 27, which are removable, and since the inner diameter of these lining-pieces must conform to the size of the heads to be gripped they will be provided in interchangeable sizes corresponding to the interchangeable cradle-pieces 15. As the bodies roll into their seats in the cradle members 15 the heads similarly roll between the spread jaws 14 14, in which the lining-pieces 27 are formed with a rabbet 28, which in width and depth corresponds to the width and thickness, respectively, of the flange of the can-head, so that the can-head is accurately lodged in said rabbet, resting

against the face of the disk 8. The lining-pieces 27 at their sides toward the body receptacle or cradle are slightly flared, so that the body resting in the cradle may have its end guided accurately into place within the encompassing flange of the head which rests in the rabbet 28, as stated. Before the body is thus forced within the flange of the head at each end the rotation of the gear causes the jaws to be closed together by reason of the inwardly-trending portion 13^b of the cam-track 13^a, which operates in a manner which can be clearly understood from Figs. 1 and 4 through the symmetrically-disposed links 16 and 17, above described.

The cam-track is calculated with respect to the obliquity of the two gears 4 4, so that the head-gripping jaws will be closed together sufficiently to insure an accurately-concentric position of the can heads and bodies before the approach of the heads has been sufficient to bring them into position where if not concentric their flanges might meet edgewise the end of the head, for it will be seen from Fig. 3 that considerable approach of the two disks carrying the opposite heads may occur before the spaced allowance between the opposite header members will be taken up. The header-jaws will be completely closed, gripping the heads by the time the can and heads have been carried through half the distance from the point at which they are received to the point of nearest approach of the gears, and during the remainder of their progress to that point of nearest approach the heads will be advanced onto the bodies, both heads and bodies being held in accurately concentric relation, so that the bodies enter the flanges of the heads and are forced thereinto, notwithstanding by construction the can-heads fit the bodies tightly. Immediately upon reaching the position indicated at which the can-heads are forced fully onto the bodies the grip of the head-clamping jaws is relaxed quickly by the abrupt divergence at 13° of the cam-track, so that there shall be no danger of pulling the heads off the bodies as the gears diverge from that point in the further rotation. Slight relaxation, caused by the abrupt deflection 13°, is all that is necessary to prevent this result, and further opening of the jaws is not desirable at this stage because it would permit the cans to partly escape prematurely; but from the time at which the can occupies the lowest position in its path directly over the shaft 7 the jaws begin to open rapidly under the action of the outer deflection 13^d of the cam-track, and they are wide open by the time the gap near the cylindrical flange 4^a passes by the chute 26, and at this position the cans roll out onto the chutes. No change in the position of the jaws occurs from this point on until after another can is received and the several movements are repeated.

For the purpose of accurate adjustment of

the several parts of the head-clamping jaws so that their work will be performed accurately and the heads lodged and held perfectly concentric with the bodies, I make the pivot which connects the jaw to the operating-link in each instance with the portion which is adapted to be made fast to one of the two pivoted parts eccentric with respect to the portion seated in the other part, so that by turning the pivot in the part in which it is adapted to be made fast the pivotal center may be adjusted in accordance with the eccentricity. This may be clearly seen in Fig. 6 with respect to the pivots 14^c, which connect said clamping-jaws 14 to their respective operating-links 16 and 17. It is most convenient to secure the pivots fixedly in the ears 14^b of the jaws, which is done by the set-screws 14^d. (See Fig. 6.) In order to make the action of the cam-track upon the clamping devices similarly adjustable for accuracy, I mount the abutment, consisting of stud-roll 21, with similar capacity for adjustment, the stud or pivot-pin 21^a having the portion on which the roll is mounted eccentric with respect to the portion that is secured in the lever-arm 19 by the set-screw 21^b. This is clearly seen in Fig. 7.

I claim—

1. A can-heading machine comprising a pair of header-wheels mounted facing each other for rotation about axes slightly oblique; means for revolving such wheels synchronously; head and body holding devices in opposed positions on the proximate faces of the wheels; means for delivering can heads and bodies to such holding devices, and means for receiving cans therefrom at separate points in the circumference of the wheels, both remote from the point of nearest approach of the wheels.

2. A can-heading machine comprising a pair of wheels mounted facing each other for rotation in slightly divergent planes; means for rotating the wheels synchronously about their respective axes; body and head holding devices for the two ends of the can mounted in opposed positions on the proximate faces of said disks; a chute for delivering heads and bodies to said holding devices and a cylindrical guard carried by each wheel for obstructing said chute, said guard being apertured in radial line with the several pairs of body and head holding devices.

3. A can-heading machine comprising two wheels whose axes intersect at a widely-obtuse angle between the wheels whereby the wheels are adapted to revolve in slightly-divergent planes facing each other; can and body holding devices for the two ends of the can mounted with capacity for universal angular accommodation at opposed positions upon the facing sides of the wheels respectively; means for rotating the two wheels synchronously and for adjusting them toward and from each other.

4. A can-heading machine comprising a pair

of wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective
 5 axes; head-holding devices mounted at opposed positions on the proximate faces of the respective wheels, and body-holding devices mounted and rotated synchronously with the wheels between said head-holding devices and
 10 means for adjusting the wheels toward and from each other.

5. A can-heading machine comprising a pair of wheels mounted for rotation about axes which intersect at widely-obtuse angles between the wheels; means for rotating the
 15 wheels synchronously about their respective axes; head-holding devices mounted at opposed positions on the proximate faces of the respective wheels with capacity for universal angular accommodation; body-holding devices
 20 mounted and rotated synchronously with the wheels between said head-holding devices and means for adjusting the wheels toward and from each other, the head-holding devices
 25 comprising clamping-jaws adapted to open at their outer side for receiving and delivering; cams fixed with respect to the bearings of the wheels and connections by which the cams open and close the jaws as the wheels revolve.

30 6. A can-heading machine comprising a pair of wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective
 35 axes; head-holding devices mounted by ball-and-socket joints at opposed positions on the proximate faces of the respective wheels; body-holding devices mounted and rotated synchronously with the heads between the
 40 head-holding devices, said head-holding devices comprising clamping-jaws adapted to open opposite the axis to receive the heads, and cams fixed with respect to the bearings of the respective wheels to close and open the
 45 clamping-jaws as the wheels revolve.

7. A can-heading machine comprising a pair of wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; means for rotating the
 50 wheels synchronously about their respective axes; head-holding devices mounted at opposed positions on the proximate faces of the respective wheels, and means for carrying bodies lodged between the opposed head-holding
 55 devices as the wheels rotate synchronously, the head-holding devices being mounted at such angle to the plane of rotation of the respective wheels which carry them as to be parallel to each other at their point of nearest
 60 approach in the paths of rotation of the wheels.

8. A can-heading machine comprising a pair of gear-wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; a shaft transverse to said
 65 wheels and pinions on said shaft engaging

said first-mentioned wheels respectively and adapted to rotate them synchronously about their respective axes; disks mounted in opposed positions on the proximate faces of the
 70 respective wheels with capacity for universal angular accommodation, and means for carrying the can bodies and heads lodged between said opposed disks as the wheels rotate.

9. A can-heading machine comprising a pair of wheels mounted for rotation about axes
 75 which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective axes; disks mounted at opposed positions on the proximate faces of the two wheels at such
 80 angle to the planes of rotation of the wheels respectively as to bring the disks parallel to each other at their point of nearest approach in their respective paths of movement as carried by the rotating wheels, and means for
 85 carrying the can elements which are to be united lodged between the opposed disks as the wheels revolve.

10. A can-heading machine comprising a pair of wheels mounted for rotation about axes
 90 which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective axes; disks mounted with ball-and-socket
 95 joints in opposed positions on the proximate faces of the respective wheels and means for carrying the can elements which are to be united lodged between the opposed disks as the wheels revolve.

11. A can-heading machine comprising a
 100 pair of wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective
 105 axes; disks mounted with ball-and-socket joints in opposed positions on the proximate faces of the respective wheels and means for carrying the can elements which are to be united lodged between the opposed disks as the wheels revolve, the bearing for one of said
 110 wheels being adjustable to permit movement toward and from the other.

12. A can-heading machine comprising a pair of wheels mounted for rotation about
 115 axes which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective axes; disks mounted at opposed positions on the proximate faces of the respective wheels; head-holding jaws pivoted on the face of the
 120 disks and having lever extensions inward from their pivots; a pair of links pivoted together and connected respectively to the lever extensions of the jaws, one of said links having an abutment-carrying lever-arm and a
 125 cam fixed with respect to the bearing of the wheels for engaging the abutment on said lever-arm to operate the jaws as the wheel revolves.

13. A can-heading machine comprising a 130

pair of wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective axes; disks mounted with capacity for universal angular accommodation at opposed positions upon the proximate faces of the wheels; a pair of head-clamping jaws pivoted upon the face of each disk, the jaws having each a lever extension inward from its pivot; a pair of links pivoted together and connected to said lever extensions respectively; a guide rigid with the disk having a radial slot in which the two links are guided at their pivot to each other, and means for operating the links to move them inward and outward at their said pivot as the wheel revolves.

14. A can-heading machine comprising a pair of wheels mounted for rotation about axes which intersect at a widely-obtuse angle between the wheels; means for rotating the wheels synchronously about their respective axes; head-holding devices mounted at opposed positions on the proximate faces of the respective wheels, said devices comprising each a disk rigid with the wheel; a pair of jaws symmetrically positioned and fulcrumed on the disk and having symmetrically-disposed lever extensions extending inward from their pivots; a pair of links pivoted together and connected with said lever extensions respectively; a body-cradling element mounted rigidly on the disk proximate to the jaws at the opposite side thereof from the disk, having a stem provided with a radial slot, the two links having their pivot guided in said slot and means for moving said pivot inward and outward as the wheels revolve.

15. In a can-heading machine, head-clamp-

ing jaws having removable lining-pieces for fitting the heads in respect to diameter, and removable body-holding elements mounted fixedly with respect to the pivots of the jaws intermediate the same.

16. In a can-heading machine, a head-holding device comprising a disk against which the heads may lodge; clamping-jaws pivoted for vibration over the face of the disk; connected links for operating the jaws and means for actuating the links to cause such operation, the pivots connecting the links to the jaws being mounted eccentrically in the two parts thus connected, and means for securing them adjustably in one of said parts.

17. In a can-heading machine in combination with a rotating wheel; a head-holding device comprising a disk mounted on the face of the wheel; a pair of clamping-jaws pivoted for vibration over the face of the wheel; a pair of connected links connected to said jaws respectively for operating them; means actuating the links for such operation comprising a cam fixed with respect to the bearing of the wheel; a lever connected with the links and having a stud and roll engaging the cam for actuating the links, the stud being adjustably mounted in the lever eccentrically with respect to the roll, and means for securing the stud in its adjustment.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 27th day of August, 1904.

HARRY C. H. WALSH.

In presence of—

J. S. ABBOTT,

FRED G. FISCHER.