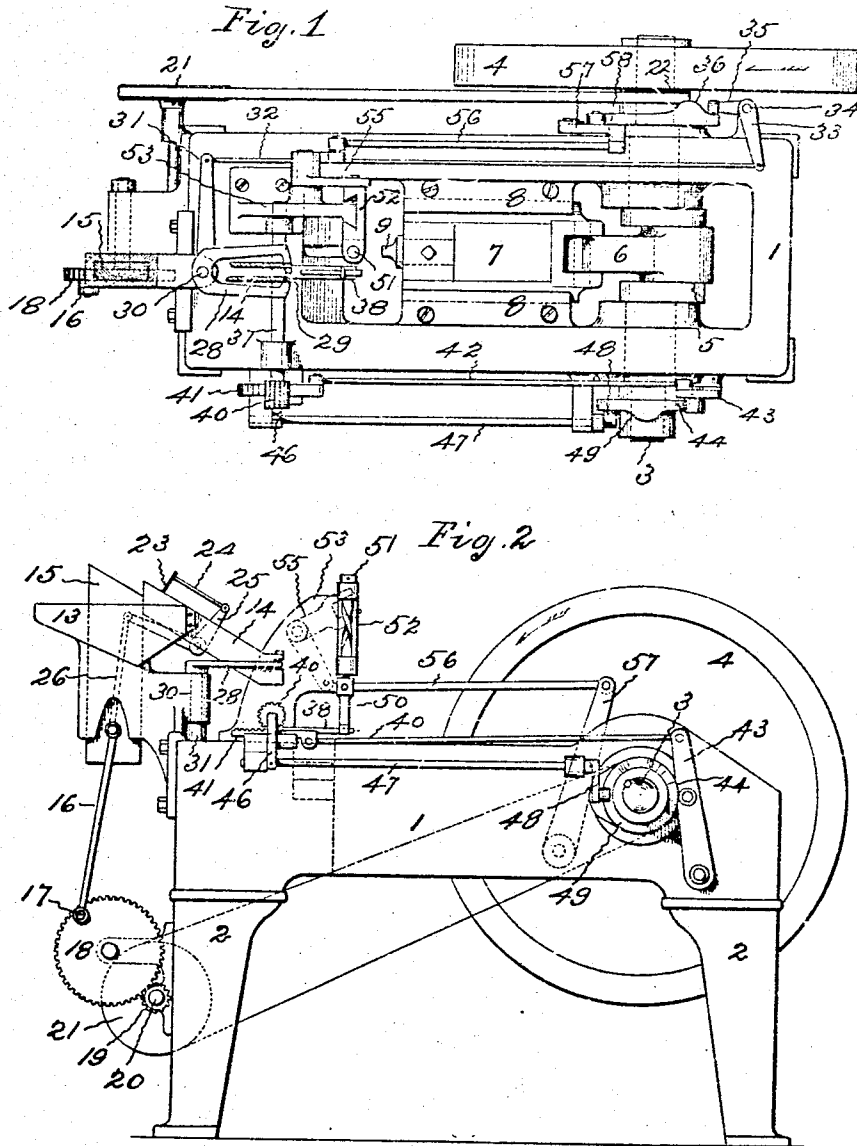


A. G. CAMPBELL.
MACHINE FOR HEADING METAL BLANKS.
APPLICATION FILED APR. 28, 1909.

959,454.

Patented May 31, 1910.

4 SHEETS—SHEET 1.



WITNESSES:

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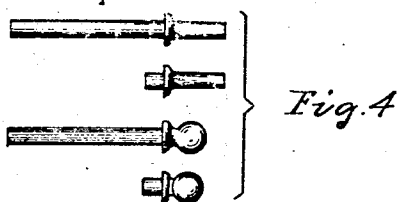
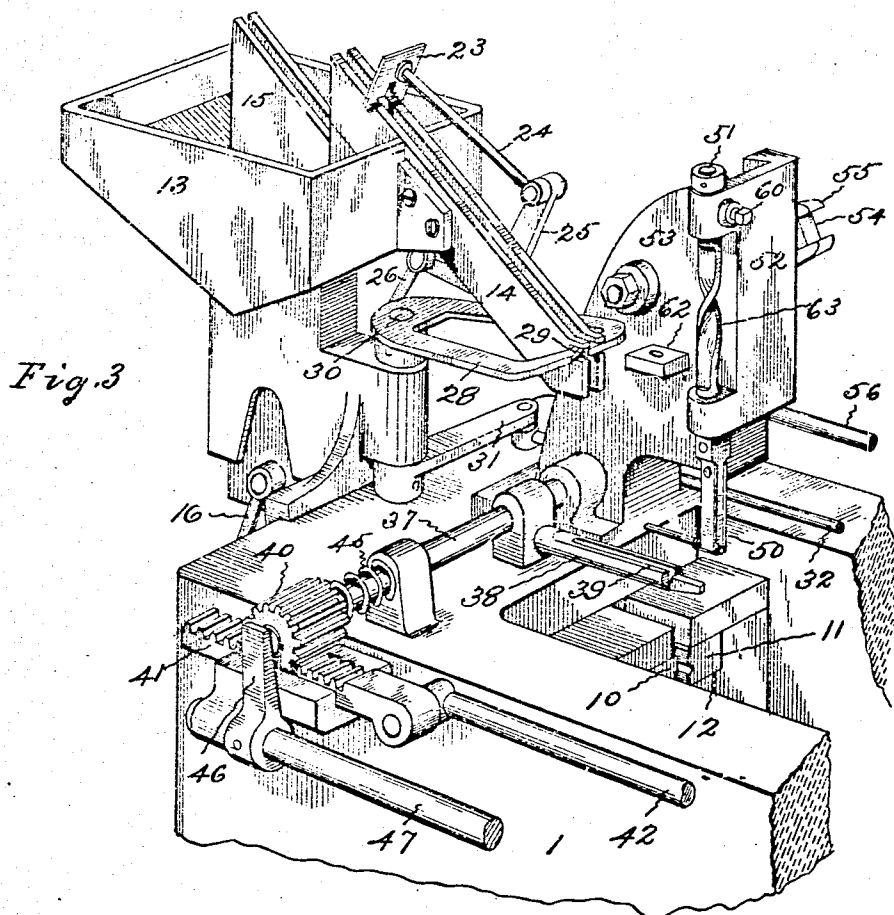
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4 SHEETS—SHEET 2.



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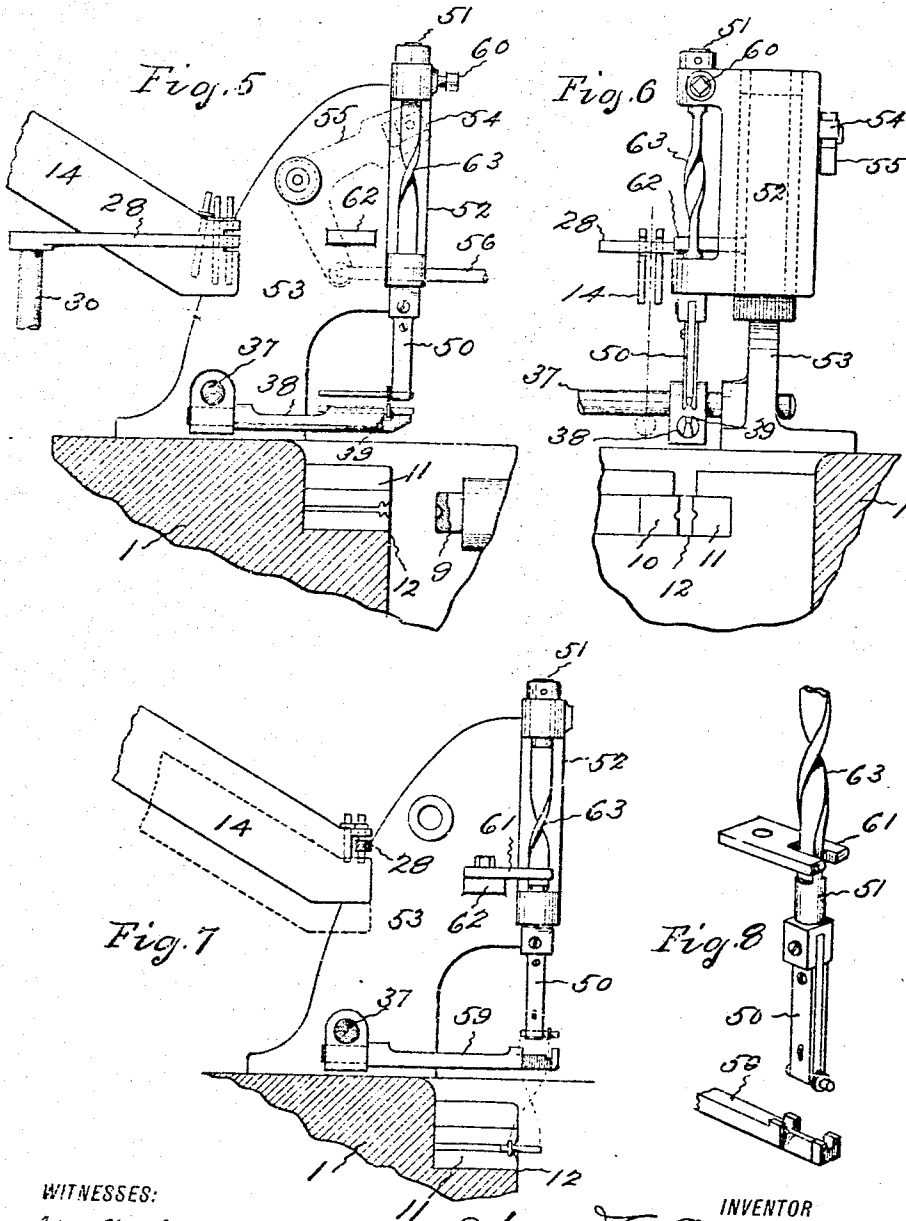
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4 SHEETS—SHEET 3.



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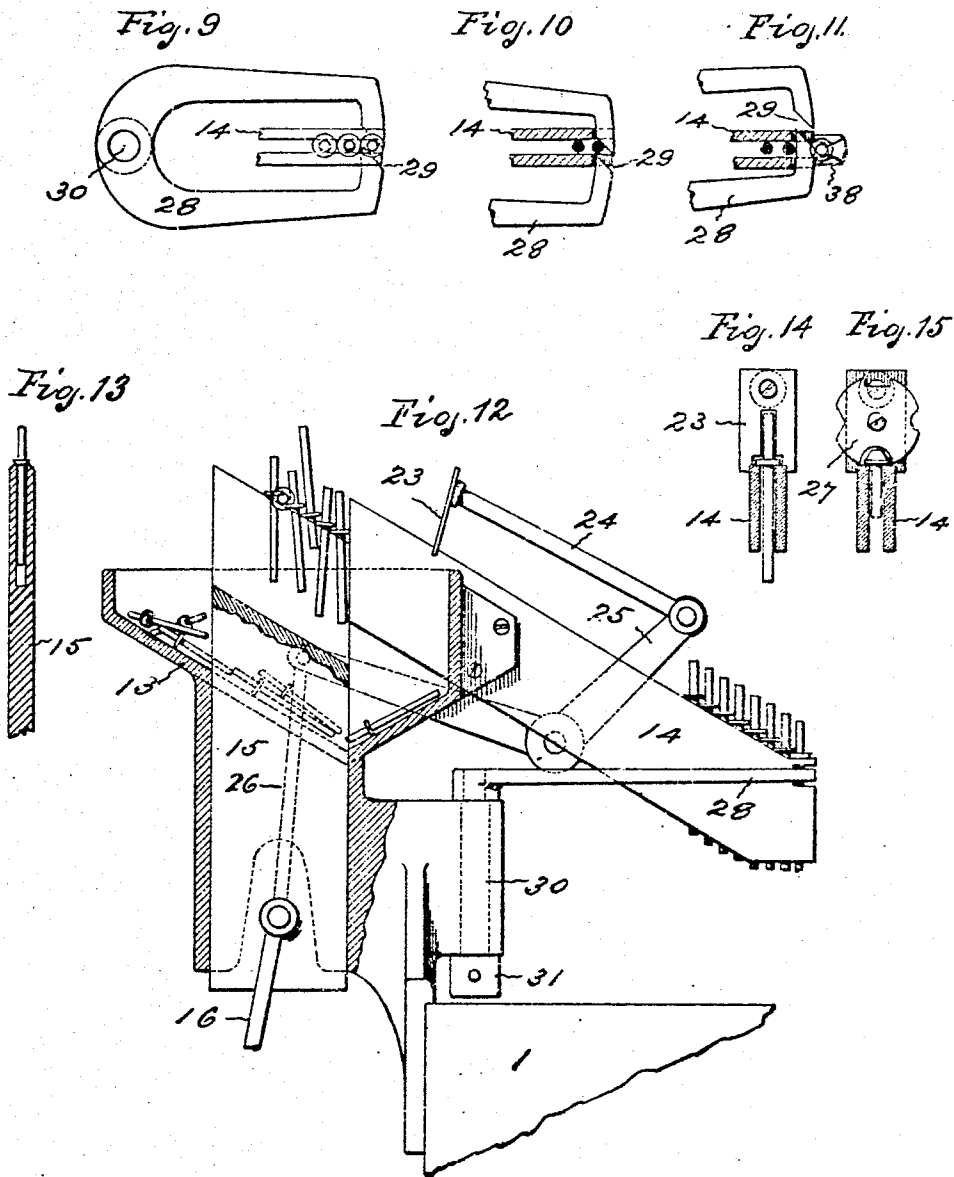
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR HEADING METAL BLANKS.

959,454.

Specification of Letters Patent.

Patented May 31, 1910.

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To all whom it may concern:

Be it known that I, ANDREW C. CAMPBELL, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Machines for Heading Metal Blanks, of which the following is a specification.

This invention relates to a machine for heading or re-heading pieces of metal, or blanks, which have previously been upset, or swaged, in another machine and provided between their ends with collars or enlarged sections.

The machine illustrated as embodying invention, is more particularly designed for forming the balls on hinge pins, that is, those pins which are used for pivoting together hinge butts. Such pieces are of different sizes and lengths, and each set comprises two pieces of materially different lengths. The pintle proper, or hinging pin, which is usually inserted into the butts from the top, is relatively long and has a ball shaped head at its upper end, while the tip pin, which is inserted from the bottom, is relatively very much shorter, and has a ball shaped head at its lower end. The present machine is one which is so constructed that it may be adjusted to automatically feed, and form the balls on, either the long pintle pins, or the short tip pins. The section of the blank from which the ball of the pintle pin is formed, is relatively very much shorter, and consequently of less weight, than the pintle section of the same blank. While on the other hand, the section of the blank from which the ball of the tip pin is formed, is relatively longer and of greater weight, than the pintle section of the same blank. In this machine the blanks are picked up from a promiscuous mass in a hopper and allowed to slide down a trough shaped track, hanging vertically by their collars. Due to the relatively different weights of the sections, gravity causes the pintle pin blanks to hang with the ball sections up, and causes the tip pin blanks to hang with the ball sections down, that is, the pintle pins and tip pins hang opposite ends up, as they pass down the track.

The object of the invention is to provide a machine of this nature, with mechanism which only permits blanks that are properly placed, that is, with the right ends up, to

pass down the inclined track; and which can be adjusted so as to take either pintle or tip blanks, of any size and length, from the track, and carry them, one at a time, to the die, with the correct ends for forming the balls properly presented to the punch.

Figure 1 of the accompanying drawings shows a plan of so much of a heading machine as is necessary to a comprehension of the present invention. Fig. 2 shows a side elevation of the same. Fig. 3 shows, on larger scale, a perspective view of the hopper, die, and mechanism which embodies this invention for transferring blanks from the hopper to the die. Fig. 4 shows a side view of such a pintle pin blank and tip pin blank, as are designed to be fed into, and to be operated upon, by the machine illustrated, and also a completed pintle pin and tip pin, such as are produced from these blanks by the operation of this machine. Fig. 5 shows a side elevation of the feed mechanism of this machine, adjusted for carrying pintle pin blanks to the die. Fig. 6 shows a front view of the same. Fig. 7 shows a side view of the same mechanism, adjusted to feed tip pin blanks to the die. Fig. 8 shows a perspective view of a part of the feed mechanism illustrated in Fig. 7. Fig. 9 shows a plan of a gate or cut-off which may be used in this machine for separating the lowest blank from the others in the track, and passing it to the carrier. Fig. 10 shows a plan of a portion of the cut-off in another position. Fig. 11 shows a similar view of the same parts in still a different position. Fig. 12 shows a sectional elevation of the pick-up mechanism illustrated in connection with this machine, and the comb or gate, which is provided to make certain that only such blanks as are right end up will pass down the track to the cut-off. Fig. 13 shows a sectional view of the upper end of the hopper elevator, and a pintle pin being carried upwardly thereby. Fig. 14 shows a section of the track with a pintle pin blank supported thereby, and a comb of such shape, as might be employed to prevent pintle blanks from passing down the track the wrong end up. Fig. 15 shows a form of gate which might be provided to insure the correct feeding of blanks having various shaped heads.

The invention is applicable to either a single or multiple stroke heading machine of the common type, using solid or open dies.

The frame 1, of the machine illustrated, is supported upon legs 2. This frame, near one end, in suitable bearings, supports the main shaft 3, which, upon one end has the ordinary fly wheel 4 and between the sides of the frame has a crank 5. A pitman 6 connects the crank with a gate 7 that is movably mounted in ways 8 arranged along the inner walls of the sides of the frame. This gate carries a punch 9 of the proper shape and construction to form the required head on the end of the blank that is held in the die. The die shown is of the open type and comprises two sections 10 and 11, mounted in a die recess 12, at the end of the frame.

Any common mechanism may be employed for separating the die sections to permit the insertion and removal of the blank and to close the die sections for holding the blank while its head is being formed. As this mechanism forms no part of the present invention, it is not illustrated herein.

Mounted on the end of the frame is a hopper 13. Into this hopper, which may be any desired shape, the blanks are thrown promiscuously. In the organization shown, a trough-shaped inclined track formed of two plates 14, slightly separated, is arranged to project from the front of the hopper over the top of the end of the frame. Arranged to move up and down in the hopper at the end of the track is an elevator 15. This elevator has an inclined, grooved upper end which, when the elevator is in its highest position, conforms to and provides an extension of the track. The elevator may be connected by a link 16 with a crank pin 17 on a gear 18, that may be rotated by a pinion 19 on a shaft 20. This shaft may have a pulley 21, which may be belted to a pulley 22 on the main shaft. By this mechanism, the elevator may be raised and lowered at intervals. When it is raised through the promiscuous mass of blanks in the hopper, some are picked up by the trough shaped upper end and carried, hanging by their collars, to the end of the track, down which they slide. The tendency of the blanks is to hang with the long or heavy ends down, and the short or light ends up. Occasionally, however, blanks are improperly picked up, some will lie across the trough, and others will stand wrong end up, as shown in Fig. 12. To prevent the blanks which are improperly located, from sliding down the track, a comb 23, having an opening so shaped that it will only permit the passage through it of the ends of the blanks properly located, is arranged to move along the upper edge of the track, as shown in Figs. 3 and 12. This comb is desirably mounted on a rod 24 that is pivoted to the end of an angle lever 25, which may be connected by a link 26 with the elevator. By this means, as the elevator rises and falls, and the lever

is oscillated, the comb is moved back and forth the track, and knocks back into the hopper those blanks which are improperly located, and only permits the passage through it and down the track of those blanks which are properly located. A comb of such shape as will permit the passage down the track of properly arranged pintle pins, is shown in Fig. 14. The comb may be provided with a rotary gate 27, having openings in its periphery of different contours, as shown in Fig. 15. Such a gate may be turned to different positions, according to the shape of the ends of the particular blanks that are at the time being passed from the hopper into the machine.

Movable horizontally back and forth across the lower end of the track of the machine shown, is a yoke-shaped gate or cut-off 28. The ends of this cut-off are beveled in such a way as to provide an angular or oblique groove 29 between them. When the cut-off is in one position, one end extends across the lower end of the track and prevents the blanks from sliding out. When it is moved to another position, the beveled point of the other end passes between the first and second lowest blanks. This separates the first blank from the second and pushes the first out, holding the others back in the track, as shown in Figs. 9, 10 and 11. The cut-off shown, is mounted on a rock shaft 30, which is supported by the hopper bracket. The lower end of this rock shaft has a rocker arm 31, that is connected by a rod 32 with an arm 33 on the end of a shaft 34. On this shaft is a lever 35 that is adapted to be oscillated by the cam 36 on the main shaft at the right time, to cause the cut-off to separate and pass outward the lowest blank.

Mounted horizontally on top of the die end of the frame is a shaft 37. This shaft has an arm 38 provided with a groove 39, which is shaped to receive and carry blanks from the track. On the outer end of this shaft is a wide pinion 40, meshing with which is a rack 41. This rack is connected by a rod 42 with a lever 43 that is oscillated by a cam 44 on the main shaft. This means rotates the shaft on its longitudinal axis and turns the carrier arm through an arc of substantially 90 degrees from a vertical position, opposite the end of the track, to a horizontal position. The shaft with the carrier arm not only has a rotation in its bearings, but it is capable of being moved longitudinally, for the purpose of moving the carrier arm transversely. A spring 45 is arranged to thrust the shaft in one direction. Pressing against the outer end of the shaft is a rocker arm 46, on a shaft 47, that has an arm 48, which is rocked in one direction by a cam 49 on the main shaft. This cam at the proper time, causes the shaft to

be pushed inwardly so as to carry the arm transversely, while it is in a horizontal position, from the plane of the track to the plane of the die opening, as shown in Fig. 6.

5 When the cam permits, the spring returns the shaft and the arm to its position in the plane of the track. This mechanism turns the carrier arm up to the lower, or delivery end of the track and holds it there while 10 the cut-off places one of the blanks in the arm. The arm is then turned down to a horizontal position in the plane of the track, and afterward moved sidewise to the plane of the die opening and beneath the fingers 15 which come down, pick up the blank from the carrier arm, and then carry it down to the die opening.

The fingers 50 are attached to the end of a shaft 51 that is supported by a slide 52.

20 This slide is movable up and down on a bracket 53, mounted on top of the end of the frame. Attached to one side of the finger slide is a block 54, engaging which is the forked end of an angle lever 55, that is 25 pivoted to the slide bracket. This lever is connected by a rod 56 with a lever 57, that is oscillated by a cam 58 on the main shaft. By this means the slide, at the proper time, is dropped down so that the fingers will 30 spring onto and grasp a blank held beneath them by the carrier arm. The fingers are raised until the carrier arm is moved transversely out of the way, and then they are lowered, carrying the blank down between 35 the die sections. After the die grips the blank, the fingers are raised sufficiently high to permit the carrier arm to bring another blank beneath them.

As previously stated, gravity causes the 40 pintle pins to hang in the track with the head ends up, for the reason that the pintle section of these blanks is the longer and heavier. As the pintle blank hangs with the head end up, the carrier arm brings it down 45 and presents the head end to the fingers. When the fingers have the head end of the blank in their grasp, they place the pintle section of the blank in the die opening so as to leave the head end of the blank projecting 50 out in position to be acted upon by the punch. The case is different when tip pin blanks are being fed into the machine, for with these blanks, as shown in Fig. 4, the head section is longer than the pintle section. Consequently, under the influence of 55 gravity, these blanks will slide down the track with the pintle section up, instead of the head section up, as was the case with the long pins. When the blanks hang this way, the carrier arm takes them and carries them down with the head section turned 60 in, and the pintle section projecting out toward the punch, just the reverse from the way the long pins are brought down. The 65 fingers must, however, grasp the blanks by

the head section in both cases, so as to pass the pintle section into the die opening, and leave the head section projecting outwardly in order that it may be acted upon by the punch. To accomplish this, in place of the 70 carrier arm 38, of sufficient length to place the head sections of the long blanks beneath the fingers, as shown in Fig. 5, a slightly longer carrier arm 59 is substituted. This longer carrier arm brings the blanks down 75 so that the head ends, which are inside, instead of outside, as before, are beneath the spring fingers, as shown in Fig. 7. To accommodate the elongated carrier arm, the end of the track must be elevated slightly, as indicated in Fig. 7. The spring fingers 80 then descend, grasp the blank, and are raised, but when they descend with the short blank held in this way, they must be rotated 180 degrees, so as to, as before, carry the 85 pintle section of the blank into the die opening, and leave the head section projecting in position to be acted upon by the punch, as shown in Fig. 7.

When long blanks are being fed, and the 90 fingers are not required to turn, a screw 60 is set in against the shaft to prevent it from rotating, as the slide moves up and down, as shown in Figs. 5 and 6. When short blanks are being fed, this set screw is removed or 95 loosened, and means, such as a fork 61, is fastened to the lug 62 on the slide bracket so as to embrace the spiral section 63 of the shaft, as shown in Figs. 7 and 8. With this 100 adjustment, when the slide is depressed for the purpose of carrying down a blank, the shaft is rotated 180 degrees so that the fingers will present the blank to the die the other end to.

By the employment of this invention, 105 blanks of various lengths and sizes having collars or enlargements of different shapes, and differently located with relation to the lengths of the blanks, may automatically be correctly presented and accurately carried 110 to the die with either the long or the short section projecting toward the punch.

The invention claimed is:

1. In a header in combination, a blank supporting track, a cut-off movable across 115 the delivery end of the track, a carrier movable from a substantially horizontal to a substantially vertical position and vice versa toward and from the delivery end of the track, reciprocating fingers, and mechanism 120 for moving the fingers to and from, then down past the carrier.

2. In a header in combination, a blank supporting track, a cut-off movable across 125 the delivery end of the track, a carrier movable from a substantially horizontal to a substantially vertical position and vice versa toward and from the delivery end of the track, reciprocating and rotatory fingers, mechanism for moving the fingers to and 130

from, then down past the carrier, and mechanism for rotating the fingers on their longitudinal axis as they reciprocate.

3. In a header in combination, a blank 5 supporting track, a cut-off movable across the delivery end of the track, a carrier movable from a substantially horizontal to a substantially vertical position and vice versa toward and from the delivery end of the 10 track and also movable transversely of the plane of the track, mechanism for moving the carrier to and from the track and also transversely, reciprocatory fingers, and mechanism for moving the fingers to and from, 15 then down past the carrier.

4. In a header in combination, a blank supporting track, a cut-off movable across the delivery end of the track for feeding blanks therefrom, a carrier movable toward 20 and from the delivery end of the track for receiving the blanks fed by the cut-off, mechanism for moving the carrier in a vertical plane to and from the delivery end of the track, mechanism for moving the carrier 25 transversely of the track in a horizontal plane, fingers for taking blanks from the carrier, mechanism for moving the fingers longitudinally to and from, then down past the carrier, and mechanism for rotating the 30 fingers on their longitudinal axis as they move longitudinally.

5. In a header in combination, a blank supporting track, a carrier movable toward and from the delivery end of the track, a 35 cut-off with an oblique opening movable back and forth across the delivery end of the track for forcing blanks, one at a time, from the track to the carrier, and rotatory and reciprocatory fingers movable toward 40 and from the carrier for taking blanks therefrom.

6. In a header in combination, a blank supporting track, a clearance gate movable adjacent to the upper edge of the track, a 45 cut-off movable across the delivery end of the track, a carrier movable toward and from the end of the track, fingers, and mechanism for reciprocating the fingers to and from the carrier.

50 7. In a header in combination, a carrier, mechanism for oscillating the carrier, mechanism for moving the carrier transversely,

fingers, and mechanism for reciprocating the fingers to and from the carrier.

8. In a header in combination, a blank 55 carrier, mechanism for moving the carrier, fingers for picking a blank from the carrier, mechanism for reciprocating the fingers to and from the carrier, and mechanism for rotating the fingers on their longitudinal 60 axis as they reciprocate.

9. In a header in combination, a vertically movable slide, mechanism for reciprocating the slide, a shaft movable vertically with the slide, mechanism for rotating the shaft on 65 its axis as it moves with the slide, and fingers connected with the shaft.

10. In a header in combination with the punch and die, a track for supporting blanks located at one side of the plane of the punch 70 and die, means for cutting off the blanks from the track, one at a time, means for carrying the blanks from a vertical position to a horizontal position in the plane of the track, mechanism for moving said 75 means laterally from the plane of the track to the plane of the punch and die, and means for taking the blanks from said carrying means in the plane of the punch and die and delivering the blanks to said die. 80

11. A blank feed mechanism for a header, having longitudinally movable fingers, mechanism for reciprocating the fingers longitudinally, and means for rotating the fingers 85 one hundred and eighty degrees on their longitudinal axis as they are reciprocated.

12. In a header, the combination of means for supporting blanks, a carrier movable back and forth between a substantially vertical receiving position and a substantially 90 horizontal delivering position, means for separating a blank from those in the supporting means and passing the separated blank to the carrier, and fingers movable to and from the carrier and adapted to take 95 a blank from the carrier after it has been carried from vertical receiving to horizontal delivering position, and carry the blank into position to be operated upon.

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Witnesses:

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