Jan. 17, 1933. R. L. WILCOX 1,894,526

HEADER MECHANISM

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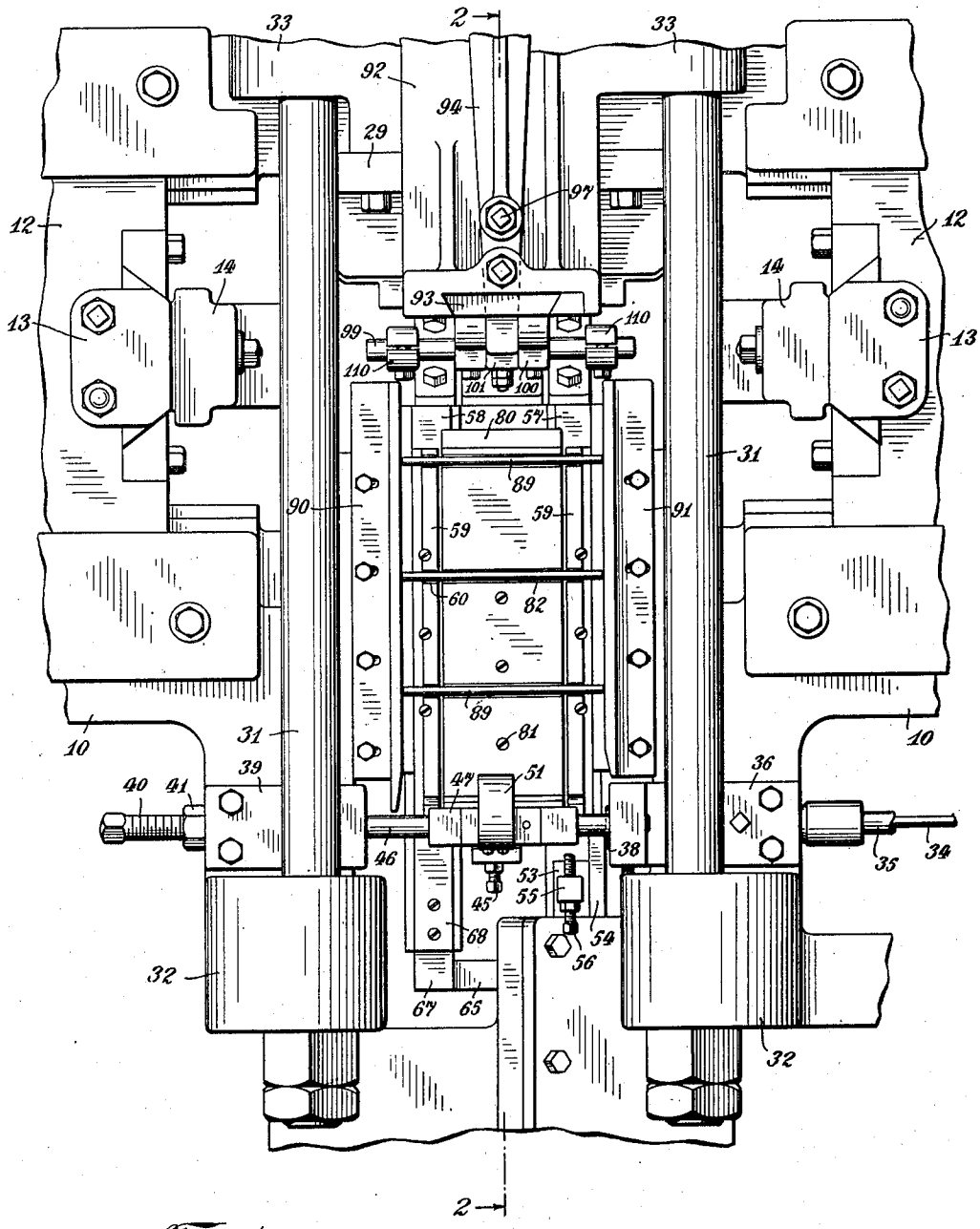


Fig. 1.

INVENTOR

Richard Lester Wilcox

BY George E. Hall

ATTORNEY

Jan. 17, 1933. R. L. WILCOX 1,894,526

HEADER MECHANISM

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Fig. 3.

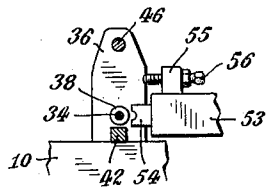


Fig. 2.

INVENTOR

Richard Lester Wilcox

BY George E. Hall

ATTORNEY

Jan. 17, 1933. R. L. WILCOX 1,894,526

HEADER MECHANISM

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Fig. 4.

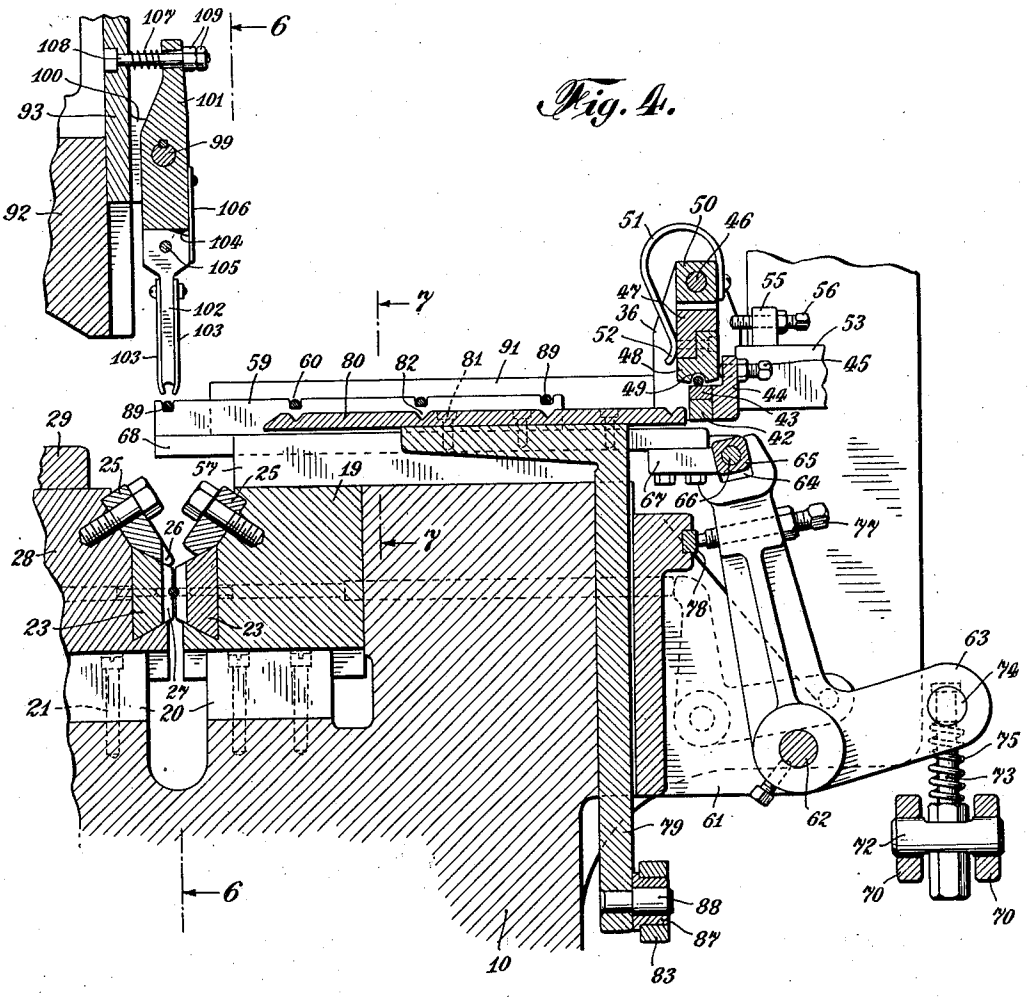
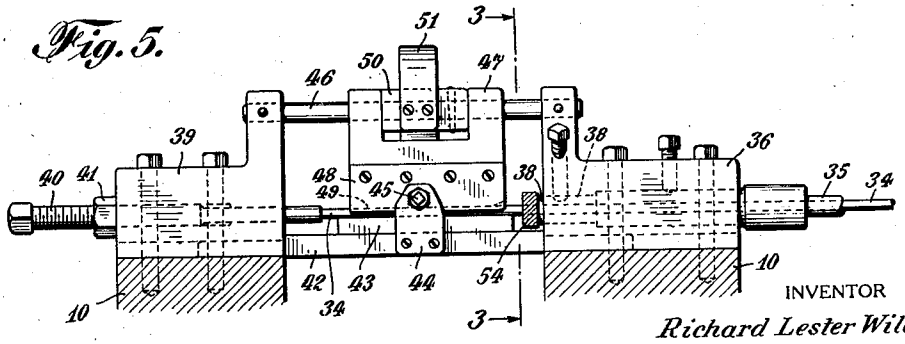


Fig. 5.



INVENTOR

Richard Lester Wilcox

BY Glenn E. Hall

ATTORNEY

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HEADER MECHANISM

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Fig. 6.

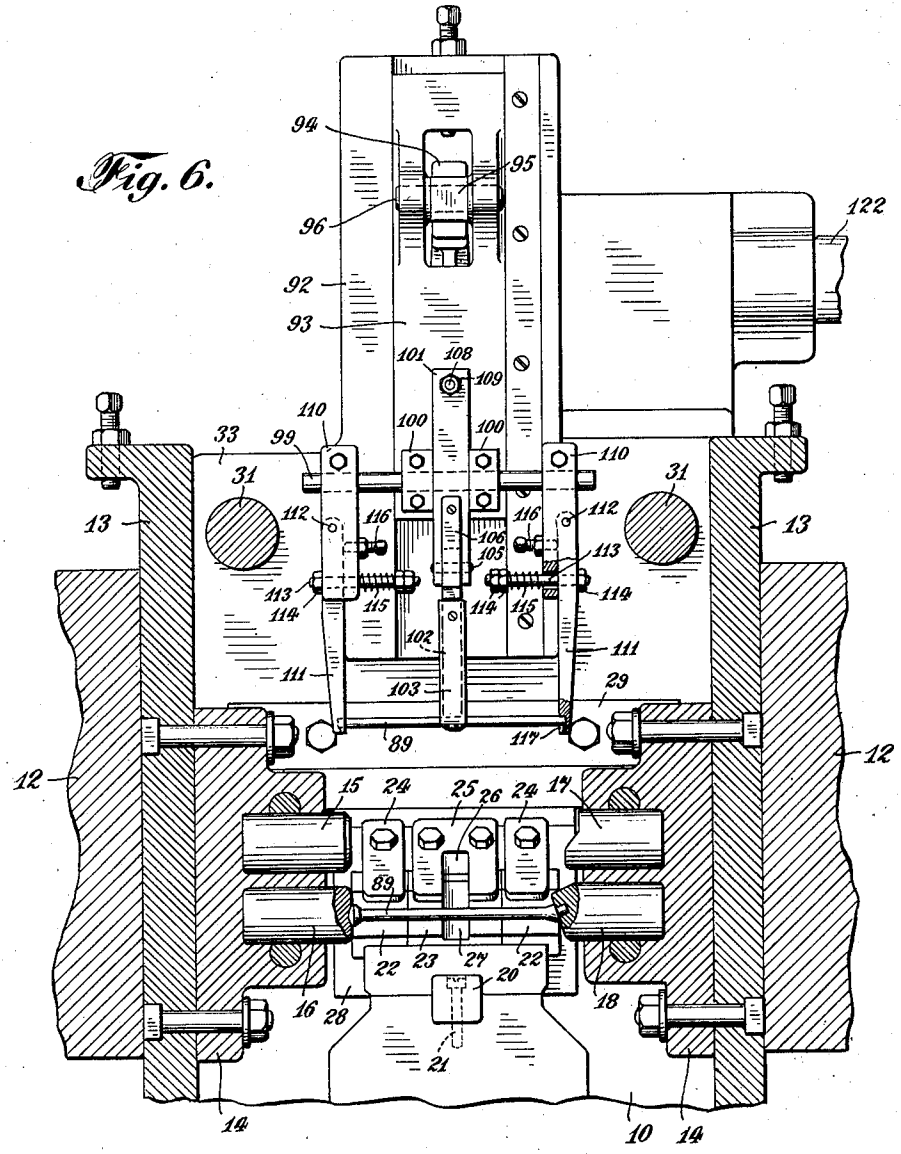
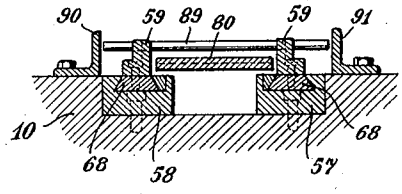


Fig. 2.



INVENTOR
Richard Lester Wilcox
BY
ATTORNEY

Jan. 17, 1933. R. L. WILCOX 1,894,526

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Fig. 8.

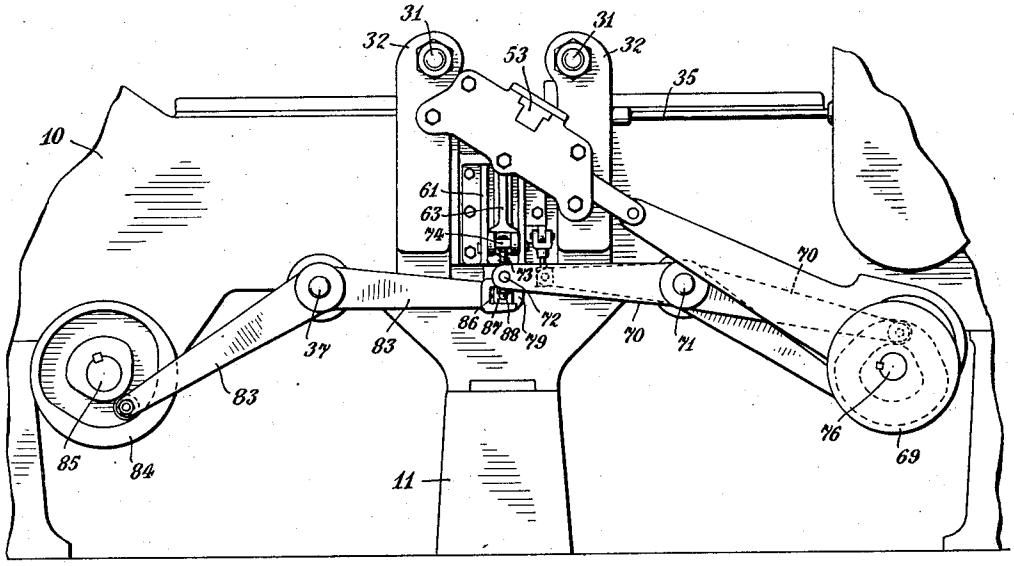


Fig. 13.

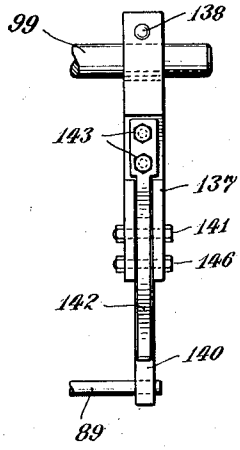


Fig. 14.

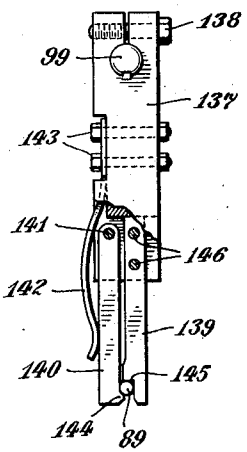
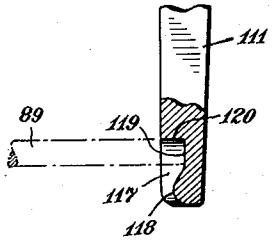


Fig. 9.



INVENTOR

Richard Lester Wilcox

BY George E. Hall

ATTORNEY

Jan. 17, 1933. R. L. WILCOX 1,894,526

HEADER MECHANISM

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Fig. 10.

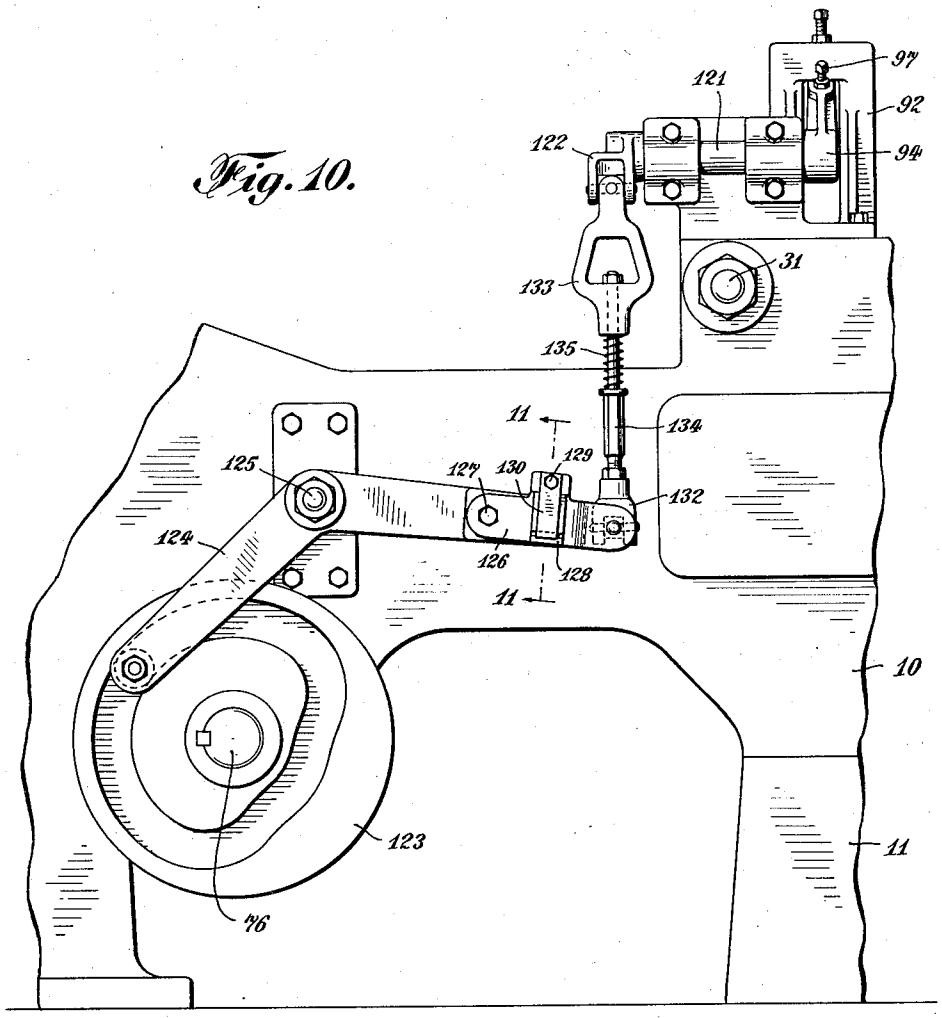


Fig. 11.

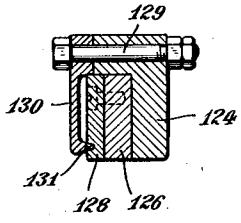
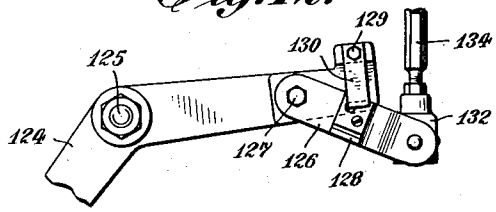


Fig. 12.



INVENTOR

Richard Lester Wilcox

BY George Wood

ATTORNEY

Patented Jan. 17, 1933 1,894,526

UNITED STATES PATENT OFFICE

RICHARD LESTER WILCOX, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT

HEADER MECHANISM

Application filed June 20, 1927. Serial No. 200,085.

My invention relates to a new and improved header mechanism and as herein illustrated is applied to a double end header or upsetting machine, that is, one wherein the workpiece is headed or upset at both ends. It is not limited, however, to this type of header because it may be applied equally as well with a header wherein the upset portion is at or near one end only.

Among the objects of this invention may be recited the provision of a device wherein a rod is cut into workpieces of predetermined lengths and then transferred automatically to the dies for the upsetting operations thereon; to so arrange the transfer of the workpieces that they will be presented to carrying devices in a predetermined relative position and then grasped at the ends thereof where they are securely held against accidental dislodgment and also at a point between such ends to provide a more secure and rigid hold thereon; and to so design a header mechanism that it is composed of few parts that are simple in design and capable of ready assembly and will operate with the maximum efficiency, and in accomplishing this I have arranged the cut-off mechanism and upsetting mechanism so that the latter is in a lower horizontal plane than the former as well as a different vertical plane.

To these, and other ends, my invention consists in the header mechanism, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures;

Figure 1 is a plan view of my new and improved header mechanism, shown in conjunction with that portion of a header immediately adjacent thereto;

Figure 2 is a transverse sectional view thereof taken generally upon line 2—2 of Figure 1, with the swinging guide and adjacent parts in one of its operative positions;

Figure 3 is a detail view of the cut-off knife and adjacent parts some of which are in section, taken generally upon line 3—3 of Figure 5;

Figure 4 is a view similar to Figure 2 on a larger scale, illustrating the swinging guide and adjacent parts in one of its operative positions;

Figure 5 is an end view of the swinging guide and adjacent parts;

Figure 6 is a sectional elevation of the header, the parts in section being taken generally upon line 6—6 of Figure 4;

Figure 7 is a detail sectional view of a portion of the transfer mechanism, taken generally upon line 7—7 of Figure 4;

Figure 8 is a fragmentary elevation of a portion of the machine showing the means by which the transfer slides and associated parts drive their motion;

Figure 9 is an elevation of a portion of one of the carrying fingers on an enlarged scale;

Figure 10 is a fragmentary elevation of a portion of the machine showing in part the mechanism that actuates the finger slide;

Figure 11 is an enlarged sectional view of a portion of the lever mechanism, taken upon line 11—11 of Figure 10;

Figure 12 is a fragmentary view of the finger slide levers in one of their relative positions;

Figure 13 is a front elevation of one form of carrying fingers; and

Figure 14 is a side elevation thereof.

In the drawings, 10 designates the body of a heading machine or the like, which is supported in part upon a suitable base 11 and within which the gates 12 reciprocate toward and away from each other. Each gate has a punch slide 13 movable thereon and each punch slide has a punch holder 14, in which are fixed the punches 15, 16, 17 and 18. For purposes of illustration, the punches 15 and 16 and the punches 17 and 18 are shaped to produce upset portions of different shapes upon opposite ends of the workpiece. The punch slides have a reciprocatory movement on the gates at substantially a right angle to the path of movement of the gate produced by mechanism known in the art and constituting no part of my present invention. The timing of these gates is such that the punches move toward each other to perform the upsetting or heading operation on the opposite

ends of the workpiece at one and the same time and away from each other after the completion of each heading operation.

Within a pocket in the body member are the stationary die holder 19 and the movable die holder 28, the latter being held against upward displacement by the cap 29 and moved toward and away from the stationary die holder 19 through a plunger 30 which is a portion of mechanism that is now known in the art and requires no detailed description herein. The die holder 19 is positioned so that the front face of the dies when held therein will be substantially coincident with the axes of the punches during the upsetting operation. Each die holder is held against movement parallel to its length by a key 20 which is secured to the body member by the screws 21 or the like. The die holders are thus held against movement parallel with the punches, irrespective of the varying degrees of pressure that may be applied to the workpiece therein by reason of the different degrees of upsetting required at the opposite ends of the workpiece. Associated with these die holders are the dies 22, each having recesses therein corresponding with the contour of the upset portion of the workpiece. Between these dies, which are preferably made of standard lengths, are the filler blocks 23, which vary in length to accommodate various lengths of workpieces. The dies are secured in the die holder by the clamps 24 and the filler block by the clamp 25, this latter having a slot 26 therein which registers with a similar slot 27 in the filler blocks 23 for a purpose hereinafter to be described. The body member adjacent to the die mechanism is strengthened by two or more tie bars 31 having nuts upon their outer ends and passing through intgeral lugs 32 and 33.

The rod 34 from which the workpieces are cut is fed through a quill 35 which is supported in a bracket 36 secured to the body member 10, or other part, in which is mounted a cut-off die 38. Similarly secured is the bracket 39, within which is threaded the stop screw 40 having thereon the lock nut 41. Extending between the brackets 36 and 39, and held rigidly thereby, is a support bar 42 having the plate 43 thereon, and a plate 44 having a stop screw 45 threaded therein. Journaled on a pin 46, fixed in the brackets 36 and 39, is a carrier 47 with a finger 48 having a groove 49 therein along its lower edge. This groove registers with the opening in the quill 35 when the carrier is in its vertical position, substantially as shown in Figure 4. The plate 43 and finger 48 are preferably hardened as both are subject to considerable wear. Endwise movement of the carrier 47 is prevented by a block 50 that is fixed on the pin 46. A spring 51 secured to the block 50 with its free end 52 in contact with one face of the carrier 47 exerts its tension so as to hold the finger in the position substantially as shown in Figure 4 and is limited by the stop screw 45.

The cut-off slide 53 has a reciprocatory movement, acquired by means well known in the art, and constitutes no part of this present invention. Secured thereto is a cut-off knife 54 and a poppet 55 through which is threaded the screw 56.

Fixed to the body member 10 are two ways 57 and 58, in each of which is a slide 68, having thereon a rail 59 with a plurality of substantially equally spaced notches in the upper edge thereof. Connected with a wall of the body member 10, adjacent to the ways 57 and 58, is a bracket 61 having journaled therein a stub shaft 62, upon which is fixed a rock lever 63, one arm of which is provided with a slot 64, in which is movably mounted a block 65 on a stud 66 fixed at its opposite ends in the two blocks 67 secured to the slides 68. Motion is imparted to the rock lever 63 from a cam 69 upon the shaft 76 through a rock lever 70 journaled on the shaft 71. This rock lever 70 is connected with the rock lever 63 through the pin 72, stud 73 and pin 74, a spring 75 exerting its tension so as to hold the pins 72 and 74 apart but permitting relative movement between rock levers 70 and 63.

Thus, from the cam 69 a reciprocatory movement is imparted to the slides 68 perpendicular to the direction of movement of the rod 34 as it is fed through the quill 35. The inward limit of movement of these slides is determined by the screw 77 in the rock lever 63 which contacts with a button 78 fixed in the bracket 61. Any excess movement of the rock lever 63 by reason of its variation of position is absorbed by the spring 75.

The lifter slide 79 has thereon a lifter plate 80, fixed thereto by the screws 81 or the like. In the face of this lifter plate are a plurality of notches 82 spaced the same distance apart as the notches 60. Motion is transmitted to the lifter slide from the rock arm 83 journaled on the shaft 37 and actuated from a cam 84 on the shaft 85 that is journaled in the body member 10 or other parts. The outer end of the rock arm 83 has a notch 86 therein embracing a block 87 journaled on the pin 88 in the lifter slide 79. The lifter plate 80 travels between and in a path at substantially a right angle to that of the slides 68.

When the carrier 47 is in the position substantially as shown in Figure 4, the rod 34 is fed through the quill 35 and groove 49 over the top of the plate 43 until it abuts against the adjustable stop screw 40. Immediately thereafter the cut-off slide 53 moves toward the rod and the cut-off knife 54 thereon severs that portion of the rod projecting beyond the face of the cut-off die 38. During this operation the inner end of the screw 56 contacts with the carrier 47 and causes the same to swing about the axis of the pin 46. The severed portion of the rod, which now becomes

the workpiece 89, is moved by the carrier laterally over the plate 43 until the carrier occupies the position substantially as shown in Figure 2, when the workpiece 89 drops by gravity into the notch 82 in the lifter plate 80 adjacent thereto, then in its substantially up position. The cut-off slide 53 is then withdrawn and the spring 51 returns the carrier 47 to receive the rod at its next feed operation. When the lifter plate is in the position substantially as shown in Figure 2, the notches in the rails 59 are below the notches 82. As the lifter plate moves downwardly the workpiece 89, just cut from the rod, enters and is supported in the adjacent notches 60 in the rails 59 and is now out of engagement with the lifter plate. The slides 68 now move inwardly and carry the workpiece away from the carrier. The workpiece 89 last cut from the rod is now in the same plane as the second notch in the lifter plate and while so positioned the lifter plate, as it moves upwardly, again lifts the workpiece out of the rail 59 and the slides 68 move to their former position, with the inner end thereof adjacent to the carrier 47. Another workpiece is now cut from the rod and deposited in the lifter plate as before. These movements continue until a workpiece is presented below the finger mechanism, substantially as shown in Figure 4.

Upon both sides of the ways 57 and 58 are the guide plates 90 and 91 which are so positioned as to guide the workpiece to the fingers in a proper relative position. Both of these guideways are capable of adjustment toward and away from each other and at an angle to each other so as to accommodate workpieces of varying lengths.

Fixed to the lug 33 is the bracket 92, in which is mounted the slide 93, which derives its motion from a rock arm 94 which is connected with the slide through the block 95 on the stud 96 fixed in the slide 93. The limit of movement of this slide 93 in one direction is determined by the stop screw 97, which contacts with a button 98 or the like in the bracket 92. Journaled in the bearing lugs 100 on the slide 93 is the shaft 99, to which is fixed the finger holder 101, in the lower end of which is journaled the finger 102, carrying the spring fingers 103 upon each side thereof. The free end of the finger 102 is concaved and the adjacent ends of the spring fingers 103 turned inwardly over the lower end of the finger so as to form a pocket therebetween in which the workpiece may be conveniently held. One corner 104 of the finger 102 is cut away so that the same may rock a limited distance on the stud 105 against the tension of the spring 106, which normally holds the finger with the upper face thereof in contact with one wall of the finger holder 101. The operative position of the finger holder 101 is determined by the stud 108 fixed in the slide, nuts 109 thereon, and the spring 107. The opening in the finger holder 101, through which the stud 108 projects, is of greater cross sectional area than that of the stud, so that the finger holder may rock against the tension of the spring 107 as the moving die closes to grip the workpiece, which spring will return the finger holder to its position against the nuts 109 when the pressure is released.

Fixed on the shaft 99, adjacent to the ends thereof, are the finger holders 110, in which the fingers 111 are journaled upon the pins 112. Projecting through each of these fingers and an opening in the finger holder 110 is a stud 113 having nuts 114 and the spring 115 thereon. This mounting of the fingers permits them to move about the axis of the pins 112 against the tension of the spring 115, which restores them to their innermost position against a wall on the finger holder 110, as shown in Figure 6, or the end of the stop screw 116, whichever the finger may first engage. The inner face of each of the fingers adjacent to the lower end is formed with a recess 117 of substantially the same width as the diameter of the workpiece. The bottom wall is formed with a rounded cam surface 118 and a substantially flat portion 119. When the workpiece has been presented in line with the finger substantially as shown in Figure 4, by the means above described, the slide 93 moves downwardly and the fingers 111 pass over the ends thereof, riding against the surfaces 118, which thereby move the fingers outwardly slightly against the tension of the coil springs 115. When the fingers have moved downwardly a sufficient distance, the workpiece is in the recess with its ends abutting against the bottom portion 119 and against the end wall 120 thereof, substantially as shown in Figure 6. During this time the spring fingers 103 have passed over the workpiece between its ends and the latter is now in the pocket formed by the end of the fingers 102 and the springs 103. Thus, the workpiece is securely held at its ends by the fingers under spring tension, and between its ends by means that has a secure grip thereon. The slide 93 moves upwardly a limited distance and lifts the workpiece out of the rails 59, which then return toward the carrier for a new workpiece and the slide moves downwardly to present the workpiece to the dies, substantially as shown in Figure 2. As so positioned, the fingers 111 are outside of the face of the dies and the finger 102 has passed down through the slots 26 in the clamps 25 and are within the slot 27 in the filler blocks 23.

In Figures 13 and 14 I have illustrated a form of carrier mechanism wherein the workpiece is gripped upon its sides rather than at the ends. As shown, this mechanism com-

prises the finger holders 137, which are clamped to the shaft 99 by the assistance of the screws 138. Fixed in these finger holders 137 by the screws 146 is the finger 139, having a shoulder 145 near its lower end, and adjacent thereto and movable upon a stud 141 is a finger 140 having a tooth 144 adjacent to its lower end. This movable finger is subjected to the pressure of the spring 142 secured by the bolts 143.

With this form of carrier mechanism the workpiece is grasped near its ends between the tooth 144 on the movable finger and the shoulder 145 on the fixed finger during the downward movement of the slide 93, the movable finger yielding under the tension of the spring 142 for this purpose.

The movable die holder travels toward the stationary die in timed relation to the carrier mechanism and grips the workpiece between the dies after the same has been presented in line therewith by the carrier mechanism, after which the slide 93 moves upwardly leaving the workpiece in the dies. The punches then move toward the workpiece and upset the ends thereof in a manner well known in the art.

The rock arm 94 is integral with or fixed upon a rock shaft 121 having a yoke arm 122 connected therewith.

On the shaft 76 is a cam 123 which actuates a rock lever 124 that is journaled on the stud 125.

Pivotally mounted on the lever 124 by the pintle 127 is an extension lever 126, in which is secured a plate 128. Fixed on the lever 124 by the bolt 129 is a locking plate 130 having a tooth 131 thereon, which normally projects into a recess in the plate 128, substantially as shown in Figure 11.

The yoke arm 122 and extension lever 126 are operatively connected by means of the hinged blocks 132 and 133, rod 134 which is fixed in the block 132 and moves freely in block 133, and surrounded by a spring 135.

Rotation of the cam 123 actuates the rock shaft 121 and through the rock arm 94 transmits motion to the slide 93.

If for any reason the fingers 102 meet an obstruction and are unable to move through their normal path, extra pressure is applied to the extension lever 126 through the intermediate parts. This causes the latter to move upon its pivot mounting relatively to the rock lever 124 to the position substantially as shown in Figure 12, which relative movement is permitted because the tooth 131 on the plate 130 springs out of the recess in the plate 128. Rock lever 124 will then continue its motion without transmitting movement to the slide 93 and the fingers connected therewith. When the obstruction that prevented the movement of the fingers has been removed the tooth 131 will again spring into the recess in the plate 128. When the rock arm 94 engages the stop screw 136 the parts will occupy their former relative and operative positions. If, however, the fingers are still prevented from moving in their normal path the tooth 131 will drag over the plate 128 until the obstruction is removed. This safety device operates automatically, movement of the fingers being stopped when they meet an obstruction and continue such movement when such obstruction is removed.

Within the scope of the appended claims there are minor changes and alterations that may be made within my invention, and I do not limit myself to the exact construction herein shown and described.

What I claim as new and desire to secure by Letters Patent is:—

1. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; automatic means for transferring the workpieces from the cut-off mechanism to a point adjacent the upsetting mechanism in a substantially right angular path from the cutting means to the upsetting means and the workpieces during the transfer being spaced from and substantially parallel to each other and means for lifting the work piece from the transferring mechanism and depositing the same into the upsetting mechanism.

2. Mechanism of the character described, having as a part thereof an upsetting mechanism, stock holding means, an adjustable stop to limit the extent of movement of the stock, and means to cut the stock into workpieces of predetermined lengths; means for upsetting the workpieces; automatic means for transferring the workpieces from the cut-off mechanism which first receives the stock before being cut into workpieces to a point adjacent the upsetting mechanism in a substantially right angular path and the workpieces during the transfer being spaced from and substantially parallel to each other, and means for lifting the work piece from the transferring mechanism and depositing same into the upsetting mechanism.

3. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; and automatic means for transferring the workpieces from the cut-off to the upsetting mechanism, including as part thereof a horizontally pivoted holder that receives the stock before it is cut into workpieces, and then delivers it to said automatic transferring means, said holder being actuated by the cut-off mechanism and the workpieces during the transfer being spaced from and substantially parallel to each other.

4. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; step by step means for transferring the workpieces from the cut-off to a point adjacent the upsetting mechanism, the transfer means including a pivoted member that is actuated by the cut-off mechanism and removes the workpiece from the path of the stock, the workpieces during the transfer being spaced from and substantially parallel to each other and means for lifting the workpiece from the transferring mechanism and depositing same into the upsetting mechanism.

5. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; and step by step means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including a pivoted guide member that supports the stock while being cut, and is thereafter actuated by the cut-off mechanism to remove the workpiece from the path of the stock.

6. Mechanism of the character described, having as a part thereof means to receive workpieces of predetermined lengths; cutting means for the work pieces, means located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to a point adjacent the upsetting mechanism in a substantially right angular path, the transfer means including movable parts having timed reciprocatory, substantially right-angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby with an open space therebetween and means for lifting the work pieces from the transfer mechanism and depositing same into the upsetting mechanism.

7. Mechanism of the character described, having as a part thereof means to receive workpieces of predetermined lengths; cutting means for the work pieces, means located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to a point adjacent the upsetting mechanism in a substantially right angular path, the transfer means including movable parts having timed reciprocatory, substantially right-angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby along a substantially horizontal course with an open space therebetween and means for lifting the work pieces from the tranfer mechanism and depositing same into the upsetting mechanism.

8. Mechanism of the character described, having as a part thereof means to receive workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including movable parts having timed reciprocatory, substantially right-angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby along a substantially horizontal course; and means, movable in a substantially perpendicular plane to the horizontal course, having fingers that are timed to grasp the workpieces at the end of the course and present them to the upsetting mechanism.

9. Mechanism of the character described having as a part thereof means to receive workpieces of predetermined lengths; companion dies for holding the workpieces during the upsetting operation; means for upsetting the workpieces while so held; means for transferring workpieces from the cut-off to the upsetting mechanism in a substantially right angle path, such means including two sets of carriers operated so as to progressively transfer the workpieces interchangeably one to the other during the travel of the workpieces along one of the sides of the right angle path; and means, having fingers thereon which engage the workpieces near the end of the carriers and convey the workpieces along the other side of said right angle path.

10. Mechanism of the character described, having as a part thereof means for transferring workpieces, comprising in part a reciprocating member, and fingers movably connected thereto which grasp and hold the workpieces at the ends thereof under a yielding pressure, each of the fingers being formed near the lower end thereof, with a recess and a cam wall adjacent thereto over which the end of the workpiece passes as it approaches the recess, the bottom of the recess and the top of the cam wall being in different planes.

11. Mechanism of the character described, having as a part thereof upsetting means and means for transferring workpieces to said upsetting means, comprising in part a reciprocating member, and fingers movably connected thereto which grasp and hold the workpieces at the ends thereof, and other fingers that grasp the workpiece between the ends thereof and capable of an independent relative movement, said upsetting means being provided with a groove through which the last named fingers are adapted to move to position the workpieces in the upsetting means.

12. Mechanism of the character described,

having as a part thereof oppositely recessed companion dies; means for transferring workpieces to said dies, comprising in part a reciprocating member; fingers connected thereto, which grasp and hold the workpieces at the ends thereof and other fingers that grasp the workpieces between the ends thereof, said fingers retaining their grasp on the workpieces until the same is securely held by the dies and the fingers that grasp the workpieces between the ends being within the recesses in the dies.

13. Mechanism of the character described, having as a part thereof oppositely recessed companion dies; means for transferring workpieces to said dies, comprising in part a reciprocating member; fingers connected thereto, which grasp and hold the workpieces at the ends thereof and other fingers that grasp the workpieces between the ends thereof, said last named fingers retaining their grasp on the workpieces until the same is securely held by the dies with the ends thereof projecting beyond the end faces of the dies and the fingers that grasp the workpieces between the ends being within the recesses in the dies.

14. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including movable parts having timed reciprocatory, substantially right-angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby along a substantially horizontal course; means, movable in a substantially perpendicular plane to the horizontal course, having fingers and timed to grasp the workpieces at the end of the course and present them to the upsetting mechanism; and means for actuating said fingers, whereby the fingers will come to a rest if they or the workpiece engage an obstacle in their path of movement.

15. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including movable parts having timed reciprocatory, substantially right-angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby along a substantially horizontal path, means cooperating with the transfer means for moving the work pieces in a vertical direction downwardly toward the upsetting means, said vertically movable means having fingers thereon timed to grasp the work pieces at the end of their movement through the horizontal path, and means for retarding the movement of said fingers and work pieces if they or the work pieces engage an obstacle in their path of movement, and will automatically continue their movement when such obstacle is removed.

16. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including movable parts having timed reciprocatory, substantially right angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby in a step by step movement; and means for moving the workpieces in a direction substantially at right angles to the transfer mechanism so that the same will arrive in a predetermined position at the end of said last named movement, the workpieces during the transfer being spaced from and substantially parallel to each other.

17. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including movable parts having timed reciprocatory, substantially right-angle movements, one to the other, to progressively transfer the workpieces interchangeably carried thereby; an adjustable guide means adjacent said transfer means between which the workpieces travel from the cut-off mechanism to said upsetting means to be presented to the latter in a predetermined horizontal position, the workpieces during the transfer being spaced from and substantially parallel to each other.

18. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces from the cut-off to the upsetting mechanism, the transfer means including movable parts, one of such parts having a reciprocatory movement in one plane and the other part a similar movement in a plane at substantially a right angle thereto, whereby the workpieces travel in a step by step movement with an open space therebetween and means for receiving the workpieces from the transfer mechanism and moving the same toward the upsetting mechanism in a path sub-

stantially at right angles to the transfer mechanism.

19. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; a device for holding the stock in place while being cut, having a swinging member with an open groove in one side thereof to receive the stock, as one of its elements; flexible means for holding the swinging member in one of its positions; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; and means for transferring the workpieces to the upsetting mechanism, said swinging member being actuated by and with the cut-off means against the tension of the flexible means for withdrawing the workpiece from the cut-off position and discharging the same through the open-sided groove onto the transfer means.

20. Mechanism of the character described, having as a part thereof means to cut stock into workpieces of predetermined lengths; a device for holding the stock in place while being cut, having a yielding member as one of its elements; means, located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; means for transferring the workpieces to the upsetting mechanism, said yielding member being actuated by the cut-off mechanism and withdrawing the workpiece from the cut-off position to said transfer means; and a stop to limit the movement of the yielding member in one direction.

21. Mechanism of the character descibed, having as a part thereof means to cut stock into workpieces of predetermined lengths; a device for holding the stock in place while being cut, having a swinging guide member with an open groove in one side thereof to receive the stock, as one of its elements; means located in a different horizontal plane than the cut-off mechanism, for upsetting the workpieces; and automatic means for transferring the workpieces from the cut-off to the upsetting mechanism, said rocking guide member being actuated by the cut-off mechanism for withdrawing the workpieces from the cut-off position and discharging the same through the open-sided groove onto the transfer means.

22. An apparatus of the character described including means to cut stock into work pieces of predetermined lengths, upsetting means for the work pieces disposed in a different horizontal plane than the cutting means, means for progressively conveying the workpieces from said cutting means in spaced relation, a pivoted guide member adjacent said cutting means that holds the workpiece during the cutting operation and actuated thereby to transfer the work pieces to said conveyor, and means for removing said work pieces from the conveyor and positioning the same between the upsetting means, said last named means moving in a path substantially at right angles to the conveying means.

23. A mechanism of the character described having as a part thereof means for transferring work pieces comprising in part a reciprocatory member, spaced arms pivoted intermediate their ends to said reciprocatory member, a spring actuated finger pivoted to each of said arms and adapted for movement in a direction at right angles to the movement of the arms for grasping and holding the work pieces during the movement of the reciprocating member, and spring means interposed between the arms and each of said fingers for normally retaining the latter in substantially parallel relation.

24. In combination with a workpiece conveyor; a transfer mechanism for taking the workpieces therefrom and delivering them to a station having carrying fingers connected therewith and spaced from each other substantially the same distance as the length of the workpiece, which fingers are provided with a recess in one of its side faces adjacent the lower end of said finger, said recess having an open bottom, the wall of said recess having a cammed face formed thereon whereby work pieces may be held with their ends in the recesses and above said cammed face to prevent lateral movement of said workpieces irrespective of the pressure of the fingers upon the ends of the work pieces.

25. A mechanism of the character described having as a part thereof means to cut stock into workpieces of predetermined lengths, means located in a different horizontal plane than said cut-off means for upsetting the work pieces, means for transferring the work pieces in a substantially right angular path from the cutting means to the upsetting means and means for holding the stock while being cut, comprising in part two members positioned upon opposite sides of the stock, one member being movably mounted relatively to the other member and actuated by the cut-off mechanism, whereby the workpiece will travel with the movable member and be discharged onto the transfer mechanism.

26. A mechanism of the character described having as a part thereof means to cut stock into work pieces of predetermined lengths, means located in a different horizontal plane than the cut-off mechanism for upsetting the work pieces, automatic means for transferring the work pieces from the cut-off to a point adjacent the upsetting mechanism and a carrier mechanism for removing the work pieces from the transferring means and depositing the same in the upsetting means, said carrier mechanism including a plurality of spring actuated fingers for engaging the ends of said work pieces, each of said fingers having a recess formed with a cam face mov-

able over the adjacent end of the work pieces for retaining the latter within the recess.

27. The combination with a rod guide having an opening therein, a movably mounted carrier with a groove therein which in one of the positions of the carrier is in line with and in extension of the said opening, stop means in the path of the carrier that limits the position of the carrier in one direction when the groove therein is in register with said opening, means for cutting off a portion of said rod outside of said opening and moving the carrier until the groove therein is uncovered and the cut-off portion of the rod is released therefrom through the open side of the groove.

28. The combination with a rod guide having an opening therein, a movably mounted carrier with a groove therein which in one of the positions of the carrier is in line with and in extension of the said opening, means for limiting the position of the carrier in one direction when the groove therein is in register with said opening, flexible means for exerting pressure against the carrier and moving it toward the limiting means, means for cutting off a portion of said rod outside of said opening and moving the carrier until the groove therein is uncovered and the cut-off portion of the rod is released therefrom through the open side of the groove.

29. The combination with a rod guide having an opening therein, adjustable stop means for limiting the extent of movement of a rod through said opening, a movably mounted carrier with a groove therein which in one of the positions of the carrier is in line with and in extension of the said opening, and occupies only a portion of the space between the rod guide and stop means, means, in part operable between the rod guide and carrier for cutting off a portion of said rod outside of said opening and an element associated therewith that during its travel engages the carrier and move the same until the groove therein is uncovered and the cut-off portion of the rod is released therefrom through the open side of the groove.

30. In mechanism of the character described; companion brackets; a rod guide having an opening therein mounted in one of the brackets; an adjustable stop in the other of said brackets in line with said opening; a support member between the brackets; a carrier movably mounted on the support member having a groove therein which in one of the positions of the carrier is in line with and in extension of the said opening; a stop member fixed between the brackets in the path of movement of the carrier, whereby the movement thereof is limited in one direction when said groove is in extension of said opening; flexible means associated with the support member for exerting pressure against the carrier and moving it toward said limiting means; a slide; a cutter thereon for severing that portion of the rod outside of said opening; and means associated with the slide and engaging the carrier, whereby the same is moved against the tension of the flexible means until said groove is uncovered and the cut-off portion of the rod is released therefrom through the open side of the groove.

In testimony whereof, I have hereunto affixed by signature.

RICHARD LESTER WILCOX.