March 14, 1939.

A. F. FISCHER

2,150,824

FEED ROLL MECHANISM

Filed April 8, 1938

2 Sheets-Sheet 1

Fig. 1.

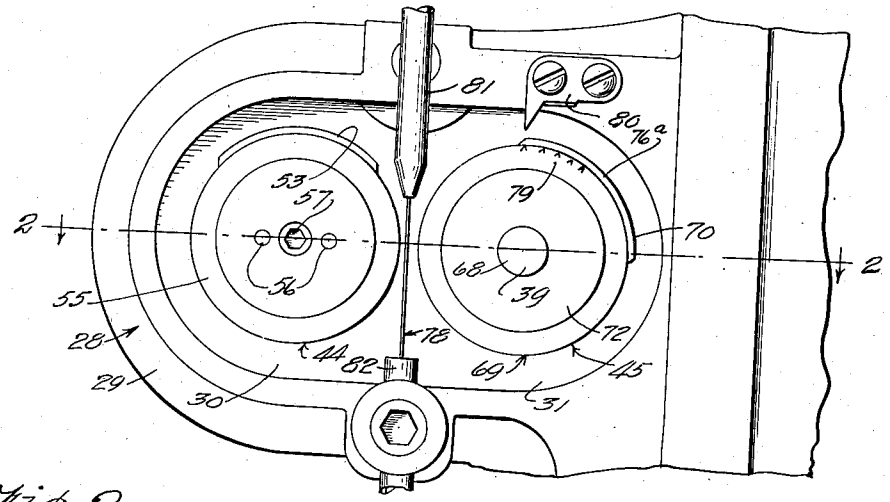


Fig. 2.

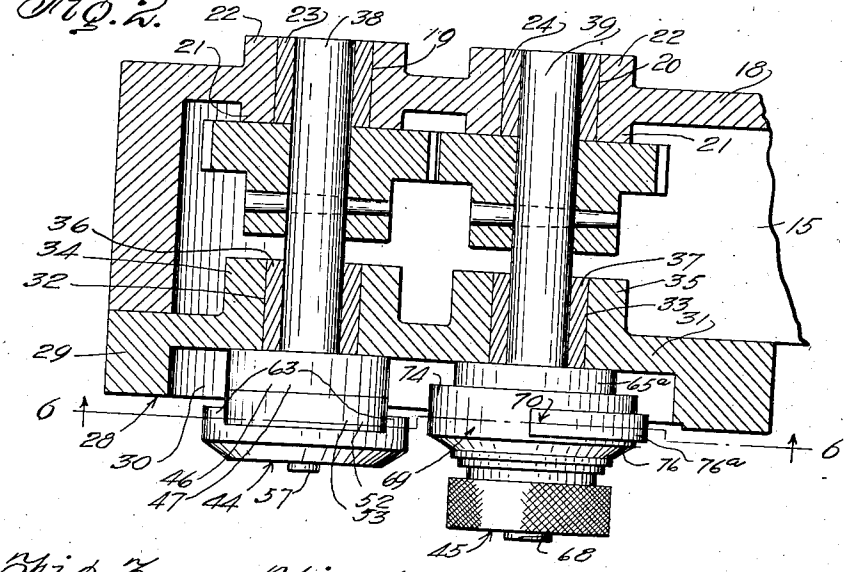


Fig. 3.

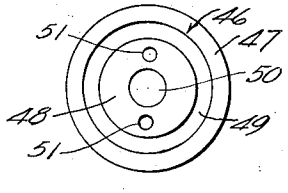


Fig. 4.

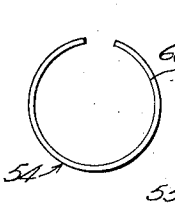
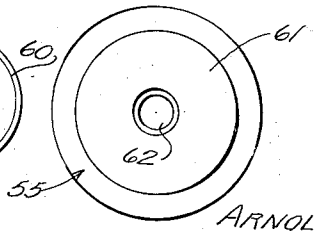


Fig. 5.



Inventor

ARNOLD F. FISCHER,

By Kimmel & Crowell

Attorneys

March 14, 1939. A. F. FISCHER 2,150,824

FEED ROLL MECHANISM

Filed April 8, 1938 2 Sheets-Sheet 2

Fig. 6.

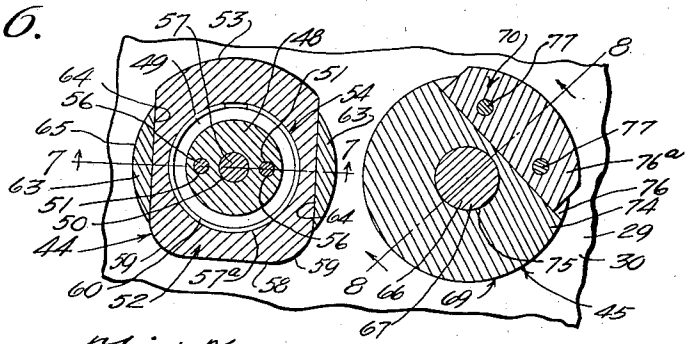


Fig. 7.

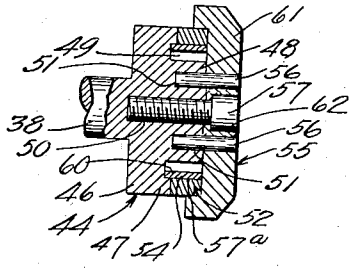


Fig. 8.

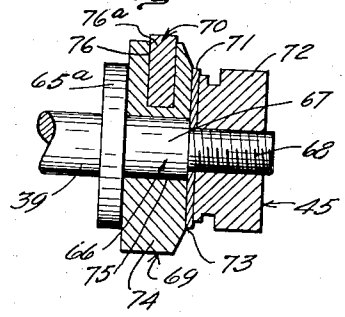
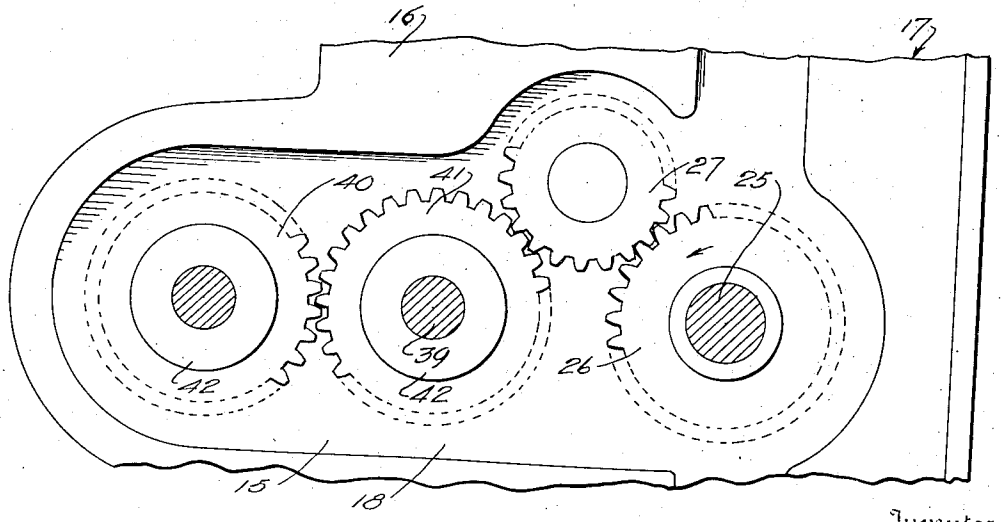


Fig. 9.



Inventor

ARNOLD F. FISCHER,

By Kimmel & Crowell,

Attorneys.

Patented Mar. 14, 1939

2,150,824

UNITED STATES PATENT OFFICE

2,150,824

FEED ROLL MECHANISM

Arnold Ferdinand Fischer, Astoria, Long Island, N. Y., assignor to Hobbs Sales & Service Station, Inc., New York, N. Y., a corporation of New York

Application April 8, 1938, Serial No. 201,017

10 Claims. (Cl. 140—131)

This invention relates to a wire feed mechanism designed primarily for use in connection with machines for forming and driving wire staples, but it is to be understood that a feed mechanism, in accordance with this invention is for employment in any connection for which it may be found applicable.

The invention has for its object to provide, in a manner as hereinafter set forth a wire feed mechanism including a pair of rotatable roll structures having coacting gripping means for intermittently feeding successive lengths of the wire to be acted upon and with one of said means being slidable relative to the other and resiliently supported.

The invention has for another of its objects to provide a resilient support for the slidable gripping means aforesaid, and with said support being so formed and disposed in such relation to said means to prevent the discarding of the latter if the support becomes impaired and a new one substituted.

The invention has for another of its objects to provide, in a manner as hereinafter set forth a wire feed mechanism including a pair of oppositely revoluble wire feed roll structures, each including a wire gripping means coacting with each other for intermittently feeding successive lengths of the wire to be acted upon, one of said means being spring controlled, bodily revoluble with and intermittently shiftable parallel to the axis of the roll structure with which it is associated during the revolving of such structure, and the other of said means being bodily revolving with and fixed stationary to that structure with which it is associated.

The invention has for another of its objects to provide, in a manner as hereinafter set forth, a wire feed mechanism including a pair of oppositely revoluble wire feed roll structures for intermittently feeding successive lengths of the wire to be acted upon, and with one of said structures capable of being adjusted independent of the other for varying the extent of the intermittent feed.

The invention has for another of its objects to provide, in a manner as hereinafter set forth, a wire feed mechanism for detachable connection to a machine of the type referred to and including a pair of oppositely revoluble wire feed roll structures, intermeshing driven gears fixed to said structures and a combined portable carrier and support for, common to and to which said structures are connected whereby the said mechanism may be bodily detached from the machine and expeditiously connected to another machine when desired.

The invention has for another of its objects to provide, in a wire feed mechanism, a pair of oppositely revoluble wire feed roll structures, one having fixed thereto a wire gripping means having a working surface in the form of a segment of a circle, and the other having slidingly connected thereon a resiliently supported hollow gripping means having a working surface in the form of a segment of a circle, said surfaces intermittently coacting during each revolution of said structures for intermittently feeding successively lengths of the wire to be acted upon.

The invention has for a further object to provide, in a manner as hereinafter set forth, a wire feed mechanism including a pair of oppositely revoluble wire feed roll structures for intermittently feeding successive lengths of wire to be acted upon and whereby one of said structures may be expeditiously adjusted relative to the other for varying the extent of the feed.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a wire feed mechanism which is comparatively simple in its construction and arrangement, strong, durable, compact, expeditiously installed with respect to the machine with which it is to be associated, readily bodily removed from the machine when desired, thoroughly efficient in its use, conveniently repaired when occasion requires, and comparatively inexpensive to set up.

Embodying the foregoing aims and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a front elevation of the mechanism installed,

Figure 2 is a section on line 2—2, Figure 1,

Figures 3, 4 and 5 are front elevations respectively of the head, resilient supports for the gripping means and retainer of the non-adjustable wire feed roll structure,

Figure 6 is a fragmentary section on line 6—6, Figure 2,

Figures 7 and 8 are respectively sections on lines 7—7 and 8—8, Figure 6, and

Figure 9 is an elevation of the driving means for the mechanism.

With reference to Figures 1, 2 and 9 therein is shown by way of example a chamber 15 formed in a portion 16 of a supporting structure 17 constituting a part of the machine with which the wire-feed mechanism, in accordance with this invention is to be associated. The chamber 15 is open at its front. The portion 16 of structure 17 may be similar to a part of the structure 13 of my co-pending application filed April 2, 1938, Serial No. 199,701, and is so shown. The rear or back wall of chamber 15 is indicated at 18 and it is provided with a pair of spaced horizontally aligned openings 19, 20. The wall 18 has integral therewith forwardly and readwardly directed collars 21, 22 respectively having their inner faces flush with the walls of the said openings. Mounted in the openings 19, 20 are bearing bushings 23, 24 respectively which are also arranged within and flush with the free ends of the said collars. The operating shaft of the machine, with which the feed mechanism is associated is indicated 25 and extends into one end of the chamber 15.

That end of shaft 25 positioned within the chamber 15 carries a gear 26 which meshes with and drives a gear 27 suspended from the wall 18 of chamber 15 and which is of less diameter than the gear 26. The gear 26 is to operate in an anti-clockwise direction and the gear 27 in a clockwise direction. The purpose of the gear 27 will be presently referred to. The wire feed mechanism, generally indicated at 28 is to be detachably connected to the structure 17 at the front of chamber 15. The mechanism 28 includes a one piece support 29 which, by way of example, forms a closure for the major portion of the open front of chamber 15 as is shown in my co-pending application aforesaid. The support 29 provides a carrier for the other parts of such mechanism and is provided with an oval shaped recess 30 in its front face. The base or inner wall of the recess 30 is indicated at 31 and it is formed with a pair of horizontally aligned openings 32, 33 arranged in spaced relation. The rear face of wall 31 has integral therewith rearwardly extending bosses 34, 35 having their inner faces forming rearward continuations of the walls of the openings 32, 33 respectively. Mounted in the openings 32, 33 are bearing bushings 36, 38 respectively. The bushings 23, 24 align with the bushings 36, 37 respectively.

Mounted in the bushings 23, 36 and extending into the recess 30 is a shaft 38. Mounted in the bushings 24, 37 and extending through the recess 30 is a shaft 39. Fixed to the shafts 38, 39 are intermeshing gears 40, 41 which abut the collars 21 and have forwardly extending hubs 42 fixed to the shafts 38, 39 by the pins 43. The forward ends of the hubs 42 are spaced rearwardly from the bosses 34, 35.

The mechanism includes a pair of revoluble feed roll structures 44, 45 operated by the shafts 38, 39 respectively. The structure 44 is non-adjustable. The structure 45 is adjustable.

The outer end of shaft 38 has formed integral therewith a circular head 46 positioned against the outer face of the wall 31 and of greater diameter than opening 32. The head 46 is formed of an inner circular part 47 and an outer circular part 48 of less diameter than and concentrically disposed with respect to the part 47. The outer or front face of part 47 is provided with an annular groove 49 which surrounds the point of mergence between the parts 47, 48. The head 46 axially thereof is formed with a threaded socket 50 opening at the front of part 48. The part 48 is provided with a pair of diametrically opposed sockets 51 spaced adjacent to opposite sides of the mouth of the socket 50.

The feed roll structure 44 includes the head 46, a shiftable carrier 52 for a wire gripper or cam 53, a resilient support or tensioning element 54 for carrier 52, a retainer 55 for the carrier 53, positioning dowels 56 for the retainer 55 and a coupling screw 57 for detachably connecting the head 46 and retainer 55 together. The gripper 53 is an integral part of the carrier 52 and bodily moves therewith. The carrier 52 is spring urged by the element 54. Owing to the manner in which carrier 52, gripper 53 and element 54 are correlated and their arrangement with respect to the head 46, the gripper 53 is not only spring urged, but it is also slidably arranged relative to the head 46.

The carrier 52 is substantially of rectangular contour and formed with a circular opening 57a of materially greater diameter than the head part 48. The carrier 52 has its lengthwise or side edges straight and one of its end edges throughout of a contour corresponding to a segment of a circle and which provides the wire gripper or cam 53. The other end edge 58 of carrier 52 is straight and merges into the rounded corners 59. The length of the carrier 52 is greater than the diameter of and has its ends permanently disposed in extended relation with respect to head 46. The carrier 52 is arranged diametrically of head 46 and positioned against and is slidable relative to the front face of head part 47. The head part 48 is arranged in the opening 57a and flush with the front of carrier 52.

The resilient support or tensioning element 54 for the carrier 52 is in the form of a split resilient ring 60 of an outer diameter substantially corresponding to the diameter of and having its outer face permanently bearing against the wall of opening 57. The ring 60 seats in the groove 49 and its body is of a width to extend from the base of the groove 49 to the front face of carrier 52. The ring 60 normally tends to hold the carrier 52 in the position shown in Figure 6 and acts as a resilient abutment for the gripper or cam 53 when the latter is active.

The retainer 55 comprises a circular body part 61 formed axially thereof with a countersunk opening 62. Integral with the body part 61 is a pair of diametrically opposed inwardly extending spaced flanges or confiners 63 having straight inner edges 64 and outer edges 65 of arcuate contour. The carrier 52 is confined between the inner edges 64 of the flanges 63. Secured to the said body part 61 and extending inwardly therefrom are the positioning dowels 56 which engage in the sockets 51. The coupling screw 57 extends through and has its head countersunk in the opening 62. The screw 57 has threaded engagement with the wall of socket 50 and acts to connect head 46 and retainer 55 together whereby the carrier 52 is held on head part 48.

The shaft 39 inwardly adjacent to its outer end has formed integral therewith a laterally extending flat annular flange 65a which constitutes an inner clamping member. That part of shaft 39 extended outwardly from flange 65a is indicated at 66 and consists of an inner smooth portion 67 and a peripherally threaded outer portion 68 of less diameter than the portion 67. The flange 65a is arranged against the front face of wall 31.

The feed roll structure 45 includes the flange

65a, shaft part 66, an adjustable carrier 69 for a wire gripper or cam 70, a washer 71 and a lock nut 72. The carrier 69 is positioned on the portion 67 of shaft part 66 and against the front face of flange 65a. The washer 71 is arranged on shaft portion 68 against the shoulder 73 formed at the junction of shaft portions 67, 68. The carrier 69 is flush with shoulder 73. The washer 71 bears against the front face of carrier 69. The lock nut 72 threadedly engages with shaft portion 68 and binds against the washer 71. The carrier 69 is capable of being shifted about the shaft portion 67 to adjust the gripper or cam 70 relative to gripper or cam 53 for a purpose to be referred to. The loosening of nut 72 will permit of shifting the carrier 69 about shaft portion 67. After carrier 69 has been shifted to the desired extent, the nut 72 is screwed home and in connection with flange 65a will clamp carrier 69 to shaft 39 whereby the latter and the carrier will bodily revolve when shaft 39 is driven.

The carrier 69 consists of a circular body part 74 of greater diameter than flange 65a having an axial opening 75 to enable for the mounting thereof on the shaft portion 67 against flange 65a. The body part 74, on a chord line adjacent said opening 75 is formed with a groove 76 having its ends and mouth opening at the edge thereof. The base or inner wall of groove 76 is straight.

The gripper or cam 70 consists of a substantially segmental shaped member 76a which is seated in and is of less length but of greater width than the depth of groove 76. The ends of member 76a are spaced inwardly adjacent opposed edge parts of body part 74 of carrier 69. The ends of member 76a extend outwardly from the edge part of said body part 74 which is arranged between the said opposed edge parts of the latter. The inner lengthwise edge of the member 76a is straight and seats against the inner wall of groove 76. The outer lengthwise edge of member 76a is upon the segment of a circle and constitutes a gripping surface for the wire. The member 76a is fixedly secured to the carrier 69 by the holdfast means 77. The gripping surface of the member 76a is permanently disposed in outwardly extended relation with respect to carrier 69.

The gear 27 meshes with and on the operation of shaft 25 drives the gear 41 in an anti-clockwise direction and which in turn drives the gear 40 in a clockwise direction, the result being the revolving of the wire feed roll structures 44, 45 in opposite directions. The structure 44 clockwise and the structure 45 anti-clockwise. On the operation of the structures 44, 45 the grippers 53, 70 will coact to bite or grip the wire 78, which is positioned between said structures and intermittently feed successive lengths of the wire to be acted upon. The adjusting of the gripper 70 with respect to the gripper 53 is for varying the period of duration of the grip or bite had on the wire 78 by the grippers when intermittently feeding the wire whereby the length of that portion of the wire which is fed by the mechanism may be varied. The grippers coact to feed the wire during a part of each revolution of the structures 44, 45.

The carrier 69 is provided with suitable indicia 79 for indicating adjustments of the gripper 70 when the length of the portion of the wire to be fed is to be varied. The support 29 has attached thereto a pointer 80 for association with the indicia 79.

With reference to Figure 1 there is shown a guide means 81 for the wire 78 and a conducting off means 82 for the successive lengths of the wire which are fed by the mechanism. The said means 81, 82 preferably will be constructed and arranged relative to the structures 45, 46 in the same manner as the wire guide and wire conducting off means are shown in my co-pending application aforesaid.

What I claim is:

1. In a wire feed mechanism, a pair of oppositely revoluble wire feed roll structures, one including a tensioned carrier slidingly mounted therein diametrically thereof, said carrier being provided at one end with a wire gripper, the other of said structures including a non-tensioned, non-slidable, adjustable carrier having fixed thereto a wire gripper, said grippers being disposed in extended relation with respect to the outer periphery of said roll structures for coaction to intermittently feed during the revolving of said structures, successive lengths of wire to be acted upon.

2. In a wire feed mechanism, a pair of oppositely revoluble wire feed roll structures, one including a tensioned slidable carrier provided with a wire gripper, the other including a non-tensioned non-slidable carrier having fixed thereto a wire gripper, said grippers being disposed in extended relation with respect to the outer periphery of said roll structures for coaction to intermittently feed during the revolving of said structures, successive lengths of wire to be acted upon, said non-tensioned carrier being adjustable for adjusting the gripper carried thereby relative to the other gripper for varying the period of duration of the grip of the grippers on the wire whereby the length of that portion of the wire which is fed by the mechanism may be varied, and that roll structure including the non-tensioned carrier being provided with means for detachably clamping the latter in its adjusted position.

3. In a wire feed mechanism, a pair of oppositely revoluble wire feed roll structures, one including a tensioned slidable carrier provided with a wire gripper, the other including a non-tensioned non-slidable carrier having fixed thereto a wire gripper, said grippers being disposed in extended relation with respect to the outer periphery of said roll structures for coaction to intermittently feed during the revolving of said structures, successive lengths of wire to be acted upon, the said tensioned carrier being in the form of a rectangular body provided with an opening intermediate its ends for receiving the tensioning therefor and having one of its end edges in the form of a segment of a circle to provide the gripper carried thereby.

4. In a wire feed mechanism, a pair of oppositely revoluble wire feed roll structures, one including a tensioned slidable carrier provided with a wire gripper, the other including a non-tensioned non-slidable carrier having fixed thereto a wire gripper, said grippers being disposed in extended relation with respect to the outer periphery of said roll structures for coaction to intermittently feed during the revolving of said structures, successive lengths of wire to be acted upon, the said non-tensioned carrier being in the form of an axially apertured circular body provided on a chord line thereof adjacent its aperture with a groove having its ends and mouth opening at the edge of said body, and the gripper carried by said body being arranged within said groove and extended beyond the edge of said body.

5. In a wire feed mechanism of that type including a pair of revoluble feed roll structures coacting to intermittently feed successive lengths of wire to be acted upon, the combination of a revoluble shaft having its forward end provided with a circular head formed of an inner part and an outer part, said outer part being of less diameter than and disposed in concentric relation with respect to said inner part, said head being formed axially thereof with a threaded socket opening at the front of said outer part, said inner part having its front formed with an annular groove surrounding the base of the outer part, a rectangular carrier formed with an opening intermediate its ends and a gripper at one end, said carrier encompassing in spaced relation said outer part, a tensioning ring of split-like form seated in said groove, encompassing said outer part in spaced relation and bearing against the wall of said opening, a holder positioned against the front of said outer part and formed with spaced retainers positioned at the sides of the carrier, and means extending through the holder and threadedly engaging with the said socket for connecting said holder and head together.

6. In a wire feed mechanism of that type including a pair of revoluble feed roll structures coacting to intermittently feed successive lengths of wire to be acted upon, the combination of a revoluble shaft having its forward end provided with a circular head formed of an inner part and an outer part, said outer part being of less diameter than and disposed in concentric relation with respect to said inner part, said head being formed axially thereof with a threaded socket opening at the front of said outer part, said inner part having its front formed with an annular groove surrounding the base of the outer part, a rectangular carrier formed with an opening intermediate its ends and a gripper at one end, said carrier encompassing in spaced relation said outer part, a tensioning ring of split-like form seated in said groove, encompassing said outer part in spaced relation and bearing against the wall of said opening, a holder positioned against the front of said outer part and formed with spaced retainers positioned at the side of the carrier, and means extending through the holder and threadedly engaging with the said socket for connecting said holder and head together, said carrier being of greater length than the diameter of the head and holder.

7. In a wire feed mechanism of that type including a pair of revoluble feed roll structures coacting to intermittently feed successive lengths of wire to be acted upon, the combination of a revoluble shaft provided intermediate its ends with a laterally extended flange, a smooth part forwardly of the flange and a reduced peripherally threaded part forwardly of said smooth part, an axially apertured adjustable carrier revolubly mounted on said smooth part against said flange and formed with a groove opening at its outer edge, a gripper positioned in said groove, fixed to said carrier and extended from the latter, and means mounted on said threaded part and coacting with said flange for clamping said carrier to the shaft to provide for the carrier bodily revolving with the shaft.

8. In a wire feed mechanism, a portable one-piece support having a recess in its front face formed with side walls, top and bottom walls and a rear wall, a pair of revoluble shafts journaled in said rear wall and having their outer end parts arranged in said recess, and spaced sidewise aligned wire feed roll structures arranged in said recess and bodily carried with the said parts of said shafts, each of said structures including a wire gripper of arcuate form disposed in outwardly extended relation with respect to the outer periphery thereof and of a length less than the outer circumference of the structure, one of said grippers being spring urged and slidingly mounted in that roll structure of which it forms a part of, said grippers coacting for intermittently feeding successive lengths of wire.

9. In a wire feed mechanism, a portable one-piece support having a recess in its front face formed with side walls, top and bottom walls and a rear wall, a pair of revoluble shafts journaled in said rear wall and having their outer end parts arranged in said recess, and spaced sidewise aligned wire feed roll structures arranged in said recess and bodily carried with the said parts of said shafts, each of said structures including a wire gripper of arcuate form disposed in outwardly extended relation with respect to the outer periphery thereof and of a length less than the outer circumference of the structure, said grippers coacting for intermittently feeding successive lengths of wire, one of said grippers capable of being adjusted in a circumferential direction with respect to the structure of which it forms a part for varying the period of the coaction between the grippers, the other of said grippers being spring urged and slidingly mounted in that roll structure of which it forms a part of.

10. In a wire feed mechanism, a pair of oppositely revoluble wire feed roll structures, one of said structures including a tensioned carrier slidingly mounted therein diametrically thereof, said carrier having one of its ends being so formed to provide a wire gripper disposed in circumferential relation with respect to the structure which the carrier forms a part of, the other of said structures including a non-tensioned, non-slidable, adjustable carrier having fixed therein and extended therefrom a wire gripper disposed in circumferential relation with respect to that structure of which the adjustable carrier forms a part of, said grippers being disposed in extended relation with respect to the outer periphery of the roll structures for coaction to intermittently feed during the revolving of the structures, successive lengths of wire to be acted upon.

ARNOLD F. FISCHER.