Nov. 11, 1947. N. W. COKER 2,430,805

APPARATUS FOR MANUFACTURING WIRE COAT HANGERS

Filed Dec. 13, 1945 2 Sheets-Sheet 1

Fig. 1.

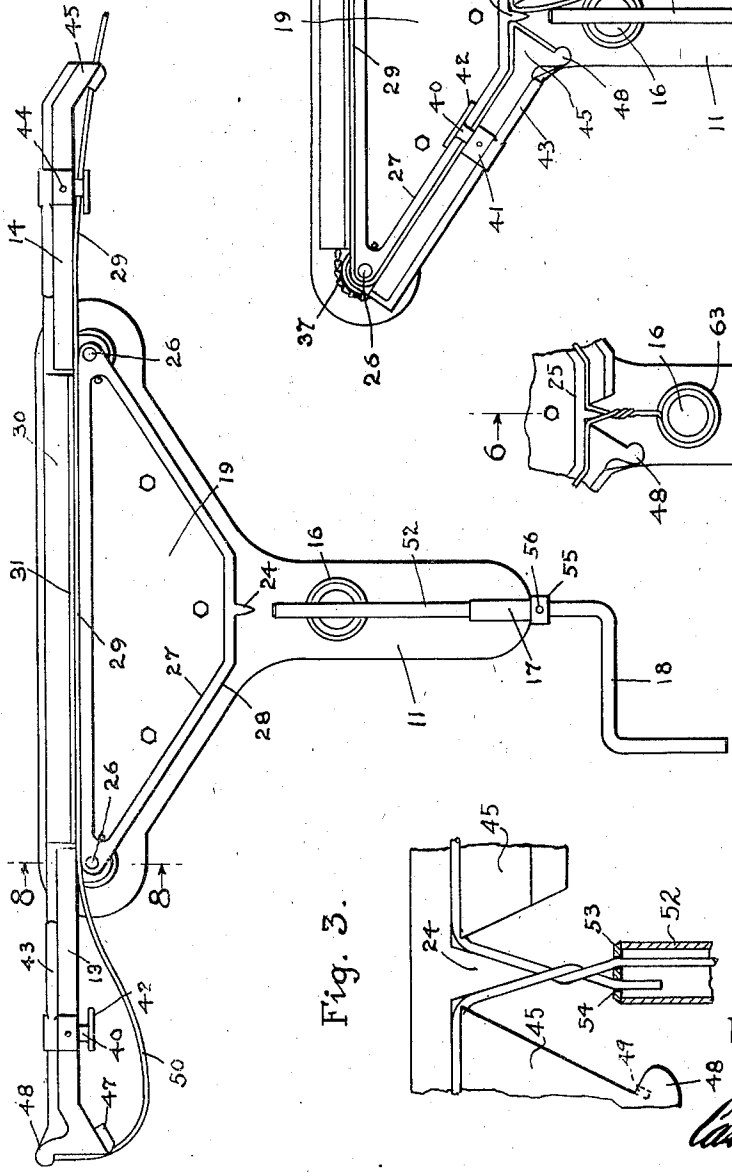

Fig. 2.

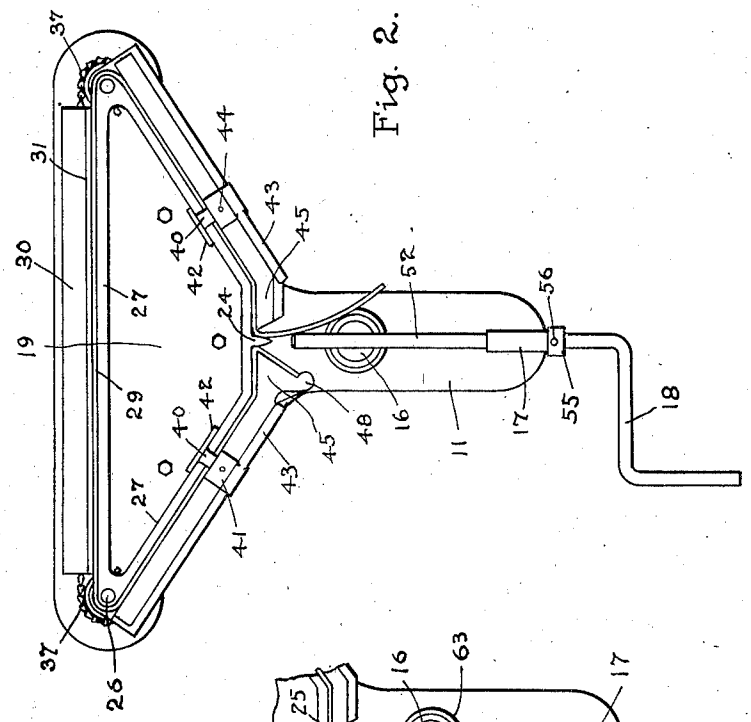

Fig. 4.

Fig. 3.

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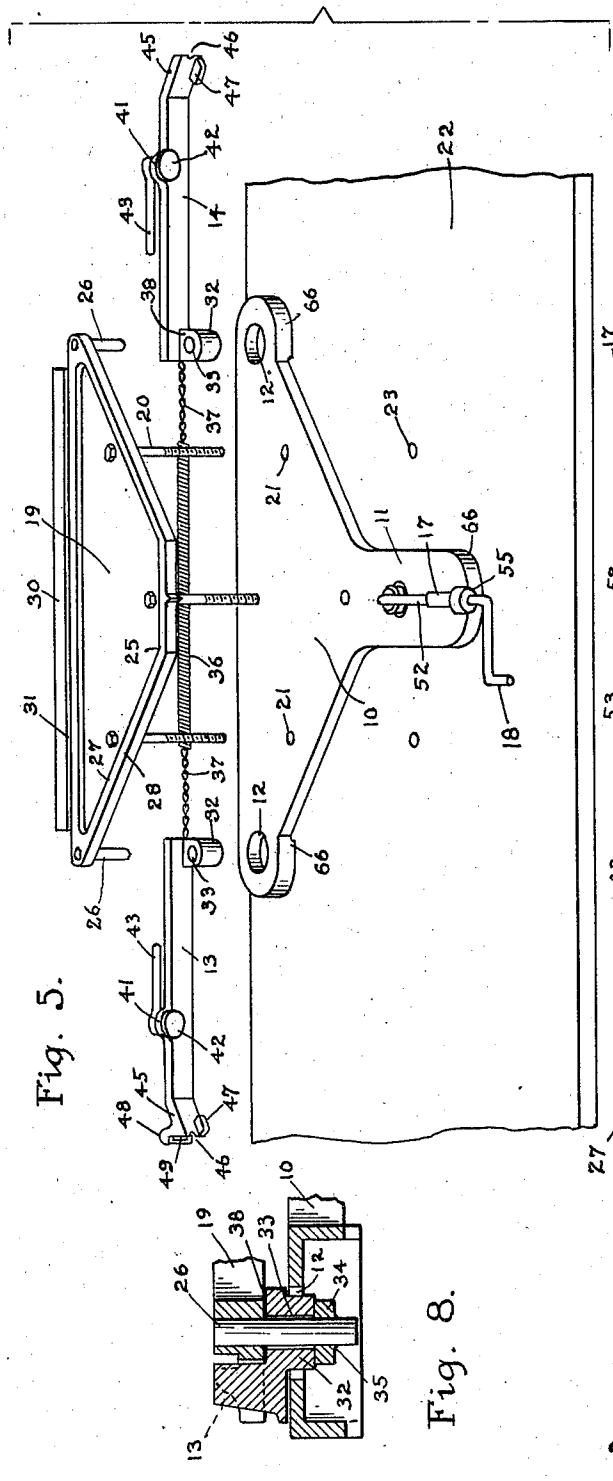

Fig. 5.

Fig. 8.

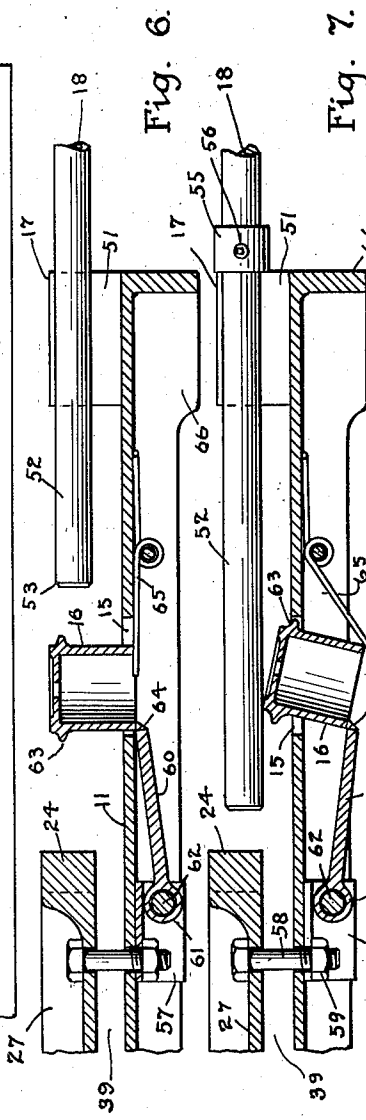

Fig. 6.

Fig. 7.

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APPARATUS FOR MANUFACTURING WIRE COAT HANGERS

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Application December 13, 1945, Serial No. 634,785

3 Claims. (Cl. 140—81.5)

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My invention relates to a machine for the manufacture of wire garment hangers, and in particular to the provision of such a machine that is manually operated as distinguished from power driven types of machines now in general use.

The machines now in use are generally large complicated power driven machines which are adapted to turn out a great volume of coat hangers per minute. These machines are intended for factory use in the production of garment hangers on a large commercial basis for resale to laundries and cleaning establishments. Such machines are of necessity both cumbersome and expensive.

In contra-distinction to the type of machine referred to, it is the object of my invention to provide a small portable and inexpensive machine which has a sufficient capacity and is otherwise suitable for use in individual cleaning establishments, to manufacture hangers in such quantities and as the needs of such individual laundry or establishment requires.

It is a further object of my invention to provide a machine which is of such simple construction and operation that practically any unskilled employee may manipulate the same to manufacture garment hangers as the need arises.

It is a still further object of my invention to provide a machine which, due to its simplicity and resulting economy in construction, may be produced at a cost which will not be prohibitive to small establishments desiring to purchase the same.

While it is generally the object of my invention to provide a machine for use in individual laundries and dry cleaning establishments, it is contemplated that such machine might serve admirably in projects for the rehabilitation of persons who have been crippled or become blind and which could be made the means of their livelihood.

In the accompanying drawings forming a part of this application and in which like reference characters are employed to designate like parts throughout the same:

Figure 1 is a top plan view of my invention illustrating the machine in its open or extended position with a wire in place preparatory to being formed into a hanger.

Figure 2 is a top plan view of my invention illustrating the machine in its actuated or closed position with the wire bent to form the body of the hanger.

Figure 3 is a detail plan view partly in section illustrating my crank assembly for twisting the ends of the hanger wire into locked relationship.

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Figure 4 is a top view illustrating my die for forming the hook portion of the hanger.

Figure 5 is an exploded view of my invention illustrating the several parts thereof in position for assembly.

Figure 6 is a sectional view on the lines 6—6 of Figure 4 and illustrating in detail my crank and hook forming die.

Figure 7 is a view similar to Figure 6 and illustrating the hook forming die in depressed position to permit movement of the crank to its operative position, and

Figure 8 is a section on the lines 8—8 illustrating in detail the pivot shown in Figure 1.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a base plate or foundation member which is substantially triangular in shape with a projecting portion 11, and is cast or otherwise formed of iron or other suitable metal. The two corners of the triangle opposite the projection 11 are rounded, as illustrated in Figure 5, and each of such rounded corners are provided with an enlarged aperture 12 pivotally carrying arms 13 and 14, the function of which will later be made apparent.

Projection 11 is also provided with an aperture shown at 15 in Figures 6 and 7 to receive the hook-forming die 16 as later described. A bearing 17 is cast integral with the projection 11 and is adapted to receive the shaft of a crank 18.

A second triangular plate 19, hereinafter referred to as the hanger die plate, is supported above the base plate 10 and is secured by bolts 20 which project through corresponding holes 21 drilled or otherwise provided in the base plate, as best illustrated in Figure 5. My entire machine, although of a portable nature, may, if desired, be attached to a table or work bench, as shown at 22, and may be secured thereto by extending the bolts 20 through appropriately spaced holes 23 provided in the table top 22.

The die plate 19, which is also preferably of cast iron, conforms generally to the triangular configuration of the base plate 10, and is slightly smaller in circumferential dimensions. The triangular die plate is sheared off at the corner 25 which, in assembled superimposed relation to the base plate, is spaced directly above the projection 11. A wedge-shaped lug 24 is cast or otherwise provided on the periphery of the die plate 19, and is positioned centrally of the sheared off section 25, whereby, upon assembly of the machine, the lug 24 is disposed directly above and in alignment with the centers of the crank shaft bearing

17 and the aperture 15 carried by the projection 11.

The two corners of the die plate 19 opposite the sheared off corner 25 are provided with pivot pins 26 which are adapted to register with the previously mentioned enlarged apertures 12 disposed in the rounded corners of the base plate 10.

Pivot pins 26 project downwardly through the die plate 19, as shown in Figure 8, and are preferably brazed or otherwise secured in fixed relation thereto. A flange 27 is disposed circumferentially about the outer edge of the die plate 19, which flange during operation of the machine provides a receiving surface 28 for the wire stock 29, as hereinafter more fully described. A further upstanding flange 30 integral with the die plate 19 extends across the back thereof between the pivot pins 26. A groove or channel 31 is formed between the flange 27 and the upstanding flange 30 at the back of the machine and, as hereinafter described, is adapted to receive the wire stock 29.

Referring to Figure 5, arms 13 and 14, respectively, are cast at their inner ends with cylindrical offset lugs 32 which project downwardly a substantial distance below the arms and upon assembly of the respective parts extend into the apertures 12 in the foundation plate 10. The lugs 32 are drilled or otherwise provided with longitudinal bores 33 forming bearings to receive the pivot pins 26 carried by the die plate 19. Washers or discs 34 are welded or otherwise secured, as at 35, to the pivot pins 26 to form a bearing surface upon which the lower faces of the lugs 32 rest and are adapted to rotate, as best illustrated in Figure 8. The arms 13 and 14 are thus hingedly secured between the plates 10 and 19 and are free to swing upon the pivot pins 26 to the open and closed positions illustrated in Figures 1 and 2, respectively. The arms are yieldably retained in their open position by means of a coiled spring 36 which has attached at each end thereof short lengths of chains 37, which chains are in turn welded or otherwise secured, respectively, to the ends of arms 13 and 14 adjacent the lugs 32. Movement of the arms beyond the open position shown in Figure 1 is prevented by contact of the inner ends of the arms with the ends of the upstanding flange 30 which flares outwardly from the die plate 19, as illustrated in Figure 1.

It will be understood from the foregoing description that the lugs 32 are offset at right angles from the innner ends of the arms 13 and 14, thus permitting the arms when swung to their closed position to lie parallel and substantially flush with the sides of the die plate 19. It will also be understood that the lugs 32 are attached only to approximately the lower half of the arms 13 and 14, and that the upper faces 38 of the lugs are slightly spaced from the underneath surface of the die plate to eliminate friction or binding when the arms are rotated, as best shown in Figure 8. The positioning of the lugs with respect to the arms, as aforesaid, permits the adjacent surfaces of the foundation plate 10 and the die plate 19 to lie nearly flush with each other when assembled in superimposed relation, there being only a limited space illustrated at 39 in Figures 6 and 7 separating the two plates.

Each of the arms 13 and 14 carries mid-way of its length a locking member consisting of a rotatable shaft 40 extending through an aperture provided in a raised portion 41 which is cast integral with the arms. An eccentric member 42 is brazed or otherwise secured to the shaft at the end thereof which lies adjacent the die plate 19 when the

arm is swung to the closed position, illustrated in Figure 2, the opposite end of the shaft terminating in a rotatable handle 43. It will be noted that the shaft 40 projects through the raised portion 41 of the arm a sufficient distance whereby, upon rotation of the handle 43, the elongated portion of the eccentric member 42 engages the circumferential flange 27 carried by the die plate 19, thereby locking the arm in the closed position as stated. If desired, the elongated portion of the eccentric 42 may be provided with a cam or beveled surface, not shown, to enable the arm to be drawn into snug relationship with the die plate 19. Oil holes 44 may be drilled in the raised portion 41 to communicate with and permit lubrication of the shaft 40.

The ends of the arms 13 and 14 opposite the lugs 32 terminate in sections 45 which project at an angle to the longitudinal axis of the arms and in the closed position of the machine illustrated in Figure 2 lie parallel to the sheared point 25 of the triangular die plate 19. The sections 45 are notched at 46 to receive and maintain the hanger wire 29 in proper spaced position during the operation of the machine, whereby, upon closing the arms, the hanger wire carried within such notches 46 is brought into engagement with the working face 28 on the periphery of the die plate 19. Lugs 47 project from near the bottom of sections 45 and when the arms are folded or swung to their closed position, said lugs are received in the space 39 between the base plate 10 and die plate 19 adjacent the projection 11 of the base and the sheared corner 25 of the die plate respectively. The lugs 47 assist in guiding and maintaining the arms in their operative or closed position and lend rigidity to the assembly of the respective parts during the subsequent twisting of the ends of the hanger wire, as later described. Angular section 45 forming a part of arm 13 is cast with an integrally formed hook-shaped member 48 which is provided with a pocket or groove 49 adapted to receive and retain one end of the hanger wire during the operation of the machine. The hanger stock 29 preferably consists of No. 12 gauge steel wire, and is cut into lengths 43¾" for the standard size hanger which my machine is intended to manufacture.

The operation of my invention as thus far described is as follows: Assuming that the arms 13 and 14 are in their open or operative position, illustrated in Figure 1, one end of the length of wire is inserted in the depression 49 carried by the projection 48 on the arm 13. From the depression 49, the wire is strung through the notch 46 in the arm 13 through the channel 31 at the back of the die plate 19 and through the notch 46 at the outer end of arm 14, the free end of the wire projecting beyond the end of the arm 14, as shown in Figure 1. To form the body of the hanger, the arms are swung about their pivots carrying the ends of the wire with them to the closed or operated position where the wire is clamped between the inner surface of the arms and the receiving face 28 of the circumferential flange 27 which extends around the outer edge of the triangular die plate. The arms 13 and 14 are snugly locked in their closed position with respect to the receiving face of the die plate by rotating the handles 43 of the locking members to engage the beveled elongated section of the eccentrics 42 with the circumferential flange 27 carried by the die plate. It is preferred, although not essential, that arm 13 is swung to its closed position and locked in place before arm 14 is

closed. By such operation, any excess length of the wire stock, such as in the loop 50 adjacent arm 13, is moved lengthwise through the channel 31 at the back of the machine and permitted to project beyond the end of arm 14. The wire is thus automatically positioned in the machine to provide a long end which projects a predetermined distance beyond the end of arm 14 and, as later described in detail, is bent to form a hook for the hanger.

In the operation of the machine to the closed position as described, the hanger wire is bent to form the triangular body portion of the hanger and is in position for the next operation which consists of twisting the ends of the hanger wire to lock them together. For such purpose, I have provided a crank assembly which is illustrated in detail in Figures 2 and 3 of the drawing, to which reference is now made. The bearing 17 positioned at the outer end of the projection 11 carried by the base plate is provided with a bore 51, the longitudinal axis of which is directly in alignment with the wedge-shaped lug 24 carried by the die plate and is adapted to slidably receive for rotation therein the shank 52 of a crank member indicated generally at 18. The crank member which is hollow may be formed from a length of metal pipe or tubing, and the end of the shank 52 is closed by a metal plug 53 which is drilled or otherwise provided with holes 54 to receive the ends of the hanger wire 29, as shown in Figure 3. In operation of the crank member, the shank 52 is inserted in the bearing 17 and advanced therethrough, the ends of the wire stock being manually threaded through the respective apertures 54 in the plug end of the shank as it is advanced. The stop member 55 is adjustably secured by a screw or stud 56 to the shaft of the crank, and the stop is adapted to engage with the outer end of the bearing 17 to restrict the advancement of the shaft beyond the position shown in Figure 2. Upon reaching the position described with the ends of the hanger wire threaded through the openings in the plug at the end of the shank, the crank is rotated to twist the wire together, as shown in Figure 2. Two complete revolutions of the crank will twist the wire sufficiently so that the ends will remain permanently locked. However, if it is desired to provide more twists in the wire, the crank may be adjusted to provide sufficient space between the end of the shank carrying the plug 53 and the wedge member 24 carried by the die plate to receive the number of additional twists required. The adjustment of the crank with respect to the wedge member is controlled by setting the stop member 55 to limit the distance which the shank 52 may be advanced through the bearing 17.

In advancing the crank shaft through the bearing to engage the ends of the hanger wire, it is necessary to first depress the hook-forming die 16 previously mentioned and illustrated in detail in Figures 6 and 7 of the drawing, to which reference is now made. Secured at the underside of the base plate 10 is an inverted U-shaped member which may consist of a relatively short length of iron shown in section at 57. The inverted U-shaped member is positioned at the point of the triangular base plate adjacent the projection 11, and is secured thereto by the threaded bolt 58 which projects through the die plate 19 and extends through registering apertures provided in the base plate and U-member 57. A nut 59 threadedly engaging the bolt 58 firmly secures the U-member underneath the plate 10 as described. Hingedly secured to the U-member 57 is a metal finger 60 formed at one end to provide an eye or bearing 61, which is mounted for pivotal movement on a pivot pin 62 extending transversely across the channel of the U-member, the respective ends of the pivot pin being welded to the adjacent legs of the U-member. The hook-forming die 16 which is preferably cast iron, is cylindrical and has a bead 63 extending about the top thereof. The die corresponds in circumferential dimension to the hook of a standard size wire clothes hanger.

The hook die 16 is brazed or otherwise secured near the bottom as indicated at 64 to the end of the metal finger 60 and is adapted to project through the enlarged aperture 15 in the projection 11 of the plate 10. A spring 65 secured underneath the base plate, as illustrated in Figures 6 and 7, yieldingly maintains the hook die in its projected position. Flanges 66 which extend downwardly from the base plate 10 at the rounded corners of the base plate and at the outer end of projection 11 serve to space the base a sufficient distance above its supporting bench or table to permit depression of the hook die, as illustrated in Figure 7.

Continuing the description of the operation of my machine, the hook die 16 is depressed out of the path of the crank shaft 52 as it is advanced through the bearing 17 to engage the ends of the hanger wire. Following the twisting together of the ends of the hanger wire by rotation of the crank, the crank member is withdrawn a sufficient distance through the bearing 17 to release the wire and clear the hook die, thereby permitting the latter to be projected through the aperture 15 in the projection 11 by the action of spring 65, as illustrated in Figure 6. In the projected position described, the hook die is ready to receive the remaining or long end of the hanger wire, the short end of such wire having been absorbed in twisting the two ends together. To form the hook of the hanger, the operator manually molds or bends the end of the wire stock about the cylindrical die beneath the bead 63 which serves to prevent the wire from slipping off of the cylinder during such bending operation. A pair of pliers or other implement, not shown, may be used to draw the end of the wire about the hook die, although it has been found that the wire is sufficiently flexible to permit the operator to bend the same by hand and without the use of tools or other equipment. To release the now completely formed hanger, the hook die is first depressed to force the bead through the aperture 15, thus detaching the hook from the cylinder. The handles 43 of the locking members are next rotated to disengage the eccentrics from the flange carried at the outer periphery of the die plate. The arms, thus released, are permitted to swing about their pivots to the open position, illustrated in Figure 1, the coil spring and chain which is secured at the ends of the arms assisting in such movement. The completely formed hanger may now be removed from the machine which is in its open position ready to receive a new length of wire in preparation for forming the next hanger.

It will be seen from the foregoing description and drawings that my invention provides a simple and practical machine which is inexpensive to manufacture and which is well adapted to carry out the objects as specified. It will also be obvious that while I have herein described a pre-

ferred embodiment of my invention, the same may be altered in detail and arrangement of parts within the scope of the appended claims.

I claim:

1. A machine for the manufacture of garment hangers having a body and a hook formed from wire stock, said machine consisting of a base member, a die plate mounted above the base and carrying a flange presenting a wire receiving surface of substantially triangular configuration, arms secured to the die plate and pivoted between said die plate and said base member for movement to an operated and an operative position with respect to said wire receiving surface, yielding means for retracting the arms to said operative position, means carried by each of said arms for engaging said wire stock and cooperating with the triangular receiving surface to bend said wire intermediate its ends to form the body of the hanger, means carried by one of the arms for positioning the wire stock in the machine to terminate in a short and a long end upon actuation to the operated position, said means consisting of a hook member projecting at an angle to said arm and having a pocket for receiving one end of said wire, locking members carried by the arms and adapted to selectively engage the flange carried by said die plate to retain the arms in said operated position, means for engaging and twisting the ends of said wire into interlocked relationship, and a hook forming die about which the hook of said hanger is formed.

2. A machine for the manufacture of garment hangers having a body and a hook formed from wire stock, said machine consisting of a base member, a die plate mounted above the base and carrying a flange presenting a wire receiving surface of substantially triangular configuration, arms secured to the die plate and pivoted between said die plate and said base member for movement to an operated and an operative position with respect to said wire receiving surface, yielding means for retracting the arms to said operative position, means carried by each of said arms for engaging said wire stock and cooperating with the triangular receiving surface to bend said wire intermediate its ends to form the body of the hanger, means carried by one of the arms for positioning the wire stock in the machine to terminate in a short and a long end upon actuation to the operated position, said means consisting of a hook member projecting at an angle to said arm and having a pocket for receiving one end of said wire, locking members carried by the arms and adapted to selectively engage the flange carried by said die plate to retain the arms in said operated position, means consisting of a hollow crank having apertures in the end thereof for engaging and twisting the ends of said wire into interlocked relationship, and a hook forming die pivotally carried by the base member and about which the hook of said hanger is formed.

3. A machine for the manufacture of garment hangers having a body and a hook formed from wire stock, said machine consisting of a base member, a die plate mounted above the base and carrying a flange presenting a wire receiving surface of substantially triangular configuration, arms secured to the die plate and pivoted between said die plate and said base member for movement to an operated and an operative position with respect to said wire receiving surface, yielding means for retracting the arms to said operative position, means carried by each of said arms for engaging said wire stock and cooperating with the triangular receiving surface to bend said wire intermediate its ends to form the body of the hanger, means carried by one of the arms for positioning the wire stock in the machine to terminate in a short and a long end upon actuation to the operated position, said means consisting of a hook member projecting at an angle to said arm and having a pocket for receiving one end of said wire, locking members carried by the arms and adapted to selectively engage the flange carried by said die plate to retain the arms in said operated position, means consisting of a hollow crank having apertures in the end thereof for engaging and twisting the ends of said wire into interlocked relationship, a hook forming die pivoted to the base adjacent the crank member and depressible out of the path thereof, said hook die including a cylindrical member about which the hook of said hanger is formed from the long end of said wire.

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