Jan. 16, 1962 W. A. EHLERT ET AL 3,017,016

WIRE DRAWING APPARATUS

Filed July 28, 1960 4 Sheets-Sheet 1

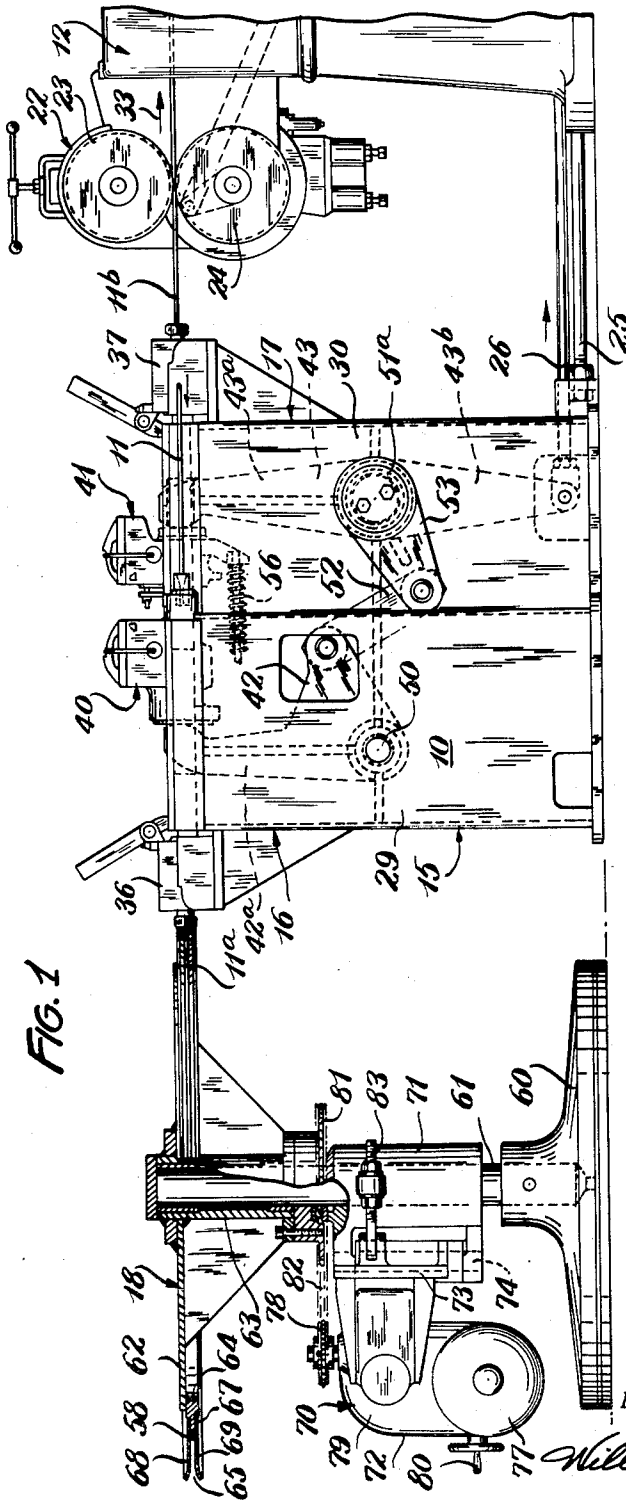

FIG. 1

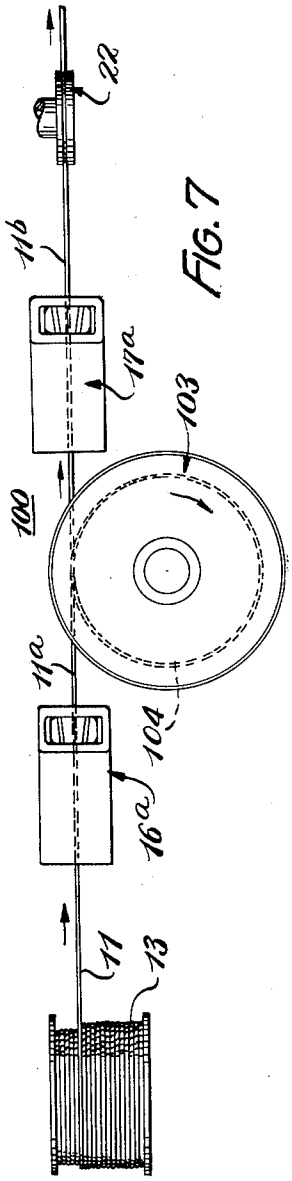

FIG. 7

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WIRE DRAWING APPARATUS

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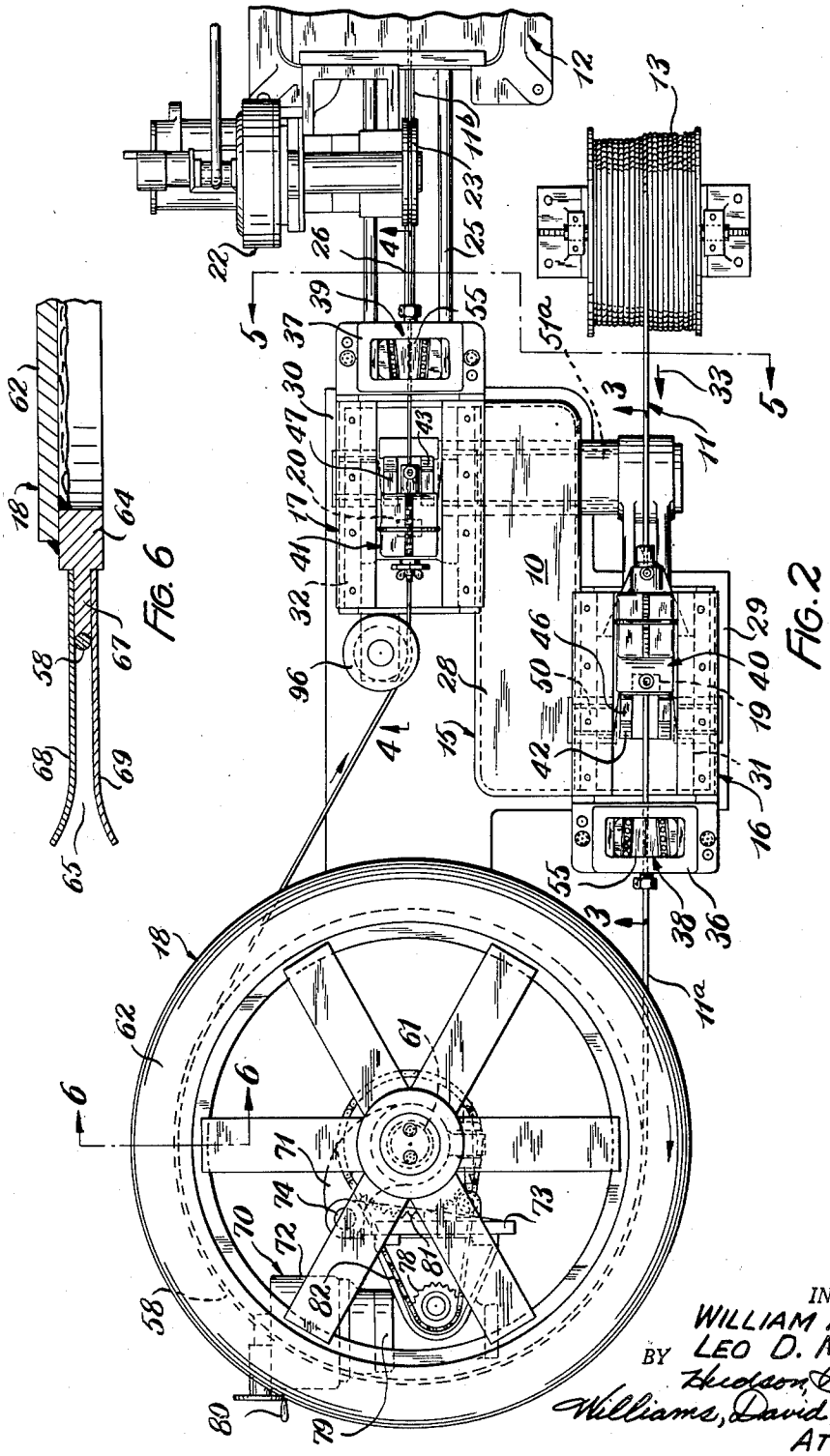

FIG. 2

FIG. 6

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WIRE DRAWING APPARATUS

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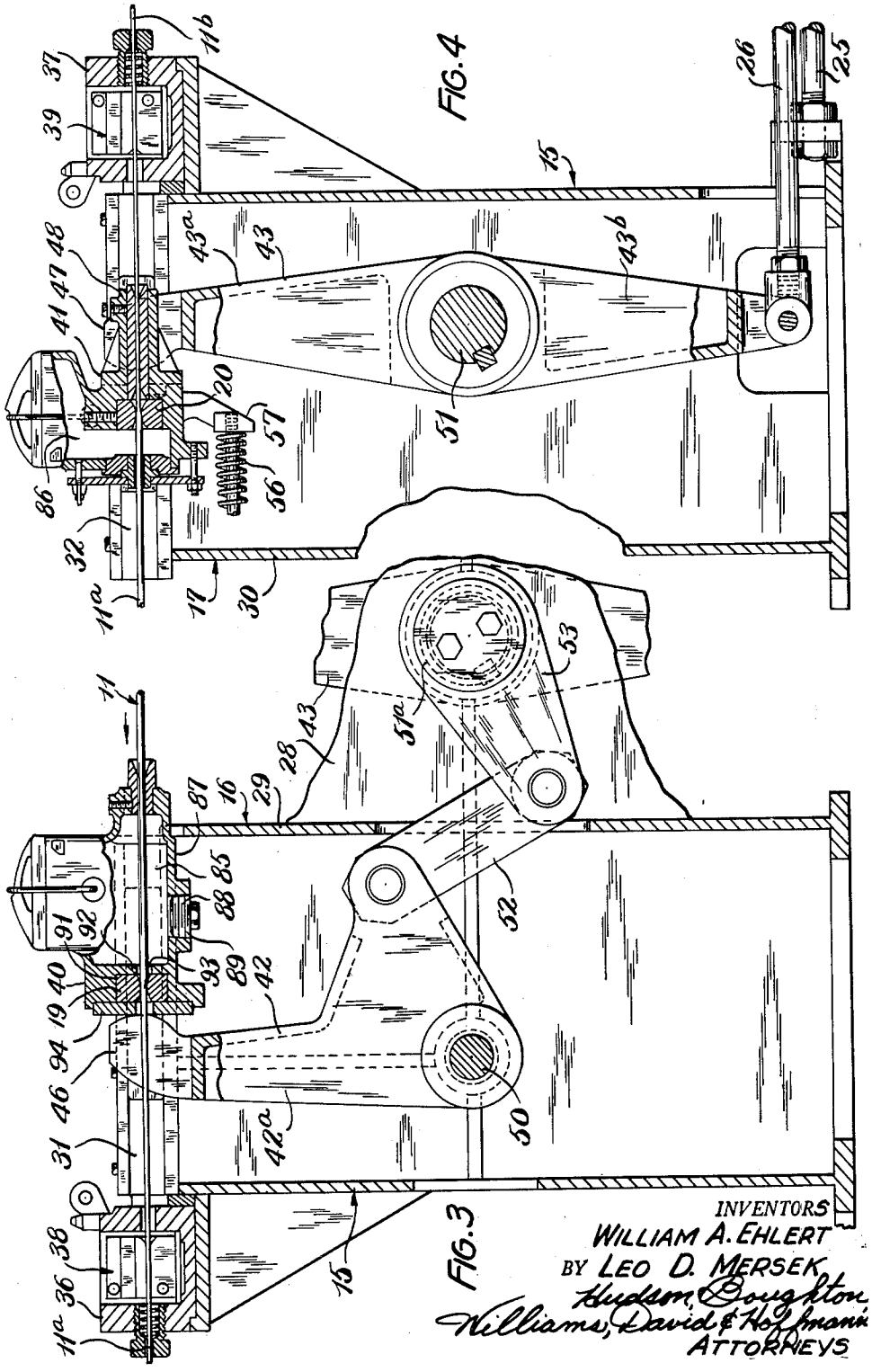

FIG. 4

FIG. 3

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WIRE DRAWING APPARATUS

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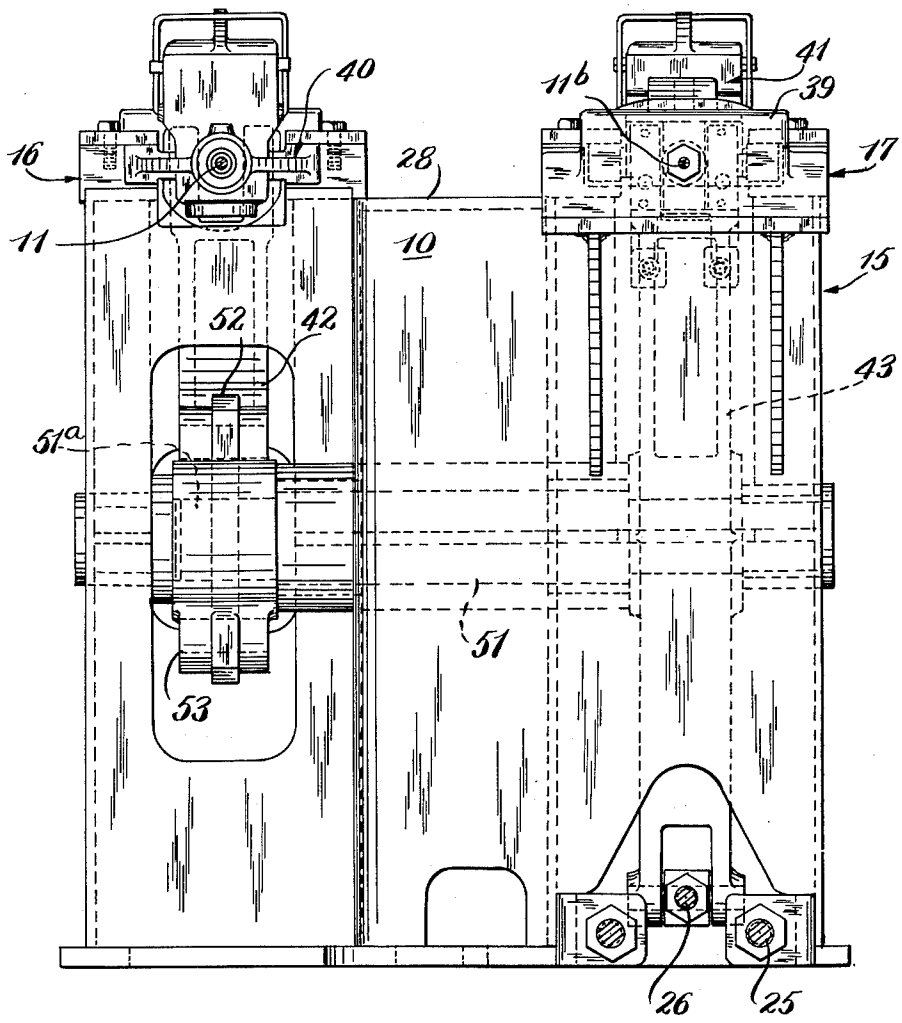

FIG. 5

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3,017,016

Patented Jan. 16, 1962

3,017,016

WIRE DRAWING APPARATUS

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Filed July 28, 1960, Ser. No. 45,916
16 Claims. (Cl. 205—13)

This invention relates to wire drawing apparatus and, more particularly, to wire drawing apparatus of the kind in which the die means is pushed over and along the wire during intermittent work strokes to effect the drawing of the wire. The invention further relates to wire drawing apparatus of this character intended for use in adjacent relation to a fabricating machine to which the drawn wire is supplied at substantially the rate of production operation of such machine.

It is recognized in the wire drawing art and in the art of fabricating drawn wire by cold working that important advantages are realized when the wire being drawn and immediately fed to the frabricating machine is a hot-rolled or fully-annealed wire stock, whereas the fabrication of wire drawn from cold-rolled stock, or wire which has become age-hardened after drawing, is usually difficult and may cause rapid wear or breakage of the dies of the fabricating machine. Furthermore, when the wire required by the fabricating machine is a small-diameter wire, it becomes even more difficult to supply the fabricating machine with such a hot-rolled or fully-annealed type of drawn wire. This results from the fact that successive draws are necessary to obtain the small-diameter wire and a practical handling of small-diameter wire usually requires storing of the wire in coils between the successive drawing operations and age-hardening is prone to occur during such storage.

This invention deals effectively with these problems and, as one of its objects, provides novel wire drawing apparatus in which a plurality of draws, performed by reciprocably movable drawing dies on wire to be fed directly to a fabricating machine, are accomplished in the same apparatus in succession and without any time delay, or any need for storage or handling of coils of wire, between the successive drawing operations.

As another object thereof, this invention provides novel wire drawing apparatus of the character above indicated and having wheel means engageable by a bight portion of the wire between successive draws, and which wheel means is rotatably driven for producing an advance feeding of the wire with respect to at least one of the first or earlier drawing stations so as to prevent or minimize marring or flattening of the wire due to an excessive pulling or clamping force which might otherwise need to be applied to the wire by a feeding means located adjacent the final drawing station.

Still another object is to provide novel wire drawing apparatus of the character just above referred to wherein the wheel means has annularly grooved rim means of a form to prevent kinking of the wire passing therearound, as well as complete disengagement of the wire therefrom due to slackening of the wire.

As a further object this invention provides novel wire drawing apparatus of the kind above indicated wherein the drawing die of the drawing station on the wire-receiving side of the wheel means has a shorter drawing stroke than the die of the drawing station on the other or wire-delivery side of the wheel means, whereby a smooth and relatively quieter operation of the apparatus is achieved.

Additionally, this invention provides novel wire drawing apparatus of the kind having a drawing die mounted on a reciprocable slide containing a lubricant chamber, and wherein the construction of the slide with respect to the lubricant chamber thereof and the location of the die relative to the lubricant chamber, greatly facilitate cleaning of the lubricant chamber, as well as the removal and replacement of the die, when these operations become necessary.

Other objects, novel characteristics and advantages of this invention will be apparent in the following detailed description and in the accompanying drawings forming a part of this specification and in which,

FIG. 1 is a side elevation, with portions in section, showing wire drawing apparatus embodying this invention and having multiple drawing units;

FIG. 2 is a plan view of the apparatus;

FIG. 3 is a partial longitudinal vertical section taken through one of the wire drawing units of the apparatus, the view being taken as indicated by section line 3—3 of FIG. 2;

FIG. 4 is a similar longitudinal vertical section taken through another of the wire drawing units as indicated by section line 4—4 of FIG. 2;

FIG. 5 is an end elevation of the main portion of the apparatus when viewed as indicated by the directional line 5—5 of FIG. 2;

FIG. 6 is a larger scale transverse vertical section through the rim portion of the wheel means of the apparatus, as indicated by section line 6—6 of FIG. 2; and

FIG. 7 is a plan view similar to that of FIG. 2 but which is somewhat diagrammatic and illustrates a modified form of the apparatus.

The novel wire drawing apparatus 10 of this invention (FIG. 2) operates to perform a plurality of drawing operations on a wire 11 at different points therealong and to supply the drawn wire directly to a fabricating machine 12, such as a cold-header type of machine, at substantially the rate of production operation of the latter. The wire 11 is supplied to the drawing apparatus 10 from a supply coil 13 or the like, and is preferably a hot-rolled or fully-annealed form of wire stock.

The wire drawing apparatus 10 comprises, in general, a frame structure 15 common to a plurality of wire drawing units, in this case first and second wire drawing units 16 and 17, and wheel means 18 around which a bight portion of the wire extends in a wrapped relation thereto in passing between the two drawing units. The drawing units 16 and 17 are of the reciprocating-die type and are provided respectively with drawing dies 19 and 20 which are pushed over and along the wire 11 during the drawing strokes performed thereby.

The fabricating machine 12 is of a conventional form having die means (not shown) thereon for performing desired operations on the drawn wire in accordance with the product being produced, and is here shown as including a feed roll device 22 for feeding the drawn wire from the apparatus 10 to the dies of the fabricating machine. The feed roll device 22 comprises cooperating feed rolls 23 and 24 adapted to grip and advance the drawn wire and which are rotatably driven, preferably from the fabricating machine 12 and in a timed relation to the operation of the latter.

The drawing apparatus 10 is connected with the fabricating machine 12 as by means of tie rods 25 and is operatively driven from the fabricating machine by a drag link 26 connected with the latter, as will be further explained hereinafter. The operating connections by which the feed roll device 22 and the drag link 26 are actuated from the movable mechanism of the fabricating machine 12 are of a conventional form well known to persons skilled in this art, such as connections of the kind illustrated in Patent No. 2,018,211 dated October 22, 1935. Since the wire drawing apparatus 10 and the associated feed roll device 22 are thus connected with the fabricating machine 12 to be operated therefrom, they

will be driven in a timed relation to the fabricating machine as well as in a timed relation to each other.

The frame means 15 is adapted to stand on a floor or the like and comprises an upright hollow main portion or frame body 28 and a plurality of guideway portions 29 and 30 connected with the frame body, in this case, in a laterally adjacent or side-by-side relation to each other as shown in FIG. 2. The guideway portions 29 and 30 are provided with guideways 31 and 32 extending in the longitudinal direction of the advance feeding movement of the wire 11. The advance feeding movement of the wire 11 is indicated by the arrows 33 and, when the guideway portions 29 and 30 are in the laterally adjacent relation mentioned just above, the guideways 31 and 32 thereof are substantially parallel.

The guideway portions 29 and 30 of the frame 15 are also provided with hollow grip boxes 36 and 37 in which wire gripping devices 38 and 39 are located for gripping engagement with portions of the wire 11 extending through these grip boxes, as will be further explained hereinafter. The grip device 38 of the first drawing unit 16 can be conveniently referred to as the first grip device and is located on the wire-delivery end of the guideway portion 29 of the frame. The grip device 39 of the second drawing unit 17 can be referred to as the second grip device and is likewise located on the wire-delivery end of the guideway portion 30. The first and second grip devices 38 and 39 are therefore located on the outer or remote ends of the drawing units 16 and 17, as is clearly apparent from FIG. 2.

The first and second drawing units 16 and 17 also comprise first and second slides 40 and 41 which support the drawing dies 19 and 20 and are reciprocably slidable in the guideways 31 and 32 for causing the dies to be pushed over and along the wire 11 in drawing engagement therewith. The drawing units 16 and 17 are also provided with first and second swingable draw levers 42 and 43 for actuating the slides 40 and 41 during the work strokes thereof, the lever 42 being a bell crank lever having an upper arm 42^a co-operable with the slide 40 and the lever 43 being a straight lever having an upper arm portion 43^a co-operable with the slide 41.

The arm 42^a of the draw lever 42 is provided at the upper end thereof with a forked portion 46 which straddles the wire 11 and is adapted for pushing engagement with the slide 40 at laterally spaced points thereof. Similarly, the arm 43^a of the draw lever 43 is provided with a forked portion 47 which straddles a projecting hollow axial portion 48 of the slide 41 and is adapted for pushing engagement with such slide at laterally spaced points thereof.

The first draw lever 42 is swingable on a transverse pivot shaft 50 mounted in the guideway portion 29 of the frame 15 and the draw lever 43 is swingably supported by, and keyed to, a transverse shaft 51 which is rockably mounted in the frame 15 and includes a shaft projection 51^a at one end thereof. The lower arm 43^b of the second draw lever 43 is connected with the drag link 26 extending from the fabricating machine 12, and the first draw lever 42 is connected with the projecting portion of the shaft 51^a by means of a connecting link 52 and a lever 53 keyed on such projecting shaft portion.

The grip devices 38 and 39 are of a conventional form each comprising a pair of grip blocks 55 having co-operating grip portions between which the wire 11 extends and which blocks are automatically effective on the wire to grip the same for preventing backward movement thereof during the drawing strokes of the dies 19 and 20. The grip blocks 55 operate to automatically release the wire 11 during advance feeding movements thereof which take place between the intermittent drawing strokes of the dies.

During the work strokes of the slides 40 and 41 (FIGS. 3 and 4) produced by their respective draw levers 42 and 43, the dies 19 and 20 are pushed along the wire 11 in a direction away from the associated grip devices 38 and 39. During the return swinging movement of the draw levers 42 and 43, their forked portions 46 and 47 are disengageable from the associated slides 40 and 41 and the advance feeding movement of the drawn wire takes place during the return swinging movements of the draw levers. During such feeding movement of the drawn wire, the dies 19 and 20 and their associated slides 40 and 41 move in the advance direction in unison with the portions of the wire which are then located in the drawing dies and slides.

The advance feeding movement of the wire 11 is produced by the action of the wheel means 18 and the feed roll device 22, as will be explained next, and is assisted by compression spring means 56 located in one or both of the drawing units and, in this case, shown only in the drawing unit 17 and engaging a depending spring seat 57 of the slide 41.

The wheel means 18 serves the important purpose of a feed means for the drawing unit 16, and also serves to receive the first drawn portion 11^a of the wire being delivered from the first drawing unit and to direct such first drawn portion to the second drawing unit 17. This latter purpose of the wheel means 18 is accomplished in a manner to prevent kinking of the first drawn portion 11^a, as well as to prevent disengagement of the bight 58 portion from the wheel means when slackening of the wire occurs.

The wheel means 18 comprises a base 60 located adjacent to or connected with the frame 15, a post or spindle 61 mounted in the base and extending thereabove, and a wheel 62 rotatably supported by the post as by having a center sleeve or hub 63 journalled on the upper end portion of the post. The wheel member 62 has an annular rim portion 64 and an annular groove 65 extending around the outer periphery of the rim member for receiving the bight 58 of the first drawn portion 11^a of the wire in a wrapped relation to such rim portion.

In order to prevent the above-mentioned kinking or disengagement of the drawn wire portion 11^a from the wheel member 62, the peripheral groove 65 (FIG. 6) is of a slot-like form and is of relatively narrow width in a direction along the rotation axis of the wheel member, and additionally, is relatively deep in a direction radially of the wheel member. The axial width of the groove 65 is only enough greater than the diameter of the drawn portion 11^a to freely accommodate the latter in a manner to prevent kinking thereof. The radial depth of the annular groove 65 is such that the maximum amount of slackening of the bight 58 occurring during the operation of the drawing apparatus 10 will be accommodated by radial shifting of the wire in the groove but with the wire always remaining in the groove and thus prevented from becoming completely disengaged from the wheel member 62.

The rim portion of the wheel member 62 can be of any suitable construction which will provide an annular groove of the axially-narrow radially-deep character explained just above for the groove 65 and is here shown as comprising a radially projecting annular blade or tongue 67 on the rim member 64 on the outer side thereof, and a pair of axially spaced coextending flat ring members 68 and 69 secured to the blade 67 on opposite sides thereof as by welding or the like. The ring members 68 and 69 preferably have their inner annular edges in abutting engagement with the rim member 64 on opposite sides of the projecting blade 67. The outer annular edges portions of the ring members 68 and 69 are preferably flared or deflected away from each other to provide the annular groove 65 with a tapered entry portion to facilitate the movement of the drawn wire portion 11^a thereinto.

The wheel means 18 also comprises driving means 70 (FIGS. 1 and 2) for imparting rotation to the wheel

member 62. The driving means 70 can be of any suitable form or construction and is here shown as comprising a support member 71 fixed on the spindle 61, and a variable-speed driving unit 72 attached to a bracket 73 which is swingably mounted on the support member by pivot means 74.

The driving unit 72 comprises an electric motor 77 connected with a drive sprocket 78 through a speed-change gearing 79 and a control means, in this case, a manually operable control handle 80 for altering the control setting of the gearing 79 in accordance with the speed at which the wheel member 62 is desired to be driven. The drive sprocket 78 is connected with a driven sprocket 81 of the wheel member 62 by a suitable chain 82. Adjusting screw means 83 connected between the support member 71 and the bracket 73 provides for swinging of the latter for tightening the chain 82.

Reverting to the die-supporting slides 40 and 41, it is pointed out that these are provided respectively with lubricant chambers 85 and 86 adapted to contain suitable lubricating material to be supplied to the drawing dies 19 and 20 to lubricate the same during the drawing operation. The die support means and the lubricant chamber 86 of the second slide 41 (FIG. 4) are conventional in form and construction. In the case of the first slide 40 (FIG. 3), however, a novel construction has been provided with respect to the lubricant chamber 85 and the mounting means for the drawing die 19.

The portion of the slide 40 forming the bottom of the lubricant chamber 85 is here shown as being a bottom wall 87 and is provided with a discharge opening or clean-out passage 88 for the easy removal of lubricant from the chamber 85 and the cleaning thereof. The discharge opening 88 is preferably a threaded opening and is provided with a removable closure or screw plug 89.

The drawing die 19 is received in a die recess or pocket 91 which extends into the slide 40 from the outer side thereof, and is separated from the lubricant chamber 85 by an intervening partition wall 92 having an opening 93 to accommodate the wire 11 and through which limited amounts of lubricant are supplied to the die orifice. The drawing die 19 is retained in the recess 91 by a cover member 94 extending across the recess and forming a thrust plate engageable by the forked portion 46 of the draw lever 42.

The thrust plate 94 is preferably of a harder metal than that of the slide 40 and takes the thrust of the draw lever 42 in a manner to prevent damage to the slide. The thrust plate 94 is detachably secured to the slide 40 as by suitable screws so that the die 19 can be easily removed and replaced and, since the die is located outside of the lubricant chamber 85, the removal and replacement of the die can be accomplished without need for emptying the lubricant chamber as has been necessary heretofore.

In the operation of the wire drawing apparatus 10, the drawing stroke of the first die 19 produced by the first draw lever 42 causes the elongation of the wire 11, resulting from the drawing stroke, to move backwardly toward the coil 13, and such elongation creates no problem. During the return swing of the lever 42 the drawn wire portion 11^a is advanced by a pulling action applied thereto by the wheel means 18. This advance feeding of the wire causes the return movement of the slide 40 and the drawing die 19 and, at the same time, pulls additional wire stock from the coil 13.

During the drawing stroke of the second die 20 produced by the second draw lever 43 the elongation of the wire 11 resulting from this drawing stroke moves in a backward direction toward the wheel means 18 and causes a slackening of the first drawn portion 11^a. Upon the completion of the drawing stroke of the die 20, the lever 43 is swung through its return movement during which the feed roll device 22 operates to advance the second drawn portion 11^b of the wire and thereby applies a pulling action to the slide 41 and the die 20 by which these members are moved through their return stroke. This return movement of the slide 41 is assisted by the spring means 56 as was mentioned above. This feeding of the drawn wire portion 11^b by the feed roll device 22 causes a tightening of the bight 58 on the wheel means 18 to enable the latter to produce the above-described feeding action for the portion of the wire extending thereto from the coil 13.

In connection with this feeding action produced by the wheel means 18, it should be explained that the speed at which the wheel member 62 is driven bears an important relation to the speed of actuation of the feed roll device 22. The wheel member 62 is driven at a speed to provide a lineal rate of advance movement for the first drawn wire portion 11^a which is at least equal to, and preferably greater than, the maximum lineal advance feeding of the second drawn wire portion 11^b produced by the feed roll device 22. This desired speed for the wheel member 62 is obtained by adjustment of the speed-change gearing 79 and, when the desired setting has been established in accordance with the rate of operation of the fabricating machine 12 and the drawing units 16 and 17, the driving rate for the wheel member can usually remain constant but is subject to further variation whenever needed by actuation of the control means 80.

By having the wheel means 18 operate as a feed means for advancing the wire 11 through the first drawing unit 16, it will be seen that the feed roll device 22 need operate only as a feeding means for advancing the wire through the second drawing unit 17 and for supplying the drawn wire $11b$ to the fabricating machine 12. The clamping force of the feed rolls 23 and 24 against the wire, and the pulling force applied by the feed device 22 to the wire, can therefore be smaller than if this feed device were required to also advance the wire through the first drawing unit 16 and to withdraw stock from the coil 13. The smaller clamping and pulling forces thus needed to be applied to the wire by the feed roll device 22 reduces or minimizes the likelihood of flattening or otherwise damaging the drawn wire, with the result that articles of a more regular and satisfactory form can be produced by the fabricating machine 12.

Whatever marring or flattening of the first drawn wire portion 11^a occurs by reason of the engagement thereof with the wheel member 62 during the feeding action produced by the latter will be eliminated during the subsequent drawing operation performed on such first drawn wire portion by the second drawing die 20. The faster rate of drive described above for the wheel member 18 prevents the same from retarding, or becoming a drag on, the advance feeding movement imparted to the drawn wire portion 11^a by the feed roll device 22.

Another important feature in the construction and operation of the wire drawing apparatus 10 is that the lever-arm relationship for the lever means serving the slides 40 and 41 is such that the work stroke of the first slide 40 will be shorter than the work stroke of the second slide 41. By providing a shorter work stroke for the first slide 40, such as a stroke which is approximately only 80% of the length of the work stroke of the second slide 41, the feeding action produced by the wheel means 18 will be more effective in maintaining the slide 40 in adjacent relation to the associated draw lever 42 during the return swinging movement of the latter. This will result in a relatively quieter operation of the drawing apparatus 10 because of the decreased tendency of the draw lever 42 to pound against the slide 40 when the draw lever starts its swinging movement for the next succeeding drawing stroke.

The relatively shorter work stroke of the slide 40 in relation to the slide 41 also produces a smoother operation of the apparatus 10 by reason of a better synchronization of the drawing units 16 and 17 with respect to the wire elongation resulting from the working stroke of the second drawing die 20, whereby such elongation is accom-

modated with minimum interference to the feeding action performed by the wheel means 18 for the portion of the wire traversing the first drawing unit 16.

The wheel means 18 is preferably located so that the annular groove 65 thereof will lie in a horizontal plane which is also the horizontal plane containing the axes of the drawing orifices of the dies 19 and 20. The rim portion 64 of the wheel member 62 can be of any suitable diameter and the wrapped engagement of the bight 58 of the first drawn wire portion 11a therewith should preferably be at least 180° in angular extent. When the diameter of the rim portion of the wheel member 62 is greater than the lateral spacing between the axes of the orifies of the die members 19 and 20, a guide roller or sheave 96 can be provided on the frame portion 30 as a fair-lead for directing the wire into the drawing unit 17.

FIG. 7 of the drawings shows a multiple-draw wire drawing apparatus similar to that of FIGS. 1 to 6 inclusive but representing a modified apparatus 100 in which first and second drawing units 16a and 17a are located in an in-line relation and the wheel means 103 is located at a point between these units. In all other respects the modified wire drawing apparatus 100 is substantially the same as the apparatus 10, with the exception that the bight 104 extending around the wheel means 103 has a wrapped engagement therewith of approximately 360° of angular extent.

From the accompanying drawing and the foregoing detailed description it will now be recognized that this invention has provided a novel construction for multiple-draw wire drawing apparatus of the reciprocating-die type by which important advantages are achieved over the prior art, including the advantages hereinabove described.

Although the novel wire drawing apparatus of this invention has been illustrated and described herein to a somewhat detailed extent, it will be understood, of course, that the invention is not to be regarded as being limited correspondingly in scope but includes all changes and modifications coming within the terms of the claims hereof.

Having thus described our invention, we claim:

1. In wire drawing apparatus; first and second drawing units in a series relation with respect to the path of advance movement of the wire to be drawn and each unit comprising a reciprocable die slide carrying a drawing die, a grip device adapted to grip the wire to prevent backward movement thereof and a swingable draw lever effective against the slide for causing intermittent drawing strokes of the die along the wire in a direction away from the grip device; frame means supporting the slides; actuating means connected with the draw levers for swinging the same to actuate said slides; wheel means at a point of said path intermediate said units and having said wire in at least a partially wrapped relation thereon; and driving means connected with said wheel means to impart rotation thereto during the operation of the drawing units.

2. Apparatus as defined in claim 1 wherein said drawing units are disposed in a laterally adjacent relation with ends of said units comprising the wire-delivery end of one unit and the wire-receiving end of the other unit facing in the same direction; the portions of the wire traversing the units being movable in opposite directions; and wherein said wheel means is located adjacent said ends and engaged by a loop portion of the reach of wire passing therebetween.

3. Apparatus as defined in claim 1 wherein said wheel means has a peripheral annular slot in which a loop portion of the wire is received; said slot being of a narrow transverse width in a direction along the axis of wheel rotation and being deep in a direction radially of the wheel means, so that slackening of the loop portion can occur during operation of said units without harmful kinking of said loop portion or complete disengagement thereof from said wheel means.

4. Apparatus as defined in claim 1 wherein said wheel means has an axially-narrow and radially-deep peripheral slot in which the wrapped portion is disposed; and wherein said wheel means is located with said slot lying substantially in the same horizontal plane as the axes of the drawing dies.

5. Apparatus as defined in claim 1 wherein said wheel means has a peripheral annular slot in which a loop portion of the reach of wire passing between said units is received in wrapped relation to said wheel means; said slot being narrow in a direction along the axis of wheel rotation and deep radially of the wheel means, so that slackening of said loop portion can occur during operation of said units without harmful kinking of the loop portion or complete disengagement thereof from said wheel means; and wherein the wrapped portion is at least 180° in angular extent around said wheel means.

6. Apparatus as defined in claim 1 wherein said units are in an aligned and spaced-apart relation in the direction of the longitudinal passage of the wire therethrough, and said wheel means is located between the adjacent ends of said units.

7. Apparatus as defined in claim 1 wherein the effective lever-arm lengths of said draw levers are such that the drawing stroke of the die of the first unit is shorter than the drawing stroke of the die of the second unit.

8. Apparatus as defined in claim 1 wherein the effective lever-arm lengths of said draw levers are such that the drawing stroke of the die of the first unit is approximately 80 percent of the length of drawing stroke of the die of the second unit.

9. Wire drawing apparatus comprising frame means having first and second guideways thereon, first and second slides reciprocably operable in said first and second guideways, first and second grip devices on said frame means adjacent said first and second guideways and effective to grip the wire to prevent movement thereof in a backward direction, first and second draw levers swingably supported in said frame means and engageable with said first and second slides for imparting work strokes thereto along their respective guideways in a direction away from the associated grip devices, first and second drawing dies on said slides and movable along the wire in drawing engagement therewith during the work strokes of said slides, actuating means connected with said levers for swinging the same, the reach of the drawn wire extending between said first and second dies having a bight therein, wheel means having rim means engaged by said bight in a wrapped relation thereto, and driving means connected with said wheel means to rotate the same for causing an advance feeding movement of the portion of the wire extending through said first grip device and first drawing die.

10. Wire drawing apparatus comprising frame means having first and second guideways thereon, first and second slides reciprocably operable in said first and second guideways, first and second grip devices on said frame means adjacent said first and second guideways and effective to grip the wire to prevent movement thereof in a backward direction, first and second draw levers swingably supported in said frame means and engageable with said first and second slides for imparting work strokes thereto along their respective guideways in a direction away from the associated grip devices, first and second drawing dies on said slides and movable along the wire in drawing engagement therewith during the work strokes of said slides, actuating means connected with said levers for swinging the same, rotatably driven feed roll means engaging the drawn wire on the delivery side of said second grip device for advancing such drawn wire at a given rate of lineal feed, the portion of the drawn wire extending between said first and second dies having a bight therein, wheel means having rim means engaged by said bight in a wrapped relation thereto, and driving means connected with said wheel means and operable to drive the same at a rate to produce an advance feeding of the

wire along said first guideway at a faster lineal rate than said given rate.

11. In double-draw wire drawing apparatus for drawing wire being supplied from a supply coil, frame means having laterally adjacent first and second frame portions provided with first and second guideways, first and second slides reciprocable in said first and second guideways, first and second drawing dies on said first and second slides, first and second grip devices on said frame portions and located adjacent the remote ends of said first and second guideways, first and second draw levers swingably supported by said frame means and engageable with said first and second slides for causing drawing strokes of said dies by pushing of the latter along different portions of a wire to be drawn and in directions away from their associated grip devices, said first and second grip devices having passages for first and second drawn portions of said wire and being operable to grip said drawn portions for preventing backward movement of the wire during the drawing strokes of said dies, rotatably driven feed roll means engaging said second drawn portion for advancing the same at a given lineal feed rate, wheel means having an annular rim portion around which said first drawn portion extends in passing from said first grip device to said second die, and driving means operable to rotate said wheel means for withdrawing wire from said coil and imparting movement to said first slide and first die in the direction of advance feed of said first drawn portion.

12. Wire drawing apparatus as defined in claim 11 wherein the driving means for said wheel means is a variable speed driving means and includes control means operable to cause said wheel means to produce an advance movement of said first slide and first die and the wire portions therein at a lineal feed rate which is faster than said given lineal feed rate.

13. Wire drawing apparatus as defined in claim 11 wherein the rim portion of said wheel means has an axially-narrow and radially-deep annular groove therein in which slackening of said first drawn portion can take place during the operation of the apparatus without harmful kinking of said first drawn portion or complete disengagement thereof from said wheel means.

14. In wire drawing apparatus; frame means containing a guideway; a slide reciprocably movable in said guideway; a drawing die on said slide and movable therewith through a drawing stroke; grip means on said frame means and adapted to grip and hold the wire during said drawing stroke of the die; actuating means effective on said slide for causing the drawing stroke of said die along the wire; said slide having passage means for the wire including a lubricant chamber, and a die recess containing said die and provided with an access opening on the side thereof remote from said chamber for movement of the die into and out of said recess; and partition means on the slide between said chamber and recess and having an opening to accommodate the wire and to feed limited amounts of lubricant to said die.

15. Wire drawing apparatus as defined in claim 14 wherein said slide has a lubricant discharge opening in communication with said chamber adjacent the bottom thereof and normally closed by a removable closure means.

16. Wire drawing apparatus as defined in claim 14 wherein the actuating means for said slide comprises a swingable draw lever; and wherein a die-retaining cover means for said recess is engageable by said lever as a thrust means.

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