A. A. ARNOLD.

SWAGING MACHINE.

APPLICATION FILED JAN. 2, 1918.

1,350,634.

Patented Aug. 24, 1920.

4 SHEETS—SHEET 1.

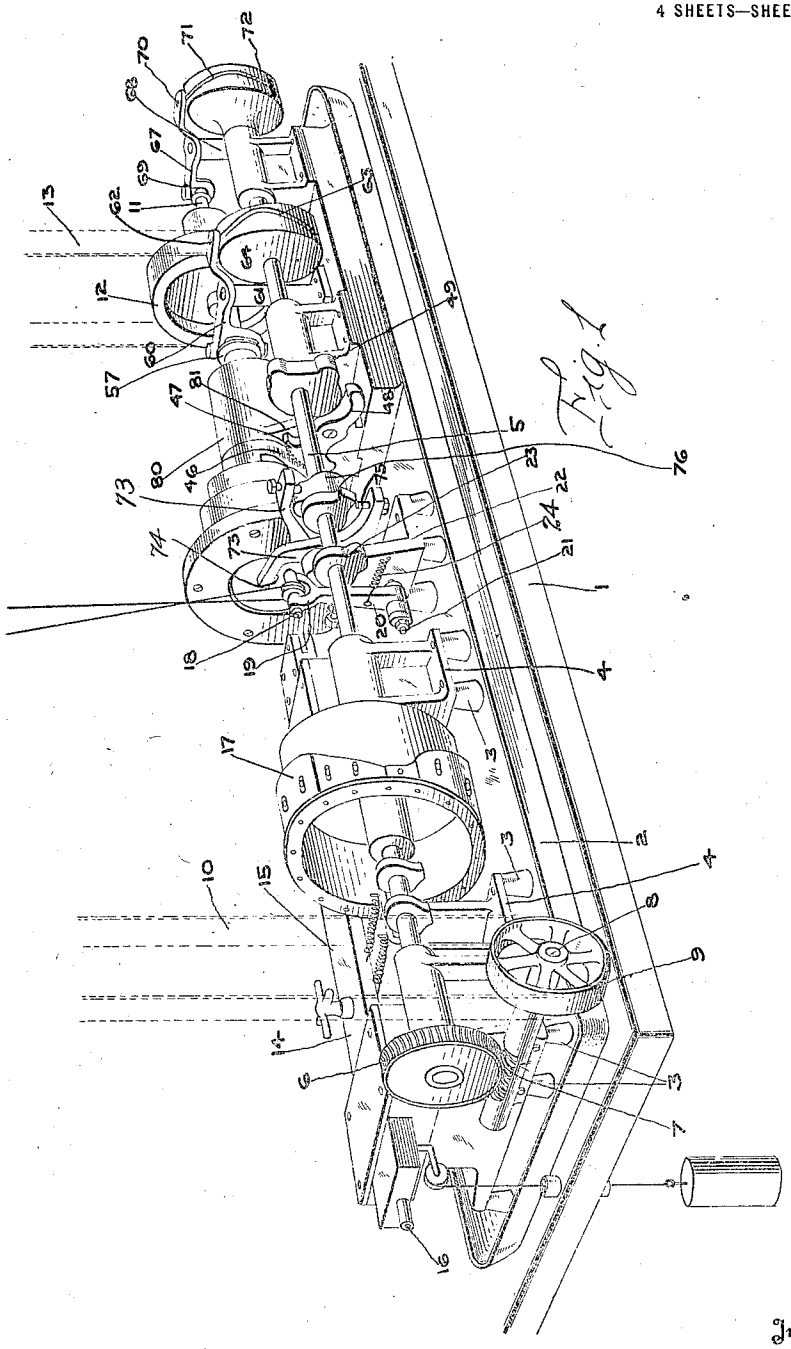


Fig. 1.

Inventor

A. A. ARNOLD

By H. H. Stull & H. K. Parsons

Attorneys

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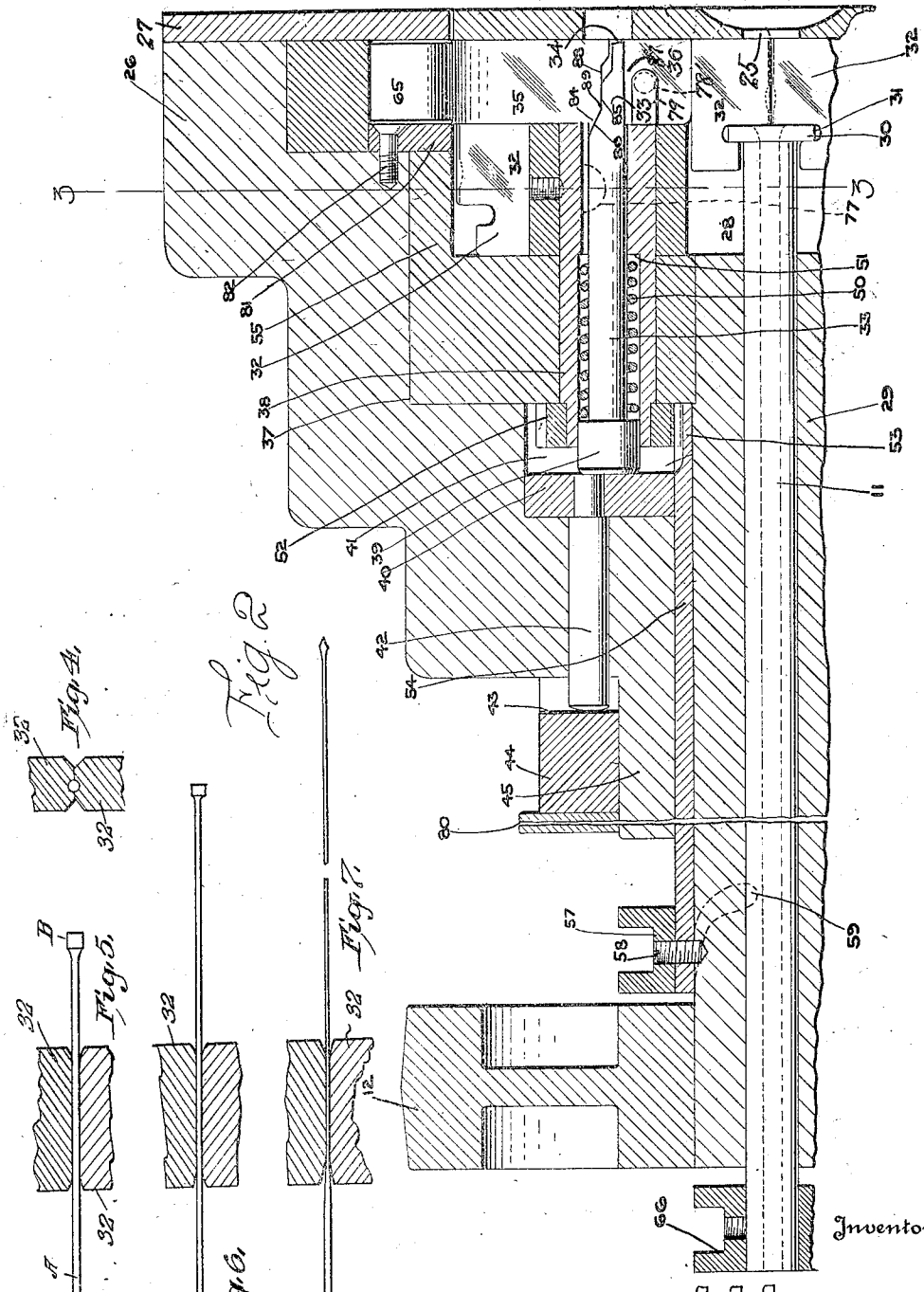


Fig. 2

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Inventor

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By H. H. Stull & K. Parsons

Attorneys

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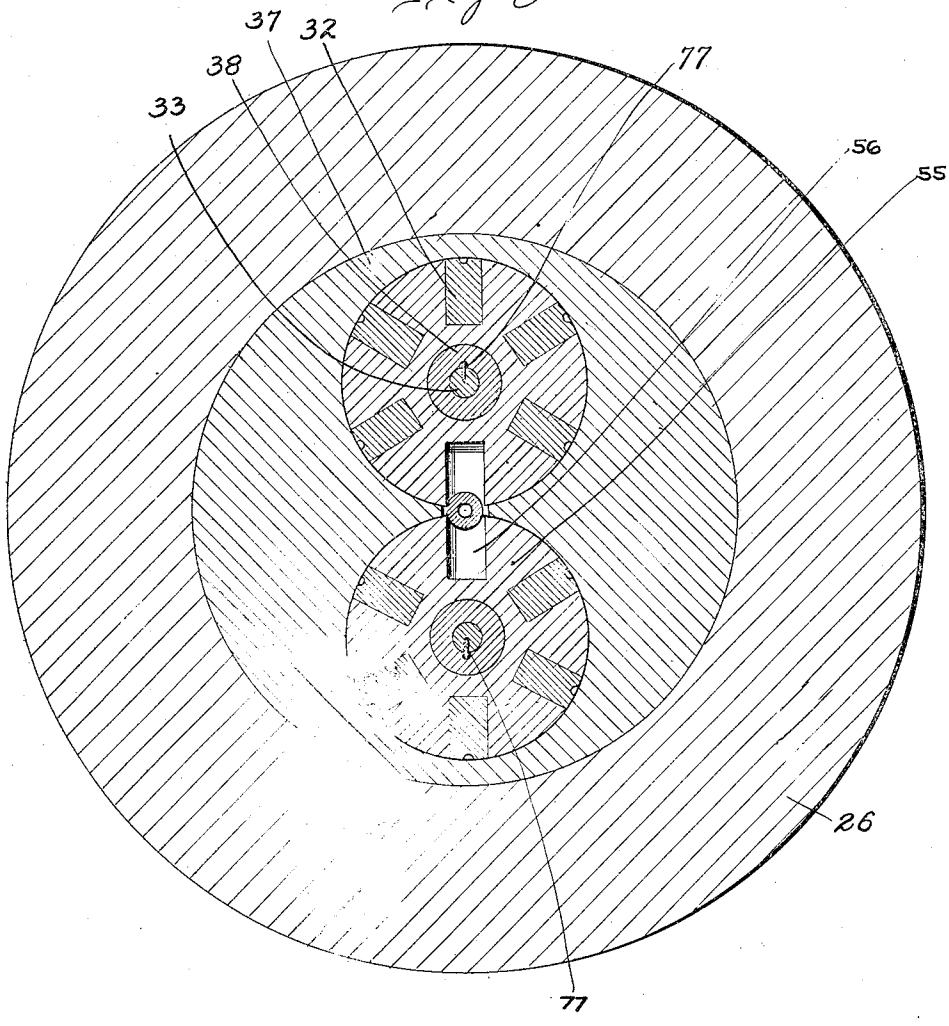
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4 SHEETS—SHEET 3.

Fig. 3



Inventor

A. A. Arnold

By H. H. Stull & A. K. Parsons

Attorneys

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4 SHEETS—SHEET 4.

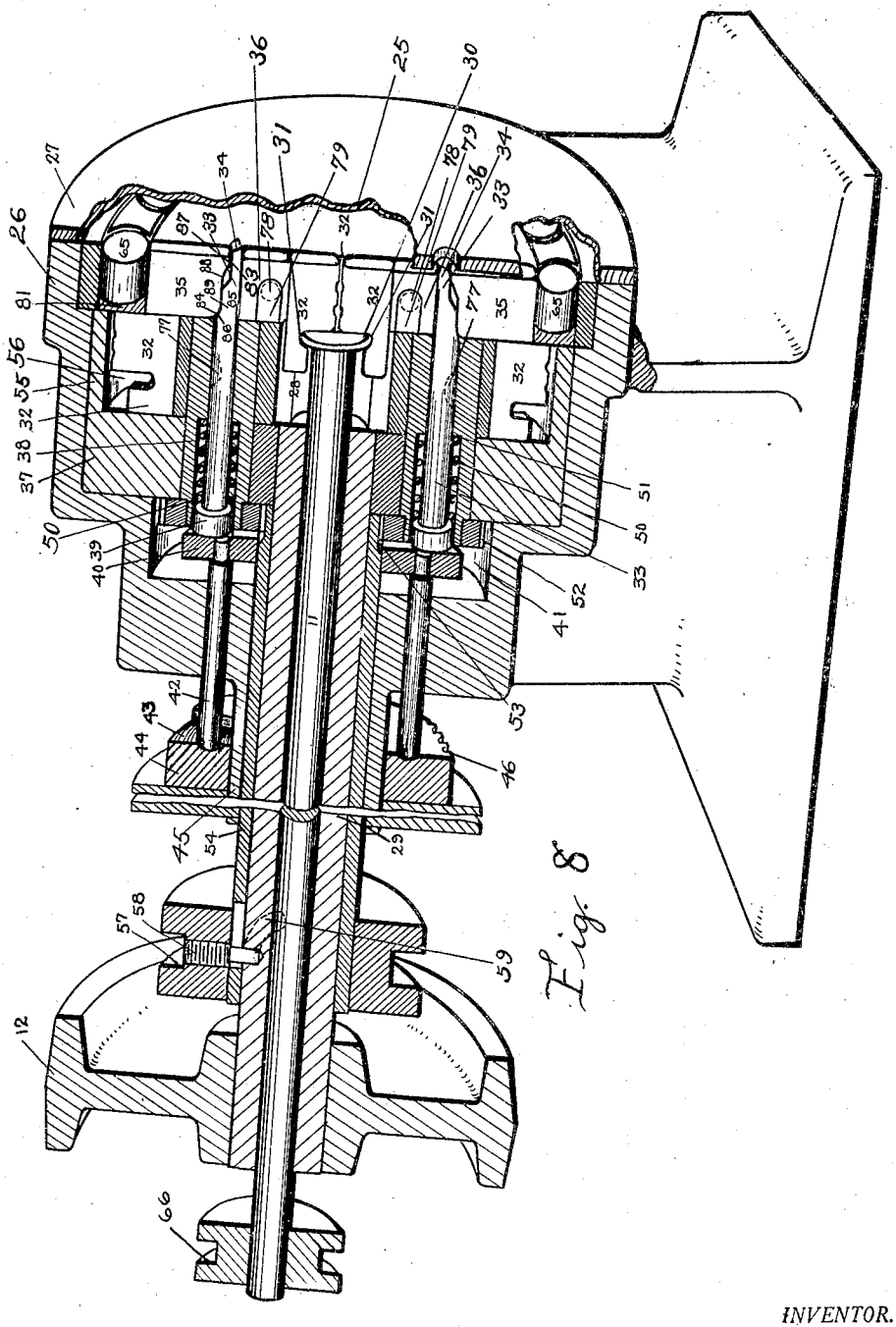


Fig. 8.

INVENTOR.

A. A. ARNOLD

BY

H. H. Stull & H. K. Parsons

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ARTHUR A. ARNOLD, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO AMERICAN OPTICAL COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A VOLUNTARY ASSOCIATION OF MASSACHUSETTS.

SWAGING-MACHINE.

1,350,634. Specification of Letters Patent. Patented Aug. 24, 1920.

Application filed January 2, 1918. Serial No. 210,032.

To all whom it may concern:

Be it known that I, ARTHUR A. ARNOLD, a citizen of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Swaging-Machines, of which the following is a specification.

This invention relates to new and useful improvements in swaging machines, and especially to a machine particularly adapted for forming temples for spectacles, but which is capable of other similar uses in the manufacture of spectacle and eyeglass construction.

The leading object of my invention is the provision of an improved construction of automatically operating a swaging machine which will take a crude blank from a suitable source of supply and will in predetermined steps perform a series of operations on the same and finally discharge the article in a semi-finished condition without having been subject to any manual work or control whatever.

Another object of the present invention is the provision of a machine of the above character having means whereby the numerous dies operating in the various steps, will be automatically delivered in their respective positions and thence returned to their normal or inoperative positions after their respective duties have been performed.

A still further object of my invention is the provision of a machine of this character which is adapted for use in swaging or reducing gold, gold-filled, and other precious metals in an entirely satisfactory manner and which, as in the case of filled stock, will swage the same into various desired configurations without piercing the precious shell, and which will also serve to cover certain of the exposed portions of the base core by swaging the shell thereover.

A still further object of the invention is the provision of means included in the operation of my improved swaging machine wherein a direct pressure is automatically brought to bear upon the dies after they have been disposed in their operative positions and wherein this pressure is automatically released as soon as the desired function of the dies has been performed so that they can be readily returned to their normal or inoperative positions.

With the above and other objects in view the invention consists in the novel features of construction and the combination and arrangement of parts hereinafter more fully set forth, pointed out in the claims, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a swaging machine constructed in accordance with my invention.

Fig. 2 is a detailed longitudinal sectional view taken through the head member in which the dies are located.

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2, and

Figs. 4, 5, 6, and 7 are detailed views illustrating a plurality of the various steps carried out through the operation of my improved swaging machine.

Fig. 8 represents a longitudinal perspective section of the swaging head and parts associated therewith.

Referring now more particularly to the drawings in which similar characters of reference are employed to designate corresponding parts throughout the several views including the various modifications, wherein the numeral 1 indicates the table or support for my machine having suitably secured thereon the bed 2 from which rises a plurality of standards 3 for supporting the various operating parts of the machine. Mounted upon suitable platforms 4 supported by the standards 3 is a shaft 5 extending longitudinally of the bed 2 and provided at one end with a gear 6 adapted to mesh with the worm 7 carried by the drive shaft 8. The shaft 8 is driven through the medium of a pulley 9 keyed to the outer end thereof and connected by means of a belt 10 to the driving medium.

Supported upon the table by means of suitable standards is a second shaft 11 arranged in parallel relation with shaft 5 and having a pulley 12 thereon, said pulley having a belt 13 engaged thereover to impart movement to the shaft 11. Arranged in substantially longitudinal alinement with this shaft 11 is the feeding mechanism generally illustrated by the numeral 14 and which includes a slide 15 through which the wire 16

is fed. The slide which feeds the wire is operated through the medium of a barrel cam 17 mounted upon the shaft 5 arranged adjacent the feeding mechanism 14.

The wire 16 is fed through the slide 14 to a point directly opposite the inner end of the shaft 11 where it is operated on by a drill 18 supported in the fork 19 at the outer end of pivoted arm 20. This arm 20 is mounted for swinging movement upon a pivot 21 secured to the outer face of a bracket 22 carried by a suitable number of standards 3. This arm 20 is actuated at intervals, by means of the cam 23 mounted upon the shaft 5, and engaging the arm to move the same inwardly whereby the drill 18 will be disposed in alinement with the inner end of the wire 16 for drilling a suitable cavity within the end. After the cam 23 moves away from the arm 20, the arm is returned to its normal inoperative position by means of a coil spring 24, one end of which is connected with the bracket 22 and the other end secured to the arm 20 whereby the tension of the spring will readily return the arm to its normal position.

After the end of the wire has been operated on by the drill 18, it is moved forward by the feeding mechanism and the end thereof extended through a suitable opening 25 formed within the end of the head drum 26. Describing in brief the construction of the head drum 26 it will be understood that the same is comparatively hollow and arranged therein is the mechanism which operates upon the wire fed therein to produce the finished product, and in order to retain the operating mechanism in place a plate 27 is removably screwed to the drum and is provided with a central opening 25 through which the wire is inserted.

Within the central portion of the drum at the inner end of the movable shaft 11 is a suitable space 28 adapted to be used for shifting the dies into and out of their operative positions. The inner end of the shaft 11, which is supported within the sleeve 29, is provided with an annular rim 30 adapted for engagement with suitable recesses 31 formed within the inner ends of the dies 32 whereby as each pair of dies is moved into the space 28, the annular rim 30 of the shaft 11 will be engaged with the recesses 31 in the dies to move them into their operative positions and after the operation, return them to their normal positions where they will be passed forward and a new set of dies moved into their place.

In Fig. 2 it will be noted that a set of dies are held in their operative positions for operating upon the end of the wire, and in order to apply suitable pressure to these dies a movable wedge 33 is provided, the inner tapering end 34 of which is movable between a backer block 35 and a shoe 36, said shoe engaging the die so that as the wedge is moved forward within the head 26, pressure will be applied to the outer faces of the dies 32 forcing them into pressing engagement with the wire which is being operated on. It will be understood that these shoes 36 are disposed upon opposite sides of the central feeding opening 25 whereby as each pair of dies is moved into their operative positions, the wedge members 34 will be forced between the backers 25 and shoes 36 to provide a suitable pressure for the dies.

The tapering end of the wedge member is provided with a series of steps. The first step being indicated by the numeral 83 is engaged at its outer end with the tapering portion 84 of the backer as the wedge is inserted between the backer and the shoe. It will be apparent that this wedge member can be forced inwardly into various positions according to the pressure required upon the dies. The several steps are indicated by the numerals 83, 85, and 86, the numeral 83 being adapted to engage, when the wedge is in its extreme forward position, with the surface 87 while the faces 85 and 86 will engage with the faces 88 and 89 respectively. It will be noticed that as the wedge is inserted between the backer and the shoe, the face will engage with any one of the faces 87, 88, and 89 according to the required pressure to be applied to the dies.

It will be understood before proceeding further with the description of this machine that in Fig. 2 only a half portion of the head member 26 is illustrated and it is to be understood that the other half not shown, upon the opposite side of the shaft 11 is identical in construction and operation with the part illustrated in the above mentioned view. In describing the construction and operation of Fig. 2 the several parts thereof which are used in plurality, but not disclosed in accompanying drawings, will be described in a single manner. Therefore, it will be understood that while only one series of dies and only one shoe, wedge, and backer are illustrated in the accompanying drawings, these several parts are used in plural in the construction of the machine.

In my improved swaging machine the construction is such that a greater number of sets of dies can be used than in the various machines in use at the present time. From the accompanying drawings it will be apparent that six different sets of dies are used in my improved machine whereas in the majority and in fact in most all of the machines in use at the present time only one set of dies is contained, with the exception of one or two, where two sets of dies are used. In proceeding with the description of the construction and operation of my improved swaging machine it will be noted that I have provided within the member 26 a sup-

porting collar 37 which is mounted upon the shaft support 29, and extending therethrough upon opposite sides of the center are suitable openings to receive the tubular members 38 which house the reciprocating wedge members 33. The inner ends of the wedge members are provided with head portions 39 adapted to abut against a movable plate 40 which is disposed within a suitable opening 41 and actuated therein through the medium of a shaft 42 connected therewith and extended through the backer for engagement at its outer end with a cam face 43. This cam face 43 is formed upon a movable pulley 44 which is mounted upon a reduced portion 45 of the head 26 and in order to move the cam face 43 for reciprocating the shaft 42, the outer face of the pulley 44 is provided with a series of teeth 46 adapted to be engaged by a rack 47 upon the inner end of a rocker arm 48, said arm being engaged at its outer end with the cam 49 mounted upon the shaft 5 whereby the engagement of this cam with the outer end of the arm will rotate the pulley 44 and move the cam faces 43 over the ends of the shafts 42 to actuate the plate 40 whereby to reciprocate the wedges 33 within the tubes 38.

Arranged within the tubes 38 and encircling the stems of the wedges 33 are suitable coil springs 50 disposed between the head member 39 and shoulders 51 formed within the tubes 38 whereby the tension of the coil springs 50 will return the wedge members 33 to their normal or inoperative positions as soon as the cams 43 are moved off of the shafts 42. From this it will be apparent that upon each rotation of the cam 49, the wedge members 33 will be moved inwardly so that the points 34 thereof will be forced inwardly between the backers 35 and shoes 36 to apply a suitable pressure to the dies 32 and as soon as the cam faces 43 are disengaged from the outer ends of the shafts 42, the coil springs 50 will return the wedge members to their normal or inoperative positions.

It will be noted from the illustration in Fig. 2 that these tubes 38 which inclose the reciprocating wedge members 33 are rotatably mounted within the collar 37 and keyed to one end thereof is a gear 52 adapted to mesh with the annular series of teeth 53 formed upon the rotating sleeve 54, whereby upon rotation of the sleeve 54, a similar movement will be applied to the sleeves 38. Keyed to the opposite ends of the sleeves 38 from the gear 52 are the rotating heads 55 in which a circumferential series of pockets 56 are formed, and movably arranged within these pockets are the different dies generally indicated by the numeral 32. From this it will be apparent that as the shaft or sleeve 54 is rotated, the heads 55 will rotate to bring the different sets of dies within the heads into their respective positions within the space 28 where the annular portion 30 on the end of the shaft 11 will be disposed within the recesses 31 and upon reciprocating movement of the shaft will be moved outwardly into their operative positions as indicated in Fig. 2 for engagement with the end of the wire which is extended in through the opening 25.

In order to impart a rotary movement to the sleeve 54, a grooved collar 57 is mounted upon the outer end of the sleeve 54 and carried thereby is a set screw 58 the inner end of which engages within a spiral groove 59 formed within the sleeve 29. Thus it will be apparent that the set screw 58 extends through the sleeve 54 into the groove 59 in the sleeve 29 whereby rotation of the head members 55 is accomplished through the medium of the gear 52 and tube 38 engaged with the grooved collar 57 by the ends of a forked lever 60, said lever being pivoted upon a suitable standard 61 and having its outer end provided with a pin 62 engaging within a spiral groove 63 formed in the face of the pulley 64 which is mounted on the shaft 5. It will be apparent from the foregoing that the inner forked end of the lever 60 will actuate the collar 57 whereby to move the pin 58 backward and forward within the groove 59 so as to rotate the sleeve 54 sufficiently to actuate the head members 55.

In the operation of my improved reducing machine, the wire 16 after having been fed through the feeding device 14, the inner end thereof is operated on by means of the drill 18. This end is then passed into the head member 26 through the opening 25 in the plate 27. The shaft 11, the inner end of which is engaged with the dies 32 disposed in the space 28, is moved longitudinally to engage the dies upon opposite sides of the end of the wire. Simultaneously with this longitudinal movement of the shaft 11 the cam face 43 of the cam 44 reciprocates the wedge members 33 whereby the tapering ends 34 of the same will be moved inwardly between the backers 35 and shoes 36, forcing the dies into pressing engagement with each other. Revolving with the head 26 and adapted for engagement with the outer ends of the backers 35 are the rolls 65 which are adapted to engage the backers 35 to produce pressure upon the dies 32 whereby the end of the wire will be pressed into a shape to conform with the face of the dies.

After this one operation has been carried out, the shaft 11 is moved in the opposite direction, by means of a pivoted arm 67 carried by the post 68 and provided at its inner end with the forked portion 69, the end of which engages within the groove of the collar, while the outer end of the arm is provided with a guide pin 70 disposed within

the zigzag groove 71 formed within the outer face of the cam wheel 72. From this it will be apparent that upon rotation of the cam 72, the arm 67 will be rocked upon its pivot to shift the shaft 11 longitudinally and move the dies 32 into their operative positions or return them to their inoperative positions. It will be noted that as the dies 32 are returned to their inoperative positions, the cam face 43 will be moved over the ends of the shafts 42 so as to release the wedge members 33 from between the backers 35 and shoes 36. It will be apparent, however, that the cam face 43 is first disengaged from the ends of the shafts 42, before the return of the dies 32, whereby the pressure upon the dies is released before they are returned to their inoperative positions.

After the first set of dies have been disposed in their operative positions, and operated upon the end of the wire, thence returned to the inoperative positions, the heads 55 are rotated by the shifting of the collar 57 through the medium of the lever 60 which is operated by means of the cam pulley 64. As the collar 57 is moved laterally upon the sleeve 54, the set screw 58 which engages within the groove 59 will tend to rotate the sleeve sufficiently to permit the second set of dies to be brought into opposing positions in the space 28 whereby the annular collar 30 on the shaft 11 will engage within the recesses 31 in the dies. As the shaft 11 is reciprocated by the operation of the pivoted arm 67 to bring the dies 32 forwardly into their operative positions, the cam face 43 of the cam 44 engages the end of the shafts 42 to actuate the wedge members 33 and force the tapering end thereof into engagement with the shoes and backers whereby a suitable pressure will be applied to the dies for operating upon the end of the wire.

The operation described above is carried out until the various sets of dies have been brought into position for the various steps of operation upon the end of the wire. It will be noted that as the set screw 58 reaches the end of the spiral groove 59, the zigzag groove 71 within the pulley 72 will actuate the arm 67 in such a manner that the collar 57 will be returned to its normal position and the member which supports the dies will also be returned to its normal position whereby the first set of dies to be used will be returned to such a position that they will be in place ready to engage a new piece of wire for operation thereon. It will be apparent that after the various sets of dies have engaged the end of the wire so that the various parts have been formed upon the wire, the end thereof is severed from the main part through the medium of a cutting member in the form of two pivoted arms 73 of substantially S shape, the inner ends thereof carrying blade members 74 arranged in opposed relation and adapted to engage the wire to sever the end thereof from the main portion. These arms 73 are provided at their outer ends with contact points 75 adapted to be engaged by the cam members 76 carried by the shaft 5 to operate the cutting blade 74 so that the finished end of the wire can be readily severed from the main portion after the same has been operated upon by the various sets of dies. In Fig. 2 it will be noted that I have provided the key member 77 which is carried by the sleeves 38 and adapted for engagement with the reciprocating wedge members 33 whereby to retain the wedge members against rotation with respect to the sleeves so that the tapering ends of the wedge members will be disposed in their operative positions at all times. The shoes 36, which are loosely mounted within the head member, are retained in their operative positions, against dropping down in the space occupied by the dies, when the dies are in their operative positions, by means of pins 78 engaging within slots 79 formed within the shoe. From this it will be apparent that the shoes will at all times be retained in their positions above the dies. It will be noted that by having the roll 65 carried by the head member 26 and rotating over the backers 35, it will provide for suitable pressure upon the dies 32 for operating upon the end of the wire.

The head member 26 and sleeve 29 are rotatably supported within a longitudinal sleeve 80 mounted upon suitable bearings 81 and are positioned between the drive pulley 12 and the inner end of the head member. It will be apparent from the illustration in Fig. 2 that the outer face of the cam 44 bears against the inner end of this sleeve 80 and retains the cam 44 against lateral movement upon the sleeve 45. It will be apparent that by having the zigzag or spiral groove 63 within the cam pulley 64 the sleeve 54 will be rotated independently of the rotation of the inner or movable portions of the head so that as the various parts rotate around the shaft 11, the arm 60 will be actuated to move the set screw 58 within the groove 59 to rotate the sleeve 54 regardless of the speed of the other parts of the machine. The rotation of the sleeve 54 will impart a similar movement of the gear 52 and sleeve 58 whereby the various sets of dies will be brought into their respective positions and after they have been used to operate upon the end of the wire, it will be noted that the grooved pulley 57 will be returned to its normal position through the movement of the arm 60. It will be understood that the end of the wire is maintained within the opening 25 until

the various sets of dies have formed the correct pattern on the wire and after this has been done, the cams 76 will actuate the cutting arms 73 to sever the end of the wire from the main part.

In Figs. 4 to 7 inclusive, I have shown a conventional type of construction and dies for forming the same which have hitherto required double or quadruple head machines or the like for their production in place of being capable of construction with a single head machine, as illustrated in the present instance. The structure here comprises the opposed dies 32 which when joined together from a substantial circle in outline, as illustrated in Fig. 4, these dies receiving therebetween the piece of stock A which may be presented therebetween of size of the portions B for example, and broken down or somewhat reduced, as shown in Fig. 5, being further reduced by a second set of the dies 32 along the lines illustrated in Fig. 6, formed with a tip if desired by suitable dies, and finally reduced to the size desired for use as illustrated in Fig. 7, which shows the final operation but partially completed, in that a portion of the stock is there shown as remaining of the size indicated in Fig. 6.

It will be understood that this is merely an example of one of many forms of structures which may be produced in a single head through the use of my improved mechanism as above described and hereinafter claimed.

The members which rotate within the head 26 are securely retained in position by means of the plate 81 rigidly secured in place by means of the screw members 82, which extend through the plate and engage with the body portion 26. It will be noted that the plate extends entirely over the face of the inner rotating parts with the exception of suitable openings whereby the die members 32 are arranged in their operative positions to operate upon the wire.

I claim:

1. A swaging machine including a rotating head, means for feeding a piece of stock into the head, a plurality of dies carried by the head, means for successively bringing the dies into operative engagement with the stock, and a cutter for severing the piece of stock which has been operated upon from the main stock.

2. A swaging machine including a rotating head, a plurality of sets of dies carried by the head, means for feeding a piece of stock into the head, means for successively bringing each set of dies into operative engagement with the stock, and means for severing the part which has been operated upon from the main piece of stock.

3. The combination with a support, of a drill, a cutter, a plurality of sets of dies, means for selectively operating said dies on different pieces of stock, and means for applying pressure to said dies.

4. A swaging means including a rotary head, feeding mechanism for continuous feeding of stock, a drill for operating upon the end of the stock, means for feeding the stock into the head, a plurality of sets of dies within the head, means for successively bringing said dies into engagement with the stock, and means for severing the part which has been operated upon from the main stock.

5. A swaging machine including a rotary head, a supporting collar carried thereby, a plurality of sets of dies arranged therein, means for intermittently rotating the dies to bring the dies of each set into opposed relation, additional means for engaging said dies when in this position to shift them forward into position for operating upon a piece of stock, and means for applying pressure to the dies when in their operative positions as and for the purpose set forth.

6. A swaging machine including a rotary head member, means for introducing a piece of stock therein, a plurality of sets of dies carried by the head member, means for successively bringing said dies into operative engagement with the stock, and means for applying pressure to the dies when in operative engagement with the stock.

7. A swaging machine including a rotating head, means for introducing a piece of stock therein, a plurality of sets of dies carried by the head, means for successively bringing said dies into operative engagement with the stock, movable shoes carried by the head for engagement with the dies when in their operative positions, a plurality of backers arranged in alinement with the shoes, means engaging the backers for producing pressure upon the dies, and means interposed between the backers and the shoes for varying the pressure to be applied to the dies.

8. A swaging machine including a rotating head, means for introducing a piece of stock into the head, a plurality of sets of dies within the head, means for successively bringing said dies into engagement with the stock, shoes arranged adjacent the dies and adapted for engagement therewith when in their operative positions, a plurality of backers arranged in alinement with the shoes, a plurality of rolls for engagement with the outer ends of the backers to apply pressure to the dies, and means interposed between the backers and the shoes for varying the pressure upon the dies.

9. A swaging machine including a rotating head, means for introducing a piece of stock into the head, a plurality of sets of dies within the head, means for successively bringing said dies into engagement with

the stock, shoes arranged adjacent the dies and adapted for engagement therewith when in their operative positions, a plurality of backers arranged in alinement with the shoes, a plurality of rolls for engagement with the outer ends of the backers to apply pressure to the dies, and reciprocating wedge members adapted to be interposed between the backers and shoes for varying the pressure to be applied to the dies.

10. A swaging machine including a rotating head, means for introducing a piece of stock therein, a plurality of sets of dies carried by the head, means for applying pressure to the dies including reciprocating wedge members, a movable plate carried by the head for engagement with the inner ends of the wedge members to actuate the same, pins connected with the movable plate and extending rivetally through the head, and a cam mounted for rotation upon the head and adapted to engage the outer ends of said pins for successively reciprocating the wedge members.

11. In a swaging machine, a drill for cutting out the ends of the stock being operated upon, means for pressing the stock into different shapes, and at the same time heading the drilled end of the stock, a cutter to provide blanks of a predetermined length, and means for automatically operating the various mechanism in the sequential order set forth.

12. A swaging machine including a support, an operating shaft thereon, a drive shaft in parallel relation with the operating shaft, working means carried by the drive shaft for successively operating upon a piece of stock, work controlling cams mounted upon the operating shaft, and means connecting said cams with the working means as and for the purpose set forth.

13. A swaging machine including a rotary head member, die carriers therein, a plurality of sets of dies arranged within said carriers and disposed in opposed relation, means engaging the dies when in an opposed position for moving them forward out of the carrier into an operative position, means for introducing a piece of stock within the head for engagement with the dies, means for applying pressure to the dies when the stock is arranged therebetween, and means for returning the dies to their normal positions within the carriers after operating upon the stock.

14. A swaging machine including reciprocating wedge members having heads formed upon their inner ends, coil springs mounted upon the wedges, a movable plate engaging the head portions of said wedges, and means for reciprocating said plate to actuate the wedges.

15. A swaging machine including an operating shaft, a main shaft, working means supported by the main shaft for operating upon a piece of stock, and means carried by the operating shaft and co-acting with the working means for successively operating upon the stock.

16. A swaging machine including a rotating head member, die carriers therein, means for introducing a piece of stock within the head for engagement by the dies, shoes carried by the head and adapted for engagement with the dies, backers arranged in alinement with the shoes, means engaging the outer ends of the backers for applying pressure thereto and communicating the same to the dies, wedge members having offset portions providing steps for varying the pressure to be applied to the dies.

17. A swaging machine including a plurality of sets of dies, means for successively arranging the dies of each set in opposed relation, means engaging the dies when arranged in sets and moving them forwardly into an operative position, for engagement with the piece of stock, and said means returning the dies to their inoperative position after the stock has been operated upon.

18. A swaging machine including a rotating head, a supporting collar arranged therein, sleeves arranged therein, pinions carried by the inner ends of said sleeves, an operating sleeve having teeth thereon for engagement with the pinions, die carriers carried by the outer ends of the first sleeves, means for rotating the operating sleeves at intervals to impart a rotary movement to the die carriers and successively bring the dies thereon into an operative position.

19. A swaging machine including a head and a pair of rotary die carriers mounted in the head, a plurality of pairs of dies, one die of each pair being disposed in each carrier, and means for rotating the carriers to present a selected pair of dies in opposition to each other.

20. A swaging machine including a head and a pair of rotary die carriers mounted in the head, a plurality of pairs of dies, one die of each pair being disposed in each carrier, means for rotating the carriers to present a selected pair of dies in opposition to each other, and means for moving the selected pair into operative position.

21. A swaging machine including a head and a pair of rotary die carriers mounted in the head, a plurality of pairs of dies, one die of each pair being disposed in each carrier, means for rotating the carriers to present a selected pair of dies in opposition to each other, means for moving the selected pair into operative position, die striking means carried by the head, and means operatively connecting the striking means and selected pair of dies.

22. A swaging machine including a head

and pair of opposed rotatable carriers mounted within the head, a plurality of dies mounted in each of the carriers, and means for automatically rotating the carriers to present a selected pair of dies in opposition one to the other.

23. A swaging machine including a head and pair of opposed rotatable carriers mounted within the head, a plurality of dies mounted in each of the carriers, means for automatically rotating the carriers to present a selected pair of dies in opposition one to the other, and means for automatically shiftng the selected pair of dies into operative position.

24. A swaging machine including a head, a pair of opposed carriers rotatably mounted within the head and provided with pinion portions, an actuating member meshing with said pinion portions for simultaneously rotating the carriers equal amounts, means for imparting rotary motion to said control device, and means for selectively extruding a pair of dies one from each carrier when the parts are in desired relatively adjusted position.

In testimony whereof I affix my signature in the presence of two witnesses.

ARTHUR A. ARNOLD.

Witnesses:

H. E. COLEMAN,

A. S. CANN.