(No Model.) 2 Sheets—Sheet 1.

A. J. LANGELIER.

FEEDING MECHANISM FOR SWAGING MACHINES.

No. 576,057. Patented Jan. 26, 1897.

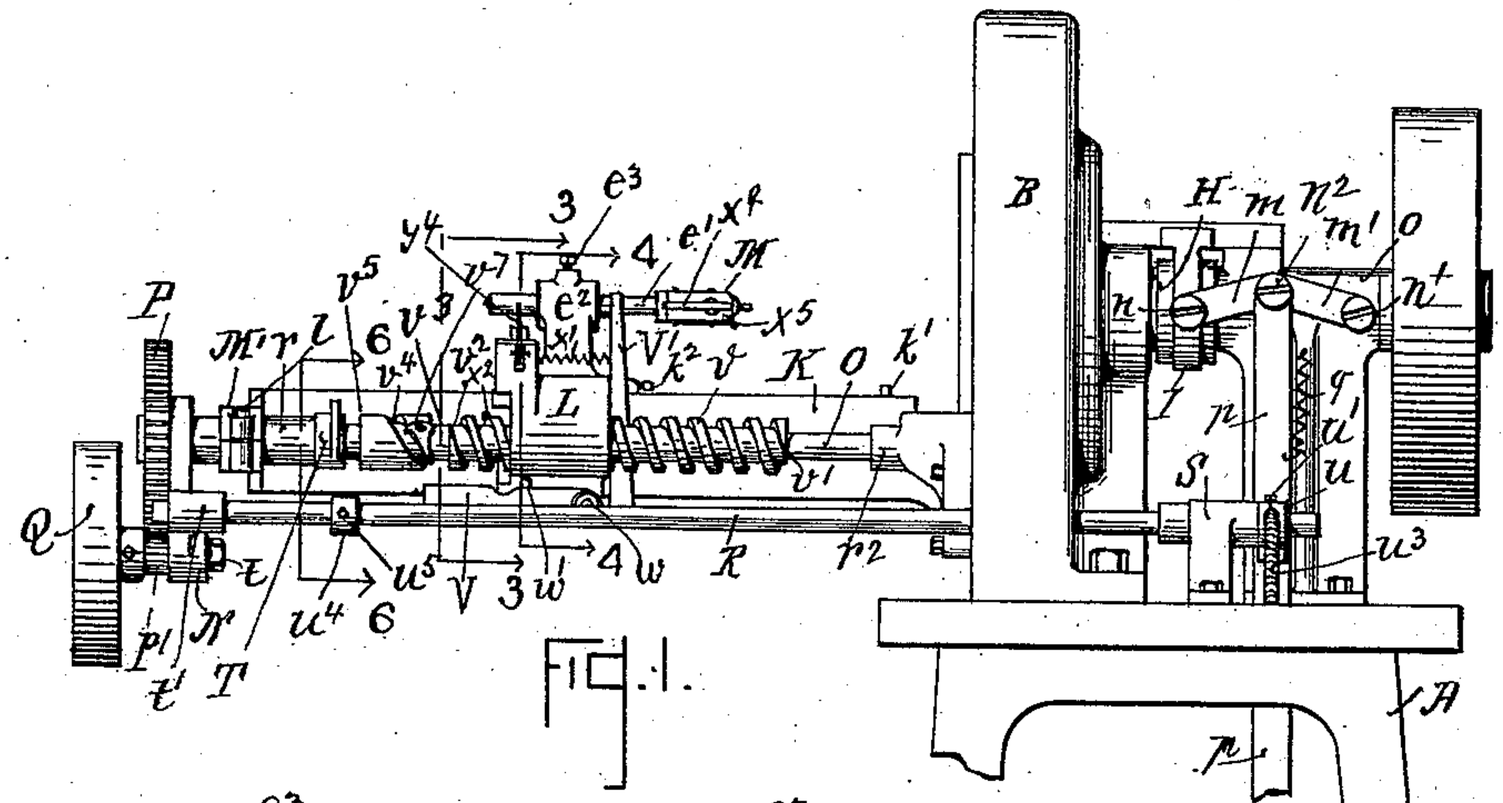

FIG. 1.

FIG. 2.

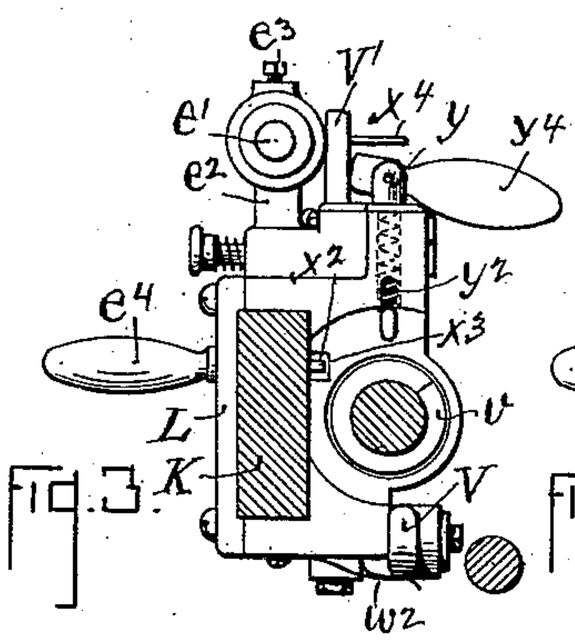

FIG. 3.

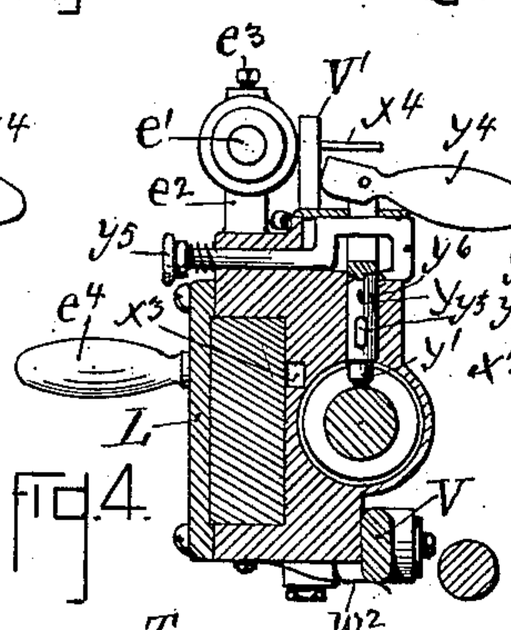

FIG. 4.

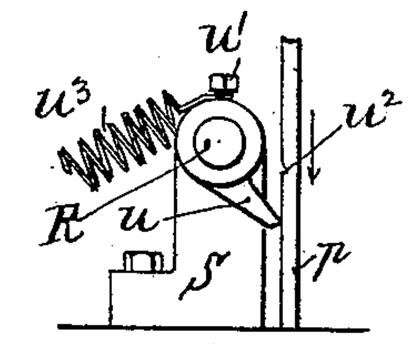

FIG. 5.

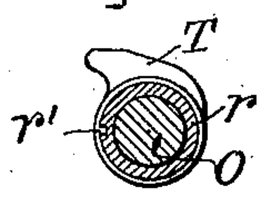

FIG. 6.

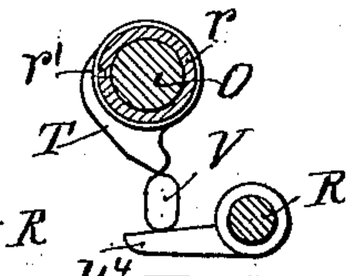

FIG. 7.

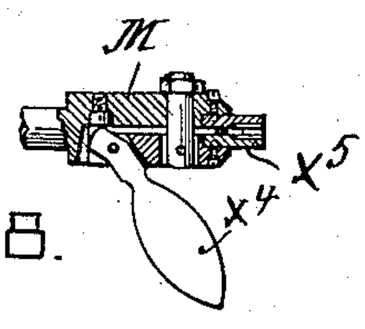

FIG. 8.

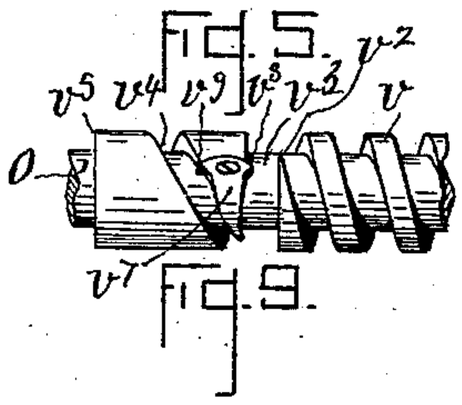

FIG. 9.

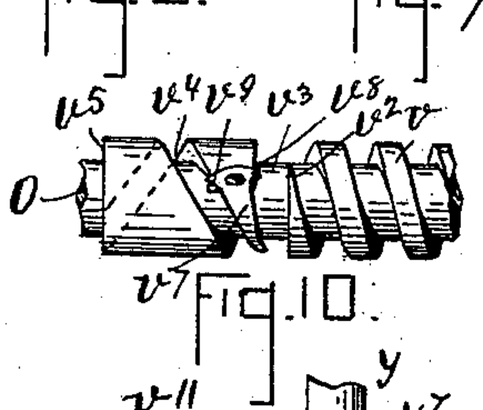

FIG. 10.

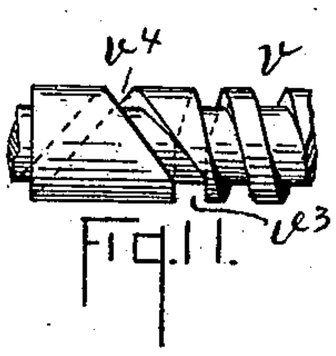

FIG. 11.

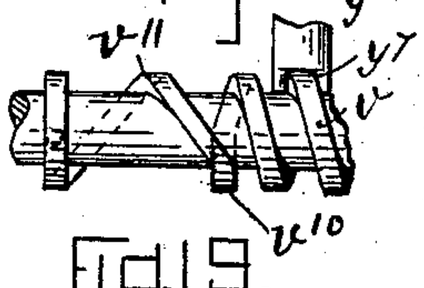

FIG. 19.

WITNESSES:

Harry J. Garceau

James W. Brennen

INVENTOR:

Antonie J. Langelier

BY A. Schofield

ATT'Y.

(No Model.) 2 Sheets—Sheet 2.

A. J. LANGELIER.

FEEDING MECHANISM FOR SWAGING MACHINES.

No. 576,057. Patented Jan. 26, 1897.

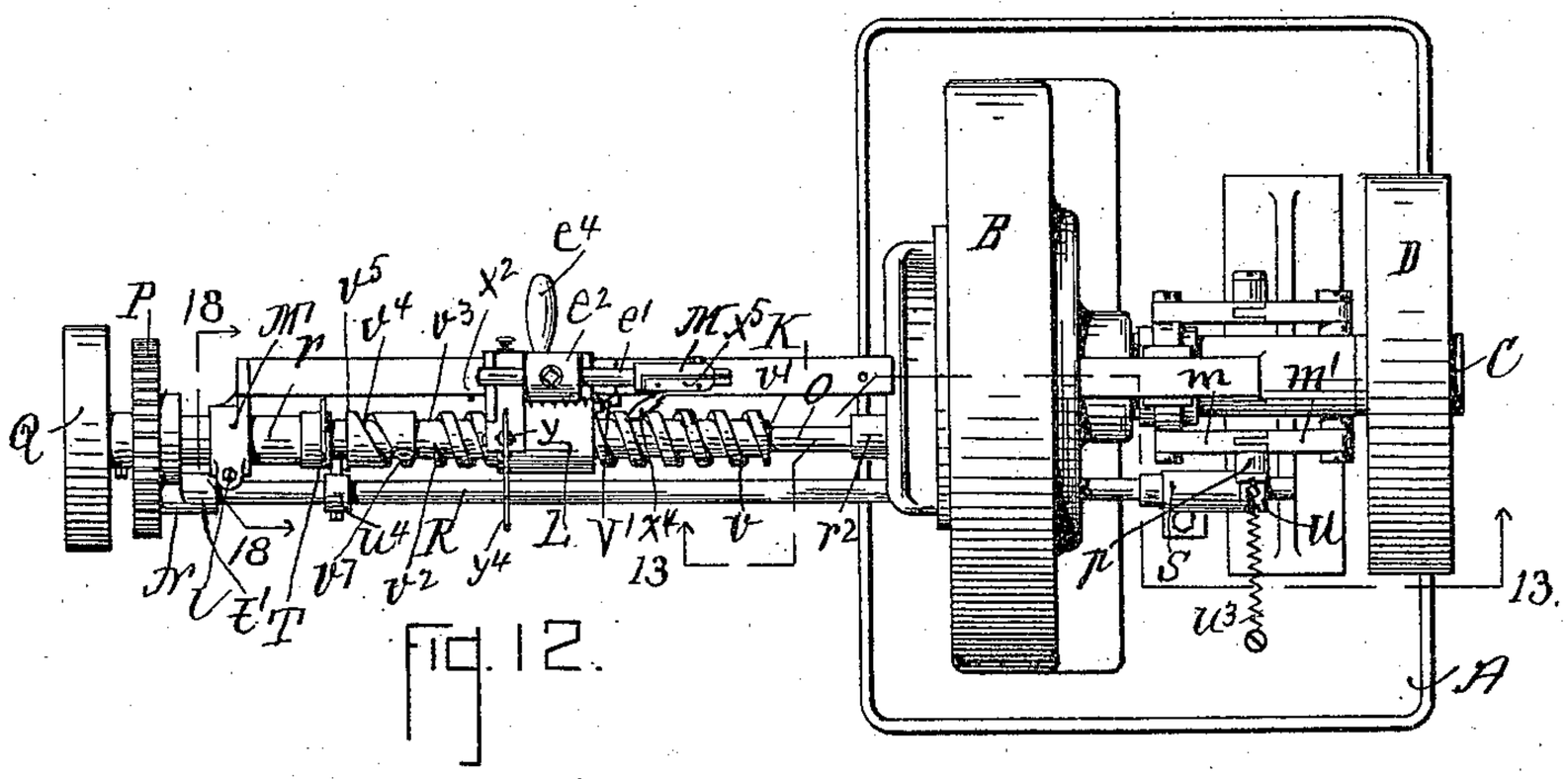

FIG. 12.

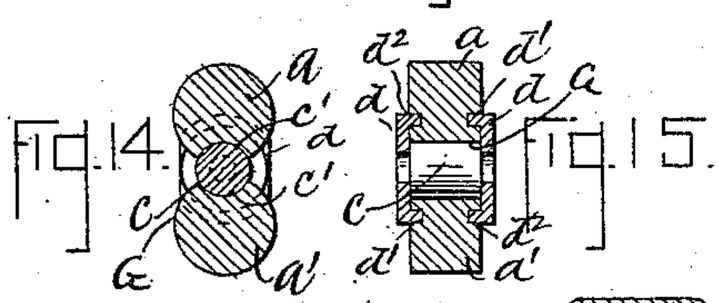

FIG. 14.

FIG. 15.

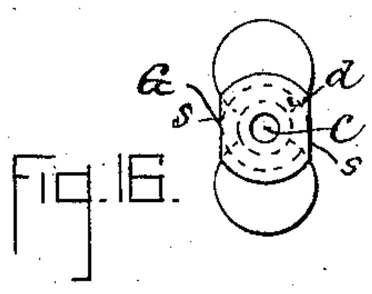

FIG. 16.

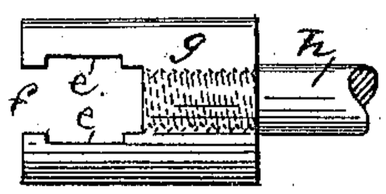

FIG. 17.

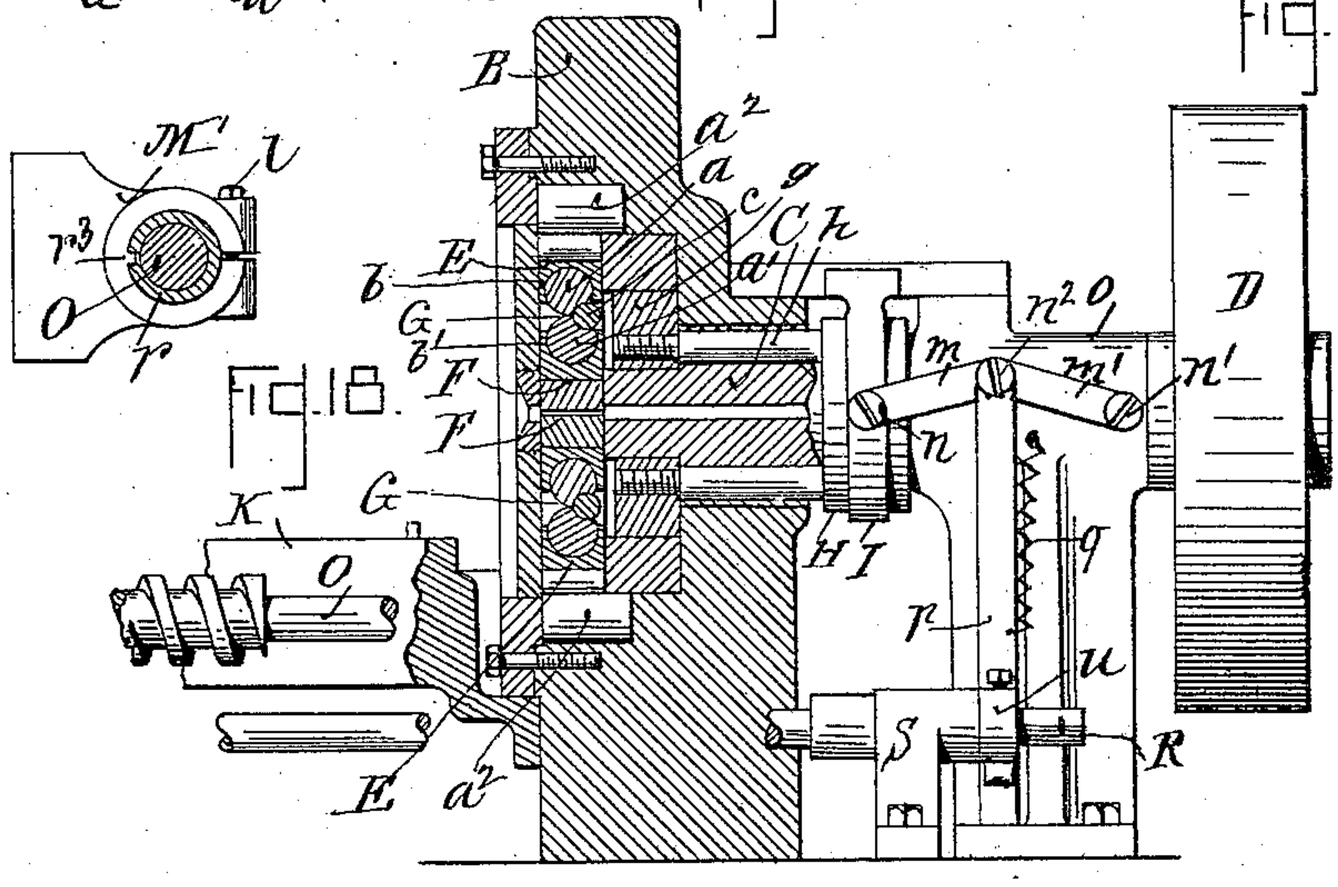

FIG. 18.

FIG. 13.

WITNESSES:

Harry J. Garrigan

Frederic W. Beaman

INVENTOR:

Antoine J. Langelier

BY S. Scholfield

ATTY.

UNITED STATES PATENT OFFICE.

ANTOINE J. LANGELIER, OF PROVIDENCE, RHODE ISLAND.

FEEDING MECHANISM FOR SWAGING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 576,057, dated January 26, 1897.

Application filed October 26, 1895. Serial No. 567,016. (No model.)

To all whom it may concern:

Be it known that I, ANTOINE J. LANGELIER, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Improvement in the Feeding Mechanism of Swaging-Machines, of which the following is a specification.

My invention is adapted for the manufacture of the wire spokes of bicycle-wheels and for other similar articles; and it consists in improved means for feeding the wire or rod through the swaging-dies and for opening the said dies automatically while the machine is in operation, and also in the details of construction, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a side elevation of the machine. Fig. 2 represents an enlarged detail side elevation of the sliding head for drawing the wire through the swaging-dies. Fig. 3 represents an enlarged section taken in the line 3 3 of Fig. 1. Fig. 4 represents an enlarged section taken in the line 4 4 of Fig. 1. Fig. 5 represents an enlarged side view of the catch which serves to hold the swaging-dies at their inner position. Fig. 6 is an enlarged detail section taken in the line 6 6 of Fig. 1, showing the cam which serves to effect the automatic opening movement of the swaging-dies and for disengaging the sliding head, the cam being shown in its disengaged position. Fig. 7 represents the same section, showing the cam in its engaging position for effecting the opening of the dies. Fig. 8 represents an enlarged section of the chuck for holding the wire to be operated upon, taken in the line 8 8 of Fig. 2. Figs. 9 and 10 are enlarged detail views of the feeding-screw and spiral groove by means of which the sliding head is operated, and Fig. 11 represents a modification of the same. Fig. 12 represents a top view of the machine. Fig. 13 shows an enlarged section of the rotary die-holding spindle and the stationary head, taken in the line 13 13 of Fig. 12. Figs. 14, 15, and 16 are views illustrating the construction of the toggle-joint. Fig. 17 represents a view of the toggle-head closed for action. Fig. 18 represents a section, enlarged, taken in the line 18 18 of Fig. 12. Fig. 19 shows a modification of the spiral.

In the drawings, A represents a stand or frame upon which the machine is placed; B, the stationary head, in which is journaled the die-holding spindle C, to which rotary motion is imparted by means of the pulley D. The stationary head B is provided with the beating-rollers a^2 a^2, which are held for rotation in cylindrical recesses and adapted for engagement with the sliding blocks E E to cause the proper reciprocation of the dies F F, the said engaging blocks and dies being loosely held in a diametrical groove made in the enlarged forward end of the die-holding spindle C; and between the dies F F and the engaging blocks E E are placed the toggle-links G G, the said links consisting of the block a, fitting in the cylindrical recess or socket b in the block E, and the block a', fitting in the recess of socket b' in the die F, the said blocks a and a' being connected to each other to form the toggle-link by means of the cylindrical pin c, which fits into the cylindrically-curved recesses c' c', made in the adjacent sides of the blocks a and a'. The said blocks a and a' are secured to each other and to the pin c by means of the washers d d, which are placed upon the projecting ends of the pin c and are provided with the circular flange d', which enters the circular grooves d^2 d^2, made in the ends of the blocks a and a' to receive the same, the parallel sides s s of said washers d d being held in the recesses e e in the opposite sides of the opening f made in the head g, so that upon the movement of the said head g back and forth a corresponding movement will be imparted to the central joint of the toggle-link G.

The head g is provided with a shank h, which passes loosely through a longitudinal perforation made in the die-holding spindle C, and is secured to the sliding sleeve H, the said sliding sleeve being provided with a groove in which is placed the loose ring I, to which operative connection is made from a pedal by means of the toggle-jointed links m m', the link m being jointed to the ring I by means of the screw n and the link m' jointed to the bearing-standard o by means of the screw n', and to the middle joint n^2 is attached the downwardly-extending link p, which is connected with a pedal, (not shown in the drawing,) the said link and pedal be-

ing caused to rise by means of a spiral or other suitable spring q. Upon the downward movement of the pedal by the operator of the machine the sleeve H will be thrown forward, thus forcing forward the central joints of the toggle-links G G and changing their angular position, whereby the distance between the engaging blocks E E and the working faces of the dies F F will be increased, so that the dies will be brought nearer together than before. The toggle-link mechanism for operating the swaging-dies thus described is shown and claimed in my Letters Patent of the United States No. 542,021.

To the face of the stationary head B is bolted the slide-bracket K, which serves to support the sliding head L. The chuck M for holding the wire or rod to be swaged is provided with a shank e', which is adjustably held in the upwardly-extending arm e^2 of the head L by means of the set-screw c^3. The head L is provided at its front side with a projecting handle e^4, by means of which the head L may be operated back and forth upon the slide-bracket K by hand, as desired. To the outer end of the slide-bracket K is bolted the split holding-bracket M′, which serves to hold and clamp the adjustable bracket-arm N, the said arm being prevented from turning in the holding-bracket by means of a groove r' cut in the side of the hub r of the said bracket, the said groove being adapted to receive a spline r^3, which is held in one side of the bore of the holding-bracket M′. The hub r of the adjustable bracket-arm N forms a sleeve-bearing for the outer end of the screw-shaft O, which serves to carry the sliding head L backward from the face of the stationary head B to draw the wire through the dies, and is clamped in the holding-bracket M′ by means of the screw l. The feeding-screw shaft O is supported at its inner end in the bearing r^2, and is capable of sliding movement therein upon the endwise adjustment of the hub or sleeve r of the bracket-arm N in the holding-bracket M′, and this sliding movement is effected in the act of adjustment. The screw-shaft O is driven by means of the gear P upon the outer end of the said shaft and the pinion P′ on the hub of the driving-pulley Q, the said pulley being loosely held upon the stud l, the said pulley Q being driven separately from the pulley D, which serves to impart rotary motion to the die-holding spindle T. In the bearing t' at the outer end of the bracket-arm N is journaled the rock-shaft R, the opposite end of the said shaft being supported in the bearing-standard S, and to the end of the shaft R is secured the catch u by means of the set-screw u', the said catch being adapted to engage with the notch u^2 in the side of the pedal-link p, the said catch u, when engaged with the said notch, serving to hold the swaging-dies at their inner position. The catch u is actuated to enter the notch u^2 by means of the spring u^3, and to the shaft R is attached the catch-tripping arm u^4 by means of the set-screw u^5.

The spiral thread v upon the feeding-screw shaft O is made continuous from the forward point v' to the rear point v^2, ending at the annular groove v^3, at the opposite side of which is formed the spiral groove v^4, which terminates at the shoulder v^5. At the junction of the spiral groove v^4 with the circumferential groove v^3 is placed the pivoted tongue v^7, provided on one side with the projection v^8 and on the opposite side with the projection v^9, by means of which the tongue v^7 is to be turned from side to side automatically. To the feeding-screw shaft R is attached the cam T, which serves to actuate the tripping-arm u^4 to cause the disengagement of the catch u from the notch u^2 in the pedal-link p.

To the side of the sliding head L is pivoted the arm V at the point w, the said arm being held in its elevated position against the stop-pin w' by means of the spring w^2, (shown in Figs. 3 and 4,) the outer end of the said arm serving to pass between the cam T and the tripping-arm u^4 to cause the proper action of the said cam.

To the bracket x, at the under side of the sliding head L, is pivoted the arm V′, which is held against the head by means of the spring x', as shown in Fig. 2, and upon the side of the slide-bracket K is placed the pin x^2, (shown enlarged in Fig. 3,) a groove x^3 being formed in the traveling head L to allow the said head to pass over the said pin, thus allowing the pin to come in contact with the side of the arm V′ to check the movement of the said arm with the sliding head, thus causing the upper end of the said arm to come in contact with the lever x^4, which serves to open the jaw x^5 of the chuck, whereby the said jaw will be opened to release the swaged wire, so that it may drop by gravity from the chuck.

The sliding head L is thrown into engagement with the screw-thread V by means of the spring-actuated sliding bolt y, the end y' of which is adapted to enter the space between the threads of the feeding-screw, the attaching-spring y^2, which serves to hold the sliding bolt in its engaged position, being arranged to act against the upper side of a projecting arm y^3 at the side of the bolt. The arm y^3 also serves for the engagement of the cam T, which acts to raise the sliding bolt y out of engagement with the shoulder v^5 at the end of the spiral groove v^4. To the upper end of the sliding bolt y is pivoted the hand-lever y^4, which, when turned in a vertical position, serves to hold the sliding bolt y in its disengaged position, the said bolt being also held in its disengaged position by means of the spring-actuated sliding catch y^5, which enters the notch y^6. The slide-bracket K is provided with the stop-pin k', which comes in contact with the adjusting-screw k^2, (shown in Fig. 1 at the forward side of the sliding

head L,) thus limiting the forward movement of the sliding head upon the slide-bracket K.

The operation of the machine will be as follows: In swaging the wire to form the spoke of a bicycle-wheel the rod or wire is inserted into the chuck M while the machine is in operation and the sliding head L brought forward until the adjusting-screw k^2 comes in contact with the stop-pin k'. Then the operator, by pressing downward upon the pedal attached to the pedal-link p, draws the central joint n^2 of the toggle-links m m' downward, thus forcing the sleeve H forward, by means of which the central joints of the toggle-links G G will be forced forward, whereby the distance between the engaging blocks E E and the working faces of the dies F F will be increased, so that the dies will be brought nearer together, and thus act upon the wire to swage the same to the proper diameter at the starting-point. The dies will thereafter be held in this operating position by the engagement of the spring-actuated catch u with the notch u^2 in the pedal-link p. (Shown in Fig. 5.) The operator now pushes back the spring-actuated catch y^5 out of the notch y^6, thus allowing the bolt y to be carried downward by the spring y^2 into engagement with the thread v of the feeding-screw, by which means a slow backward movement will be imparted to the sliding head L to feed the wire backward through the swaging-dies F F until the engaging bolt y arrives at the end of the thread v and enters the annular groove v^3, thus completing the progressive movement of the wire through the swaging-dies and allowing the swaging-dies to operate continuously in a circular path around the wire to produce a properly-finished shoulder. As the screw-shaft O continues to revolve after the engaging end y' of the bolt y has entered the annular groove v^3 it comes in contact with the projection v^8 of the pivoted switch v^7, and thus turns the said pivoted tongue from the position shown in Fig. 9 to the position shown in Fig. 10, whereby upon the continued revolution of the feeding-screw shaft O the engaging end of the bolt y will be carried into the spiral groove v^4, by means of which the swaged wire will be quickly withdrawn from between the dies, the said dies having in the meantime been opened to cause their action upon the wire to cease by means of the entrance of the spring-actuated pivoted arm V between the revolving cam T and the tripping-arm u^4, by means of which the catch u will be withdrawn from the notch u^2 in the pedal-link p, thus allowing the spring q to carry the central joint n^2 of the toggle-links m m' upward to cause the required opening of the swaging-dies, and as the end y' of the bolt y enters and passes along the spiral groove v^4 it comes in contact with the projection v^9 of the switch-tongue v^7 and turns the said tongue back to the position shown in Fig. 10 preparatory to the succeeding operation of the machine. When the wire has been completely withdrawn and the end y' of the bolt y has arrived at the shoulder v^5, the continued rotation of the screw-shaft O causes the cam T to engage with the under side of the arm y^3 of the bolt y to cause the said bolt to be raised out of engagement with the shoulder v^5 and into engagement with the spring-actuated catch y^5, which enters the notch y^6, thus holding the engaging end of the said bolt out of engagement, whereby the sliding head L may be moved back and forth upon the slide-bracket K by hand to any position desired. During the backward movement of the sliding head, when the bolt y is in engagement with the spiral groove v^4, the spring-actuated pivoted arm V' comes in contact with the pin x^2, and is thus thrown forward, so as to come in contact with the lever x^4, which serves to open the movable jaw x^5 of the chuck, so that the swaged wire can drop by gravity from the chuck, and when the sliding head L has been moved forward by hand so as to release the lever x^4 from its engagement with the arm V a new piece of wire may be inserted into the chuck for continued operation.

In the modification shown in Fig. 11 the end y' of the bolt y passes from the feeding-screw v into the circumferential groove v^3, and thence direct to the spiral groove v^4, the resting-point for the sliding head being thus made shorter than when the switch-tongue v^7 is employed.

In the modification shown in Fig. 19 the spiral thread v is made continuous with a circumferential thread v^{10}, which also connects with the spiral v^{11}, and in this case the engaging bolt y is provided with a notch y^7, which embraces the spiral.

The adjustment of the feeding mechanism for operation upon different lengths of wire is effected by means of the proper adjustment of the bearing-sleeve r in the holding-bracket M.

It is to be understood that I do not limit my improvement to the toggle-link herein shown by means of which the opening and closing movement is effected, since it is evident that other well-known devices can take the place of the specific devices shown for this purpose.

It is also to be understood that the wire may be fed in either direction through the dies, but I have preferred the outward direction.

I claim as my invention—

1. In a swaging-machine, the combination of a sliding head, and the chuck for holding the wire to be swaged, with the feeding-screw provided with a circumferential groove or thread, adapted to provide a resting-point in the movement of the sliding head, and means for engaging the sliding head with the screw, substantially as described.

2. In a swaging-machine, the combination of a sliding head, and the chuck for holding the wire to be swaged, with the feeding-screw provided with a circumferential groove or