(No Model.)

J. H. GERRY.

WIRE FEEDING MACHINE.

No. 332,889. Patented Dec. 22, 1885.

Fig. 5,

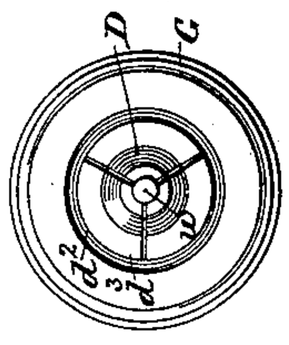


Fig. 4,

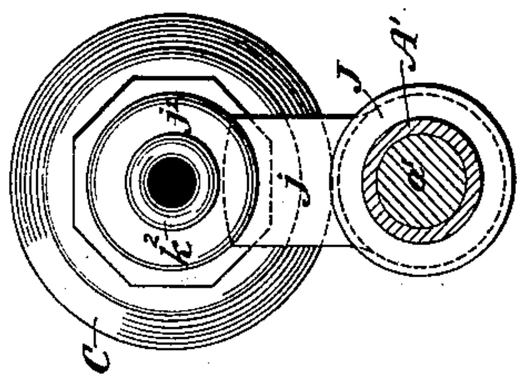


Fig. 3,

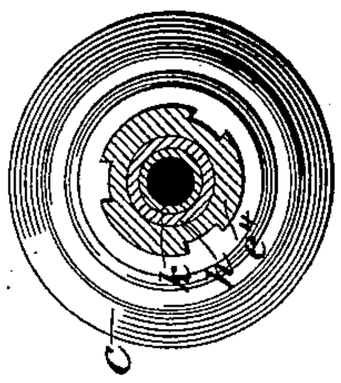


Fig. 2,

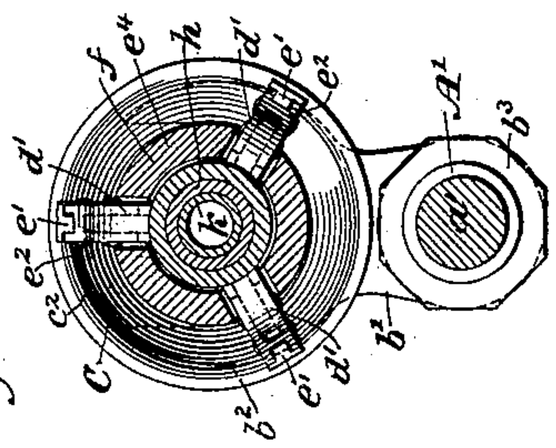
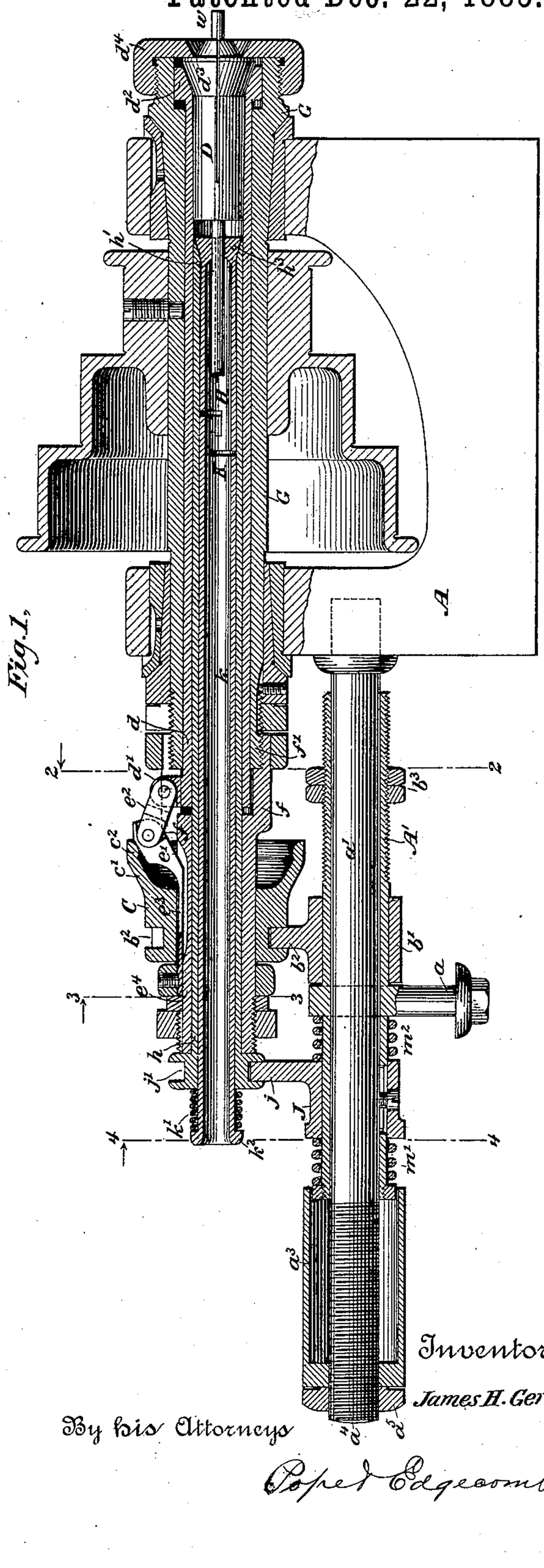


Fig. 1,



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JAMES H. GERRY, OF BROOKLYN, NEW YORK.

WIRE-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 332,889, dated December 22, 1885.

Application filed October 2, 1885. Serial No. 178,840. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. GERRY, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Wire-Feeding Machines, of which the following is a specification.

My invention relates to the class of apparatus applied to lathes and similar machines for feeding wire and small rods in regulated lengths for manufacturing screws, pins, parts of clocks and watches, and for other similar purposes, and to means employed for tightening and holding the chucks.

The object of the invention is to provide reliable mechanism for this purpose which is easily operated and which will feed the wire and actuate the chuck without stopping the machine to which it is applied.

There have been numerous methods proposed for feeding the wire in regulated lengths. In some instances springs have been employed, which push the wire forward when moved in one direction, and which slide upon the wire when moved in the opposite direction. In other instances weights have been employed, which continually exert a tension upon the wire, and serve to carry it forward when it is released by the chuck. I prefer to employ a feed-chuck which grasps the wire when moved forward, but releases its hold when moved in the opposite direction by reason of its inherent resilience, so as to slide along the wire and again grasp it when it is again moved forward.

My invention also involves certain improvements in the construction of the chuck devices and the means whereby they are operated, and also in the general construction of the machine.

In the accompanying drawings, Figure 1 is a transverse section of the wire-feeder, and Figs. 2, 3, 4, and 5 show certain details in the construction of the various parts.

Referring to the figures, A represents a suitable support or head-stock, upon which the feeder is carried.

It is designed that a lever shall be applied to an arm, *a*, for the purpose of moving it forward and backward to operate the movable portions of the machine. The arm *a* is secured to a sleeve, A′, which moves upon a stationary rod, *a′*. The rod *a′* is secured to the head-stock above mentioned, and at one end carries a micrometer-stop, a^3, which is adjustable upon the screw-thread a^4 and secured by the nut a^5. Surrounding the sleeve A′ is a collar, *b′*, which is provided with a lug or fork, b^2, entering a groove in a collar, C, which will be hereinafter described. It is intended that the longitudinal movements of the sleeve A′ shall operate the collar C by means of the fork b^2.

The collar C is designed to operate a chuck, D, and may for that reason be termed the "chuck-collar." This is accomplished by providing the chuck-collar with an annular flange, *c′*, having an inwardly-projecting lug, c^2. This bears upon a series of toggle-joints, each of which is composed of two arms, *e′* and e^2. The arm *e′* is preferably supported through a flexible spring or extension, e^3, from a rigid support, e^4.

The support e^4 constitutes a portion of a collar, *f*, which surrounds certain movable portions of the chuck-operating mechanism, and is rigidly attached to the end *f′* of a hollow spindle, G. The spring e^3 normally presses the arm *e′* upward against the flange *c′*. The arm e^2 is pivoted to the arm *e′* at one end, and at the other end to a lug, *d′*, on the movable chuck-sleeve *d*. The arm e^2 is thus a link connecting the chuck-sleeve with the arm *e′*. The resilience of the spring e^3 tends to force the arm *e′* outward, and thus draw back the sleeve *d*. The sleeve *d* surrounds the split chuck D, and is provided at the end with an extension, d^2, which is preferably split into three parts, extending into an annular enlargement in hollow spindle G. The inner surfaces of the extension d^2 are beveled to an angle which corresponds with the outer surfaces of the chuck-jaws d^3. When the sleeve *d* is drawn backward, the extension d^2 releases the chuck and permits it to open. When, on the contrary, the sleeve is forced forward, the shoe tends to close the jaws d^3. Such movements of the sleeve are occasioned by the to-and-fro movements of the collar C. When this collar is moved toward the right hand, the flange or lug c^2 presses against the bearing-surface of the arm *e′*, and thus forces the

joint of the toggle inward, and acting through the link e^2 forces the sleeve d toward the right hand. The bearing-surface of the arm e' is preferably flat, so that when the lug e^2 is pressing it inward the spring e^3 cannot force the collar C back. When the collar C is moved toward the left hand, then the sleeve will be drawn back by reason of the resilience of the spring e^3. This portion of the device is employed for holding the wire or rod, which is indicated at w as passing through the chuck, when it has been fed forward by the feeding-chuck H, which will be hereinafter described.

It should be here stated that the apparatus is provided with a face-plate, d^4, against which the front end of the chuck D strikes, so that the movement of the sleeve d will not force the chuck outward. A certain amount of play, however, may be given to the chuck within the sleeve or between the jaws d^2, provision only being made that it shall not be driven forward beyond a certain point. The face-plate d^4 screws upon the end of the hollow spindle G.

It has been proposed to connect a sleeve for operating a chuck with a stationary support by bow-springs, and I make no claim to such construction.

It is evident that it is desirable that the chuck D should remain closed while the chuck H is being drawn backward to grasp the wire farther down, and that it should be closed after the wire has been fed forward. For this reason the collar b' is loosely carried upon the sleeve A', and is engaged by suitable adjustable nuts, b^3, when the sleeve has nearly completed its movement toward the left hand.

For the purpose of operating the chuck when the sleeve A' is moved toward the right hand, an enlargement of the arm a strikes against the collar b' and forces it forward.

The operation of the feed-chuck H is made positive by means of a collar, J, mounted upon the sleeve A', to which it is coupled by a screw and slot, allowing a slight longitudinal movement. The collar J is provided with an arm, j, which grasps a grooved collar, j', formed at the end of a movable sleeve, h. This sleeve extends within the sleeve d to the ends of the jaw h' of the chuck H. The inner surface, at the end of the sleeve h, is beveled, as shown, and its surfaces coincide with the outer surfaces of the enlargements h^3 at the ends of the jaws h' of the chuck H. When the sleeve h is moved toward the right hand, it tends to close the jaws of the chuck H in precisely the same manner as described with reference to the sleeve d and the chuck D. It is necessary, however, that the chuck itself should have a to-and-fro motion, and for this purpose it is connected, preferably by means of a bayonet-joint, as indicated at K, with a movable sleeve, k, extending within the sleeve h and beyond the enlargement j'. A spring, k', surrounds the end of the sleeve, and by being pressed between the enlargements j' and a corresponding enlargement, k^2, at the end of the sleeve k, tends to draw the sleeve and thus the chuck H backward—that is to say, toward the left hand in Fig. 1. If the collar J be moved toward the left, then at first the tension of the spring k' will be increased and the sleeve h drawn backward, thus releasing the jaws of the chuck H. After the spring has become compressed the chuck itself will also move toward the left hand, sliding upon the rod or wire w, which is meanwhile held by the chuck D. The limit of the movement thus given to the chuck H is determined by the position of the collar J with reference to the inclosing sleeved stop a^3, for the latter serves as a stop for arresting the movement of the collar. Thus by adjusting their relative positions the length of the feed may be readily modified. The micrometer-screw a^4 permits of a very careful adjustment for this purpose. After the chuck H has thus been opened and drawn back preparatory to grasping the wire anew a still further movement of the rod a' is required before the nut b^3 shall engage the collar b' and operate the chuck-collar C. For this reason the collar J is supported between equilibrium-springs m' and m^2, which surround the sleeve A' and give it a determinate position. When, however, its movement is arrested by the sleeved stop a^3, a still further movement of the rod a' is permitted by the compression of the spring m^2, and this carries the nut b^3 against the collar b', thus carrying the chuck-collar C toward the left, and thereby releasing the jaws d^3. The parts are so adjusted that the nut b^3 will engage the collar b' at the moment the movement of the collar J is intercepted by the stop a^3, so that the chuck H will remain at rest while the chuck D is being released. When the arm a is again moved toward the right hand by its lever, the tension of the spring e^3 will tend to hold the collar C back, thus allowing the chuck D to remain open. The collar j' will be pressed forward by the spring k', thus causing the sleeve h to close the chuck H and carry it forward, causing it to grasp the wire firmly and feed it forward the required length. When the forward stroke has been nearly completed, the enlargement of the arm a will strike the collar b' and force the chuck-collar C against the toggle, and thus cause the chuck D to grasp and securely hold the wire.

The chuck-tightening devices, it is evident, may be employed independently of the feeding apparatus and applied to various forms of split-chucks, especially where such chucks are employed in working wire and rods.

The operation of the chucks and the tightening-sleeve may be reversed—that is to say, the sleeve may be stationary and the chuck drawn back into the same.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a revolving chuck, a longitudinally-movable chuck in the same axial

line therewith, means for withdrawing the second chuck from the first chuck, means for permitting said second chuck to open before it is withdrawn and for closing it when so withdrawn, means for then permitting the opening of the first chuck and for advancing the second chuck to its normal position, and means for subsequently closing the first chuck.

2. The combination, substantially as hereinbefore set forth, of a wire-holding chuck, means for causing it to grasp and to release a wire at will, a longitudinally-movable chuck for engaging the same wire normally tending to open by reason of its inherent elasticity, and means for causing the latter chuck to move from and toward the former and to be open when moving from and to be closed when moving toward the first-named chuck.

3. The combination, substantially as hereinbefore set forth, of a wire-holding chuck, a longitudinally-moving feeding-chuck tending to open by reason of its inherent elasticity, a sleeve for closing the same, and means for causing a to-and-fro movement of the feeding-chuck in the axial line of the holding-chuck.

4. The combination, substantially as hereinbefore set forth, of a wire-holding chuck, a feeding-chuck normally tending to open by reason of its inherent elasticity, means for moving the latter toward and from the holding-chuck, and means for causing the holding-chuck to be closed when the feeding chuck is adjacent thereto.

5. The combination, substantially as hereinbefore set forth, of a holding-chuck, a feeding-chuck normally tending to open by reason of its inherent elasticity, means for moving the latter in the axial line of the former, and means for opening the holding-chuck when the feeding-chuck has reached one limit of its movement and for closing it when the feeding-chuck is at or near the other limit of its movement.

6. The combination, substantially as hereinbefore set forth, of a chuck, a sleeve surrounding the same, a stationary support, one or more toggle-joints, each consisting of two pivoted arms connecting the sleeve with the support, a flat bearing surface upon one of the arms of each toggle-joint, and a device for extending said joint or joints and resting upon said surface.

7. The combination, substantially as hereinbefore set forth, of a chuck, a sleeve surrounding the same, a support, one or more toggle-joints, each consisting of two pivoted arms, one arm of each of which is connected with the sleeve and the other connected with the support through a flexible extension, and means for extending said joint or joints against the tension of said flexible extension.

8. The combination, substantially as hereinbefore set forth, of a holding-chuck, a sleeve for closing said chuck, means for operating said sleeve, a feeding-chuck, a sleeve for operating the same, means for moving the last-named sleeve longitudinally upon the said chuck, and means for moving said feeding-chuck and its sleeve together, substantially as described.

9. The combination, substantially as hereinbefore set forth, in a wire-feeding machine, with a holding-chuck, a sleeve for operating the same, and one or more toggle-joints, each consisting of two arms pivoted to each other, of a feeding-chuck, a sleeve surrounding the same, a spindle for said chuck extending beyond the end of said sleeve, a yielding spring tending to force said sleeve upon the chuck to close it, and means for forcing said sleeve toward the projecting end of said spindle, thereby compressing said spring and permitting said chuck to open.

10. The combination, substantially as hereinbefore set forth, of a rotating and a longitudinally-movable chuck located in the same axial line, a spindle attached to the longitudinally-movable chuck, a collar for moving said spindle, a sleeve extending through said collar, equilibrium-springs tending to hold said collar in a given position upon said sleeve, means for moving said sleeve longitudinally, a stop for limiting the movement of said collar without interrupting the movement of said sleeve, a device for operating the rotating-chuck, and means moving with said sleeve for operating said device after said collar has been arrested, substantially as described.

11. The combination, substantially as hereinbefore set forth, of the chucks D and H, the forks b^2 and j for operating the same, the rod a', the sleeve A′ upon which said forks are supported, and the adjustable stops a^3 and b^3.

In testimony whereof I have hereunto subscribed my name this 1st day of October, A. D. 1885.

JAMES H. GERRY.

Witnesses:
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CHARLES A. TERRY.