(No Model.)

O. COLLINS.

WIRE STRAIGHTENER AND CUTTER.

No. 348,660. Patented Sept. 7, 1886.

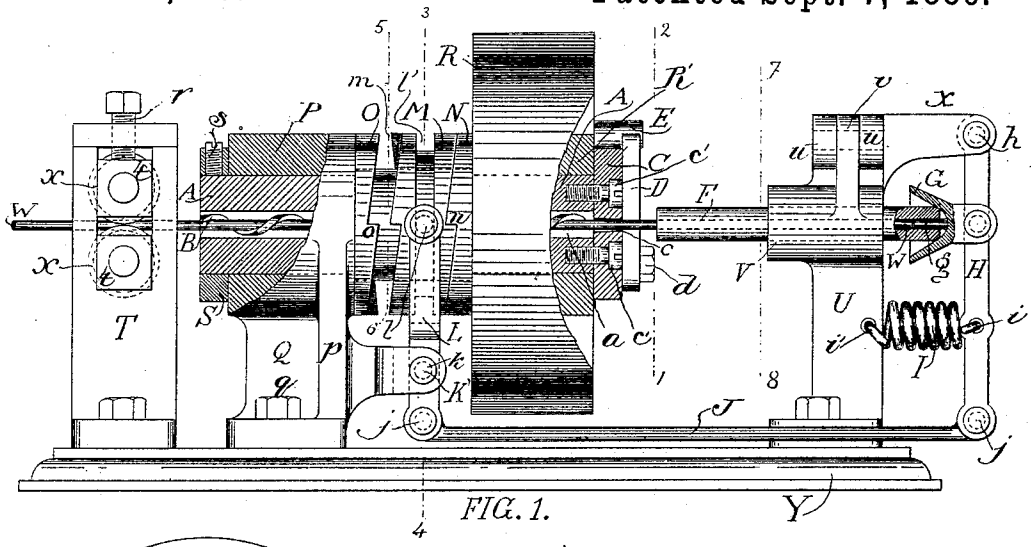


FIG. 1.

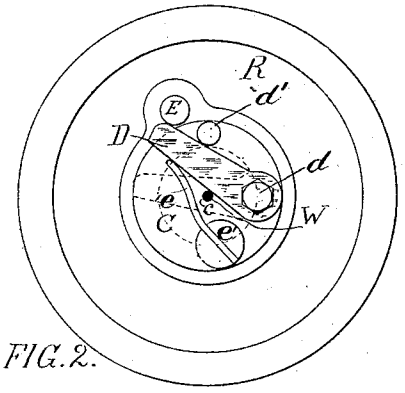


FIG. 2.

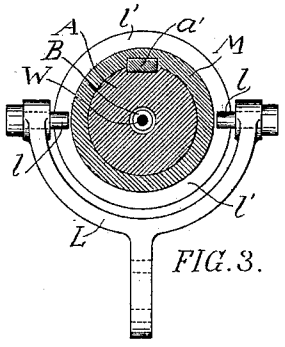


FIG. 3.

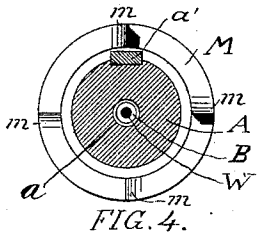


FIG. 4.

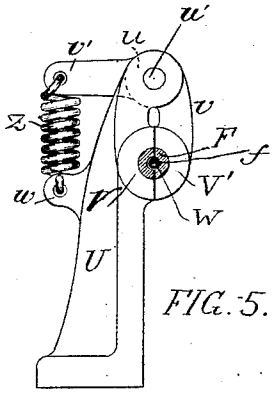


FIG. 5.

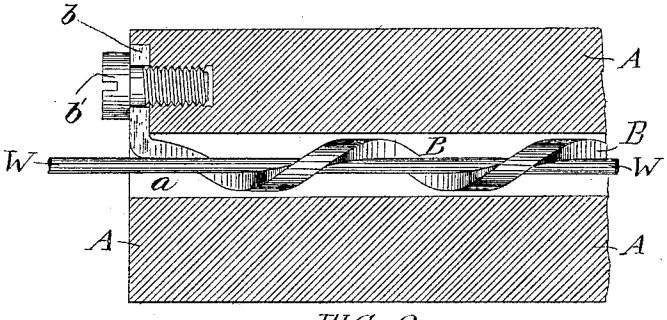


FIG. 6.

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UNITED STATES PATENT OFFICE.

OLMSTEAD COLLINS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO ALMON P. DODGE, OF SAME PLACE.

WIRE STRAIGHTENER AND CUTTER.

SPECIFICATION forming part of Letters Patent No. 348,660, dated September 7, 1886.

Application filed June 19, 1886. Serial No. 205,733. (No model.)

To all whom it may concern:

Be it known that I, OLMSTEAD COLLINS, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Automatic Wire Straightening and Cutting Machines, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation with the driving pulley and part of the bearing or journal box in section; Fig. 2, a sectional elevation, on line 1 2 of Fig. 1, of the driving-pulley and wire-cutting devices; Fig. 3, a sectional elevation on line 3 4 of Fig. 1, showing the sliding clutch; Fig. 4, a sectional elevation, on line 5 6 of Fig. 1, showing the stationary clutch; Fig. 5, a sectional elevation, on line 7 8 of Fig. 1, of the receiving-tube; Fig. 6, a longitudinal section of the sleeve, showing the spiral therein and a wire in the act of being straightened, one end of the parts shown being broken off. Fig. 6 is enlarged as compared with the other figures.

The object of this invention is to construct a machine by which wire can be rapidly and successfully straightened and be cut off into pieces of any desired length; and its nature consists in the several parts and combinations of parts, hereinafter described, and pointed out in the claims as new.

In the drawings, A represents a sleeve of cast-steel or other suitable material, having a central circular bore or hole, *a*.

B is a spiral, also made of steel or other suitable material, located within the bore *a* of the sleeve A, and secured thereto at the ends by having a turned portion, *b*, through which and into the end of the sleeve a screw, *b'*, passes for holding the spiral in place, the end of the sleeve being recessed to receive the end *b* of the spiral.

C is a disk of a larger diameter than the diameter of the sleeve A, and having a central tapering hole, *c*, which lines with the center of the bore *a* and the hole formed by the spiral B. This disk C is secured to the end of the sleeve A by screws *c'*, or in some other firm manner.

D is a cutter formed of a piece of steel or other suitable material, and pivotally attached at one end to the disk C by a pin or bolt, *d*, and so located as to have its cutting-edge coact with the edge of the opening *c*, and shear the wire at that point.

E is a stud projecting out from the end face of the hub of the driving-pulley, so as to travel around the periphery of the disk C, and strike the free end of the bar or cutter D at each revolution when the driving-pulley is disengaged from the sleeve. The cutter or bar D is held out of operating position by a spring, *e*, secured to a stud, *e'*, on the face of the disk C, as shown in Fig. 2; and in order to prevent the spring from throwing the cutter too far out, a stop-pin, *d'*, is provided, projecting out from the disk C, as shown in Fig. 2.

F is a receiving-tube formed in two halves or sections, and located to have the wire pass from the hole *c* into the hole *f* of the receiving-tube.

G is a bell-mouth located at the outer end of the receiving-tube F, and forming a means for biting onto the end of the tube and closing the sections together for receiving the wire. The outer end of the tube F receives a stop, *g*, the end of which, when the machine is in use, abuts against the end of the bell-mouth and forms a stop for the length of wire to be cut off.

H is a lever, to which is attached the bell-mouth G, and by which the bell-mouth is carried forward to close the tube F, and back to allow such tube to open for the cut piece of wire to drop out.

I is a spring for moving the lever H to cause the bell-mouth G to close the tube F and hold it firmly.

J is a connecting-link, one end of which is pivotally connected to the end of the arm or lever H by a pin or pivot, *j*, and the other is pivoted to the end of the clutch-fork by a pin or pivot, *j'*.

K represents ears, between which is pivoted the stem of the clutch-fork by a pin or pivot, *k*.

L is the clutch-fork, the arms of which are each provided with a pin, *l*, to enter the groove of the sliding clutch.

M is the sliding clutch, mounted on the sleeve A and connected with the sleeve by a spline or key, *a'*, so that the clutch is free to slide longitudinally on the sleeve, but is locked

thereto when rotated. This sleeve has a peripheral groove, *l'*, to receive the pins *l* of the clutch-fork, so as to move the clutch forward and back, and at the same time allow it to revolve, and each face of the clutch is provided with teeth *m*, to engage with the coacting clutches.

N is a clutch formed with or suitably secured to the hub of the driving-pulley, and having teeth *n* to engage with the teeth *m* of the sliding clutch and lock such clutch to the pulley, so that the rotation of the pulley drives the clutch M and with it the sleeve A.

O is a stationary clutch, with the teeth *o* of which the teeth *m* of the clutch M interlock to stop rotation of the clutch M and the sleeve A. The clutch O is secured to a standard or post of the frame-work in any suitable manner, so as to be stationary.

P is a bearing or journal-box in which the sleeve A is mounted and rotates, to the end of which box is secured the clutch O in the construction shown.

Q is a standard extending up from the bed-plate or other support and having thereon the journal-box P.

R is the driving-pulley, to the hub R' of which is secured the clutch N, or such clutch may be formed with the hub, and from this hub R' projects out the stud E.

S is a collar on the projecting end of the sleeve A, and locked to the sleeve by a set-screw, *s*, so that the face of the collar will abut against the end of the journal-box P and hold the sleeve A against end-thrust in connection with the clutch O. As shown, the journal-box P and standard Q are formed in one piece, and strengthening-flanges *p* are added, and the standard is attached to the bed-plate by bolts *q*.

T is a standard or upright having in its upper end a slot to receive the sliding boxes *t*, the upper one of which is adjusted by means of a set-bolt, *r*. This standard T is bolted or otherwise secured to the bed-plate.

U is a standard bolted or otherwise secured to the bed-plate, and having at its upper end a head to receive the tube F.

V is the head of the standard U, which receives the tube F, the head having a semicircular hole to receive the tube, the head itself being also semicircular.

V' is a movable jaw or head coacting with the head V to support the tube F, this head V' being semicircular and having a semicircular hole to receive one half of the tube, the other half being carried by the head V, as shown in Fig. 5. Extending up from the head V is a secondary head, *u*, between which is the arm *v* of the head V', and through which head *u* and the arm *v* a pin or pivot, *u'*, passes. An arm, *v'*, extends out from the arm *v*, by which arm *v'* the jaw V' is thrown open to release the wire after it is cut and allow it to drop down.

W is the wire to be straightened and cut.

X represents guide-rollers, between which the wire passes, and by which it is properly directed to pass into the spiral B. The rollers X are carried by the adjustable boxes *t*, and the periphery of each roller is grooved so as to partially receive the wire, and the amount of pressure on the wire is regulated by the adjusting-bolt *r*, the pressure being sufficient to overcome the tendency of the spiral to draw the wire in too fast to be properly straightened by the action of the spiral.

Y is the bed-plate on which the several parts are supported.

Z is a spring, one end of which is attached to the arm *v'*, and the other to a projection, *w*, on the standard U, and to this standard is also attached one end, *i'*, of the spring I, the other end, *i*, of which is attached to the arm or lever H. The arm or lever H is hung by a suitable pin or pivot, *h*, to a projecting arm, *x*, extending out from the secondary head *u* of the standard U.

The clutch O is firmly secured to the journal-box P, and the end of the sleeve passed into such journal-box P, and the clutch secured to the box P forms a stop by abutting against a shoulder on the sleeve A, the other stop being formed by the collar S, which is secured to the projecting end of the sleeve by the set-screw *s*. The clutch M is mounted on the sleeve so as to slide back and forth thereon, being held in place by the spline *a'*, and the pulley R is slipped onto the sleeve, with the clutch N on its hub to engage with the clutch M. The disk C is secured to the end of the sleeve by the screws *c'* locking the pulley onto the sleeve against endwise movement. The wire is slipped between the grooved holding-rollers X, and its end entered into the spiral B to pass through the sleeve A and hole *c* and enter the receiving-tube F, the stop *g* being adjusted at the proper point in the tube for the length of wire to be cut.

The pulley R is driven by a belt from any suitable motive-power, and when the clutch M is engaged with the clutch N the pulley in its rotation imparts rotation to the sleeve A, and the spiral B, being located in the bore of this sleeve, is carried around with the sleeve, and this movement of the spiral causes it to bite around the wire and straighten the wire in its passage through the spiral by the rotation of the spiral, the spiral drawing the wire forward and through the sleeve by its own rotation, and a too rapid feed is prevented by the grooved rollers X. The end of the wire, after passing through the hole *c*, enters the tube F, and passes into such tube until the stop *g* is reached by the end of the wire, which checks the further advance, and at this point the clutch M is shifted by the stop *g* being forced against the mouth G, carrying back such mouth, and with it the arm or lever H, which, through the connecting-rod K, throws the fork L of the clutch M over to release the clutch M from the clutch N and throw it into engagement with the clutch O, which stops the rotation of the sleeve A; but as the pulley R is

then loose upon the sleeve, it continues to be driven, and its rotation will cause the stud E on its hub to strike the free end of the bar or cutter D and force it across the hole *c*, severing the wire at that point. The carrying back of the bell-mouth G releases the bite on the tube F, by which it is closed, allowing the spring Z to throw open the jaw V′, which opens the tube F, so that the piece of wire as it is severed by the cutter D is free to drop out of the tube, and as the pressure of the wire against the stop *g* is released by the wire dropping out of the tube, the spring I acts, and carries the arm or lever H forward, forcing the bell-mouth over the tube F and closing the tube. At the same time the connecting-rod J acts to carry the fork L over, to throw the clutch N into engagement with the clutch M, for the sleeve A to be rotated by the pulley R, forcing another section of wire through the sleeve and spiral B, to enter the tube and be severed by the cutter D, as already described, and so on, until the required amount of wire has been straightened and cut.

It will be seen that the entire operation of straightening the wire, after it has been entered into the spiral, and cutting it off into sections of any desired length is automatic. The rotation of the spiral straightening the wire, and the wire itself entering the receiving-tube when the required length is reached, carries back the stop *g*, and through the lever H, connecting-rod J, fork L, and clutch M, disconnects the pulley from the sleeve to cause the cutter D to sever the wire, and when the wire is severed its dropping out of the tube F allows the stop *g* to return to position, which returns the arm H, connecting-rod I, and fork L, to throw the clutch into engagement for the next operation of straightening and cutting.

The stop *g* can be formed by using a number of pieces of varying length adapted to enter the end of the tube, so as to cut the wire off in varying lengths, or that stop might be a single piece adjustable in the bell-mouth G, and adapted to enter the end of the tube F. The cutter D can be prevented from stopping over the hole *c* by arranging the clutch-teeth *m n*, so that when the clutches are engaged the position of the pulley will be one by which the bar D is at the side and not over the hole *c*. The spiral B, as shown, is secured in the hole or bore *a* by turning the ends *b* to enter recesses in the sleeve A, and be there held by screws *b*′, and this form of securing the spiral in place enables a ready removal thereof to be had in case the spiral becomes too much worn to work properly, in which case the spiral can be replaced by another one by simply removing the screws and withdrawing the spiral and inserting a new one in position. This spiral, as shown, does not fill the entire diameter of the bore *a*, and when so made it is to have sufficient rigidity to not bend from rotation during the process of straightening the wire. This spiral could be made to fill the bore completely, and, if desired, the spiral might be formed by cutting it in the metal of the sleeve around the wall of the bore; but in such case the replacing of the spiral as it becomes worn would be impossible, except by providing a new sleeve entire, which could be done. The spiral being continuous and regular in its windings forms a bearing on all sides of the wire equally, so that when the wire passes through the spiral it will of necessity be pressed equally on all sides, and thereby straighten without any short kinks or bends being left therein.

What I claim as new, and desire to secure by Letters Patent, is—

1. A rotating sleeve, A, carrying a spiral, B, for receiving and straightening wire, substantially as specified.

2. The sleeve A and spiral B, in combination with the disk C and cutter D, for straightening and cutting wire, substantially as specified.

3. The sleeve A, spiral B, and cutters C D, in combination with the receiving-tube F and a connection between the receiving-tube, and a clutch mechanism on the sleeve for automatically stopping and starting the rotation of the sleeve in straightening and cutting wire, substantially as specified.

4. The sleeve A, spiral B, and cutters C D, in combination with the receiving-tube F, stop *g*, bell-mouth G, lever H, spring I, connecting-rod J, fork L, and clutch M N O, for automatically straightening and cutting wire, substantially as specified.

5. The combination, with a rotating sleeve, A, carrying a spiral, B, of grooved wheels operating to clamp the wire and prevent a too rapid feed, substantially as and for the purpose specified.

OLMSTEAD COLLINS.

Witnesses:
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EDGAR T. BOND.