(No Model.) 2 Sheets—Sheet 1.

O. COLLINS.

WIRE STRAIGHTENER.

No. 435,285. Patented Aug. 26, 1890.

Fig. I.

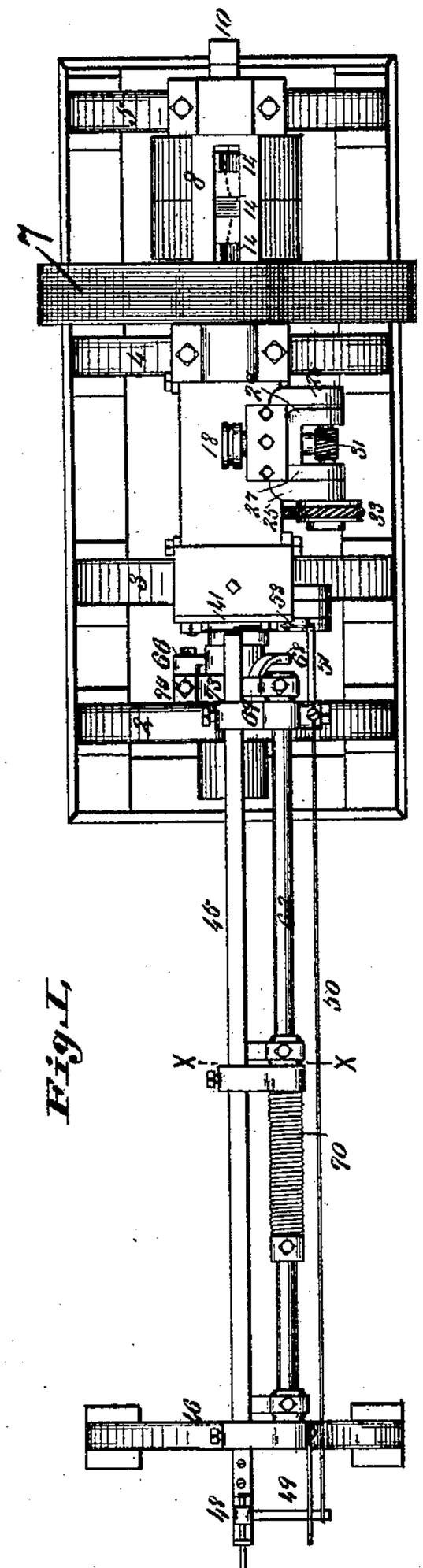


Fig. II.

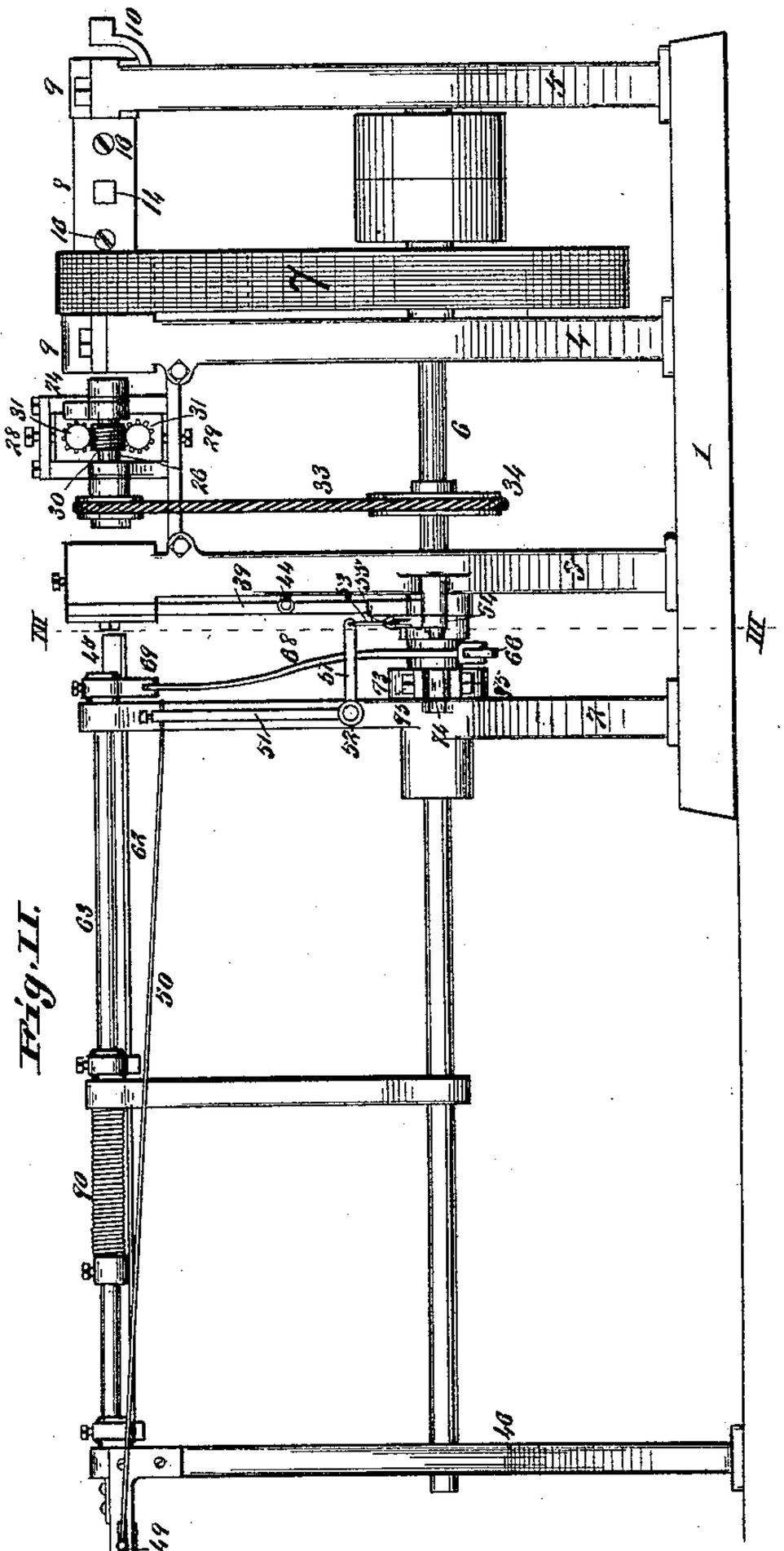
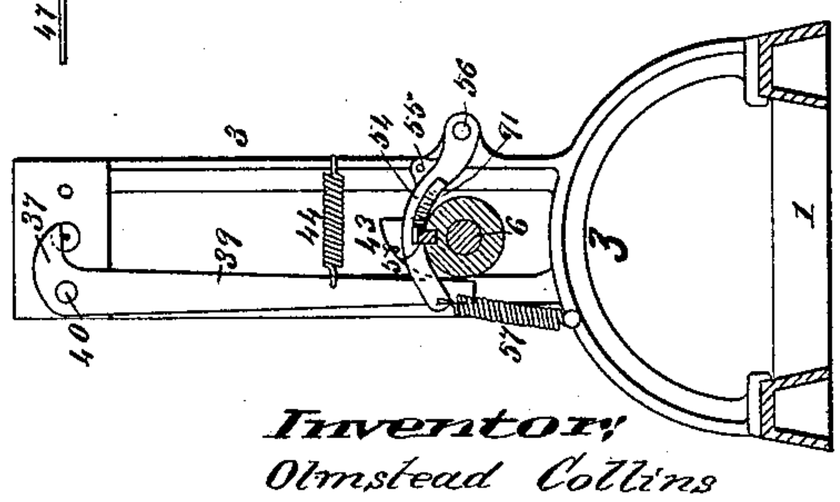


Fig. III.



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Inventor:
Olmstead Collins
By Knight Bros
Atty's

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Fig. IV.

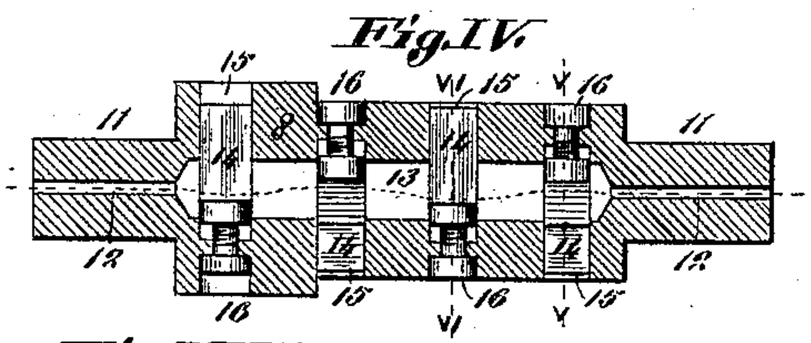


Fig. V.

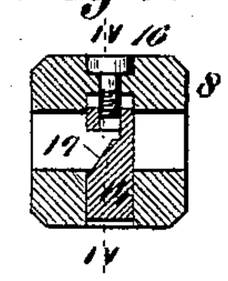


Fig. VI.

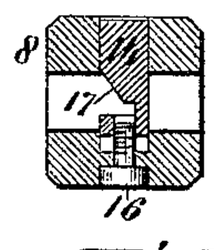


Fig. VII.

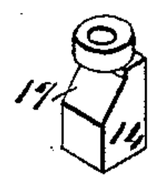


Fig. VIII.

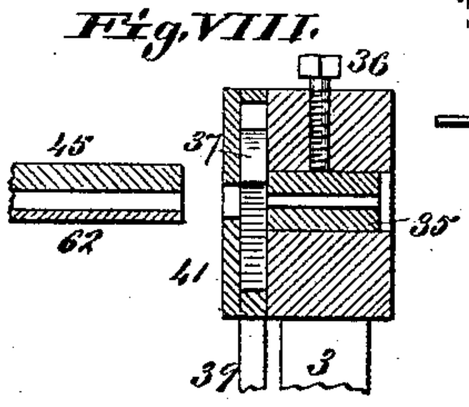


Fig. IX.

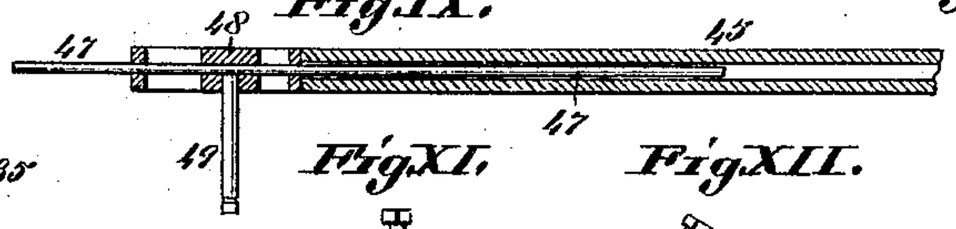


Fig. X.

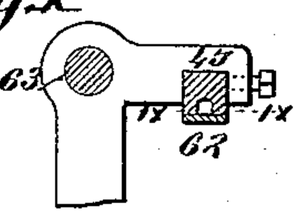


Fig. XI.

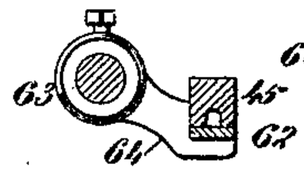


Fig. XII.

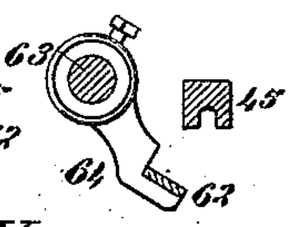


Fig. XIII.

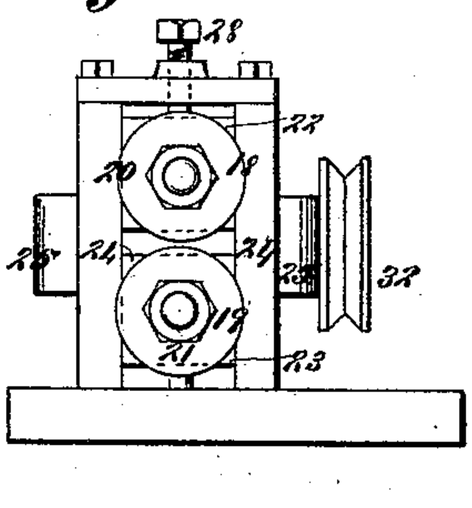


Fig. XIV.

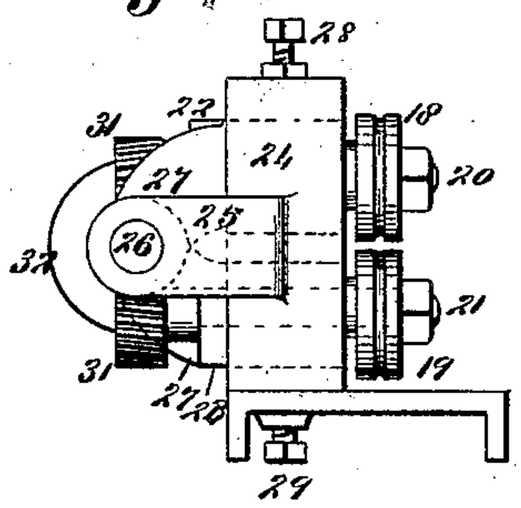


Fig. XV.

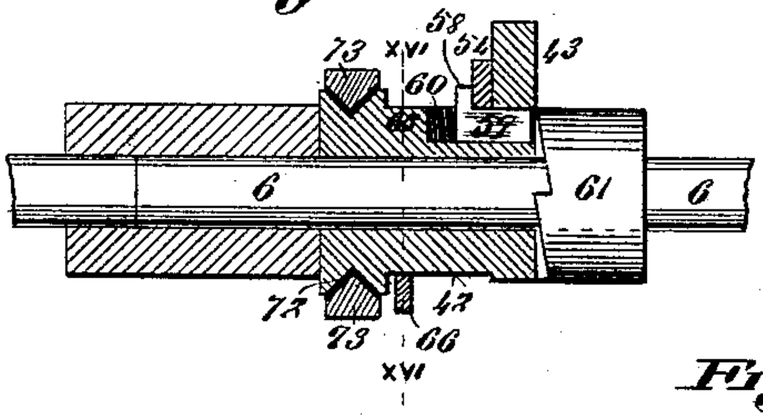


Fig. XVI.

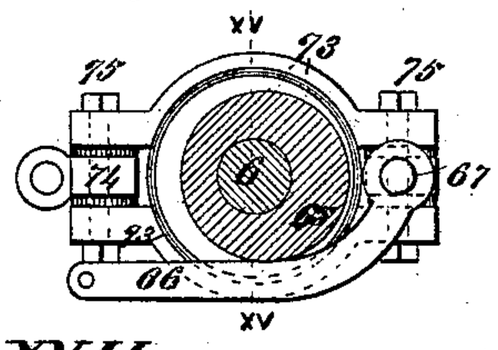
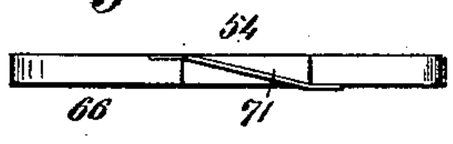


Fig. XVII.



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UNITED STATES PATENT OFFICE.

OLMSTEAD COLLINS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE COLLINS-GOODIN MANUFACTURING COMPANY, OF MISSOURI.

WIRE-STRAIGHTENER.

SPECIFICATION forming part of Letters Patent No. 435,285, dated August 26, 1890.

Application filed December 23, 1889. Serial No. 334,740. (No model.)

To all whom it may concern:

Be it known that I, OLMSTEAD COLLINS, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Wire-Straighteners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an improved device for straightening and cutting wire; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a top view of my improved machine. Fig. II is a side elevation. Fig. III is a vertical transverse section taken on line III III of Fig. II. Fig. IV is an enlarged longitudinal section of the straightening-dies and their holder, taken on line IV IV of Fig. V. Fig. V is a section taken on line V V of Fig. IV. Fig. VI is a section taken on line VI VI of Fig. IV. Fig. VII is a perspective view of one of the straightening-dies. Fig. VIII is an enlarged section showing the cutting-die and its holder, and showing, also, part of the knife and retaining-tube. Fig. IX is a longitudinal section of the receiving-tube, the section being taken on line IX IX of Fig. X. Fig. X is a transverse section taken on line X X of Fig. I. Figs. XI and XII are transverse sections showing the receiving-tube, Fig. XI showing it closed and Fig. XII showing it open. Fig. XIII is an end view of the feed-rollers and their supporting parts. Fig. XIV is an elevation of same. Fig. XV is a section taken on line XV XV of Fig. XVI, and showing the automatic device for operating the knife, &c. Fig. XVI is a section taken on line XVI XVI of Fig. XV. Fig. XVII is an edge view of the lever 66.

Referring to the drawings, 1 represents a suitable bed-plate or base, upon which rest standards 2, 3, 4, and 5.

6 represents an operating-shaft journaled in the standards 2, 3, 4, and 5, and upon which is a driving-pulley carrying a belt 7.

8 represents a flier journaled on the upper ends of the standards 4 5 by means of boxes 9. The wire to be straightened passes through the flier from a guide 10. (See Figs. I and II.) The construction of the flier is represented in Figs. IV, V, and VI. It is provided with end journals 11, (see Fig. IV,) fitting in the boxes 9, and which have perforations 12 and and open center 13, through which the wire passes from the holder 10.

14 represents straightening-dies located in openings or sockets 15, extending transversely through the flier.

16 represents set-screws by which the dies may be individually adjusted in or out. Each die has an inclined bearing-surface 17, (shown plainly in Figs. V, VI, and VII,) and against which the wire bears as it passes through the flier. I have shown four of these dies, and they are so placed that their inclined bearing-surfaces 17 will be presented alternately in opposite directions, as plainly shown in Fig. IV. I am of course aware that adjustable straightening-dies in this class of machines, broadly considered, are not new. My invention, so far as it relates to this part of the machine, consists in providing the dies with the inclined surfaces 17, so that by adjusting the dies their bearing-surfaces for the wire are moved not only inward or outward, but also upward or downward, according to the direction in which the dies are moved—that is to say, by moving the die shown in Fig. V, for instance, inward, its bearing-surface for the wire is moved both inwardly and upwardly, and by shifting the die in the other direction this bearing-surface is moved both outwardly and downwardly, and thus I am enabled, with the use of dies which are all arranged parallel, to get the same result that would be obtained by dies arranged at right angles to each other, resulting materially both in the cheapness and usefulness of the machine. As the wire leaves the flier, it passes between feed-rollers 18 19. (See Figs. XIII and XIV.) These rollers are grooved to receive the wire and are located on shafts 20 and 21. The shafts are journaled in boxes 22 and 23, which are held adjustably in a frame 24. The frame 24 is provided with lugs 25, (see Figs. I and XIV,) extending in a direction away from the feed-rollers 18 and 19. These lugs form the journal-bearing of a shaft 26, and with the shaft 26 form a pivot for the shafts 20 and 21, the boxes 22 and 23 of the shafts having perfo-

rated extensions 27, through which the shaft 26 also passes. The frame 24 is provided with upper set-screws 28 and lower set-screws 29, and it will be observed that by tightening on these screws the feed-rollers 18 19 will be forced toward each other to increase their tension on the wire, and by loosening on the set-screws the friction between the rollers and the wire will be diminished. I am thus with a very simple contrivance enabled to regulate the size of the opening between the feed-rollers at will.

On the shaft 26 is a worm 30, (see Fig. II,) and on the outer ends of the shafts 20 and 21 are wheels 31, which engage the worm 30. The shaft 26 is also provided with a pulley 32, to receive a belt 33, which passes also around a pulley 34 on the shaft 6. It will thus be seen that the feed-rollers 18 19 will be operated from the shaft 6, and that the adjustment of them, as stated, will not interfere with their driving mechanism. From the feed-rollers the wire passes into and through a cutting-die 35, located in the upper end of the standard 3. This die is shown plainly in Fig. VIII. It is held in place by a set-screw 36.

37 (see Figs. III and VIII) represents a knife or cutter formed on the end of a lever 39, which is pivoted at 40 to the standard 3.

41 represents a plate screwed or bolted to the standard 3, and between which and the standard the knife 37 and the upper end of the lever 39 fits. This plate holds the knife firmly against the face of the standard and against the end of the cutting-die 35. The lever 39 extends downwardly to or past a shaft 6. On the shaft 6 is a loose collar 42, carrying a cam 43, which at the proper time bears against the lower end of the lever 39, and by forcing this end of the lever outwardly moves the knife 37 in a downward direction, causing it to traverse the opening of the cutting-die 35 to sever the wire. When the cam leaves the lever, the latter, with the knife, of course, is restored to its normal position by a spring 44. The collar 42 is operated intermittently, as hereinafter explained. Leaving the cutting-die the wire passes into a receiving-tube 45, supported on the upper end of the standard 2 and on the upper end of a standard 46. (See Fig. II.) In this tube is located a rod 47. (See Figs. I and IX.) On this rod, beyond the end of the tube 45, is a collar 48, held adjustably to the rods by means of a set-screw 49. Now it will be seen that when the wire passing through the receiving-tube strikes the inner end of the rod 47, the latter will be forced outwardly, and in doing so carries the collar 48 and set-screw 49 in the direction in which the wire is moving.

The outer end of the set-screw 49 is connected by means of a rod 50 to the upper end of a bell-crank lever 51, (see Fig. II,) which is pivoted at 52 to the standard 2. The lower end or arm of the bell-crank lever 51 is connected by means of a link 53 to a lever 54, (see Fig. III,) the connection being made to the lever 54 at 55. The lever 54 is pivoted at 56 to the standard 3, and it is held in its lower or normal position by means of a spring 57, and when in its lower or normal position fits between the standard 3 and a head 58 of a spring-actuated dog 59. (See Fig. XV.) When the dog is thus held against the action of a spring 60, it is out of engagement with a clutch 61, rigidly secured to the shaft 6, permitting the shaft to turn without moving the collar 42, in a slot or recess of which the dog 59 fits. When the wire being straightened comes against the rod 47, it will be seen that through the described connection the lever 54 will be raised. The dog 59 is then thrust forward by the spring 60 into engagement with the teeth of the clutch 61, which causes the collar 42 to be revolved with the shaft and causes the cam 43 to come against the lever 39, as described, and produces the cutting of the wire. As soon as the wire is cut off, the portion of it within the receiving-tube 45 is discharged by the opening of the tube, which, as shown in Figs. XI and XII, is provided with a removable side 62. This side is capable of being moved from the position shown in Fig. XI to the position shown in Fig. XII, and when it is thus moved the wire drops freely and automatically from the tube. It is thus moved by being supported on a rock-shaft 63, journaled in the upper ends of the standards 2 and 46, and to which the side 62 is connected by arms 64. After the wire is cut off, as stated, the shaft 63 is rocked to open the tube 45 by means of a cam 65 on the collar 42, (see Fig. XVI,) which, before the collar ceases to turn, comes against a lever 66, pivoted at 67, and connected at its free end by means of a rod 68 and crank 69 to the rock-shaft 63. (See Fig. II.) Thus after the wire is cut off the shaft 63 is rocked, and the side 62 of the tube 45 drops down, allowing the wire which has been straightened and severed to fall from the receiving-tube. As soon as the cam 65 leaves the lever 66, the shaft 63 is moved back to its normal position by a spring 70, (see Figs. I and II,) and the portion of the wire which was contained in the tube and which produced the movement of the rod 47 and its accompanying parts having dropped out, it will be seen that under the influence of the spring 57 the lever 54 and the rod 47 will be returned to their normal positions. The collar 42 has not yet made a complete revolution, and before it does the lever 54 is thrust back to its normal position, and the head 58 of the dog 59 comes against an incline 71 on the lever 54, which causes the dog to be forced inward against the pressure of the spring 60 and out of engagement with the clutch 61, and thus the collar 42 is automatically disengaged from the shaft 6, which revolves continuously.

To prevent the collar 42 from being carried around by its momentum after the dog 59 is

disengaged from the collar 61, I form a circumferential groove 72 therein and pack it with a rubber or other suitable ring, upon which bears friction bars or plates 73, (see Figs. XV and XVI,) which are supported by lugs or projections 74 on the standard 2. (See Fig. II.) These bars are connected by bolts 75, (see Fig. XVI,) and it will be seen that by tightening on the nuts of these bolts the bars will be forced toward each other, thus tightening in the groove 72 of the collar 42 and producing the required friction to prevent the collar 42 from turning under the momentum imparted to it by its connection with the shaft 6.

An edge view of the lever 66 is shown in Fig. XVII.

A machine thus constructed is entirely automatic in its operations, is cheap and durable, and is not liable to get out of order.

I claim as my invention—

1. In a wire-straightener, a flier provided with adjustable dies having inclined bearing-surfaces 17, substantially as and for the purpose set forth.

2. In a wire-straightener, a flier having parallel dies provided with inclined surfaces presented in opposite directions, and set-screws for adjusting the dies, substantially as and for the purpose set forth.

3. In a wire-straightener, the combination of straightening-dies, feed-rollers, and a shaft having worm-gear connection with the shafts of the feed-rollers and forming a pivot upon which the feed-rollers may be moved, substantially as and for the purpose set forth.

4. In a wire-straightener, the combination of feed-rollers, shafts upon which the feed-rollers are located, boxes in which said shafts are journaled, an operating-shaft forming the pivot of said boxes and said feed-rollers, a worm on the shaft, wheels on the feed-roller shafts meshing into the worm of the driving-shaft, and means for turning the driving-shaft, substantially as and for the purpose set forth.

5. In a wire-straightener, the combination of a cutting-die, a knife formed on the end of a pivoted lever, a cam for moving the lever, and a plate 41, for holding the knife against the cutting end of the die, substantially as and for the purpose set forth.

6. In a wire-straightener, the combination of a receiving-tube having a movable side, a rock-shaft to which the movable side of the receiving-tube is connected, a crank on the rock-shaft, a lever connected to the crank, and a cam for operating the lever, substantially as and for the purpose set forth.

7. In a wire-straightener, the combination of a receiving-tube, a rod fitting in said tube and provided with a collar and set-screw or their equivalents, a bell-crank lever, a rod connecting the bell-crank lever to said collar, an operating-shaft, a clutch on the operating-shaft, a spring-dog controlled by said lever, and a loose collar carrying said dog, substantially as and for the purpose set forth.

8. In a wire-straightener, the combination of a receiving-tube having a movable side, a rod located in and adjustable in said tube and against which the wire being straightened impinges, and mechanism adapted to be operated by the movement of said rod and which opens the movable side of the receiving-tube automatically, substantially as and for the purpose set forth.

9. In a wire-straightener, the combination of a receiving-tube having a movable side, a rod located in said tube and against which the wire being straightened impinges, a bell-crank lever connected to said rod, a spring-actuated lever 54, connected to said bell-crank lever, an operating-shaft 6, a clutch on said shaft 6, a loose collar on the shaft 6, a spring-actuated dog carried by the loose collar, and a cam or incline 71 on the lever 54, substantially as and for the purpose set forth.

10. In a wire-straightener, the combination of a driving-shaft provided with a clutch, a loose collar on the shaft, carrying operating-cams and provided with a spring-actuated dog adapted to engage with the clutch, mechanism operated by said cams, and a friction device consisting of bars 73, adapted to fit in a groove of the collar, and means for moving the bars, said friction device being adapted to prevent the collar being carried around by its momentum when disengaged from the clutch, substantially as set forth.

OLMSTEAD COLLINS.

In presence of—

E. S. KNIGHT,

A. M. EBERSOLE.