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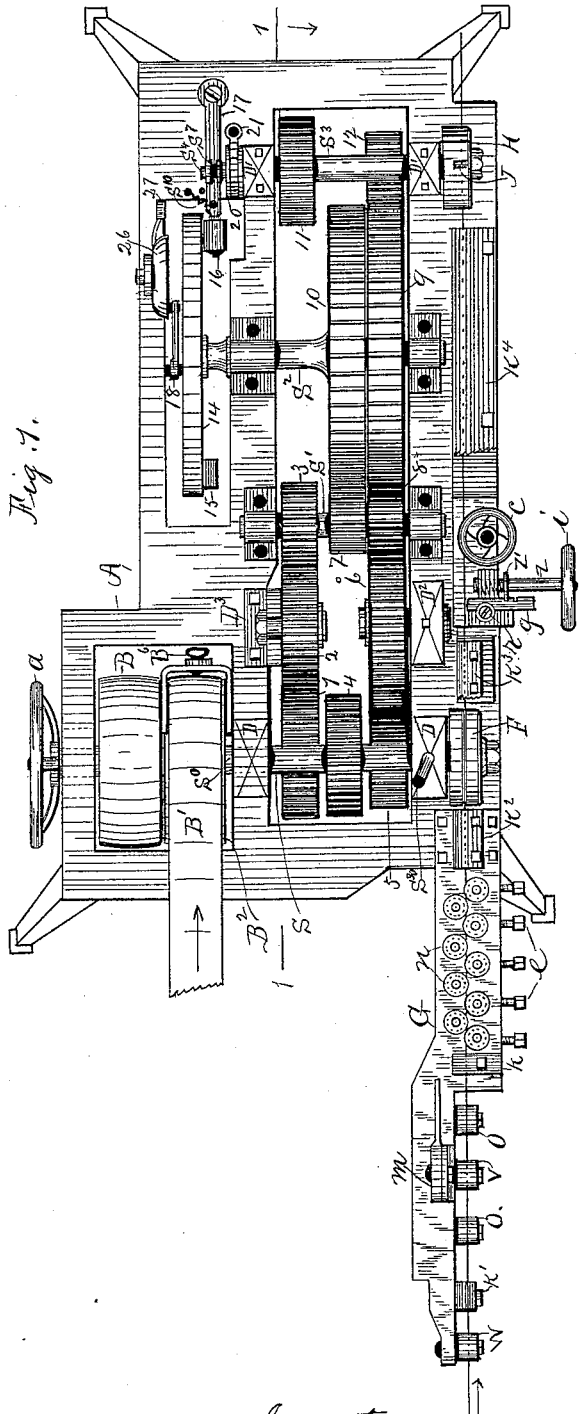
C. B. BRAINARD.

WIRE STRAIGHTENING AND CUTTING MACHINE.

No. 482,000. Patented Sept. 6, 1892.

Fig. 1.



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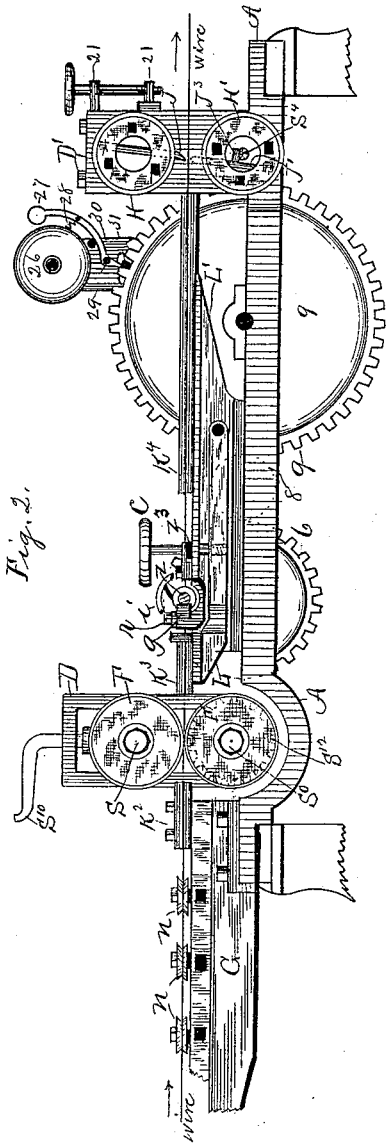

Fig. 2.

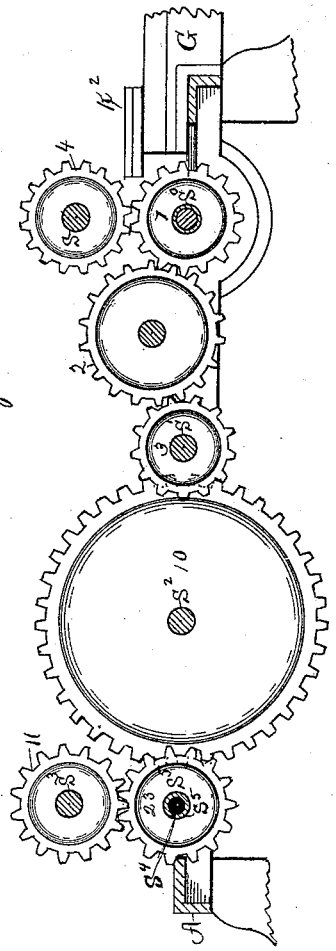

Fig. 3.

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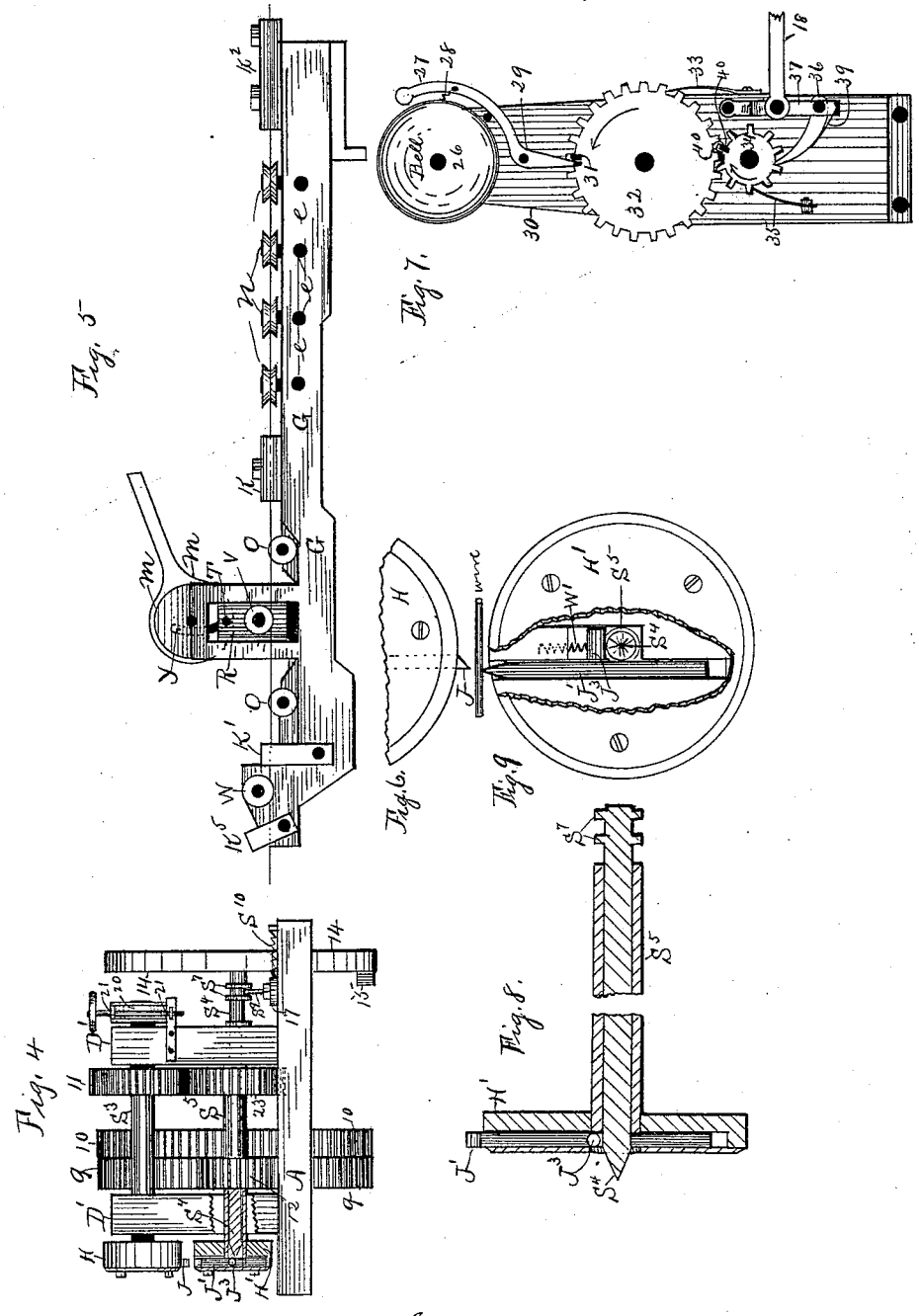

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UNITED STATES PATENT OFFICE.

CURTIS B. BRAINARD, OF JOLIET, ILLINOIS.

WIRE STRAIGHTENING AND CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 482,000, dated September 6, 1892.

Application filed May 23, 1892. Serial No. 433,940. (No model.)

To all whom it may concern:

Be it known that I, CURTIS B. BRAINARD, a citizen of the United States of America, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Machines for Cutting Off Wire and Rods in Lengths, of which the following is a specification, reference being had therein to the accompanying drawings and the letters and figures of reference marked thereon, forming a part of this specification, in which—

Figure 1 is a top plan view. Fig. 2 is a side elevation. Fig. 3 is a vertical longitudinal section taken on line 1 1 of Fig. 1, looking in the direction of the arrow. Fig. 4 is an end elevation. Fig. 5 is a side view of the wire-straightener. Fig. 6 is a section of the disk holding the upper wire-cutter. Fig. 7 is a face view of the tally mechanism. Fig. 8 is a vertical section through the disk holding the lower reciprocating wire-cutter and of its hollow shaft and reciprocating lathe-center shaft for operating the wire-cutter; and Fig. 9 is a face view of the disk holding the lower wire-cutter, having a portion of its face-plate broken away to show the parts within the disk.

This invention relates to certain improvements in machines for cutting wire, rods, &c., in lengths, which improvements are fully set forth and explained in the following specification and claims.

Referring to the drawings, A represents the bed of the machine, designed to be supported on suitable legs.

S^0 is the drive-shaft, properly boxed to the bed and has secured to it the lower feed-roll F′, pinions 5 and 7, drive-pulley B^2, loose pulley B, and hand-wheel *a*.

F is the upper feed-roll, secured on shaft S, arranged in boxes D, and having secured on it at about its center the gear-wheel 4, which meshes with and is driven by a similar gear-wheel on drive-shaft S^0, located immediately below gear-wheel 4, looking at Fig. 1, and shown in broken lines in Fig. 2 as S^{12}.

6, 8, and 9 are a train of idle-gears loose on their shafts for connecting gear 5 on drive-shaft S^0 with gear 12 on shaft S^5 for driving the disk H′, holding the reciprocating wire-cutter J′.

Shaft S^5 has on it the gear-wheel 23, which meshes with gear-wheel 11 on shaft S^3 for driving disk H, which carries the upper wire-cutter J, which is secured in said disk by a face-plate, as shown in Figs. 1, 2, and 4. 14 is a wiper-wheel secured on shaft S^2. Said wiper-wheel is driven by drive-shaft S^0 through the medium of idle-gears 2, pinions 3 and 7 on shaft S′, and gear-wheel 10 on shaft S^2. Said wiper-wheel has secured to its side the cam-wiper 15, which at each revolution of said wheel engages with the friction-roller 16 on the outer end of lever 17 for reciprocating the lathe-center shaft S^4, located in hollow shaft S^5, as shown in Figs. 1, 4, 8, and 9. For connecting said lever with shaft S^4 said shaft is provided on its rear end with two annular flanges S^7 for receiving between them an upwardly-extending pin or lug S^9 on the upper side of lever 17, as shown particularly in Fig. 4. At each reciprocation of shaft S^4 its pointed forward end will move under the projecting side lug or pin J^3 on reciprocating wire-cutter J′ in disk H′ and move said cutter out, so that it will register with cutter J, secured in disk H, and cut off wire that may be between them. When shaft S^4 recedes, which is caused by coil-spring S^{10}, it permits cutter J′ to return, caused by a coil-spring W′, seated in a recess and pressing on the upper side of said pin or lug J^3, as shown more particularly in Fig. 9, so that the disks H and H′ may have or make several revolutions while wire is passing between them before their cutters will be caused to register and cut off the wire, as their cutters will not operate to cut off the wire until the wiper-wheel 14 engages lever 17 and reciprocates shaft S^4 forward to the position shown in Fig. 8, so that a length of wire is cut off at each revolution of said wiper-wheel, and the length of the wire cut off depends upon the speed of said wiper-wheel, which is regulated by substituting for gear 3 either a larger or smaller gear, which can be done by removing it from shaft S′ and placing another thereon. Looking at Fig. 3, it will be seen that the idle-gear 2, with which gear 3 meshes, is located on a higher plane than gear 3, and its journal can be adjusted vertically within certain limits, so that it may mesh with any substituted gear, so that the wiper-wheel 14 may be driven at different speeds by such substituted gears

and cause the wire to be cut off any desired length.

The shaft S^3 is provided on its rear end with a brake-wheel 20, having a brake-band 21 passing around it, as shown in Fig. 1, to take up the lost motion of said shaft, so as to cause the wire-cutters J and J′ to always register accurately with each other.

A register or tally is attached to the machine to register the number of wires cut off. This register is shown in Fig. 7, and is shown attached to the machine in Figs. 1 and 2. This register consists of a standard 30, secured at its lower end to the machine-bed adjacent to wiper-wheel 14 and having pivoted to it the notched wheels 32 and 34, wheel 32 having twenty-five notches and wheel 34 having ten notches. The notches or teeth of wheel 32 overlap those of wheel 34, so that their teeth do not mesh. Wheel 34 is provided on its outer side near its periphery with a projecting stud or pin 40, which at each revolution of said wheel engages a tooth of wheel 32 and rotates it the distance of the width of one tooth.

Wheel 32 is provided with a similar projecting stud or pin 31, which at each revolution of the wheel engages a bell-knocker 27, pivoted at 29 to standard 30, and causes it to strike a bell 26. A coil-spring 28, attached to said knocker, causes it to be retained in its proper place.

Wheel 34 is driven intermittently by means of the pawl 39 and lever 37, the said lever being connected to a crank-pin on said wiper-wheel by means of a pitman 18. The flat springs 33 and 35 prevent backward rotation of said wheels 32 and 34. It will be seen that each time a length of wire is cut off wheel 34 is rotated one notch, that at each revolution of said wheel ten wires have been cut off and wheel 32 rotated one notch, so that each notch move of wheel 32 represents ten wires cut off, and each revolution of said wheel 32 indicates that two hundred and fifty wires have been cut off, which fact will be announced by the bell-stroke, so that an exact account or tally may be kept of the number of wires cut off.

A wire-straightener is attached to the machine, through which the wire must be passed to straighten it before being cut in lengths. This wire-straightener is shown in Figs. 1, 2, and 5, and consists of the bed-piece G, secured at its forward end to the machine-bed in line with the feed-rolls F and F′ and cutter-disks H H′, and is provided on its upper side with the train of grooved wheels *n* and set-screws *e* for adjusting them in the ordinary manner. It also has the wheels O O V W, whose axles are at right angles with those of wheels *n*, and the wheel V is journaled on a spindle attached to a sliding head R in frame T, to which frame is pivoted the hand-lever *m*, provided with a slot *y*, in which traverses a pin secured to said sliding head, by means of which lever and sliding head said wheel V may be vertically adjusted to bear more or less on the wire, as may be found necessary to take bends out of the wire. Said bed G is also provided with the wire-guides K K′ K^2 K^5, formed of grooved plates, for passing the wire between them. A wire-guide is also placed between the feed-rolls and cutter-disks, as shown in Figs. 1 and 2, and consists of a bed L′, secured to the bed of the machine and bearing on its top the long guide-plates K^4. Said bed L′ has pivotally connected to it at its outer side the bed L, having on its outer end, adjacent to the feed-rolls, the guide-plates K^3, which may have vertical adjustment by means of a screw and hand-wheel C. The shaft of said hand-wheel has a collar z^3 connecting it with bed L′, and its screw-threaded lower end screws into bed L for the purpose of adjusting it, as stated, when said hand-wheel is turned.

g is a sliding die held in a cross-channel on the upper side of bed L′ by means of a set-screw and washer *r* and is adapted to be reciprocated by means of the band-wheel *i* and its screw-shaft *z* and flange *z′* on said shaft entering a notch in the side of said die. By turning said hand-wheel and screw-shaft said die may be adjusted horizontally to bear more or less against the wire, as may be necessary to straighten it or hold it in proper position as it passes through the machine.

A cap-screw S^{30} is used in box D to regulate the grip of the feed-rolls on the wire.

In operation the wire passes in through the wire-straightener and feed-rolls through the guides to and between the disks holding the wire-cutters in the direction shown by the arrow and is cut off in lengths as it passes through the machine, as stated. A belt-shifter B^6 serves to stop the machine, and a hand-wheel *a* serves to start the machine or turn it a little either forward or backward, as may be required in operating the machine.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows, to wit:

1. In a machine for cutting off wire in lengths, the combination of drive-shaft S^0, having gear-wheels 1, 5, and S^{12}, fast pulley B^2, loose pulley B, and feed-roll F′ mounted thereon, shaft S, having gear-wheel 4 and feed-roll F mounted thereon, straightening-rolls *n* O V W, guide-box K^2 for guiding the wire to the feed-rolls, an adjustable guide K^3 at the opposite side of said rolls, guide-box K^4 for conducting the wire to the wire-cutters, shaft S′, having gear-wheels 3 7 8 mounted thereon, shaft S^2, having gear-wheel 10, wiper-wheel 14, and idle-gear 9 mounted thereon, shaft S^3, having gear-wheel 11 and disk H mounted thereon, hollow shaft S^5, having gear-wheels 12 and 23 and disk H′ mounted thereon, lathe-point shaft S^4, arranged in said hollow shaft and having the flanges S^7, lever 17, having pin S^9 for engaging said flanges, wire-cutter J, fixed in disk H, and reciprocating wire-cutter J′, having the pin J^3 and

spring W′ arranged in disk H′, all arranged to operate substantially as and for the purpose set forth.

2. In a machine for cutting off wire in lengths, the combination, with the drive-shaft S^0, bearing gear-wheel 1, idle-gear 2, shaft S′, bearing gears 3 and 7, shaft S^2, bearing gear 10, and wiper-wheel 14, having cam 15, lever 17, having pin S^9, spring S^{10}, lathe-center shaft S^4, having flanges S^7, hollow shaft S^5, having gears 12 and 23 mounted thereon, and disk H′, reciprocating wire-cutter J′, having the pin J^3 and spring W′, shaft S^3, having gear 11 and disk H mounted thereon, wire-cutter J, fixed in said disk and arranged to register with cutter J′, the means for driving shafts S^3 S^5 and said disks and cutters, and the means for feeding the wire into the machine, substantially as and for the purpose set forth.

3. In a machine for cutting off wire in lengths, the combination of the feed-rolls and means for straightening and conducting the wire into and through the machine and a pair of wire-cutters arranged in revolving disk holders in such manner that their cutting-edges may register as they revolve in the direction the wire travels between them, one of said cutters being fixed in its holder and the other adapted to be advanced or reciprocated forward to register with the fixed cutter and cut off the wire between them and then recede to be out of the way of the next feed of wire forward, substantially as and for the purpose set forth.

4. In a machine for cutting off wire in lengths, the combination, with wiper-wheel 14 and the means for driving the same, of the tally or registering mechanism comprising the standard 30, the notched wheels 32 and 34, having, respectively, the pins 31 and 40, the bell 26 and its knocker 27, adapted to be engaged by pin 31, lever 37, pawl 39, springs 33 and 35, and pitman 18, all arranged to operate substantially as and for the purpose set forth.

5. In a machine for cutting off wire in lengths, the combination of bed L′, arm L, pivoted thereto and having the guide-box K^3 on its outer end at the rear of the feed-rolls, hand-wheel C, and its screw-shaft having the collar z^3 for vertically adjusting the said guide-box, substantially as and for the purpose set forth.

6. In a machine for cutting off wire in lengths, the combination of bed L′, guide-box K^4, screw-shaft z, having hand-wheel i and flange z', and die g, having a notch for receiving said flange and for reciprocating said die, substantially as and for the purpose set forth.

7. In a machine for cutting off wire in lengths, the combination of bed L′, screw-shaft z, having hand-wheel i and flange z', and die g, having a notch for receiving said flange and for reciprocating said die, substantially as and for the purpose set forth.

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