(No Model.) 3 Sheets—Sheet 1.

C. VAN DERZEE.

MACHINE FOR STRAIGHTENING, MEASURING, CUTTING, AND COUNTING WIRE.

No. 311,213. Patented Jan. 27, 1885.

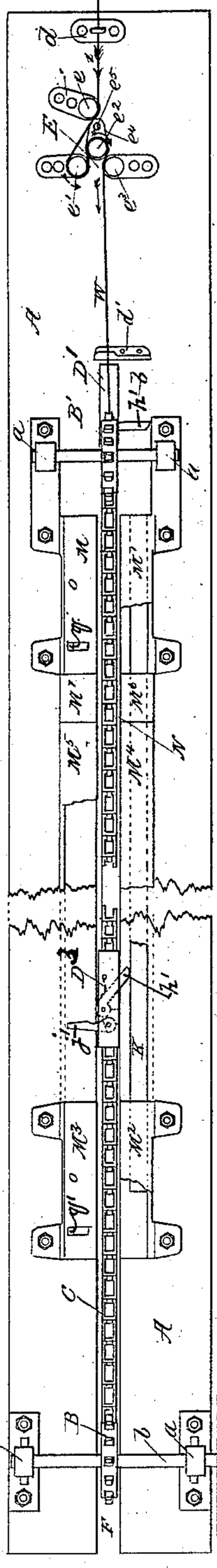

Fig. 1.

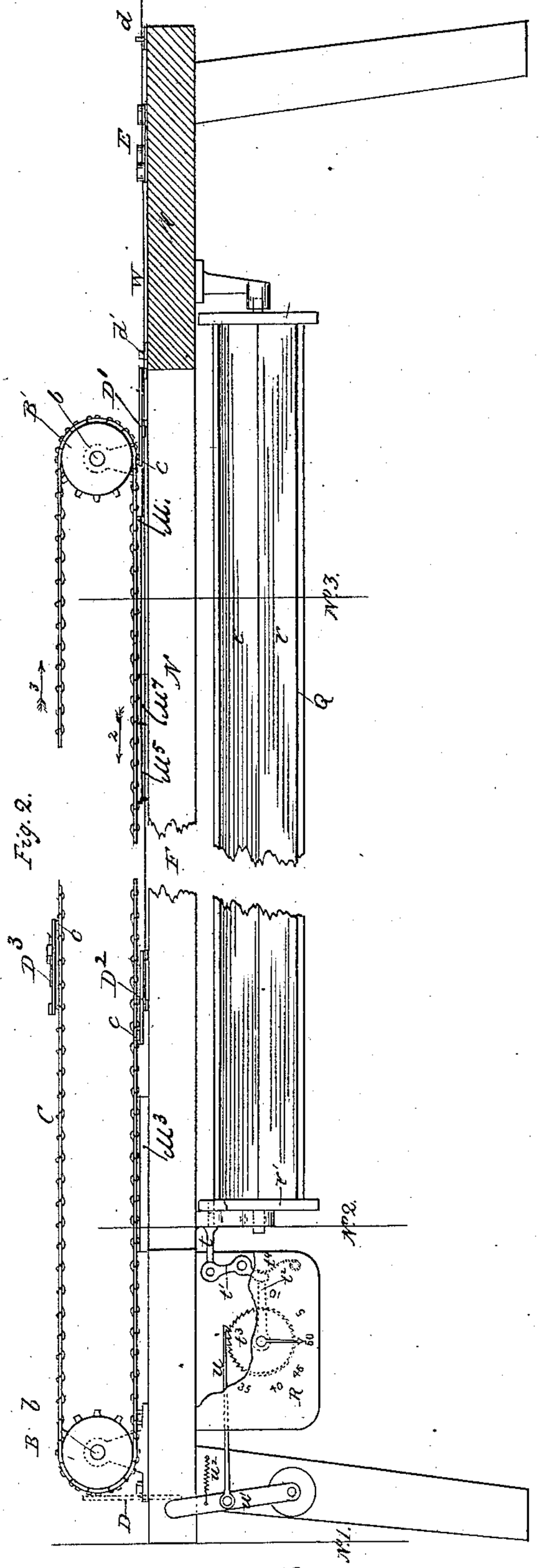

Fig. 2.

Witnesses:
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Cornelius Van Derzee
Inventor
per his attorney
Alex. Selkirk

(No Model.) 3 Sheets—Sheet 2.

C. VAN DERZEE.

MACHINE FOR STRAIGHTENING, MEASURING, CUTTING, AND COUNTING WIRE.

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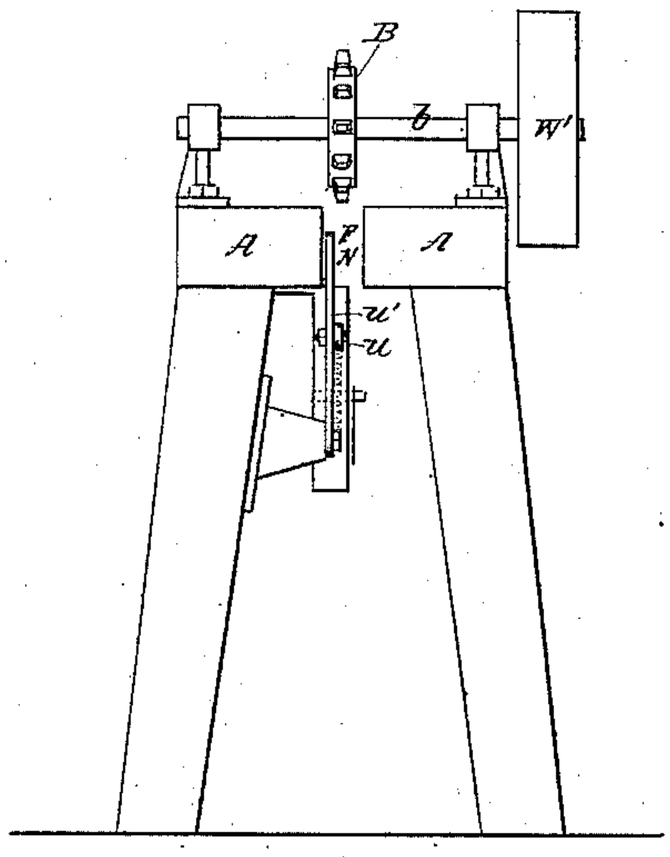


Fig. 3.

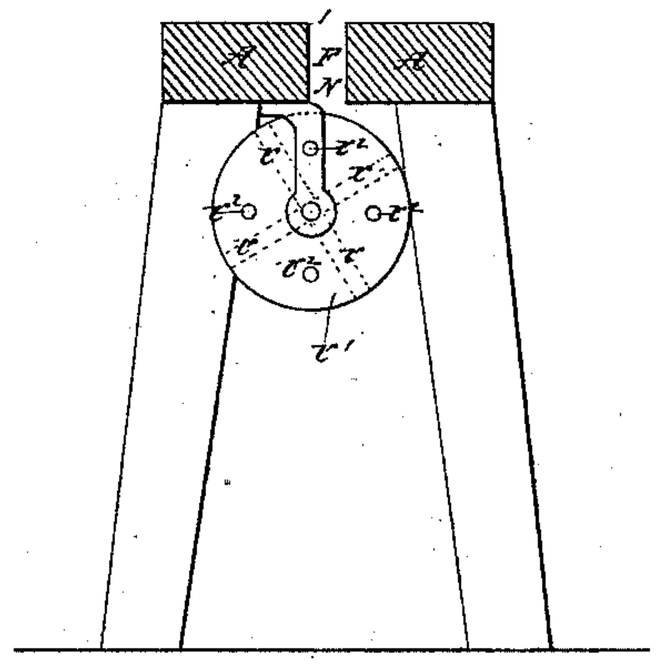


Fig. 4.

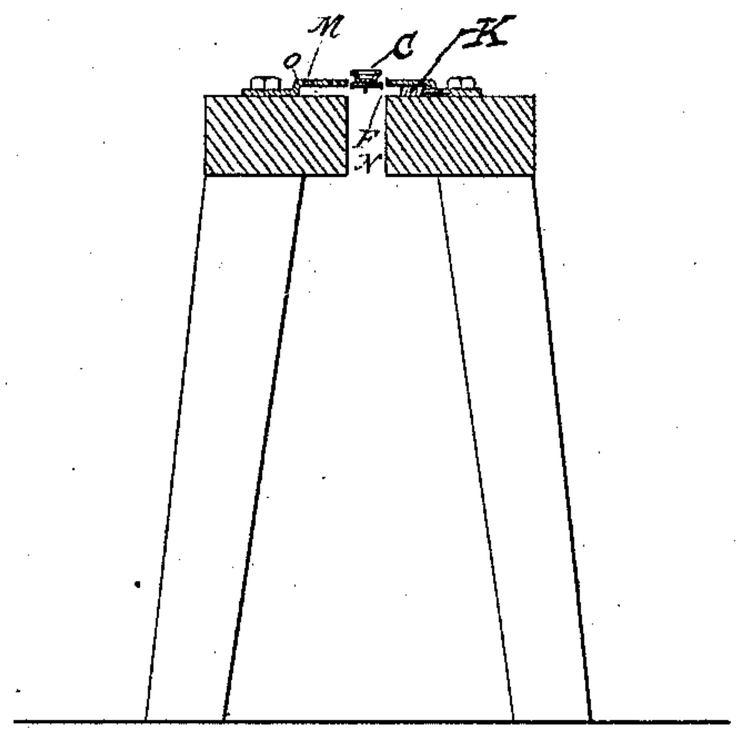
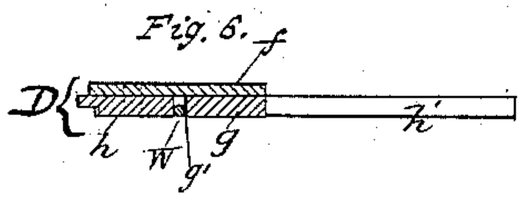
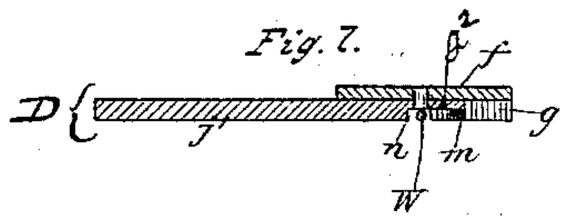


Fig. 5.





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by his Attorney
Alex. Selkirk

(No Model.) 3 Sheets—Sheet 3.

C. VAN DERZEE.

MACHINE FOR STRAIGHTENING, MEASURING, CUTTING, AND COUNTING WIRE.

No. 311,213. Patented Jan. 27, 1885.

Fig. 8.
view of under side of runner D.
Nos 5 No 11.

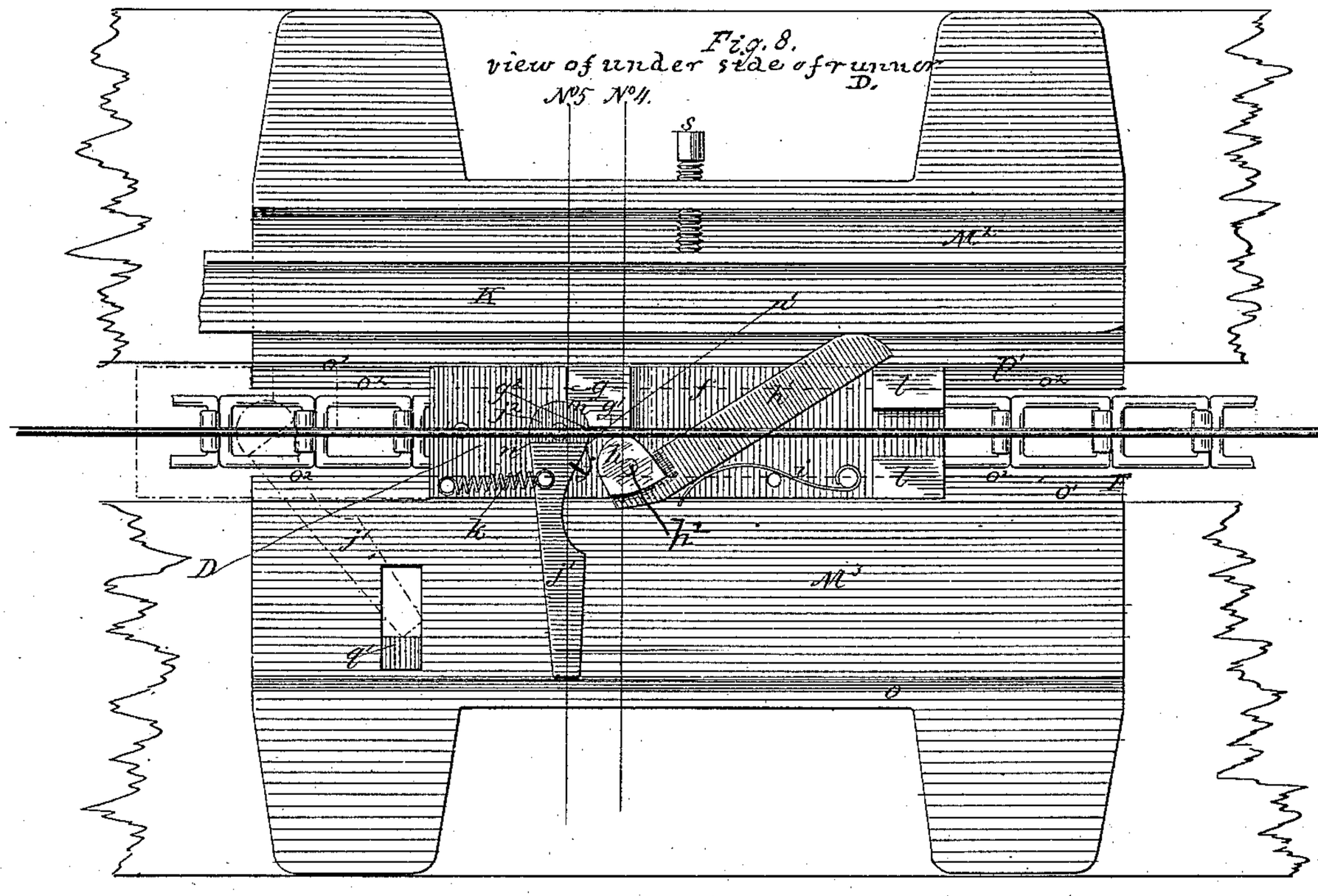

Fig. 9.

Witnesses:
Chas. Seekamp
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Cornelius Van Derzee
Inventor.
Geo. Selkirk
His Attorney

UNITED STATES PATENT OFFICE.

CORNELIUS VAN DERZEE, OF ALBANY, NEW YORK, ASSIGNOR TO DAVID H. MATHIAS, OF SAME PLACE.

MACHINE FOR STRAIGHTENING, MEASURING, CUTTING, AND COUNTING WIRE.

SPECIFICATION forming part of Letters Patent No. 311,213, dated January 27, 1885.

Application filed November 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS VAN DERZEE, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented a new and Improved Machine for Straightening and Cutting Wire to Definite Lengths, of which the following is a specification.

My invention relates to a machine which is provided with mechanism for straightening the wire as it is drawn from the coil, and mechanism for drawing the straightened strand out to definite equal lengths successively; mechanism for cutting the wire at points forward of the points where the wire is held; mechanism for releasing the cut wire; mechanism for counting the wires as they are cut and delivered from the machine, and mechanism for delivering a given number of wire strands simultaneously, and in a lot, from the machine without necessitating a stoppage of the same.

My invention consists of the several devices and combinations of devices hereinafter described and set forth; and the objects of my invention are to provide mechanism for operating progressively and successively on the wire (from a coil) to straighten the same, and run out and cut off strands of equal length, and count the same and deliver the strands in lots of a definite number from the machine, and thereby obviate the necessity of employing several machines or instruments and counting the wires, as heretofore required in producing wire strands of uniform length. I accomplish these objects by means of the mechanism illustrated in the several views in the accompanying three sheets of drawings, containing nine figures, and forming a part of this specification, in which—

Figure 1 represents a horizontal view of the machine from above. Fig. 2 is a sectional elevation of the same. Fig. 3 is an end view taken at line No. 1 in Fig. 2. Fig. 4 is a cross-sectional view taken at line No. 2 in Fig. 2. Fig. 5 is a cross-sectional view taken at line No. 3 in Fig. 2. Fig. 6 is a cross-sectional view (on an enlarged scale) of runner D, with parts in a normal position, taken at line No. 4 in Fig. 8. Fig. 7 is a cross-sectional view, on the same scale, of the runner, taken at line No. 5 in Fig. 8. Fig. 8 is a view of runner D when moving in its way and viewed from below. Fig. 9 is a view of the same from above.

The same letters of reference refer to similar parts throughout the several views.

In the drawings, A represents the frame of the machine. B B′ are sprocket-wheels, which are mounted on shafts *b b*, supported in proper bearings, *a a*, made with upright brackets secured to the frame.

Carried by sprocket-wheels B B′ is endless link-belt C, which is actuated through sprocket-wheel B by band-wheel W′, driven by any preferred power; or a crank may be employed if manual power is used.

Secured to link-belt C are two or more devices, D, which I denominate the "runners." These runners are each pivoted at its forward end to the chain belt, as at *c*, and are each provided with a gripping device for engaging with the wire to be drawn out, and with a nipper, by which the wire is cut.

I will hereinafter particularly describe runners D in all their parts, and also in connection with other devices, which are provided to operate with the same.

At the rear end of frame A is arranged a wire-straightener, E, which is composed of four rollers, *e*, *e′*, e^2, and e^3. These rollers are so arranged in relation to each other that the wire W worked by them will be continuously turned back on itself at least twice before it is finally run forward. In this arrangement the final roller e^3 is set with its wire-bearing side on a line coincident with the line of the center of the machine, and with the line of the straightened wire being drawn into the machine.

Set opposite to the wire-bearing side of final roller e^3, and to a distance from the same about equal to two of its diameters from centers, is the first turning-roller, *e′*, and a little back from a line drawn through the centers of both said rollers is the second turning-roller, e^2, of the same diameter.

Set at a point back from roller e^2 and off from a line drawn through the center of the same and parallel with the line of the straightened wire strand W, is starting-roller *e*. I pre-

fer to make each of these rollers with a diameter about one and three-quarters inch, and with a wire-receiving groove of about one-eighth of an inch in depth in the periphery, and all on the same horizontal plane. In the arrangement of the group of rollers e', e^2, and e^3, those rollers are set with their centers at points relatively triangular, with centers of rollers e' and e^3 on a line corresponding with the base of a triangle, and with center of roller e^2 at a point corresponding with the apex of the same.

In the arrangement of the group of rollers e, e', and e^2, their centers are set relatively triangular with center of roller e^2 at apex and centers of rollers e and e' at the base of the triangle, so that in reference to the triangular arrangement of the rollers in both groups the roller e^2 will be relatively at the apex in both cases, and the wire, when drawn forward, will be run in direction of arrows 1 in Fig. 1, and be delivered from roller e^3 straightened. Rollers e, e', e^3 are mounted on vertical spindles, which are stationary, while roller e^2 is mounted on a vertical spindle, which is attached to vibrating bracket e^4, adapted to oscillate from pivot e^5.

Secured to the bed of the machine at a point relatively rearward of roller e is guiding-piece d; and secured also to the bed forward of roller e^2 is the wire-guiding piece d', the eye of which is in a line drawn from the wire-bearing side of roller e^3 central through the machine in its longitudinal direction.

As above stated, two or more runners D are employed with endless link-belt C. I prefer to use three of said runners, though a larger number may be employed when the length of the endless band will be increased proportionately. These runners are made each to be a duplicate of the other or others employed, therefore a description of one will suffice for the others. Runner D is composed of horizontal plate f, fixed block g, provided with pinching-face g' and cutting-edge g^2, pinching-cam h, provided with lever h', spring i, operating with lever of cam h, pivoted cutter J, provided with lever J' and spring K, operating with the lever of the cutter. Shoes l l, secured to the rear end of plate f, are also provided for supporting the device in a horizontal position.

All the above-mentioned parts of this runner are shown in Fig. 8 (view of the runner from its lower side) to be arranged as follows: Block g is situated between pinching-cam h and cutter j, and has its pinching-surface g' a short distance from the face of the cam, which is pivoted at a point on plate f, as at h^2, and on the side portion of the same opposite from block g, and when lever h' is moved from position shown by full lines to that shown by dotted lines in Fig. 9, the wire will be nipped between block g and cam h. Block g has made in its inner and off corner a recession, made on the curve of a true circle, as shown at m, and the line of edge g^2, at the intersection of the nipping-surface g' and curved line m, is the cutting-edge on said block. The cutter j is pivoted about at the middle of the width of plate f, with its head j^2 made with a curvature corresponding with the curvature of recession m in block g. This head j^2 has its half portion toward block g sunken at n in relation to the lower side of the other half portion of the cutter-head, as shown in Fig. 7, and the line of edge produced at the intersection of line of surface n with the curved line n' of surface of the projected half portion of the cutter-head, as at j, is made the cutting-edge, which will coact with the line of edge g^2, made with block g to cut the wire when lever j is moved from position shown by full lines in Fig. 9 to that of dotted lines in the same figure. Spring i operates to throw cam h to its normal position, as shown by full lines in Fig. 8, and spring k operates to throw cutter j to its normal position, as shown by full lines in the same figure. This runner is pivoted to a link, L, of the endless belt C, (shown in Figs. 2 and 9,) and is carried by said belt in direction of arrow 2 when operating with the wire, and is returned idle by being moved in direction of arrow 3 in Fig. 2. These runners are moved by belt C through way F, made in the top surface of frame A. This way has on one side the longitudinal flange o, made on plate M and setting off from the side of plate f to a distance sufficient to permit lever j' to move freely within said way. From the upper edge line of flange o', plate M is extended inwardly in a horizontal manner, and has flange-shoulder o', which bears against the edge of plate f, and also a horizontally-projecting lip, o^2, which bears on the upper side of the side margin of said plate, as shown in Fig. 8. On the opposite side of the runner is the bar K, set off from plate f of the runner to a distance sufficient to have a firm bearing against the end of lever h' of the pinching-cam h, when it is in the act of pinching with block g the wire, as shown by full lines in Fig. 8. This bar is movable and may be set nearer to or farther from the edge of plate f of the runner by set-screws s, or inclined wedges or cams, as may be preferred, and it is covered over by plate M^2, through the outer side edge of which set-screw s works. The inner edge of plate M has flange-shoulder o' bearing against the edge of plate f, and horizontally-projecting lip o^2, bearing on the side margin of said plate, as shown in Fig. 8.

Fixed in the side of way F, in which lever h' of the cutter moves, is the inwardly-projecting tripping-piece q, against which lever j' strikes at the moment the cutter is to be operated to cut the wire, as illustrated by dotted lines in Fig. 8. Two plates, M^2 M^3, made similar to plates M M', (with the exception which will be hereinafter described,) are fixed to frame A over way F, and plates M^4 and M^5 are arranged intermediate between plates M M', and M^2 and M^3, and over way F. The flanges

o o' and lips o^2 are continued in the intermediate plate, M^4, and the movable bar K is continued beneath plates M^2 and M^4, for having bearing against the end of lever *h'* of the pinching-cam *h*, to hold it in action with the wire being held. This movable bar K terminates beneath plate M^2 at a distance of about four inches (more or less) from the forward end of said plate, as shown by full lines in Fig. 9, so as to leave chamber-room O, that when the runner has been carried forward sufficiently to bring the end of pinching-cam lever *h'* to the end of bar K, the said lever will be free to be moved to an open position, as shown by dotted lines in Fig. 9.

Fixed in way F, at plate M^2, and at a point a little forward of the end termination of bar K, is the projecting tripping-piece *q'*, which sets relatively nearer toward runner D than tripping-piece *q*. This second tripping-piece, *q'*, is placed at such a point as will cause it to operate with the lever of the cutter at the instant the lever of the pincher reaches the end of bar K, and this tripping-piece projects inward to a distance sufficient to force lever *j* against lever *h'*, so as to throw the latter forward toward its normal position, as indicated in dotted lines in Fig. 9.

Made central in the width of the bed of the machine is the longitudinal vertical slot N, through which the wires, when cut and released by the runners, will fall, and arranged beneath the bed and below slot N is a revolving rack, Q, provided with shelves *r* for holding the cut wires. Secured to one end of the revolving rack is plate *r'*, provided with as many perforations, r^2, as there are shelves, in which perforations detent *t* works. This detent is preferably operated by lever *t'*, actuated by projection t^2, secured to ratchet-wheel t^3 and spring t^4. Ratchet-wheel t^3 is provided, preferably, with fifty teeth, and is operated by pawl *u*, pivoted to lever *u'*, supported by spring u^2, and this lever is operated by runners D striking against its upper end. A dial numbered to fifty and a pointer carried by the ratchet-wheel form register R. It should be understood that the link-belt should be of a length sufficient to receive the number of two, three, or four runners D at equal intervals apart with each interval of length of distance equal to the length of the wire to be cut, and that the length of this belt is to be adjusted accordingly as the length of the wires are to be cut longer or shorter by the addition or removal of links from the belt at places between runners D, and accordingly as this belt is lengthened or shortened sprocket-wheel B and plates M M' are to be shifted in a corresponding direction. When the belt is lengthened, annex-plates M^6 M^7, corresponding in form of parts to plates M^4 M^5, are fixed to the bed to fill out the intervals between the latter plates and plates M M', and when the belt is shortened these annex-plates are to be removed.

The manner in which the several parts of my improved machine operate is as follows: The end of the wire W is run from a coil mounted on a spool (not shown) and passed through guiding-piece *d* to the straightening-rollers E, when the wire is brought first against roller *e* and thence passed around roller *e'*, and thence back around the rear side of vibrating roller e^2, and thence forward to the inner side of final roller e^3, as indicated by arrows in Fig. 1. The wire is then carried forward and passed through guiding-piece *d'* and thence to one of the runners D', where it is secured by the pincher of one of said runners. Sprocket-wheel B is then revolved, so as to carry the endless belt C in direction of arrow No. 2 in Fig. 2, when runners D', D^2, and D^3, in Fig. 2, will be carried with it. When runner D' is drawn into way F, the lever *h'* of pinching-cam *h* will be moved by bar K toward plate *f* of the runner and force cam *h* against a side of the wire lying against the pinching side surface of block *g*, and the wire will be thereby firmly held. As the runner D' is drawn through way F the lever *j'* of the cutter *j* will move freely therein until said lever strikes tripping-piece *q*, when the cutter will operate with the wire to sever the same just forward of the point where the pincher operates with the wire to hold the same. The forward movement of runner D' being continued, the lever of pincher *h* will have bearing against the face-surface of bar K until it reaches the forward termination of the same, and at the same time the lever *j'* of cutter *j* will be brought in contact with tripping-piece *q'* and forced from position, as shown by full lines in Fig. 8, to that shown by full lines in Fig. 9, when said lever will be thrown with considerable force against lever *h'* of the pincher, and throw the latter forward from position in full lines to that of dotted lines in Fig. 9, when the lever of the pincher will be thrown out to its normal position in the chamber-room O, to move therein unobstructed, and the pincher be thrown out of pinching contact with the wire, and the wire will drop down through slot N on one of the shelves of the revolving rack Q beneath. Just before runner D' is made to drop the first cut strand of wire, runner D^3 will be carried down to the bed of the machine at the rear of sprocket-wheel B', and will so drop on said bed as to receive the wire between pincher *h* and block *g* as before, and when the runner is drawn forward, bar K will operate the same as before to force the lever of pincher *h* inward, when the same operations of parts will be had as with the first runner. The operations being continued, each runner will be carried down to the wire, and will grasp the same, and at a proper time cut and release the length of the wire thus drawn out and cut. As each runner is being carried upward in front of sprocket-wheel B, as shown by dotted lines in Fig. 2, the rear end of plate *f* of the runner will strike against lever *u'* and force it

to a short distance back, and thereby operate to move ratchet-wheel t^3 one notch through pawl u, when spring u^2 will carry lever u' and pawl u back. When ratchet-wheel t^3 has been moved fifty notches by as many movements of the pawl by the action of the runners against lever u', the projection t^2, secured to the ratchet-wheel, will press on lever t', and thereby draw detent t from perforation r^2 in plate r', attached to the end of the revolving rack, when the weight of fifty wires on the shelf will force the rack to revolve to a distance sufficient to dump the lot of wires therefrom, when the spring t^4 throws detent into engagement with another perforation, r^2, in plate r'. The pointer on the ratchet-wheel will be carried one point at each movement of said wheel, and count the wires as they are cut. I prefer to use link-belts, though endless bands or cable may be employed to carry the runners.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for straightening and cutting wire, the runner D, constructed and arranged to be moved in a way, and provided with mechanism for pinching and holding a strand of wire, and mechanism for cutting the wire at a point forward of the point where the wire is held by the pinching mechanism, the said pinching mechanism being constructed and arranged to be operated as described, for the purposes set forth.

2. In a runner, D, of a wire-straightening machine, the combination, with plate f, of block g, pinching-cam provided with a lever, cutter provided with a lever, and a spring operating with each said lever, all substantially as and for the purpose set forth.

3. In combination with the moving runner D, above described, the horizontal flange-shoulder o', operating with one edge of the runner, and horizontal bar K, operating with the lever of the pincher of said runner, substantially as and for the purpose set forth.

4. The combination, with the moving runner D, above described, of flange-shoulders o' and p', and the tripping-piece q, adapted to operate with the lever of the cutter of the runner, substantially as and for the purpose set forth.

5. The combination, with the moving runner D, above described, of a way provided with flange-shoulders o' and p, bar K, and tripping-piece q, for operations with the respective parts of said runner, substantially as and for the purpose set forth.

6. The combination, with the moving runner D, above described, of a way provided with flange-shoulders o' and p, tripping-piece q', and chamber-room O at the forward end termination of bar K, substantially as and for the purpose set forth.

7. The combination, with the runner D, above described, and way F, provided with flange-shoulders o' and p, of the movable bar K, and mechanism for moving said bar nearer to said runner or permit it to be moved from the same, substantially as and for the purpose set forth.

8. In a machine for straightening and cutting wire, the combination, with frame A, provided with way F, having horizontal flange-shoulders and the bar above described, with chamber-room O, at the rear end of said bar, and tripping-pieces $q\,q'$ and slot N, made in said way of the endless belt, carried by sprocket-wheels and provided with two or more runners, D, as above described, and mechanism for operating the same, all substantially as and for the purpose set forth.

9. The combination, with frame A and moving runner D, of a register, R, and mechanism for operating said register by the action of the runner, substantially as and for the purpose set forth.

10. The combination, with the wire straightening and cutting machine above described, of the revolving rack Q. and mechanism for alternately holding and loosing said rack accordingly as the runners of said machine are brought in action with said mechanism for operations, substantially as set forth.

11. The combination, with frame A and group E of wire-straightening rollers arranged and combined as above described, of an endless belt provided with two or more runners provided with mechanism, substantially as above described, and moving in way F, provided with mechanism for operating with the parts of said runners, as set forth.

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Witnesses:
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