4 Sheets—Sheet 1.

H. W. PUTNAM.

FENCE-WIRE BARBING-MACHINE.

No. 187,776. Patented Feb. 27, 1877.

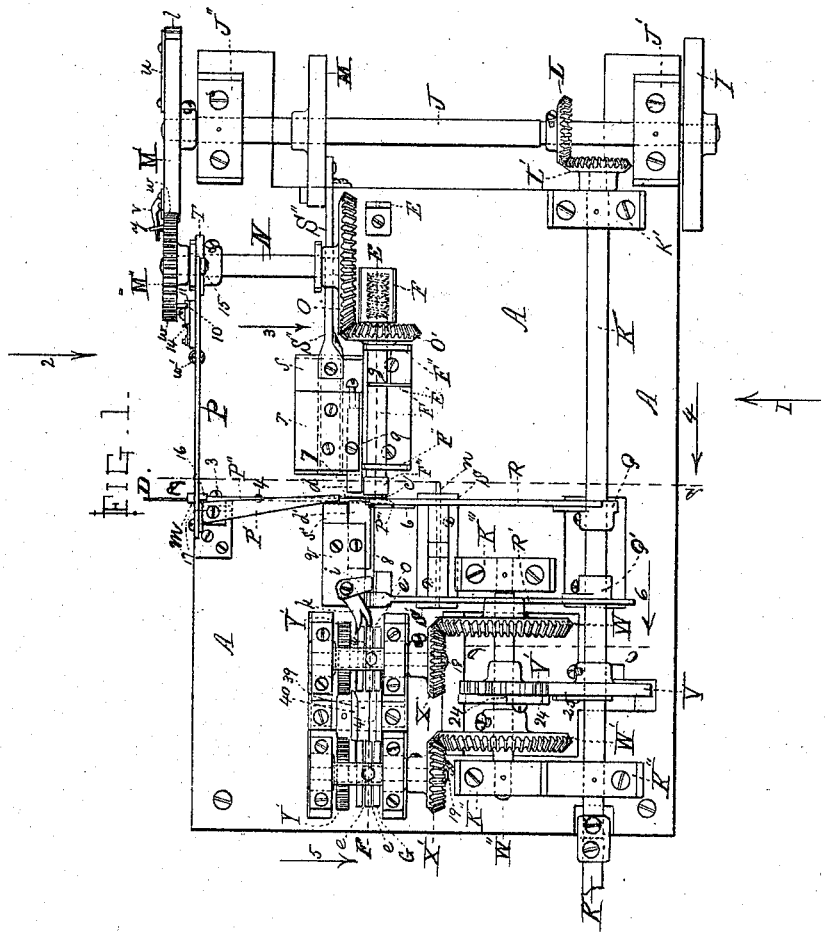

FIG. 1.

WITNESSES;

Wm. H. Blair

Thos. G. Dodge

INVENTOR;

Henry W. Putnam

4 Sheets—Sheet 2.

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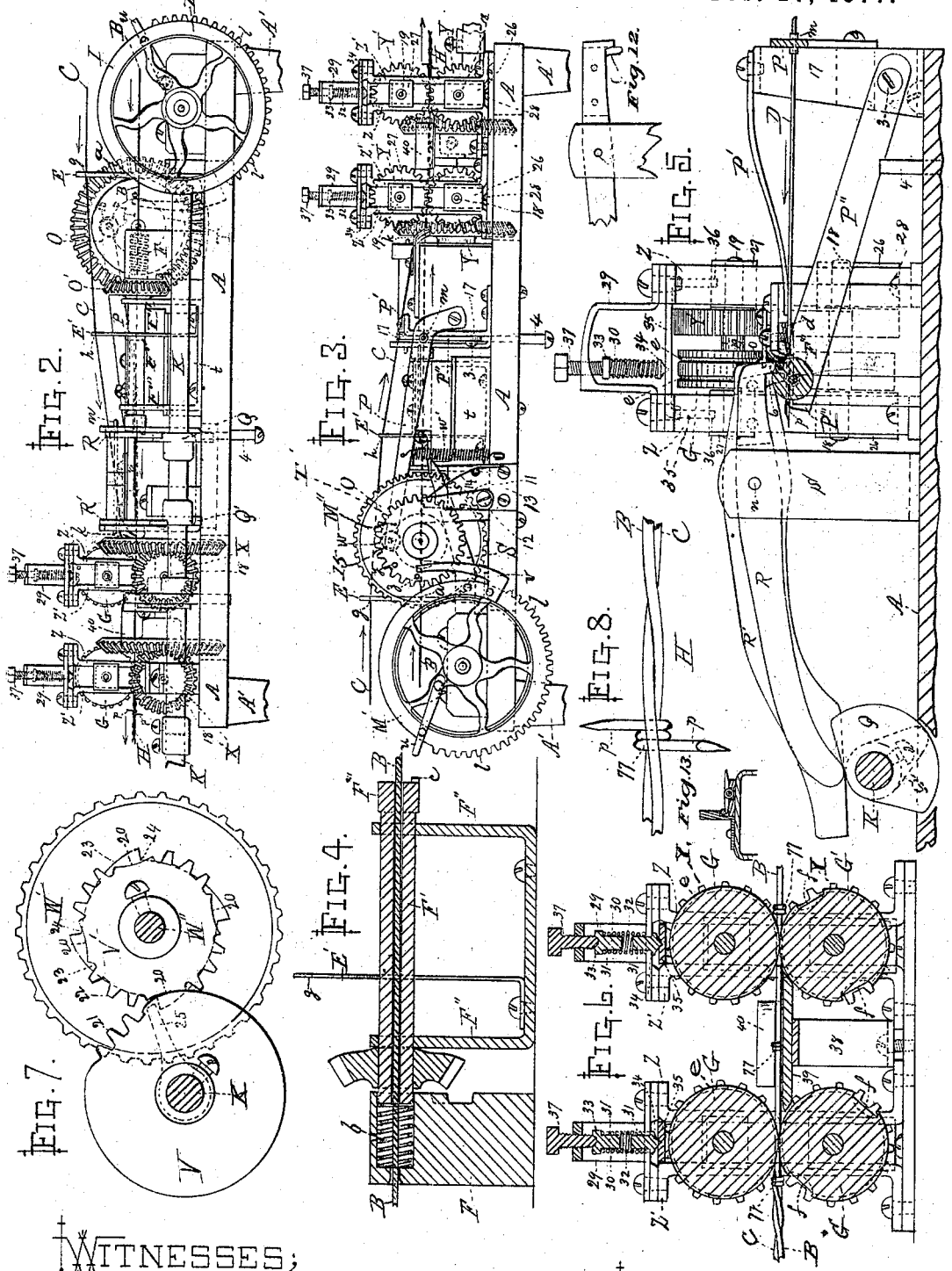

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

WITNESSES;

Wm H Blair

Thos. H. Dodge

INVENTOR;

Henry W. Putnam

4 Sheets—Sheet 3.

H. W. PUTNAM.

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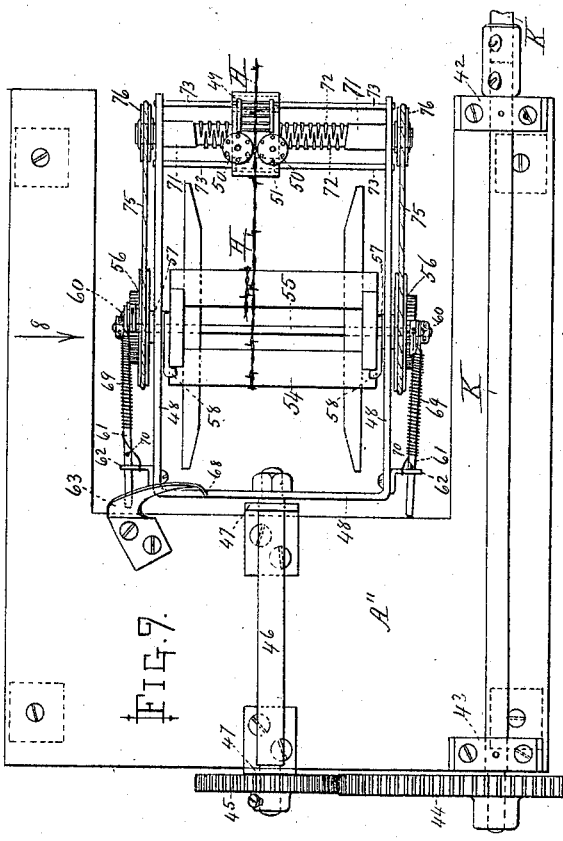

FIG. 7.

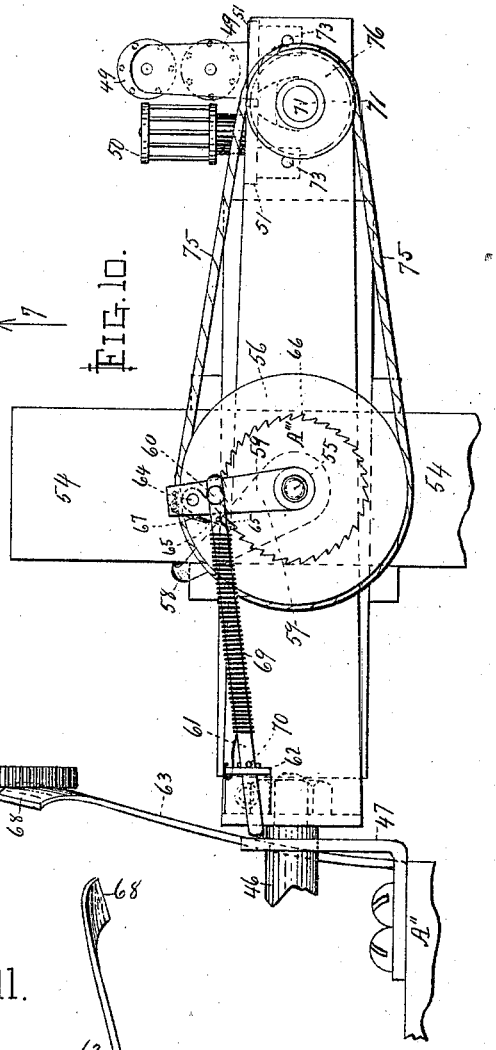

FIG. 10.

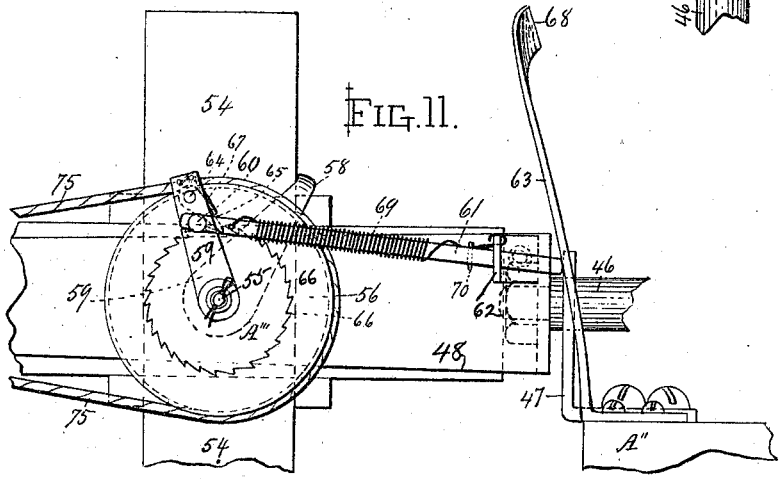

FIG. 11.

WITNESSES;

Wm. H. Blair

Thos. C. Dodge

INVENTOR;

Henry W. Putnam

4 Sheets—Sheet 4.

H. W. PUTNAM.

FENCE-WIRE BARBING-MACHINE.

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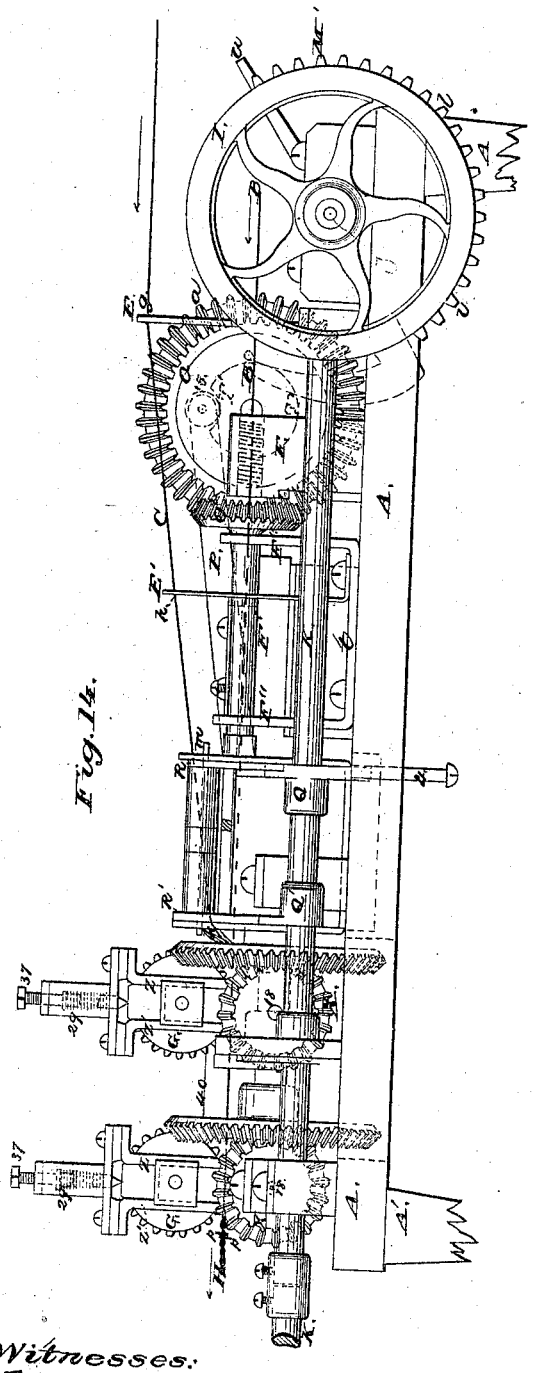

Fig. 14.

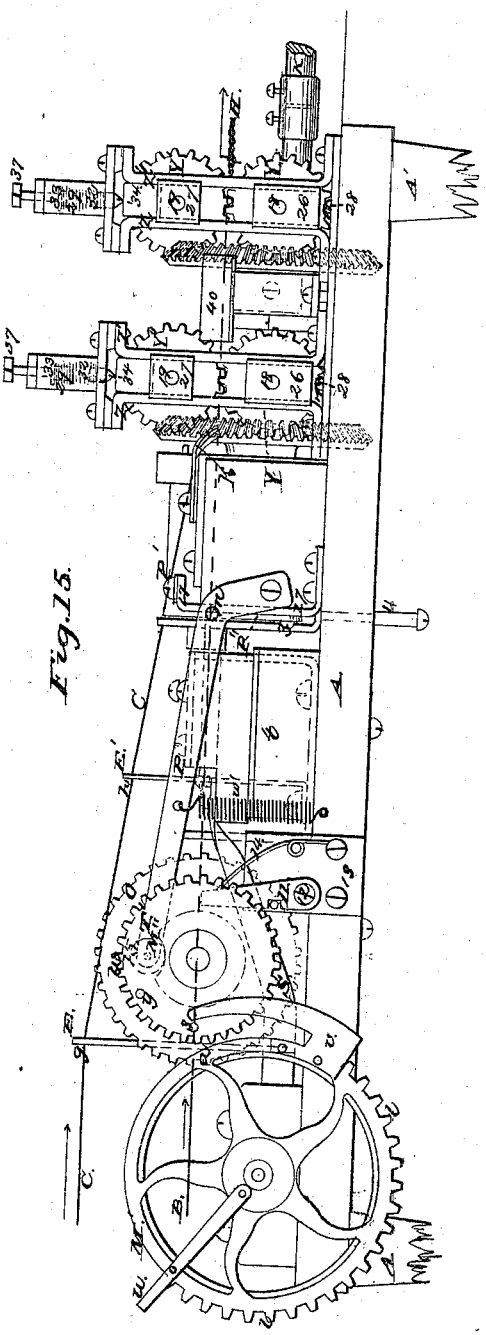

Fig. 15.

Witnesses:

Wm. H. Blair

Thos. H. Dodge

Inventor:

Henry W. Putnam

UNITED STATES PATENT OFFICE.

HENRY W. PUTNAM, OF BENNINGTON, VERMONT.

IMPROVEMENT IN FENCE-WIRE-BARBING MACHINES.

Specification forming part of Letters Patent No. **187,776**, dated February 27, 1877; application filed January 15, 1877.

To all whom it may concern:

Be it known that I, HENRY W. PUTNAM, of Bennington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in Machines for making Barbed Fence-Wire or Fencing; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a top or plan view of a part of my said improved machine, as will be hereafter more fully described. Fig. 2 represents a side view, looking in direction of arrow 1, Fig. 1. Fig. 3 represents a side view, looking in direction of arrow 2, Fig. 1. Fig. 4 represents, upon an enlarged scale, a vertical central longitudinal section, taken on line E, Fig. 1, looking in the direction indicated by arrow 3, of the same figure. Fig. 5 represents, also upon an enlarged scale, a vertical central transverse section of my said improved machine, taken on line A B, Fig. 1, looking in the direction indicated by arrow 4 of the same figure. Fig. 6 represents, also upon an enlarged scale, a vertical central section on line F, looking in direction of arrow 5, Fig. 1, of a portion of the machine, as will be hereafter more fully explained. Fig. 7 represents, also upon an enlarged scale, a section on line C D, looking in the direction indicated by arrow 6, Fig. 1, of a portion of the machine, as will also also be hereafter more fully explained. Fig. 8 represents a top or plan view of a section of the barbed wire or fencing made by my said improved machine. Fig. 9 represents a top or plan view of the twisting and spooling part of my said machine, as will be hereafter more fully explained. Fig. 10 represents, upon an enlarged scale, a side view of a portion of the twisting and spooling part of my said machine, looking in the direction of arrow 7, Fig. 9, as will be hereafter more fully explained; and Fig. 11 represents, also, upon an enlarged scale, a side view of a portion of the twisting and spooling part of my said machine, looking in the direction of arrow 8, Fig. 9, as will be hereafter more fully explained. Figs. 12 and 13 represent certain parts of the machine hereafter more fully described, and Figs. 14 and 15 represent, upon an enlarged scale, the parts shown in Figs. 2 and 3.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In the drawings, the part marked A represents the main frame, which is of rectangular form, and supported upon four legs, A′, one at each corner of the machine. Said frame may be made and supported in any suitable manner, although differing from what is shown in the drawings. B and C are two corresponding wires, which are twisted together to form the main wire, the barb-wire D being wound about wire B, and cut off to form the barbs previous to wires B and C being twisted, as will be hereafter more fully explained. Wires B and C may be fed into the machine from coils or reels, and pass directly through it, as indicated in Figs. 2 and 3 of the drawings.

The wire B is first passed through an opening or hole, *a*, in the lower part of stand E. It is then passed through a hole in the end of stationary bearing-piece F, in which is arranged a spiral spring, *b*, and through which spiral spring the wire passes forward, and thence through a hole in the center of the rotating and barb-winding shaft F′, which turns in bearings F″ F″, one end projecting into the rear end of the stationary bearing-piece F, and abutting against the spiral spring *b*, as indicated in Fig. 4 of the drawings. At this point wire B is stopped by the action of the machine, as will be hereafter explained, and the barb-wire D is carried forward by proper mechanism, and wound upon wire B by a projecting finger, *c*, upon the head F‴ of rotating and barb-winding shaft F′, after which it is cut off to form the barb by cutters *d d′*, and the wire B is again carried forward, with the barb formed upon it, through feed-rolls G G′, both of said rolls being grooved to receive the wires B and C, as shown at *e e*, while the lower rolls, G′, are gouged or cut out, as shown at *f f*, to receive and allow the barbs to pass through. After wire B has been passed through feed-rolls G G′, it is then twisted with wire C to form cable-wire H, as shown in Figs. 2, 3, 6,

and 8 of the drawings. Wire C is first passed through an opening or hole, *g*, in the upper part of stand E; then through a corresponding opening or hole, *h*, in stand E′; thence forward over guide-plate *i*, and under notched guide-piece *k*, through feed-rolls G G′, in rear of which it is twisted with wire B, as before mentioned, and is also wound upon a spool by suitable mechanism by a twisting device, which will be hereafter more fully explained.

Having described the manner in which wires B and C pass through the machine, I will proceed to describe the operation of the machine itself, in connection with said wires B and C. I is a pulley connected with the main shafting, and by which, through shafts J and K, supported in suitable bearings J′ J″ and K′ K″, secured to main frame A, driving power is imparted to the machine. Upon shaft J is arranged and secured bevel-gear L, which meshes into a corresponding gear, L′, and through which latter gear L′, by means of shaft K, upon which it is secured, the central or feeding part of the machine receives its driving power. There is also arranged and secured upon shaft J cam-wheel M and cog-gear M′.

As will be observed, cogs or teeth *l* upon cog-gear M′ extend but part way around the periphery of said wheel. This is so made that when, at the proper time in the action of the machine, cog-wheel M″ requires to remain stationary, driving power will not be imparted to it by wheel M′.

As cross or barb wire D is fed forward it is first passed through an opening or hole in a tubular guide-piece, *m*, secured to arm P; thence forward under spring-arm P′, which serves to hold the wire in position as it is being fed forward. It then passes over an inclined supporting-arm, P″, hinged at 3.

If desired, the upper side of said arm P″ at its inner end, where the wire rests upon it, may be formed with a slight groove or depression, into which the lower edge of the wire can rest, thereby retaining it more securely in position while it is being fed forward and wound upon wire B. In this instance, however, inclined arm P″ is beveled off on its edge next to stationary cutter *d′*, so that wire D rests or is held in place between the end of said cutter *d′* and flange or beveled edge 7 of arm P″.

It will be seen that inclined arm P″ extends forward under and beyond wire B, and terminates with a curved point, P‴, the object of this curved point or guide being to give the end of the cross-wire, when first acted upon by finger *c*, a back spiral motion as it is being wound about wire B, to form the first coil thereon.

Arm P″ may be raised or lowered, as occasion may require, by means of a set bolt or screw, 4, upon the upper end of which the arm rests, and which, in this instance, is operated from the under side of main frame A. The object of this arrangement to raise or lower said arm P″ is to adjust the barb-wire D to cutters *d d′*. Wire D, having been fed forward over inclined arm P″, is then passed over wire B, then under and beyond finger *c* a sufficient distance to allow of its being wound upon wire B the desired number of times, and also to leave, after being so wound, a sufficient length of wire remaining to form the barb.

In practice I have found that twice around wire B, and partly around the third time, will generally be sufficient.

At the same time that cross-wire D is being fed forward, as before mentioned, wire B is also, at the same time, being fed forward by feed-rolls G G′, and by the time that each have been fed forward the proper distance required, wire D, to form the barb; and wire B, to the point upon which the next barb is to be wound, cog-gear M′ in its revolution has arrived at the point at which it locks into gear M″, turning the latter, which, at the same time, turns rotating and barb-winding shaft F′, through connecting-shaft N and bevel-gear O and O′, and thus winds the barb-wire D upon wire B to form the barb.

Upon shaft K are arranged two cams, Q and Q′, which operate levers R and R′, said levers being hinged upon rod *n*, which is supported in suitable standards S S′, secured to the main frame A.

The outer end of lever R is bent down to bear upon cam Q, and the inner end is also bent down and provided with a foot adapted to rest and press upon the cross or barb wire D, between cutter *d′* and wire B, as the end of wire D is being wound upon wire B, holding it in a perfectly secure manner at that time, as well as when the wire is cut off by cutters *d d′* to form the barb.

The inner end or head of lever R upon the side next to lever R′ is provided with a thin plate, 6, the lower portion of which projects down below the end of foot of lever R, and is of a similar form to said foot. This foot to plate 6 passes down by and against wire B upon the side next to cutter *d′*, thereby holding it securely in position from a lateral motion in that direction as wire D is being wound upon it, otherwise; if such a foot were not provided, finger *c*, as it winds the first half of the first coil of barb-wire D upon wire B, would tend to push the latter forward in the direction of said cutter *d′*, thereby impairing the action of the machine.

After the first half of the first coil of wire has been wound upon wire B, that half-coil holds wire B from being pushed in an opposite direction by finger *c* as it winds the last half of the coil upon the wire. Thus it will be seen that in this manner wire B is held perfectly secure while the barb-wire is being wound upon it. The foot of plate 6 not only serves to hold wire B from being pushed laterally in the direction of cutter *d′*, but also assists the foot of lever R to hold the barb-wire D in place. The inner end of lever R′

is provided with a head, *o*, and is operated by cam Q′ in the same manner that lever R is operated by cam Q. During the time that the barb-wire D is being wound upon wire B and the latter remains stationary, the head *o* of lever R′ is pressed firmly down by cam Q′ upon the coil forming the barbs upon wire B, flattening it, and thereby securing the barbs more firmly upon said wire B. Cross or barb wire D, having been fed forward and wound upon wire B, as already explained, is next cut off by cutters *d d′* to form barbs *p p*. Said cutters *d d′* are secured by means of set-screws 8 and 9, respectively, passed through plates *q* and *r*. Cutter *d′* rests in a slot or recess formed in the top of stand *s′*, while cutter *d* rests in a slot or recess formed in the top of movable head *s*, which is fitted to move back and forth upon the top of stationary stand *t*, being operated by means of a cam-lever, S″, which in turn is operated by means of a cam upon wheel M. Sliding head *s* is retained in its proper relative position, as it works back and forth upon the top of stand *t* by suitable guides combined with its lower side and the top of stand *t;* but as these guides are of ordinary construction in all cases where it is desired to retain a moving part from lateral motion, when moving back and forth, no further description is here necessary.

Cutters *d d′* are set upon an incline, for the purpose of making a beveled cut to form the barbs, as shown in Fig. 8. If a longer bevel is desired, the cutters are set upon a less incline, and vice versa.

Cog-gear M′ is provided with a locking-lever, *u*, and also with an arm, *v*, which, after cogs *l*, upon cog-gear M′, have moved out of mesh with cogs *w* of cog-gear M″, by means of pin *y*, against which said arm *v* strikes, cog-gear M″ is turned back to the proper place, at which it again locks into cogs *l* of gear M′. Locking-lever *u* is secured to gear M′ just in front of cogs *l*, so that just before cogs *l* strike cogs *w*, by means of another pin, *z*, upon gear M″, against which it strikes, cogs *l* are again thrown into mesh with cogs *w* of gear M″.

To provide against cog-gear M″ being thrown back too far by arm *v*, a pin, 10, is secured to the inner side of said cog-gear M″, which strikes upon the top of a detent-lever, 11, pivoted at 12 on stand 13, secured to the side of main frame A, and holds it there securely locked from turning any farther in that direction. As cog-gear M″ revolves and pin 10 comes in contact with lever 11, it springs it back; but as soon as it has passed the end it is immediately sprung back by spring 14, also secured to stand 13, upon the main frame.

Upon shaft N is secured a wheel or pulley, T, which is grooved out at the point T′ to receive a small friction-roller, 15, upon the end of arm P. The inner end 16 of tubular guide-piece *m*, as will be seen by Fig. 1 of the drawings, is cut out on the side next to stand 17, for the purpose of allowing the barb-wire D to bear against the side of said stand 17. This pressure upon wire D against stand 17 is produced only when wheel 15 does not rest in groove T′ in wheel or pulley T, which is during the time that the barb-wire D is being wound upon wire B and cut off by cutters *d d′*. As soon as said cutters *d d′* have performed their office, the pressure upon wire D is released, so that it may be fed forward to form the next barb in the following manner: Wheel or pulley T is arranged and secured upon shaft N in such a manner that when cog-gear M″, which is also secured to shaft N, has made its revolution and stopped, groove T′ upon pulley T has come to the proper place for wheel 15 to drop into and rest in it, and is held in this position by spring *w′*, secured at one end to arm P and the other end to main frame A, thus lowering the end of arm P, and thereby at the same time lowering tubular guide-piece *m* upon arm P, which releases the pressure upon barb-wire D against stand 17, and allows it to be fed forward to be wound upon wire B to form the barbs.

The barbing mechanism may be arranged so as to put barbs upon both or all of the main wires used at the same time, but in such case the barbing mechanism would have to be duplicated.

The tube *m*, it will be noticed, projects from the sides of arm P; consequently, when said arm is depressed to hold the barb-wire, there is not that liability to cut or indent the wire, as in my previously-patented machine, and, besides, the wire is held more steadily by the present device.

Upon shaft K is arranged and secured a gear, V, which, as will be hereafter explained, operates, by means of locking-gear V′, cog-gears W W′ upon shaft W″, which is supported in bearings K″ K‴. Cog-gears W W′, in their turn, by means of connecting-shafts 18 and 19 and cog-gears X X′, into which they mesh, operate cog-gears Y, which turn upon shafts 19, and which in turn mesh with gears Y′, turning the latter, and thereby turning feed-rolls G G′, secured to shafts 18 and 19, thus giving wires B and C the necessary positive forward feed motions.

Cog-gear V is provided with only three cogs, while gear V′ is formed, as represented in Fig. 7 of the drawings, with the cogs cut off at the points 20 to form a concave surface, which fits upon the smooth portion of the periphery of gear V. During the time occupied in winding the barb-wire D upon wire B, and while wire D is being cut of to form the barbs, gear V is revolving with the smooth portion of the surface bearing against one of the concave surfaces, 20, of gear V′, thus keeping said gear V′ locked in that position; and by the time wire D has been cut off, and it is time to feed forward wires B and C, cogs 21 have arrived at the point at which they lock into cogs 22 upon gear V′.

Upon shaft W″, and bearing against the side of gear V′, is arranged and secured a wheel, 23, upon which is cut four notches, 24, said

notches being so arranged in connection with a lever, 25, secured to the side of gear V, that, just previous to cogs 21 coming in contact with cogs 22, lever 25 strikes one of the notches 24—thereby insures that cogs 21 shall come into mesh with cogs 22, which turns gear V′ as far as the next concave surface 20, thereby feeding forward wires B and C, as before explained, the desired distance required between the point at which the last barbs were formed, and the point upon which the next barbs are to be formed upon wire B.

The ends of shafts 18 and 19 are supported in suitable bearings 26 and 27, said bearings being fitted to slide up and down between standards Z Z′ secured to main frame A, and are held in position by means of lip-pieces formed upon their sides, which fit over the edges of standards Z Z′, thereby keeping them in position as they slide up and down. Bearings 26 rest upon the heads of adjusting-screws 28, thus supporting shafts 18, upon which feed-rolls G′ and cog-gears Y are secured, but bearings 27 do not rest upon any support, thus allowing the whole weight of feed-rolls G to rest upon wires B and C, which pressure, in connection with the rotation of feed-rolls G G′, gives wires B and C a strong, steady, and positive forward motion.

Upon the top of standards Z Z′ are secured frames 29, in each of which is arranged self-adjusting compressing devices 30, said devices being arranged directly over the center of feed-rolls G, which operate and are constructed as follows: Upon a stem, 31, which is formed in two parts, as represented in Fig. 6 of the drawings, is arranged a spiral spring, 32, being held in position by heads 33 and 34 upon said stem. The lower part of stem 31 is of a conical form, and rests in a hole corresponding in shape cored out in the top of plate 35, formed with the two ends bent down, which rest in grooves 36, formed upon the upper sides of bearings 27, as shown by dotted lines, Fig. 5, of the drawings. 37 is an adjusting-screw, which may be turned up or down to give to spring 32 the required tension. It will thus be seen that if the barbs become twisted and catch, feed-rolls G, by means of such a device, will spring up and allow them to pass through without injury to the machine or to the barbed wire.

Upon a stand, 38, is secured a table or guide-piece, 39, over which wires B and C pass as they are fed forward between one set of feed-rolls to the other. The outer side of said guide-piece is provided with a flange, 40, the under inner side of which is grooved out to receive and keep in place wire C as it is being fed forward, while guide-piece 39 is also grooved out at 41 to keep wire B in place.

I have not described the mechanism for feeding the cross or barb wire D, since I use the same mechanism as that described and shown in my former patent for improvement in machine for making barb fence-wire or fencing, dated February 15, 1876, and upon which machine my present invention is an improvement, and which improvement enables me to make a barbed cable-wire.

Having described the manner in which wires B and C are fed forward through the machine, the manner in which barb-wire D is fed forward and wound upon wire B, and then cut off by cutters *d d′*, and then carried forward, with the barbs formed upon it, through feed-rolls G G′, I will proceed to describe how the wires B and C are twisted and reeled after they have left said feed-rolls G G′.

In my drawings I have represented shaft K, upon the main or front part of the machine, as being connected to shaft K upon the twisting and spooling part of the machine; but in practice I prefer to run each part of the machine by separate belts, and have the barbing part of the machine stand some distance from the twisting part of the machine, for the purpose of allowing some length of wire between the last set of feed-rolls and the twisting rolls or wheels.

I have described and represented only two main fence-wires, B and C, but, if preferred, more than two main wires may be used, and the barbs may be wrapped or coiled about more than one of the main wires, and the machine may also be arranged so as to put the barbs alternately on different wires.

Shaft K of the twisting part of the machine is supported in suitable bearings 42 and 43 of its main frame A″. Upon the rear end of shaft K is arranged and secured a large cog-gear, 44, which meshes into and drives a smaller cog-gear, 45, secured to the outer end of shaft 46, which shaft is supported in suitable bearings 47. To the inner end of shaft 46 is secured the twister-frame 48. As the driving-shaft K revolves, twister-frame 48 is turned, thereby twisting wires B and C together to form the cable-wire H, as follows: Cable-wire H first passes through skeleton guide-rolls 49 and 50, secured to the top of sliding table 51. Guide-rolls 49 are arranged so as to stand at right angles to guide-rolls 50, and both sets of rolls being of a skeleton form allow cable-wire H to pass through freely without injury to the barbs or wire. Cable-wire H, having passed through guide-rolls 49 and 50, is then wound upon reel 54 in the following manner:

Upon each end of shaft 55 is arranged and secured combined pulley and ratchet wheels 56, provided upon their inner sides with hubs 57, upon which are secured arms 58, and by means of which arms reel 54 is locked and held in position from turning upon shaft 55. There are also arranged and fitted to turn upon each end of shaft 55 levers 59, upon which are pivoted at 60 one end of rods or levers 61, the other ends of which levers rest and are fitted to slide back and forth in bearings 62, secured to the side of twister frame 48. As the twister revolves the end of rod 61 comes in contact with an inclined arm, 63, secured

to main frame A″, which is so formed and arranged that it forces or pushes back rods 61 as they pass its upper end, and as each rod 61 is pushed back it pushes back its arm 59, to the upper end of which, at 64, is pivoted a pawl, 65, which catches into ratchet-teeth 66 on ratchet-wheel A‴.

In the operation of the twister, whenever either of the rods 61 and its lever 59 are pushed back, their respective pawl 65 is also drawn back over its ratchet-teeth 66, and said pawl, being held down by its spring 67, catches into its ratchet-teeth when it reaches its extreme back motion; consequently when the end of rod 61 passes the curved end 68 of the inclined arm 63 said rod 61, its lever 59, and pawl 65, are forced back to their normal position by means of spring 69, thereby turning back combined pulley and ratchet-wheel 56 until pin 70, in rod 61, strikes against bearing-piece 62, and by which operation reel 54, keyed or secured to the combined pulleys and ratchet-wheels 56, is turned, and the barbed or cable wire H is wound thereon by spring-tension, depending upon the power of springs 69, and they may be adjusted to give any required degree of tension upon the finished cable-wire H during the operation of winding it upon reel 54.

To provide for a uniform and automatic winding of the barbed cable-wire H upon its reel 54, as fast as it is delivered from the barbing part of the machine, shaft 71 is provided with two sets of screw-threads, 72, one of which is right handed and the other left-handed, and these threads are so arranged, in combination with the beveled shoulders on shaft 71, at each end of the screw-threads, that a traverse device, (shown in dotted lines, Fig. 10,) secured to the under side of table 51, and which fits into said screw-threads, will reverse the motion of table 51 when it reaches either end of its extreme lateral motion on shaft 71. Table 51 is slid backward and forward upon guide-rods 73, which pass loosely through flanges secured to the under side of said table.

Shaft 71 is turned or revolved by means of belts or cords 75, running from combined pulleys and ratchet-wheels 56 to pulleys 76 upon the ends of said shaft 71.

From the foregoing description of the twisting and spooling device it will be seen that a constant tension is secured for winding the completed barb fence-wire upon its spool 54, and which spool and its supporting-shaft 55 are so arranged that when the spool is filled it can be easily removed and an empty spool substituted therefor, the arms 58 being so arranged as to hold the spool, when being filled, in a rigid connection with the hubs of combined ratchet and pulley wheels 56.

The operation of the machine may be briefly stated or summed up thus: Wires B and C are first fed forward, in the manner already explained, to the point upon which the barbs are to be formed, when barb-wire D is fed forward, and wound upon wire B by finger *c* upon the end or head of rotating and barb-winding shaft F′, after which wire D is cut off by cutters *d d′*, to form the barbs, when both wires B and C are again carried forward—wire B under the head *o* of compressing-lever R′, which descends at the proper time, as before explained, and secures the barb more firmly upon the wire B, while wire C is carried over guide-plate *i*, and under notched guide-piece *k*, thence through feed-rolls G and G′, after which the wires B and C are twisted together to form the cable-wire H, which then passes forward through skeleton guide rolls 49 and 50, and is wound upon reel or spool 54, as before explained.

It will be understood that the broken end of shaft K in Fig. 1 is to connect in the arrangement of the machine shown and described with the broken end of shaft K in Fig. 9.

It will thus be observed that by my invention barbed-cable fence-wire or fencing can be produced and reeled upon spools or reels in a continuous and rapid manner, while all the coils 77 and barbed ends *p p* are of uniform shape and size.

Having described my improvement in machines for making barbed-cable fence-wire or fencing, and reeling the same by a continuous and automatic operation, what I claim therein as new and of my invention, and desire to secuae by Letters Patent, is—

1. The combination, with barb-winding shaft F′, of lever R, provided with wire-holding feet *o* and 6, substantially as described.

2. The combination, with guide-plate *i*, of notched guide-piece *k*, substantially as and for the purposes set forth.

3. The combination, with cog-gear M″, provided with pins *y* and *z*, of blank cog-gear M′, provided with locking-lever *u* and arm *v*, substantially as and for the purposes set forth.

4. The combination, with notched wheel or pulley T and standard 17, of spring-lever P, provided with tubular guide-piece 16, substantially as and for the purposes set forth.

5. The combination, with the feed and guide-rolls G G′, the latter gears being provided with barb receptacles *f f*, of the cog-gears Y and Y′ upon shafts 18 and 19, as and for the purposes stated.

6. The combination, with the feed and guide roll G′, provided with barb-receptacles *f f*, of grooved table 39 and vertical flange 40, as and for the purposes set forth.

7. The combination, with the bearings of the upper feed-rolls G, of the self-adjusting compressing devices 30, consisting of the parts marked and lettered 31, 32, 33, 34, 35, 37, and Z Z′, substantially as and for the purposes set forth.

8. The combination, with locking-gear V′ and notched wheel 23, of blank gear-wheel V, provided with lever 25, substantially as and for the purposes set forth.

9. The combination, with spring-acted feed-rods 61, of the inclined arm 63, provided with

curved end 68, as and for the purpose set forth.

10. The combination, with twister-frame 48, of the skeleton-guide and twisting-rolls 49 and 50, as and for the purposes set forth.

11. The combination, with the twister-frame 48, of combined pulley and ratchet wheels 56, double-threaded screw-shaft 72, provided with pulleys 76, and sliding table 51, as and for the purposes set forth.

12. The combination, with the mechanism for barbing the wire B and feeding the barbed wire B and the wire C, of mechanism for at once both twisting or cabling the wires, to form the finished barbed cable-wire or fencing H, and winding the same upon its spool or reel in a uniform and even manner, substantially as described.

HENRY W. PUTNAM.

Witnesses:

WM. H. BLAIN,

THOS. H. DODGE.