3 Sheets—Sheet 1.

T. B. DOOLITTLE.

Wire-Barbing Machine.

No. 199,524. **Patented Jan. 22, 1878.**

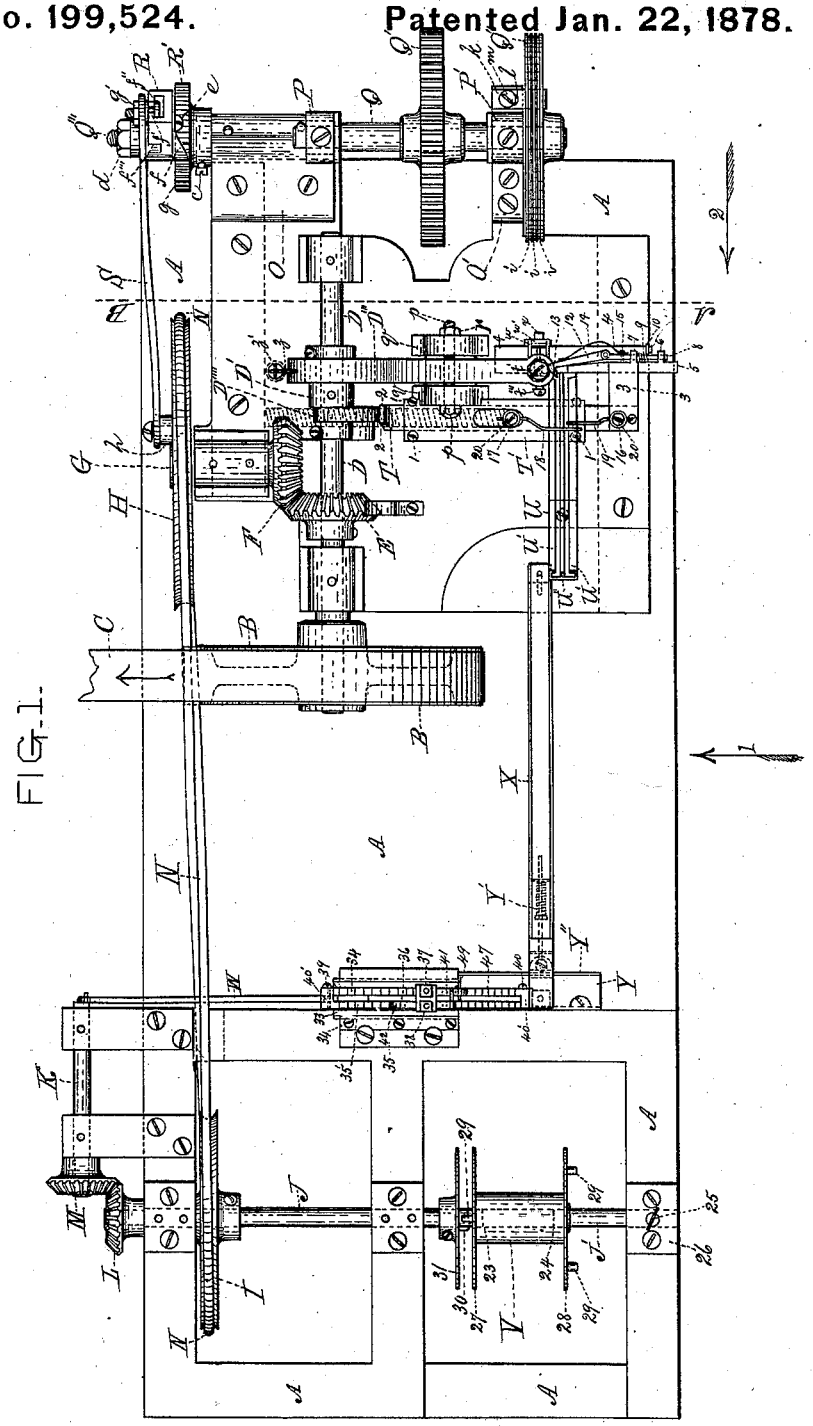

FIG. 1.

Witnesses;

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Inventor;

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3 Sheets—Sheet 2.

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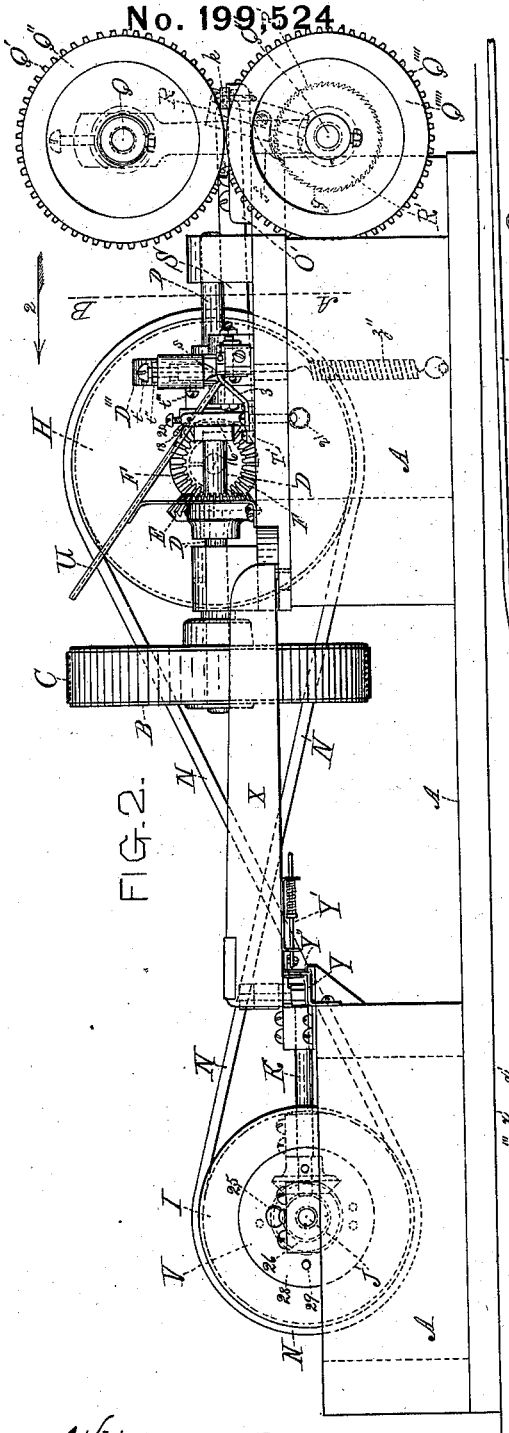

FIG. 2.

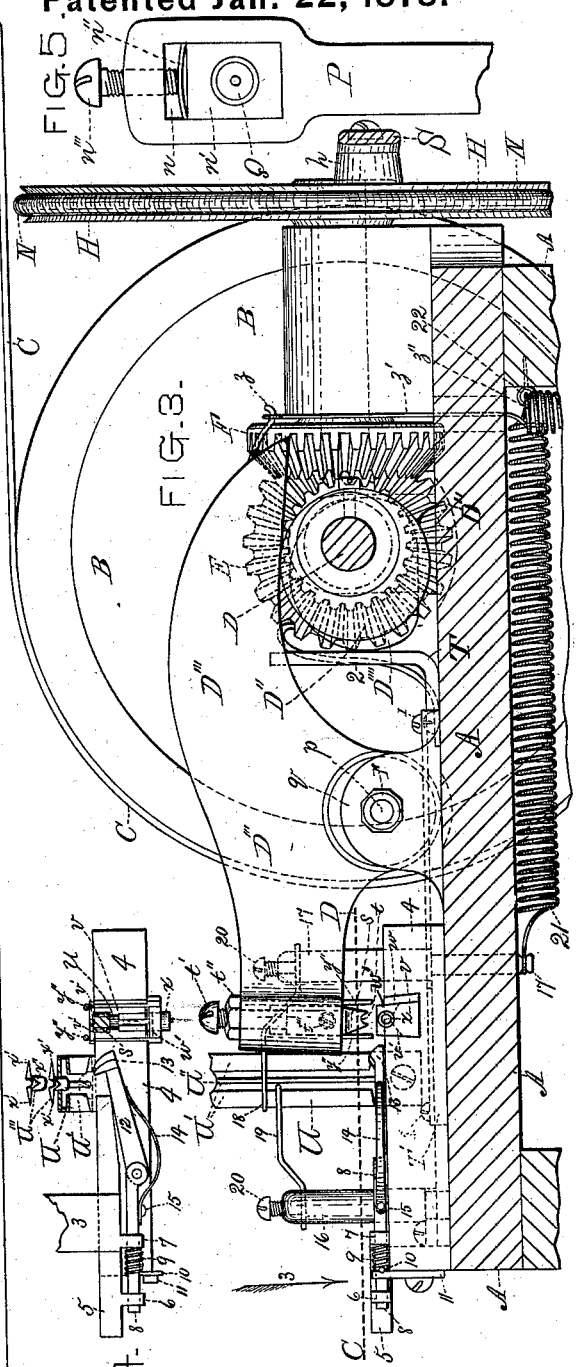

FIG. 3.

FIG. 5.

FIG. 4.

Witnesses;

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3 Sheets—Sheet 3.

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Wire-Barbing Machine.

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Fig. 7.

Fig. 6.

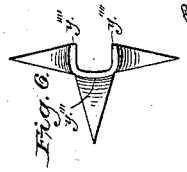
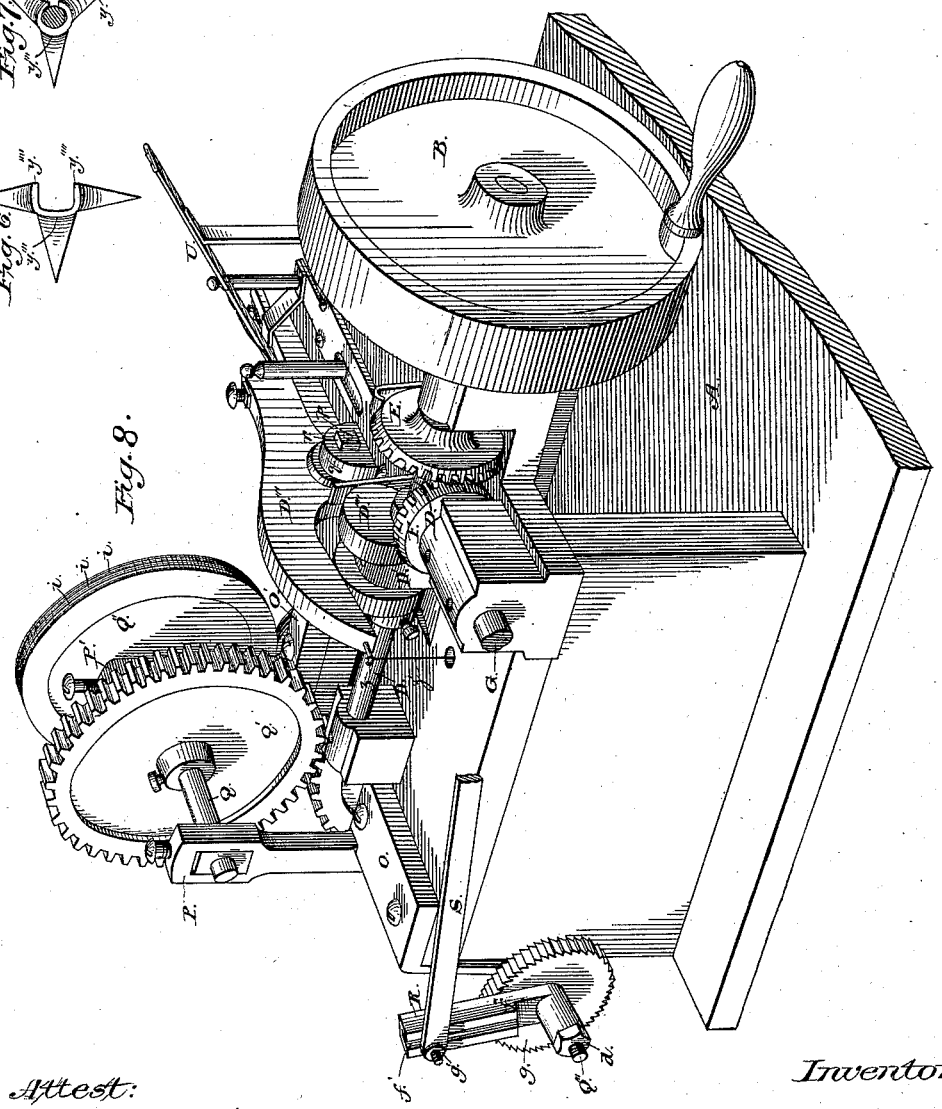


Fig. 8.



Attest:

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UNITED STATES PATENT OFFICE.

THOMAS B. DOOLITTLE, OF BRIDGEPORT, CONN., ASSIGNOR TO WASHBURN & MOEN MANUFACTURING COMPANY, OF WORCESTER, MASS.

IMPROVEMENT IN WIRE-BARBING MACHINES.

Specification forming part of Letters Patent No. **199,524**, dated January 22, 1878; application filed October 22, 1877.

To all whom it may concern:

Be it known that I, THOMAS B. DOOLITTLE, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Putting on or Attaching Barbs to Wire for Fencing Purposes; 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 machine embodying my said improvements. Fig. 2 represents a side view of the same, looking in the direction indicated by arrow 1, Fig. 1. Fig. 3 represents, upon an enlarged scale, a vertical transverse section of the machine, taken on line A B, Fig. 1, looking in the direction indicated by arrow 2 of the same figure. Fig. 4 represents, also upon an enlarged scale, a section on line C D, Fig. 3, looking in the direction indicated by arrow 3 of the same figure, showing a plan view of a portion of the machine, as will be hereinafter more fully described. Fig. 5 represents, also upon an enlarged scale, a detail of one of the supporting-standards and sliding journal-bearing. Fig. 6 represents, also upon an enlarged scale, a barb in the process of being bent about the wire. Fig. 7 represents a barb folded about the wire; and Fig. 8, Sheet 3, represents a perspective view of the machine with certain parts removed, so as to show cams and operating-levers.

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 parts marked A represent the frame-work of the machine. B represents the main driving wheel or pulley of the same, which may be run by an endless belt, C, connected to the main shafting, and by means of which power is imparted to the machine through said wheel or pulley B, shaft D, cog-gears E and F, shaft G, auxiliary driving-wheels H and I, shafts J and K, and cog-gears L and M.

Wheels or pulleys H and I are connected and run by means of a round belt, N, said wheels being formed with a groove similar in form to receive it. Although I employ a round belt in this instance, any other form may be used, if preferred.

Upon main frame A are secured two frames, O and O′, their upper portions forming standards P P′, in which are arranged the bearings of shaft Q, upon which are mounted and rigidly secured spur-gear Q′ and grooved feed roll or pulley Q″, while their lower portions extend or hang down and support the bearings or journals of shaft Q‴, upon which are mounted spur-gear Q⁗ and grooved feed roll or pulley Q⁗′, which work in connection with spur-gear Q′ and grooved feed roll or pulley Q″.

Shaft Q‴ at one side of the machine is provided upon its end with a standard, R, loosely fitted upon the same, and having a ratchet-wheel, R′, secured to its outer end by means of a set-screw, *c*. Said standard R is held in place laterally by means of ratchet-wheel R′ upon one side, and by a nut, *d*, screwed upon the end of shaft Q‴ upon the other side.

Upon the inner side of the standard R, over ratchet-wheel R′, is pivoted, at *e*, a pawl, *f*, which catches into ratchet-teeth *g* upon ratchet-wheel R′, while upon the outer side of standard R, and near its upper end, is fulcrumed one end of a lever, S, its other end being fulcrumed upon a hub, *h*, cast upon or secured to driving-wheel H.

As wheel H revolves, in connection with the other parts of the machine, standard R is drawn forward or carried back, as the case may be, by lever S secured to hub *h*, the latter acting as a crank or wrist pin. During the revolution of hub *h* above the horizontal line of center of wheel H, pawl *f* is being drawn back over ratchet-teeth *g*; but as soon as it passes below said central line in its reverse motion, said pawl *f* catches into one of the ratchet-teeth *g*, and turns ratchet-wheel R′, thereby turning the spur-gear and grooved feed-roll upon shaft Q‴, and as the former meshes into spur-gear Q⁗′, the same motion is imparted to that, as well as to grooved feed-roll Q⁗′.

Standard R is provided upon its outer side with two flanges, f' f'', which extend from the top of the standard to the point f''', and the journal of lever S is so arranged that by loosening a nut, g', it may be slid up or down in the groove formed by said flanges f' f'', so that the radius or swing of said lever S may be regulated to a greater or less degree, thereby allowing of the distance between the barbs to be varied more or less, as desired.

As will be observed by Figs. 1 and 2 of the drawings, feed-rolls Q'' and Q'''' are provided with three circular grooves, *i*, which may all be of one size; or they may each be of a different size, to conform to different sizes of wire, as desired.

Upon frame-piece O' is arranged a wire-guide, *k*, through the end of which is an opening or hole, through which the wire passes, and is guided between one of the set of grooves *i*. Said guide-piece *k* is provided with a slot, *l*, through which a set-screw, *m*, is passed, whereby it may be adjusted so as to guide the wire into any one of the set of grooves *i* desired.

To secure against feed-rolls Q'' and Q'''', spur-gears Q' and Q'''', or any of the adjoining parts becoming injured or broken by particles of metal and other substances getting between them, and to allow of an adjustment of the parts to produce the necessary pressure required upon the wire to feed the latter into and through the machine, the following arrangement, which gives to the upper grooved and gear wheels a springing motion, is provided: Through each standard P and P' is cut a rectangular-shaped hole or opening, *n*, into which are fitted loosely bearings *n'*, and in which bearings turn the ends of shaft Q. Upon the upper ends of said bearings *n'* rest curved spring-plates *n''*.

Set-screws *n'''* are inserted through the upper ends of standards P and P', with their lower ends resting upon spring-plates *n''*, and by means of which the pressure upon the journals of shaft Q can be regulated at pleasure, thus enabling the attendant to increase or diminish the pressure of the feed-rolls upon the wire passing between them.

It will be understood that shafts Q and Q''' are prevented from moving longitudinally in the usual manner, viz., by having shoulders turned on their ends to abut against their journal-boxes.

Upon shaft D, and bearing against standard D', projecting up from frame A, is arranged and secured a cam, D'', which operates a lever, D''', fulcrumed upon a rod or bolt, *p*, passing through and supported in bearings or standards *q*, and held in place by a nut, *r*. The forward end or head of lever D''' is provided with a barb-compressing hammer or die, *s*, for fastening or compressing the barbs upon the wire, the lower end being formed with a circular groove, *t*, for that purpose, as represented in Fig. 3 of the drawings. A corresponding groove, *u*, is also formed in a block, *v*, secured in block 4, secured to main frame A. Block *r* is held in place in said block 4 by means of a wedge, *w*. The forward end of said block *v* projects above the top of block 4, forming a flange, *w'*, and a tube or pipe, *x*, for guiding the wire, is passed through it, and about half-way through the block, only about half of the tube, in this instance, being embedded in the block beyond the flange.

The opposite end of block *v* projects beyond the side of block 4, and is beveled down to form the angles represented by dotted lines *v'*, Fig. 3 of the drawings, for the purpose of preventing the points *y* of the barbs being twisted or bent too far around to form a well-shaped barb, as the neck of the barb is secured upon the wire by barb-compressing hammer or die *s*, said bevel being formed so that the edges *y'* of points *y* of the barbs will be, when secured upon the wire, about the angle represented.

Pins *y''* secured to the head of lever D''' pass down just beyond the edge of block *v*, and serve the purpose of preventing the points of the barbs from being bent out of shape, they keeping them in a straight perpendicular line from the side of the wire.

In order that an adjustment of barb-compressing hammer or die *s* may be made, a screw, *t'*, set-nut *t''*, and set-screw *t'''* are provided for the purpose.

The operation of fastening a barb upon the wire by compressing hammer or die *s*, with its groove *t*, in combination with groove *u*, is as follows: As groove *t* strikes upon the top *y'''* of the neck of the barb, over the center of the wire, it is pressed down around the same at the top, while at the same time the lower edges *y''''* of the neck of the barb come in contact with the curved surface *u*, which bends them in under and around the under side of the wire, thereby securely fastening the barb upon the same.

Upon the rear end of lever D''' is hung or secured upon a hook, *z*, secured to said lever, a wire, *z'*, forming a part of spiral spring *z''*, secured to the lower part of frame A, (shown in dotted lines, Fig. 2,) which spring operates to always keep the rear end of lever D''' in contact with cam D''.

Upon shaft D, also bearing against standard D', but upon the opposite side from cam D'', is secured a cam, D'''', which operates a sliding frame, T, which slides in a socket formed to receive it in bed-piece T', secured to frame A by means of screws 1.

The inner end of sliding frame T is bent and extended up to form a standard, 2, against which bears cam D'''', while upon its outer end is secured an inclined piece, 3, which extends up over block 4 secured to standard A. Upon the upper end of piece 3 is secured a barb-holding device, consisting of the following arrangement of parts. A long square piece of metal, 5, the inner end of which is beveled

off upon one side, as represented in Figs. 1 and 4 of the drawings, is secured immediately upon the end of said piece 3, and is provided with two flanges or ears, 6 and 7, through which is passed a square bar, 8, provided with a spiral spring, 9, held in place between flange 7 and a pin, 10, which pin strikes and bears against a stop piece or standard, 11, secured to the end of block 4. Upon the inner end of bar 8 is hinged one end of an arm or lever, 12, provided with a head, 13, held against the side of piece 5 by a flat spring, 14, secured to bar 8 at 15. The operation of the several parts will be hereinafter described.

U is an inclined receptacle or feed-guide, in which are placed the barbs to be fed into the machine, preparatory to being compressed upon or about the wire. Said inclined receptacle U is formed, as shown in Figs. 1, 3, and 4, with two flanges, U′, and a rib, U″, which serve to keep the barbs in place, flanges U′ keeping them from falling out and assisting in guiding them, while rib U″ prevents their turning or moving out of position laterally.

The barbs are passed into the receptacle with their necks down, as represented by barbs U‴, Fig. 4, the two points x' upon each side of the barb passing down under flanges U′, while the third upper point, x'', passes down outside between them. The receptacle may be filled with barbs in the above-mentioned manner, thereby obviating the necessity of constant attendance upon this part of the machine.

In order that each barb may be deposited at the bottom of receptacle U separately, and at the proper time to be fed into the machine under the barb-compressing die or hammer *s*, an arrangement is provided in connection with sliding frame T by means of which such a result may be obtained, and to this end two standards, 16 and 17, are secured to said sliding frame T, through the upper ends of which are passed wires or fingers 18 and 19, provided with adjusting-screws 20.

The operation of feeding a barb out of inclined receptacle U into the machine is as follows: As the action of cam D⁗ is released upon standard 2 of sliding frame T by means of a spiral spring, 21, secured at one end to frame A at 22, and the other end to the lower end of standard 17, which is extended down through frame A for that purpose, and slots formed in said frame A and in bed-piece T′ to allow of its movement back and forth, sliding frame T is drawn back, which operation draws back standards 16 and 17, with fingers 18 and 19, a sufficient distance to allow a barb to slide down beyond the end of finger 18 between the fingers, and rest against finger 19, when cam D⁗ then reverses the motion, carrying back finger 19, which allows the barb to slide down and rest upon the top of block 4, between the end of bar 5 and head 13 of arm 12, said parts forming jaws, which receive and carry it under barb-compressing hammer or die *s*, to be acted upon as before explained.

The barb having been deposited and held over the center of the wire until acted upon by hammer or die *s*, the action of sliding frame T is then reversed, and by the time the jaws are in proper position again another barb is dropped in between them and carried under hammer or die *s*, and so on from each succeeding barb to the next.

V is a reel, upon which the wire is wound after having been passed through the machine and barbed, and is arranged so that it may be removed and replaced by another after having been filled with the barbed wire.

The entire operation may be briefly summed up thus: The wire, in entering the machine, first passes through the opening in adjustable guide-piece *k* arranged upon frame O′, thence between feed rolls or wheels Q″ and Q⁗, which feed it forward into and through tube or pipe *x* over circular grooved portion *u*, when the barb, which has meanwhile been fed forward between the jaws formed by the end of bar 5 and head 13 of arm 12 over the center of the wire, is then bent and pressed around said wire by barb-compressing hammer or die *s*, provided with circular grooved end *t*, acting in combination with circular groove *u*, when it is again fed forward to the point upon which the next barb is to be secured, and the operation above mentioned repeated, the barbed wire being wound upon reel V as fast as manufactured, and fed forward in an even and uniform manner, as before explained.

I have shown in Figs. 1 and 2 a reeling mechanism; but this forms no part of the invention of the present application.

Having described my improvements in machines for putting on or attaching barbs to wire for fencing purposes, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the shafts Q and Q‴, provided with gears Q′ and Q⁗, of the grooved feed-rolls Q″ and Q⁗, grooved standard R, ratchet-wheel R′, pawl *f*, and operating-lever S, with its journal and journal-nut *g*, substantially as and for the purposes set forth.

2. The combination, with feed-rolls Q″ and Q⁗, provided with two or more grooves, of adjustable guide *k* and tube or pipe *x*, substantially as and for the purposes set forth.

3. The combination of lever D‴, cam D″, and barb-compressing hammer or die *s* with grooved block *v* and pins y'', said parts being constructed and relatively arranged substantially as and for the purposes set forth.

4. The combination, with shaft D and sliding frame T, of cam D⁗, inclined piece 3, sliding piece 5, provided with ears 6 and 7, bar 8, hinged arm or lever 12, head 13, and spring 14, substantially as and for the purposes set forth.

5. The combination, in a machine for barbing fence-wire, of an inclined barb-receptacle, U, provided with flanges U′ and a central rib, U″, substantially as and for the purposes set forth.

6. The combination, with sliding frame T and inclined barb-receptacle U, of standards 16 and 17, provided with fingers 18 and 19, substantially as and for the purposes set forth.

7. The combination, with block 4, of bar 5 and head 13 of arm 12, substantially as and for the purposes set forth.

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2