No Model.)

4 Sheets—Sheet 1.

S. M. STEVENS.

BARB WIRE MACHINE.

No. 263,073. Patented Aug. 22, 1882.

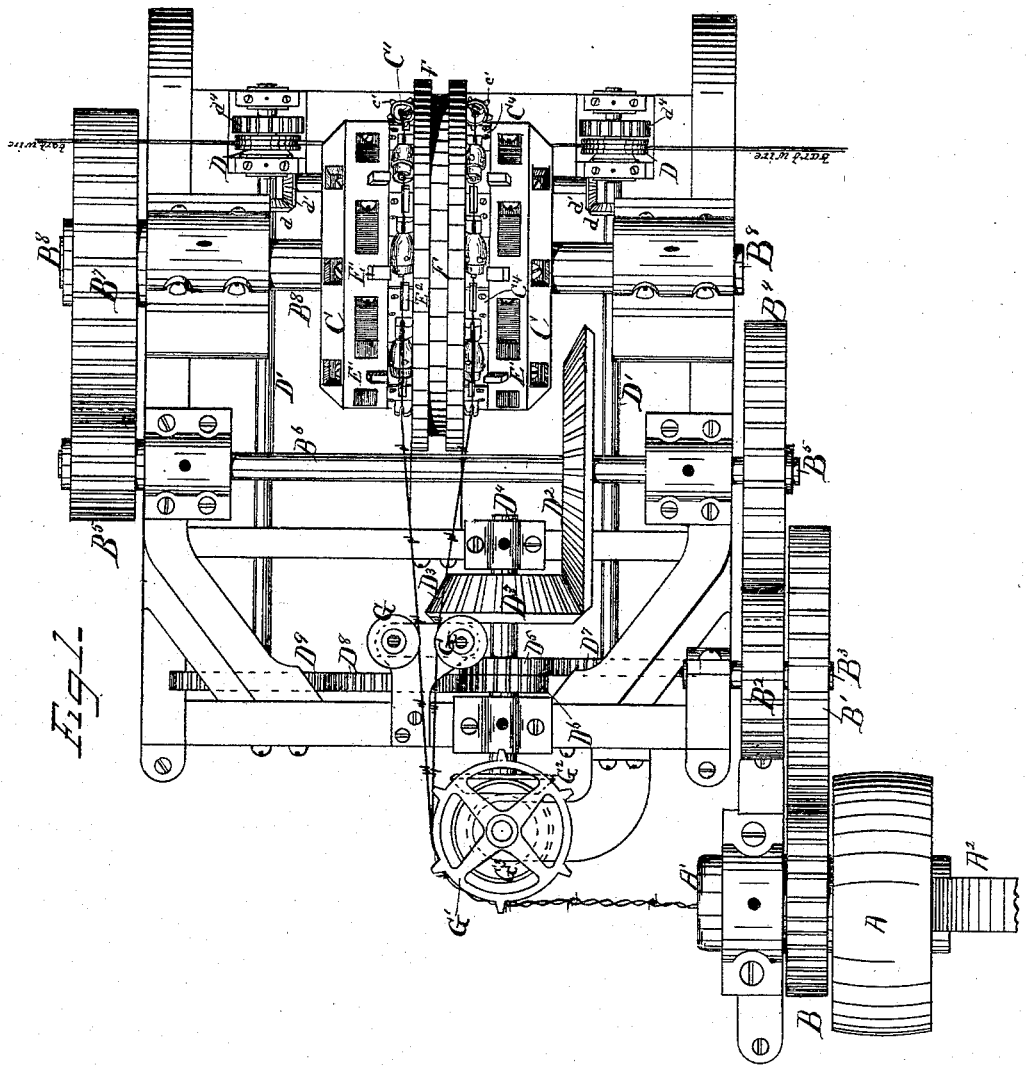

Fig. 1.

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A. M. Munday.

INVENTOR—

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by Munday Evarts & Adcock

his attys.

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S. M. STEVENS.

BARB WIRE MACHINE.

No. 263,073. Patented Aug. 22, 1882.

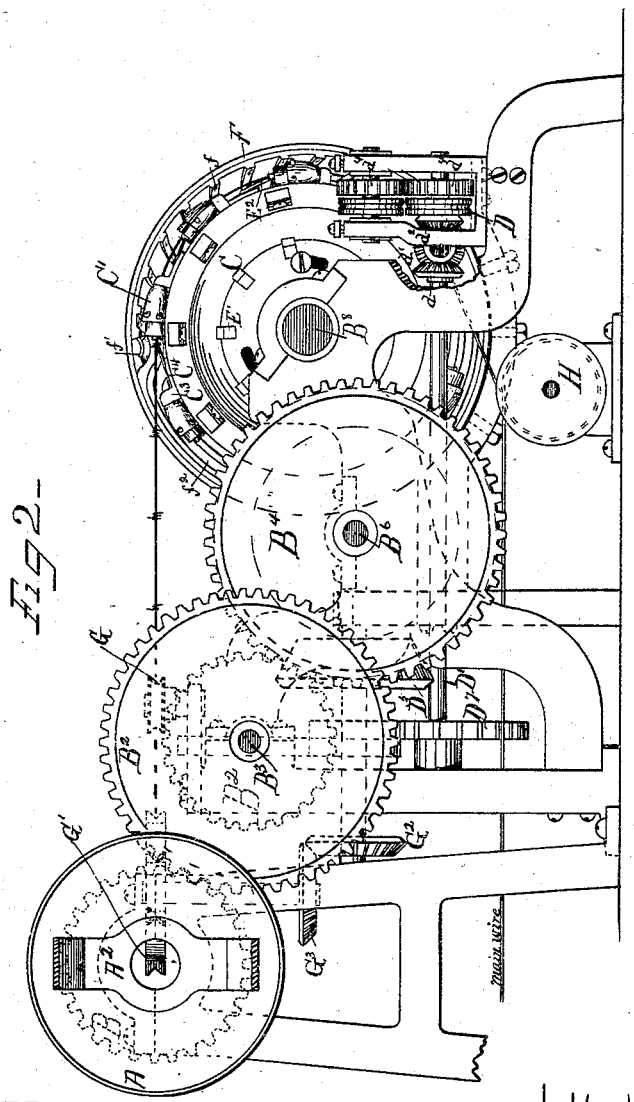

Fig 2.

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(No Model.) 4 Sheets—Sheet 3.

S. M. STEVENS.

BARB WIRE MACHINE.

No. 263,073. Patented Aug. 22, 1882.

Fig 3.

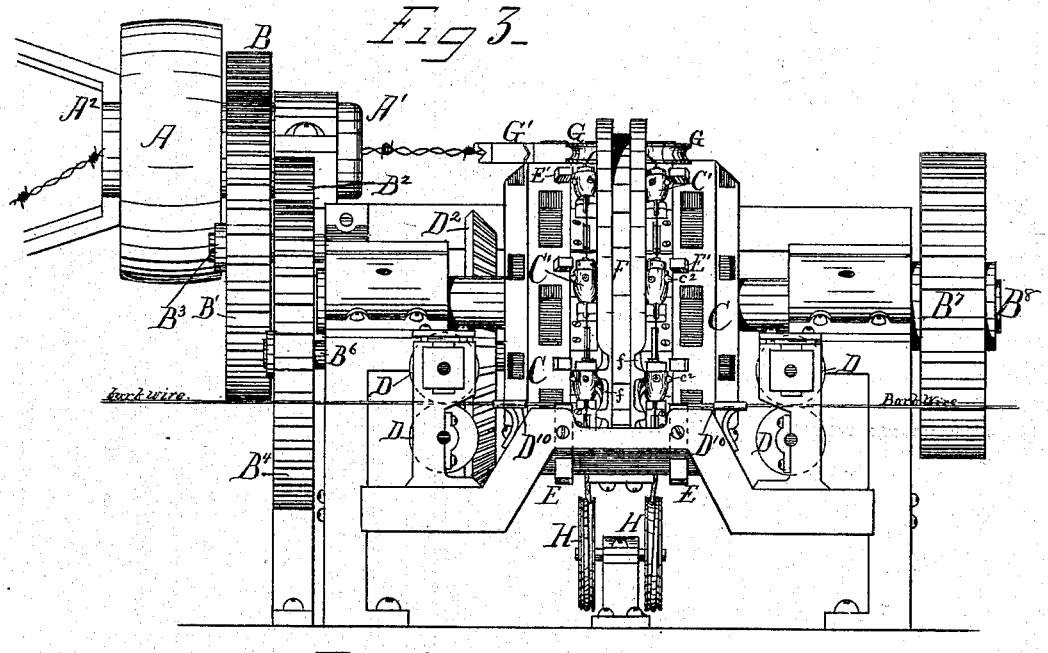
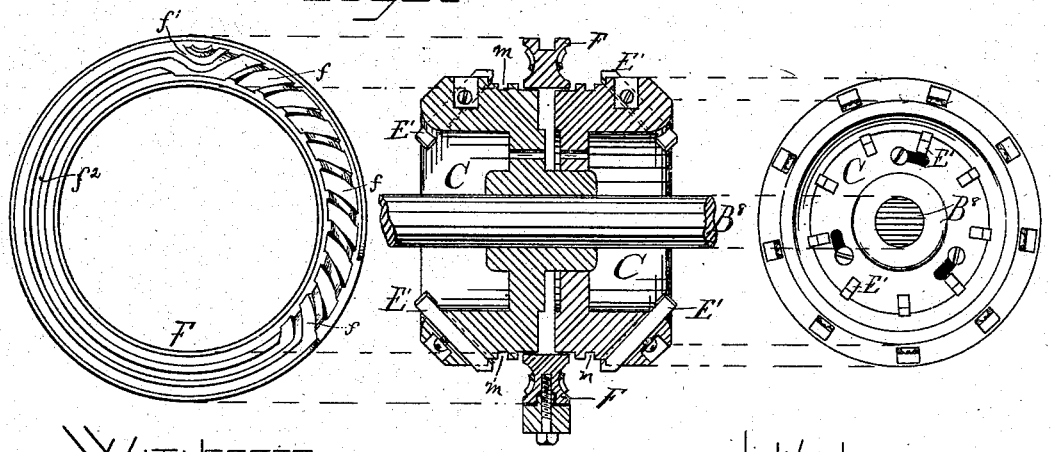


Fig 4.



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(No Model.) 4 Sheets—Sheet 4

S. M. STEVENS.

BARB WIRE MACHINE.

No. 263,073. Patented Aug. 22, 1882.

Fig 5.

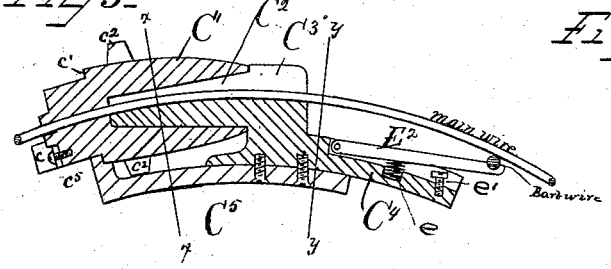

Fig 6.

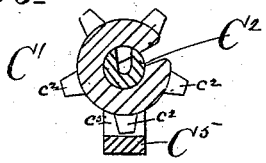

Fig 7.

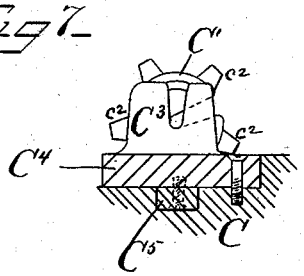

Fig 8.

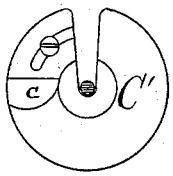

Fig 9.

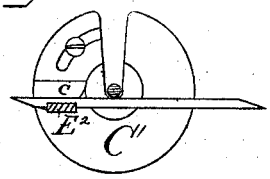

Fig 10.

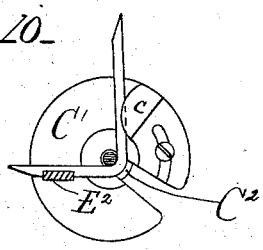

Fig 11.

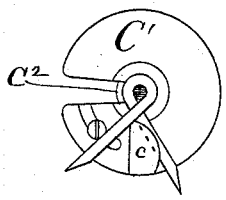

Fig 12.

WITNESSES.

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UNITED STATES PATENT OFFICE.

SIDNEY M. STEVENS, OF DE KALB, ILLINOIS.

BARB-WIRE MACHINE.

SPECIFICATION forming part of Letters Patent No. 263,073, dated August 22, 1882.

Application filed May 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY M. STEVENS, of De Kalb, in the county of De Kalb and State of Illinois, have invented certain new and useful Improvements in Barb-Wire Machines, of which the following is a specification.

This invention relates to improvements upon the machine patented to me in Letters Patent No. 243,170, dated June 21, 1881. By these improvements I design giving the barb-wires a greater amount of wrap around the fence-wires than was contemplated by the construction disclosed in said patent. I employ in the present invention a rotating barb-applying wheel similar to that in my former machine; but instead of using the same barb-applying devices I mount a number of coiling-cylinders upon the wheel, such coiling-cylinders being longitudinally slotted to permit the entrance and withdrawal of the fence-wire, and being intermittently rotated by stationary cams, with which they engage during a portion of the revolution of the wheel. This and other features of my invention will be particularly described hereinafter.

The accompanying drawings show at Figure 1 a plan, at Fig. 2 a side elevation, and at Fig. 3 a front elevation, of my improved machine. Fig. 4 embraces a side view of the cam for actuating the coiling-cylinders, a central section of the barbing-wheel and said cam, and a side view of the wheel. Fig. 5 is an enlarged longitudinal section of one of the coiling-cylinders with its supports. Fig. 6 is a cross-section of the same upon the line *x x* of Fig. 5. Fig. 7 is a like section upon the line *y y* of Fig. 5. Figs. 8, 9, 10, 11, and 12 are enlarged end views of the coiling devices, showing positions occupied at different stages of the barb-applying operation.

Power is applied to my machine by a pulley, A, upon the arbor A′ of a twister, A^2, placed at right angles to the line of feed of the machine. The power is transmitted from the twister to the barbing-wheel by the gears B, B′, B^2, B^4, B^5, and B^7, the first being upon the arbor A′, gears B′ and B^2 having a common shaft, B^3, gears B^4 and B^5 having also a common shaft, B^6, and gear B^7 being upon the same shaft, B^8, with the barbing-wheel. This barbing-wheel I prefer to make in two parts, C C, relatively adjustable, as in my former machine, and for the same reasons. One part only may be used, however, and but one of the fence-strands be barbed. The fence-strands pass to the wheel from the rollers H below and immediately enter the longitudinal slots in the coiling-cylinders C′, of which there is a series, mounted upon the periphery of each of the parts C C, the slotted side of the cylinders being outermost at the time they pass the point of entrance of the wire. Said slots extend to the center of the cylinders, so the wire will lie in the axial line thereof. Each cylinder is supported upon the forward end of a stationary shaft or supporting device, C^2, also slotted from its outermost surface to its axial line to permit the wire to lie centrally therein, and it is secured to the wheel through a standard, C^3, cast on the shaft, and a plate, C^4, bolted or screwed to the wheel. The depending rib C^5 has an outward projection, c^5, which engages with a shoulder, c', upon the cylinder, and so retains the latter upon the shaft.

The barb-wires are fed to the machine by pairs of friction-rollers D, which are operated from shafts D′ by the nest of gears d d' d^2. Said shafts D′ receive power from the shaft B^6, as follows: Bevel-gear D^2 upon the shaft B^6 meshes with another gear, D^3, upon the shaft D^4. Said shaft D^4 carries two gears, D^5 and D^6, one of which meshes with the gear D^7 upon one of the shafts D′, and the other of which meshes with an intermediate gear, D^8, and that with the gear D^9 upon the other shaft D′. Between the rollers and the barbing-wheel the barb-wire passes through guide-tubes D^{10} upon the frame of the machine, whereby they are deflected sufficiently to give the proper bevel to the cut of the knives E and E′. Of the knives, the two lettered E are stationary and held in the frame of the machine, and those lettered E′ are held in the periphery of the barbing-wheel. Of course there is one of the latter for each coiling-cylinder.

Fig. 8 shows the position of one of the coiling-cylinders when ready for the entrance thereinto of the straud-wire—that is, with the slot therein coinciding with that in its shaft—and both open outwardly from the wheel. In Fig.

9 the barb-wire has been fed in between the strand and the wheel, so that its inner end rests upon a spring-lever, E^2, which is pivoted at its forward end to the standard C^3 of the next preceding cylinder, and supported at its other end by a spring, *e*. The barb first rests upon the forward part of the lever, and slides back thereon until it lodges in the recess therein, as shown in Fig. 5. By the time it has reached this position it is ready for the coiling operation, and I provide the recess in order that it may be retained measurably at the start of that operation. A set-screw, *e'*, prevents too much depression of the lever. In Fig. 10 the coiling projection *c* has carried the outer end of the barb a quarter-turn. In Fig. 11 the coiling is complete, and in Fig. 12 the coiling-cylinder has been retracted slightly, so the slots in cylinder and shaft again coincide and the wire has been partially lifted from out of the same.

It will be noticed that during the coiling operation the strand-wire is wholly inclosed by the cylinder, so as to be able to withstand the lateral pressure or strain caused by the coiling, except during the instant the slot in the cylinder is crossing in its rotation the slot in the shaft; but this crossing does not occur until after the barb has been sufficiently wound to have a clamp of its own upon the strand, and, besides, the strand is then bent in conformity to the line of the wheel, so that no tendency to escape exists at such times. The inner end of the barb rests upon the lever E^2 until the barb is almost coiled and so long as its support is required.

The rotation of the cylinders for the performance of the coiling operation is insured by the teeth c^2 thereon entering the grooves upon the side of a cam-ring, F, encircling the wheel and secured firmly to the frame-work of the machine. This ring has such a number of spiral grooves *f* extending across its side surfaces as may be necessary to rotate the cylinders the required amount, each of said grooves moving the cylinder the proper distance to insure the entrance of the next tooth into the next groove. Thus in the drawings there are shown eleven of such grooves, so that cylinders provided each with five teeth will be rotated two and one-fifth revolutions in passing this part of the ring. In order to bring the cylinders back to the open position and permit the withdrawal of the wire, the last of these grooves—to wit, the one at the top of the ring marked *f'*—reverses their direction one-fifth of a turn, leaving the net rotation made by the cylinder an even two turns, while the barb may have received two and a fifth turns, or a less amount, depending upon the point at which the cylinder commenced to coil it. After thus reversing the movement of the cylinders the same tooth which passes through the groove *f'* is continued into the concentric groove f^2, which extends the remainder of the distance around the ring and opens into the first of the spiral grooves *f*, thus keeping the cylinders with the open side outermost until the strand-wire has again passed within their embrace. All the cylinders being alike, in these particulars they are operated alike by the cam-grooves in the ring, and the operation is repeated with each revolution of the wheel. By this construction, also, the cylinders are at all times controlled by the ring, so that a perfect timing of their movements is obtained, and they can never fail of being in the right position at the receiving and discharging moments. Each side of the wheel applies the barbs to a strand of the fence, and, after being barbed, the strands are brought together by the horizontal rollers G G and the feed-wheel G', either with the barbs in such close fellowship that they will form in the twisted cable what is commonly called a "four-pointed barb," or they may alternate—that is, those upon one strand may be located midway between those upon the other strand, these different results being brought about by the relative adjustment of the two parts of the wheel. Said feed-wheel is positively operated at a fixed speed by the bevel-gears G^2 and G^3, the former upon the shaft D^4 and the latter upon the shaft of the feed-wheel. From the feed-wheel the wires pass at right angles to the twister, as already explained.

Of the barb feed-rolls one of each pair receives motion from the nest of gears d d' d^2, while the mate rolls are operated from the ones so actuated by pinions d^3 and d^4. The return movement given to the coiling-cylinders by the grooves *f'* is of special importance, because the coil given to the barb should be such a one as will leave its points looking in the proper directions, and such conformation can only be imparted by revolving the coiler something more or something less than a complete revolution or number of revolutions. The coiling projection upon the ends of the cylinders is adjustable thereon, being held by a screw passed through a circular slot, as clearly shown in Figs. 8, 9, 10, 11, and 12. It also has a lip, which partially incloses the wire and prevents its escape from the projection during the coiling.

The depending ribs C^5 set down into the annular groove *m* of the wheel, whereby I am enabled easily and accurately to position them on the wheel.

So much of the coiling-cylinder as comes in contact with the fence-wire is made short, as shown, so as to avoid as far as possible any tendency to twist the said wire with it in its rotation around the same. The non-rotating support, on the contrary, is of such length as to afford the wire a long bearing.

I claim—

1. The barbing-wheel provided with a series of slotted coiling-cylinders, in combination with the cam-ring, substantially as set forth.

2. A barbing-wheel carrying a series of slotted coiling-cylinders, having projecting teeth, in combination with an annular cam provided

for a portion of its periphery with spiral grooves for rotating the cylinders, and for the remainder of its periphery with a concentric groove for holding them against rotation, substantially as set forth.

3. A barbing-wheel carrying a series of slotted coiling-cylinders, having projecting teeth, in combination with an annular cam provided with both spiral and concentric grooves, in which the said teeth are continuously confined, substantially as specified.

4. A coiling-cylinder mounted upon a moving support, and having projecting points or teeth, in combination with a stationary grooved cam engaging with said teeth, whereby the advancing cylinder is operated substantially as shown and described.

5. In an automatic barb-fence machine, the combination of a series of slotted coiling-cylinders provided with slotted supporting devices, and mounted upon a rotating wheel, in combination with said wheel, whereby the fence-wire is allowed to enter and leave said cylinders in a lateral direction as the wheel rotates, substantially as specified.

6. The slotted cylinder, the slotted supporting device and its standard, the plate, and the depending rib, having the projection by which the cylinder is confined endwise, in combination with the wheel, substantially as set forth.

7. The combination, with the coiling-cylinders, of recessed spring-levers for supporting the inner end of the barb during the coiling operation, substantially as specified.

8. A barb-fence machine consisting of a wheel carrying a series of coiling mechanisms, a cam for operating said coiling mechanisms, barb-feeding mechanism, barb-severing mechanism, and a positively operated feed-wheel, substantially as specified.

SIDNEY M. STEVENS.

Witnesses:

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THOMAS H. FULLER.