

B. SCARLES.  
WIRE NETTING MACHINE.

Patented Aug. 5, 1890.



Inventor

Benjamin Seattles,  
by Crosby Gregory *clerk*



# UNITED STATES PATENT OFFICE.

BENJAMIN SCARLES, OF CLINTON, MASSACHUSETTS, ASSIGNOR OF ONE HALF  
TO THE CLINTON WIRE CLOTH COMPANY, OF SAME PLACE.

## WIRE-NETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 433,633, dated August 5, 1890.

Application filed March 27, 1890. Serial No. 345,524. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN SCARLES, of Clinton, county of Worcester, State of Massachusetts, have invented an Improvement in Wire-Netting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to provide a wire-netting machine with devices whereby a longitudinal strand or strands may be introduced in the wire-netting at any point of its width, the said longitudinal strands adding very materially to the strength of the netting.

United States Letters Patent to myself, No. 380,664, dated April 3, 1888, show and describe a series of segments having semi-gears arranged face to face in semicircular notches in the contiguous faces of two pairs of carriages adapted to be moved longitudinally with relation to each other sufficiently to enable these segments to be interchanged or shogged to the right or left to co-operate with other segments when twisting together the wires to form the netting. These segments in one of the upper and in one of the lower rails were connected by a cop tube or chamber to receive a cop of wire.

To enable me in this class of machines to introduce a longitudinal strand at intervals in the width of the netting, I remove from both parts of the two carriages three sets of segments and attached semi-gear wherever a longitudinal strand is to be inserted, and for the central pair of segments so removed I substitute other segments, which are both connected with feet in the lower member of each pair of carriages by cop tubes or chambers, so that the central sets of segments are enabled to contain two cops rather than one, as heretofore, and between the contiguous faces of the segments of this central set in the upper carriage I lead a bobbin-wire, the bobbin-wire lying in a channel or groove in the said segments in line with their center of rotation, and the segments at the right and left of this central set of segments adapted

to rotate about a bobbin-wire, as stated, to twist two other cop-wires about it are somewhat differently shaped at their faces to enable the central segment to co-operate with them, and also to enable the semi-gears to be retained in the same size of circle, so that their teeth will correctly mesh with the sliding rack employed to rotate the segments when twisting the wires together.

In my invention, as herein shown, the central segments have each a lug extended from near one side its center to its outer side, so that when the pair of lugged segments are opposite each other the lug of one segment bears against the face of the other segment, leaving a space between the said lugs and faces for the passage of the bobbin-wire. The segments with which one of these lugged segments is engaged at the right and left as the carriages are moved are provided with transverse grooves to receive the lugs, and to enable the semi-gear on these segments to always fill out a circle or constitute a full gear of the same diameter in the different positions of the segments the latter have been provided with lips and shoulders, which contact together and act as gages, as will be described.

Figure 1 is a partial front elevation of a portion of a wire-netting machine, such as shown in the said patent with my improvements added. Fig. 2 is a section in the line  $x x$ , Fig. 1, the said section being taken through the central set of segments added by me to enable my present invention to be practiced. Fig. 3 is an enlarged top or plan view of that part of the machine shown in Fig. 1, in which I have substituted my present improvements for the segments common to the said patent. Fig. 4 is a partial longitudinal section of the part shown in Fig. 3 in about the line  $x'$ , Fig. 2, the said section being through the segments shown in Fig. 3 in the line of their semi-gear. Fig. 5 is a section of Fig. 3 in the line  $x^2 x^2$ . Fig. 6 is a section in the line  $x^3 x^3$ , Fig. 3. Figs. 7, 8, and 9 are respectively a face view, a top view, and a section through the semi-gear of one of the lugged twisting-segments; and Figs. 10, 11,



and 12 are like views of one of the transversely-grooved twisting-segments next adjacent to the lugged segments.

The frame-work A, the mesh-roll B', having 5 teeth B<sup>2</sup>, the pair of sliding carriages D D' E E', (shown as one above the other,) the sliding rack *m*, the tension-rolls *f*<sup>4</sup> *f*<sup>5</sup> *f*<sup>6</sup> *f*<sup>7</sup>, the spool *f*<sup>2</sup>, the cop-tubes *g*, connecting one of the twisting-segments in the carriage D with 10 a foot in the carriage D', are common to the said patent, except that I use the wire *f* to constitute the longitudinal strand.

In accordance with my invention, it being supposed that a longitudinal strand *f* is to be 15 introduced in the line of the second set of twisting-gears from the right of Fig. 1, I provide the carriages at that point with a pair of twisting-segments *a b*, each having a semi-gear *a*<sup>x</sup> *b*<sup>x</sup>, each segment having connected 20 to it a tube *g*<sup>x</sup>, receiving a cop of wire *g*<sup>2</sup>, each tube having a foot *a'* or *b'*, provided with a semi-cylindrical neck fitting a semicircular notch at the inner edge of one or the other of the carriages D' E'. In practice all the 25 carriages referred to will be reciprocated as in the said patent. These twisting-segments *a b* at their faces or flat sides are provided, respectively, with like lugs 3, so shaped (see Figs. 3, 4, 7, 8, and 9) as to enable one 30 lug to constitute a shoulder and come against part of one face of the opposed segment and leave a wire-passage 5 between them for the longitudinal wire *f*, led from the bobbin *f*<sup>2</sup> between the tension-rolls *f*<sup>4</sup> *f*<sup>5</sup>, &c., and up 35 between the feet *a'* *b'*, as shown in Fig. 2, the said feet having a central passage, the said wire being passed beyond the top of the said twisting-gears and having wound around it the wires *g*<sup>2</sup> from the cops in the cop-tubes *g*<sup>x</sup>.

40 The pairs of twisting-segments supported in the carriages at the right and at the left of the twisting-segments having the like lugs 3 have their faces grooved transversely, as at 8, opposite the semi-gear, (see Figs. 4, 10, and 45 12,) so that when the carriages are shogged or moved longitudinally in the directions of the arrows thereon in Figs. 3 and 4 the lugs 3 of the twisting-segments will enter a groove 8 of one of the other segments. When the segments *a b* are brought together, as in Fig. 4, 50 a wire-passage 5 for the strand *f* is left between the lugs 3 3—one on each of said segments at one side of the said groove.

I have designated the pairs of segments at 55 the right and left of the segments *a b*, which are the central segments referred to, with the letters *s s'* and *t t'*, respectively, merely to aid in their description, it being understood that the contiguous faces of the said segments are provided with the grooves 8. The segment *b* 60 has secured to its top or its top is shaped to leave a shoulder 9, the edge of which falls back of the face of the segment *b* at that side of the central groove 5 and immediately above the lip 3 of that segment, and the segment *a* 65 has at its top, but at the opposite side of the line *x*<sup>2</sup> *x*<sup>2</sup>, Fig. 3, a similar shoulder 10, which

falls back of the face of the segment *a* above the lug 3, attached to that segment. The faces of the segments *s' t'* at the opposite 70 sides of the central segments *a b* have overhanging lips 15 16, which project beyond the faces of those segments for a distance substantially equal to the distance of the shoulders 10 from the faces of the segments *a*, the 75 said projections coming in contact with the shoulders 10 and 12 at the top of the segment *a* whenever the said segments *s'* or *t'* are placed opposite a segment *a*. The segments 80 *s* and *t* have at their upper ends shoulders which correspond substantially with those described of the segment *a*. These lips and shoulders, when a segment having a lug at one side of its longitudinal center is matched with a segment having a transverse groove 8, 85 act as a gage to insure that the circle occupied by the teeth of the semi-gears of the said segments thus placed in co-operative position opposite each other will not be lessened in diameter, but will remain of the determined 90 or established diameter, in order that the said semi-gears, however they may be matched in the operation of the machine, may be correctly engaged by the rack *m*, for it will be understood that any variations in the diameter of the gear composed of any two semi-gears in any position of the carriages would prevent the proper mesh of the teeth of the rack *m* with the teeth of the said gear. 95

When the two segments *a* and *b* are in the 100 position shown in Fig. 3, the lugs 3—one on each segment—abut against the face of the opposite segment at a point where it does not have a lug, the said lugs being of proper proportion to maintain the semi-gears in their 105 center of rotation (see Fig. 4) with their teeth in the proper periphery to be engaged by the rack *m*. Now, when it is necessary to shift the carriage, as described in the said patent, segment *a*, for instance, is brought opposite 110 the segment *t'* and the segment *s* opposite the segment *b*. In this condition it will be noticed that the lips or projections 16 overhanging the face of the segment *s* will abut against the shoulder 9 at the upper part of the segment 115 *b*, and the lips 10 12 of the plate connected to the upper end of the segment *a* will abut against the shoulders 16 15 of the plate attached to the upper part of the segment *t'*, each segment having a transverse groove 8, 120 having like overhanging lips at opposite sides of the center of rotation of the said segments.

I claim—

1. The twisting-segments, each having lugs 3 at their flat sides or faces to constitute 125 shoulders and leave a space at the center of rotation of the twisting-segments for the passage of a bobbin-wire between the said segments and also to maintain them in proper rotative position, substantially as described. 130

2. The twisting-segments *a b*, each having a lug 3 located at one side of its center of rotation, each lug contacting with the faces of its opposed segment, leaving the space 5 at



the center of rotation of the segment for the passage of a bobbin-wire, each segment having an attached cop tube or chamber adapted to carry a wire, whereby the wires coming from both of said cop-tubes may be wound around the bobbin-wire, leaving the latter as a longitudinal strand extended through the fabric in the direction of its length, substantially as described.

3. The segments *a b*, having lugs 3, and the reciprocating carriages in which they are mounted, combined with other segments having transverse grooves 8 for the entrance of the lugs 3 when the carriages are moved longitudinally one with relation to the other to shift the segments, to thereby bring the segments *a b* opposite to and into operative contact with the segments, respectively, adjacent thereto, substantially as described.

4. The segments *a b*, having lugs 3, and the carriages in which they are mounted, combined with other segments having transverse grooves 8 for the entrance of the lugs 3 when the carriages are moved longitudinally one with relation to the other to shift the segments, and with lips located at the tops of the said segments to act as gages and keep the semi-gears attached to the said segments in proper circle to mesh correctly with and operate the rack-bar, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJAMIN SCARLES.

Witnesses:

JAS. H. CHURCHILL,  
EMMA J. BENNETT.