(No Model.) 4 Sheets—Sheet 1.

O. P. BRIGGS.

MACHINE FOR WEAVING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 348,150. Patented Aug. 24, 1886.

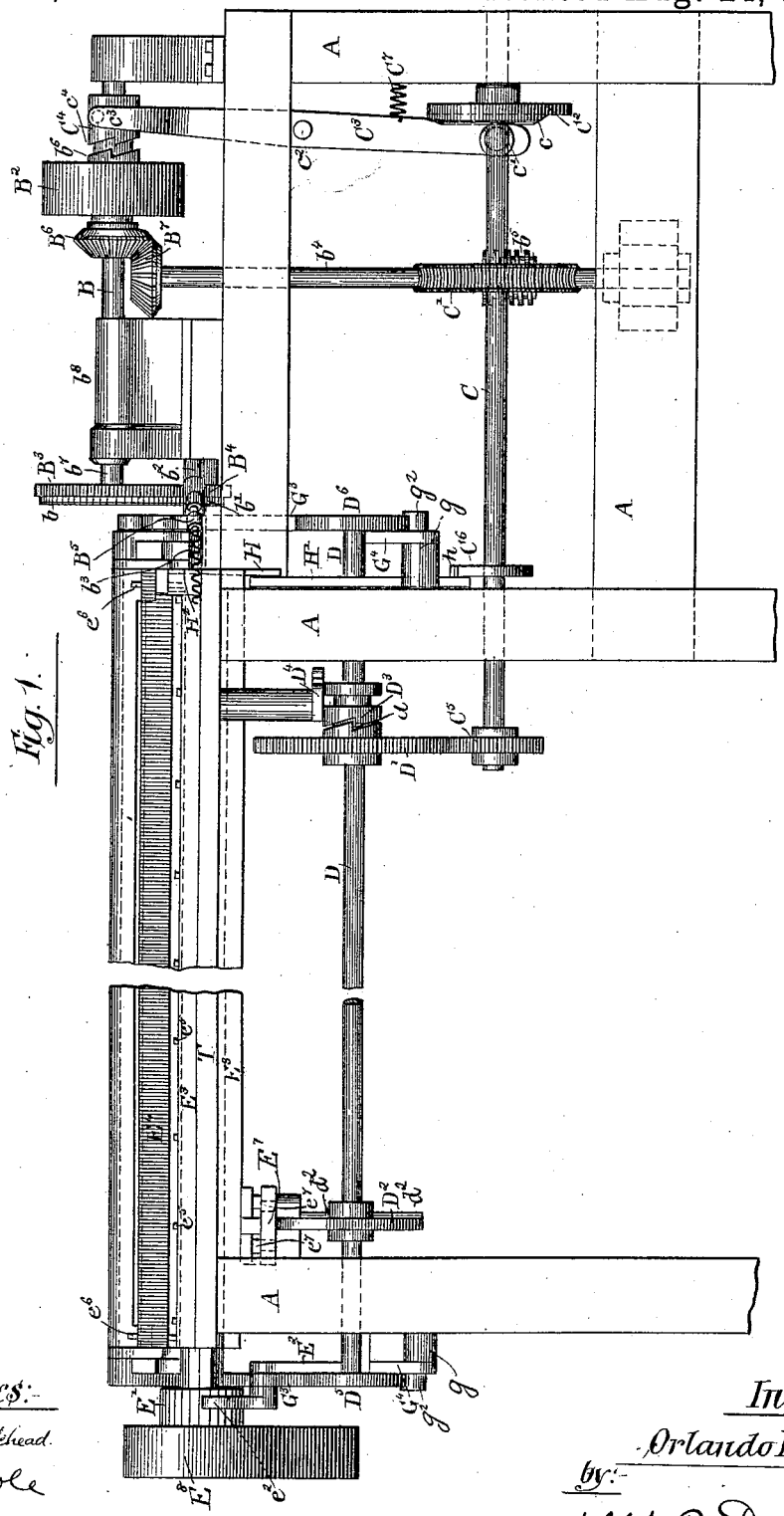


Fig. 1.

Witnesses:-
Louis W. Whitehead.
C. C. Poole

Inventor:-
Orlando P. Briggs
by:-
M. E. Dayton
Attorney:-

(No Model.) 4 Sheets—Sheet 2.

O. P. BRIGGS.

MACHINE FOR WEAVING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 348,150. Patented Aug. 24, 1886.

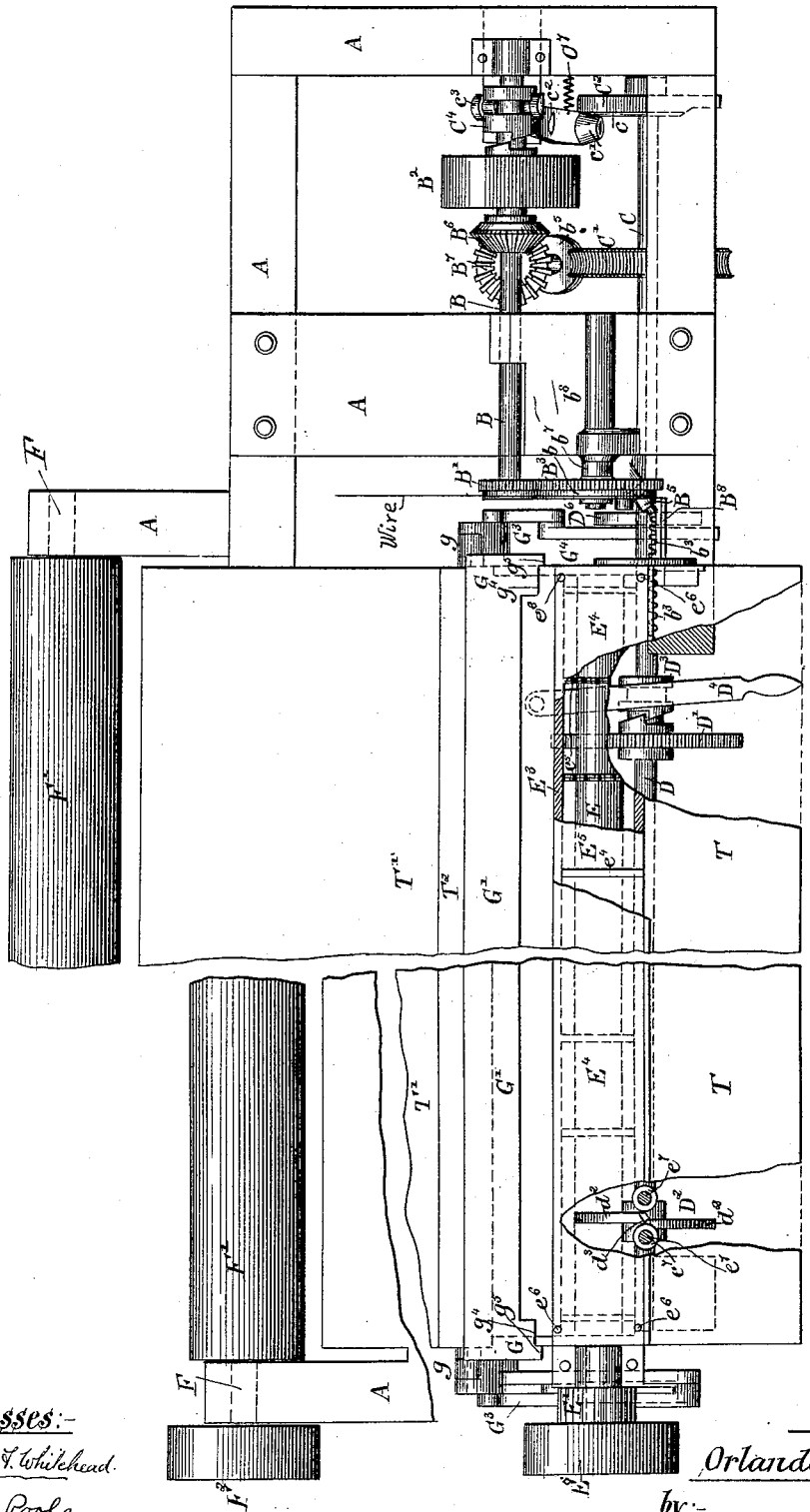


Fig. 2.

Witnesses:-
Louis M. T. Whitehead.
C. C. Poole

Inventor:
Orlando P. Briggs.
by:-
W. E. Dawson
Attorney:-

(No Model.) 4 Sheets—Sheet 3.

O. P. BRIGGS.

MACHINE FOR WEAVING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 348,150. Patented Aug. 24, 1886.

Fig. 3.

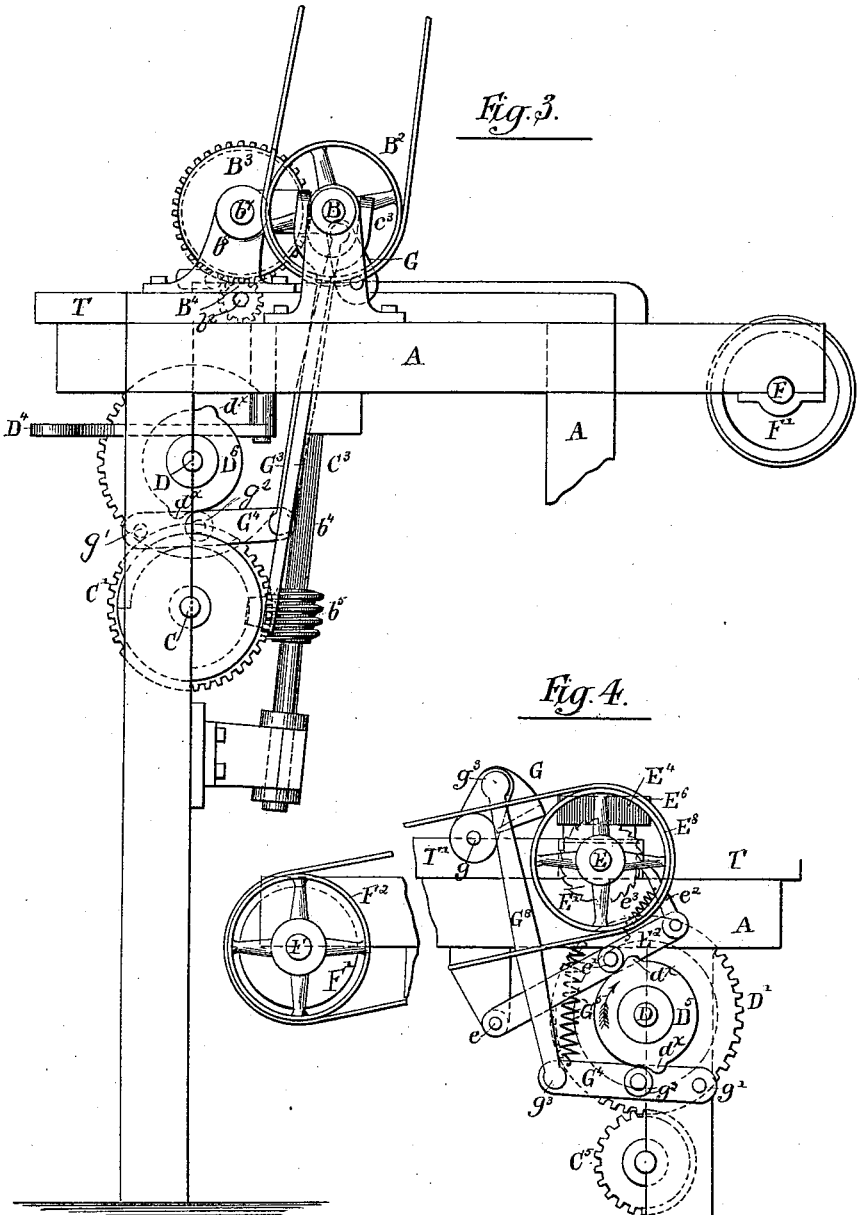


Fig. 4.

Witnesses:-

Louis W. Whitehead.

C. C. Poole

Inventor:-

Orlando P. Briggs.

by:- W. L. Dayton

Attorney:-

(No Model.) 4 Sheets—Sheet 4.

O. P. BRIGGS.

MACHINE FOR WEAVING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 348,150. Patented Aug. 24, 1886.

Fig. 5.

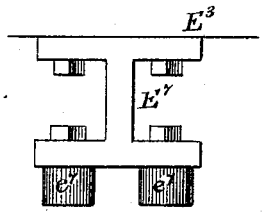


Fig. 6.

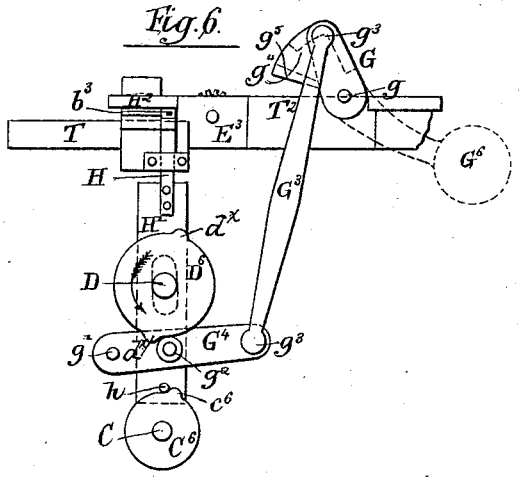


Fig. 7.

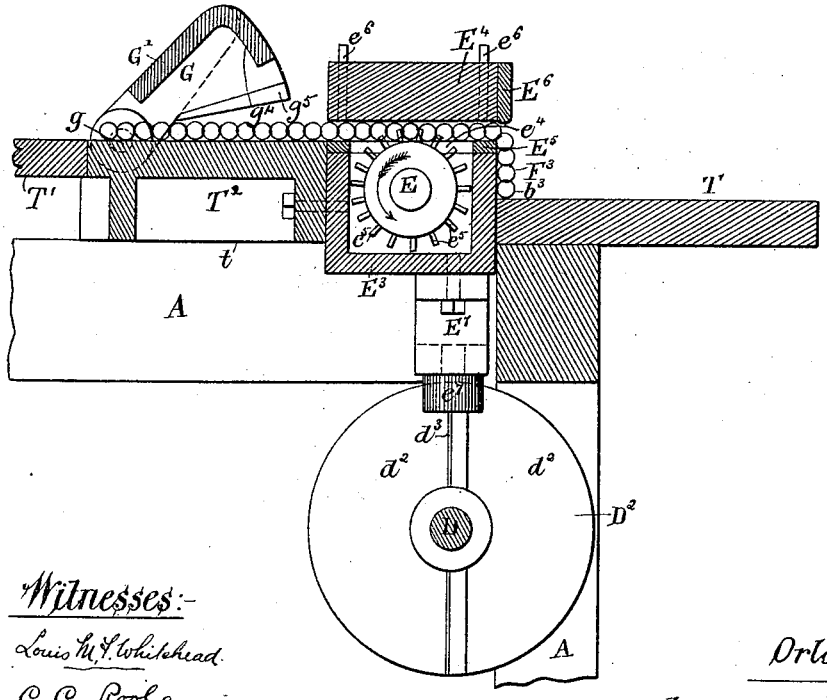


Fig. 7ª

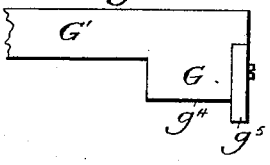
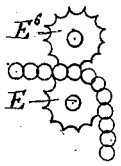


Fig. 8.



Witnesses:-
Louis M. L. Whitehead.
C. C. Poole

Inventor:-
Orlando P. Briggs.
by:- M. E. Dawson
Attorney:-

UNITED STATES PATENT OFFICE.

ORLANDO P. BRIGGS, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHARLES L. AMES AND ABEL H. FROST, BOTH OF SAME PLACE.

MACHINE FOR WEAVING COILED-WIRE FABRIC FOR BED-BOTTOMS.

SPECIFICATION forming part of Letters Patent No. 348,150, dated August 24, 1886.

Application filed June 18, 1885. Serial No. 169,148. (No model.)

To all whom it may concern:

Be it known that I, ORLANDO P. BRIGGS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Weaving Coiled-Wire Fabric for Bed-Bottoms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an automatic machine for weaving coiled-wire fabric for bed-bottoms. The apparatus heretofore employed for the purpose of weaving such fabric consists of a broad table on which the fabric lies while being made, and a coiling-machine arranged at one end of said table and run by hand or power. In order to enable each new coil as it is being made to run forward into a marginal coil of the fabric being woven, it is necessary to move the fabric or said marginal coil thereof longitudinally to or from the machine, preferably about half of the length of one twist of a coil, in order to insure the entrance thereto of the new coil to be added to said fabric, and to prevent its running out at any point in the length of the coil with which it is being woven. This longitudinal movement of the fabric or of its marginal coil, (for, of course, only the marginal coil need be so moved,) has heretofore been produced by hand as has also the bodily backward movement upon the table of the entire fabric as new coils are added. When each coil is completed or made of the proper length, the machine is stopped and the coil is cut by hand, and the fabric is readjusted on the table for the reception of a new coil, after which the machine is again started and the operation repeated. It has also been customary in thus weaving bed-bottom fabric by hand to interlace or interweave as many coils as are required to make a single bed-bottom, and to thereafter start a new fabric.

In my invention I propose to effect all the several movements required in and by the same machine automatically, and also to make a continuous fabric composed of transverse coils from which a suitable quantity to form a single bed-bottom may be detached as required, either by cutting the wire or by the withdrawal otherwise of a coil thereof.

To the ends above set forth my invention consists in the matters substantially hereinafter described, and more definitely pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a front elevation of a machine embracing my improvements. Fig. 2 is a top view of said machine, having parts broken away. Fig. 3 is an elevation of that end of the machine to which the driving-pulley is applied. Fig. 4 is a broken elevation of the opposite end of the machine. The remaining figures are details.

A A is any suitable frame, preferably of such height as to bring the working parts of the machine at a proper elevation to be conveniently manipulated or observed by a person standing. At one end of the frame is located a coiling mechanism, of which B is a horizontal driving-shaft mounted in suitable bearings and arranged longitudinally with the machine. Said shaft carries the driving-pulley B^2, and at one end a pinion, B′, which meshes with the spur B^3 on the shaft b^7, arranged parallel with the shaft B in the long bearing b^8 of Fig. 2. The outer face of the spur B^3 is provided with a narrow feed cylinder or flange, *b*, having a circumferential groove, (seen clearly in Fig. 2,) and immediately beneath this spur B^3, and intermeshing therewith, as seen in Fig. 1, is located the pinion B^4 on the shaft b^2, and having the opposing wire-feeding cylinder or flange *b′* provided with a groove similar to and opposite that in the face of the flange *b*.

B^5 is the coiling-spindle, arranged to receive the wire from the feed-faces *b b′* and to direct the coil b^3 to the left as it passes from said coiler.

B^8, Fig. 2, is a suitable guide-plate arranged to direct the coil being made accurately in its proper course lengthwise of the machine as it leaves the coiling-spindle.

Any other suitable coiling mechanism may be employed in place of that above shown and described, which is not new.

Mounted on the frame A, and just in the rear of the free end of the coiling-spindle B^5, is a carrier or feed shaft, E, a little longer than

the coils of the fabric, arranged longitudinally of said frame and supported at its ends, as here shown, in a cast-iron box or shell, E^3, which, for reasons hereinafter stated, has a longitudinal movement upon the frame A. Said carrier is intended to engage the fabric near that edge thereof to which the coils are successively added, and, by a rotative movement produced by means to be described, to carry the fabric backward at suitable intervals as the new coils are added. For this purpose said carrier or feed shaft is provided on its surface with radial pins e^5, Fig. 7, arranged in circumferential series at intervals of a few inches along the length of the shaft, as shown in Fig. 2. A cap-plate, E^5, Figs. 2 and 7, rests on the shell E^3, and is provided with transverse slots e^4, through which the pins e^5 protrude a sufficient distance to properly engage the fabric by entering the same between the wires of its coils. Said fabric is held in positive engagement with the pins e^5 by means of any suitable presser or guide arranged above the carrier-shaft, such suitable means consisting, as here shown, of a presser-bar, E^4, of equal length with the frame E^3, arranged to bear by its weight upon the fabric directly over the pins e^5, and held laterally and removably in place by means of vertical guide-posts e^6, set in or secured to said frame E^3 and rising through or at the sides of said presser-bar, as indicated in Figs. 1, 2, and 7. Instead of a bar, E^4, a roller may be employed, if preferred, which roller may be retained in place by having its ends or terminal spindles arranged in slotted uprights secured to the shell or frame E^3.

In front of the carrier-shaft described is located a narrow ledge or table, T, and at the rear of said shaft a broader table, T'. At the rear of this table T', and parallel with the carrier-shaft E, is located a long winding-drum, F', mounted upon a shaft or spindle, F, being intended to receive the fabric as it passes backward from the carrier E, and rotated by suitable means, as will be described.

The new coils are successively added immediately in front of the carrier-shell E^3, and the coiling-spindle B^5, or other coiling device employed, is arranged to send the coil forward parallel and in proximity with the front vertical face of said shell, as indicated in Figs. 1, 2, and 7, either with the aid of a guiding device, B^8, or by such a position of the coiling-spindle as will render such guide unnecessary, it being common to locate and arrange the coiling-spindle in such a position as to give a desired course to the coil as it leaves said spindle.

In order that the last formed and marginal coil of the fabric may be positively held in proper position, vertically and laterally, to receive the next coil to be added thereto, the edge of the fabric in the machine, as herein shown, is allowed to depend from the edge of the shell E^3, or of its cap-plate E^5, to the extent, say, of three or four coils, or thereabout, as experience may show to be desirable, the last coil made resting by its gravity in the proper position against the front face of the shell E^3 to receive the new coil to be added. To further insure the proper position of the last-made coil of the fabric and to prevent the fabric from being drawn unevenly forward by the carreir E, a presser, E^6, is provided, which, as here shown in the drawings, consists of a heavy strip of soft rubber attached to and extending slightly below the front face of the bar E^4. Said presser E^6 may, however, be wholly independent of the bar E^4, and may consist of a roller of rubber or of other material, and, if desired, a second roller may be arranged beneath the fabric in opposition to that just mentioned in place of the edge of the plate E^5.

In the operation of a machine for automatically weaving coiled-wire fabric, as herein contemplated, it is necessary that the coiling device be arrested on the completion of the coil, that the coil be severed near the coiler, that the fabric be fed forward, and that at least its final or marginal coil be shifted longitudinally for the reception of a new coil, and that on the completion of this last movement the coiler shall be again set in motion. For the accomplishment of these various purposes the following mechanisms are shown: The driving-pulley B^2 is made to run loosely on the shaft B and is in constant motion. It has a clutch-hub and a corresponding gland, C^4, and is feathered on the shaft B. The gland is operated by a vibrating lever, C^3, pivoted at c^2 and connected with said gland at c^3 in the usual manner. Fixed to the opposite side of the hub of the pulley B^2 is a beveled pinion, B^6, arranged to engage with the similar pinion B^7 on the vertical shaft b^4. Said shaft b^4 is provided with a worm, b^5, which engages with the worm-wheel C' on the shaft C, which being thus actuated is also in constant motion. Upon said shaft C is fixed a cam-wheel, C^2, operating by a suitable elevation, c, on its side face, engaged with the roller c' on the lower end of the lever C^3, to throw the gland C^4 out of engagement with the pulley B^2. A spring, C', connected with said lever and with the frame, as shown, opposes the cam and throws the clutch into engagement with the pulley when the roller c' has passed the prominence c. At the proper point in the path of the coil b^3 is located a suitable device for severing said coil, which, as here illustrated, consists of a vertically-reciprocating blade, H, which cuts by its upper edge, arranged in suitable relation to the opposing stationary cutter H^2, as plainly shown in Fig. 6. The blade H is arranged in suitable guides, as shown, and is attached to the reciprocating vertical slide H', extending down into proximity with the cam C^6 on the shaft C, where it is provided with a laterally-projecting pin, h, which rides on the periphery of said cam. A suitable projection, c^6, on said periphery strikes the pin h and lifts the slide H' and its connected knife H at the

proper time and severs the coil b^3. Usually a downwardly-pulling spring will be employed to lower the knife slide; but it may fall by its own weight, if so constructed.

For the purpose of actuating the carrier E, the shaft D is provided, being arranged longitudinally of the machine and beneath said carrier, as clearly shown. Said shaft is driven continuously (unless thrown out of action by the hand-lever D^4, as will be explained) by the spur D', meshed with the pinion C^5, fixed to the inner end of the shaft C, as seen in Fig. 1. On the shaft D is secured a side bearing cam disk or wheel, D^2, consisting, as here shown, of two semicircular plates, d^2 d^2, affixed in the offset relation shown in Fig. 2, and having their adjacent diametrical edges beveled outwardly in opposite directions, as also seen at d^3 in Fig. 2. For the purpose of engaging this cam the longitudinally-movable carrier shell or frame E^3 is provided with a depending rigid arm, E', having two rollers, e^7 e^7, arranged one on either side of the disk D^2 and at such a distance apart that by the rotation of the cam the carrier will be thrown alternately one way and the other longitudinally the desired distance to provide for the insertion of each new coil, as stated.

To provide for throwing the shaft D out of action, the spur D' is made to run loosely on said shaft, and a sliding clutch-gland, D^3, is feathered on the shaft, and controlled by the hand-lever D^4, as shown in Figs. 1 and 2.

For the purpose of giving the desired rotative movement to the carrier-shaft E, said shaft is provided with a ratchet, E', (seen in Fig. 4,) engaged by a movable pawl, e^2. Said pawl e^2 is pivoted to the free end of the arm E^2, which is fulcrumed at e and is vibrated by a cam, D^5, on the shaft D, provided with a suitable projection or projections, d, which engage the laterally-projecting roller-pin e' on the side of said arm. The winding-drum F' is rotated in the same direction with the carrier by means of a belt leading from the pulley E^8 on the shaft E to the equal pulley F^2 on the shaft or spindle F of said winding-drum, said belt being intended to slip, as required, by the varying quantity of fabric on said drum.

The longitudinal and rotative movements of the carrier-shaft E may be simultaneous or successive, as preferred, and the winding drum with the table may partake of the movement of the carrier or not. Provision is made for a laterally stationary position of the pawl e^2, when such longitudinal movement of the carrier takes place, by giving the ratchet E' suitable width, as shown in Fig. 1.

Obviously the several cams and connections just described may be so timed in their intervals and durations of movement as to give the required succession to the several operations of starting, stopping, cutting, feeding, and shifting, as will be necessary in an operative machine.

As here illustrated, the machine is represented as being intended to make a fabric containing double coils, and to make each of the two coils forming the double coil separately, wherefore the carrier-feed is constructed to retain the fabric unmoved in either direction until the coiler shall have completed said two coils, after which it shifts and feeds.

A coiler adapted to make a double coil by one operation, or, in other words, two coils simultaneously is the subject of another patent—to wit, No. 335,889, dated February 9, 1886—and when said double wire-coiler is used in the machine herein described, the latter will be arranged to shift and feed at each cycle of movements in the remaining parts. This will be effected by doubling the speed of the shaft D, or reorganizing the cams thereon to the same effect. By throwing the said shaft out of engagement with the clutch D^3, a coil containing any number of wires may be formed at intervals in the fabric. Instead of employing the hand-lever D^4 here shown for this purpose, a cam-wheel may be used, having its motion reduced by a train of gear-wheels actuated from a pinion on the shaft C.

The foregoing description provides for all of the movements and operations requisite for automatically weaving a coiled-wire fabric. Two other operations, usually performed on the fabric before its application to the bed-bottom frame, are also provided for in the machine illustrated—namely, the flattening of the ends of the coils, and the trimming of the ends of the coils or of the margins of the fabric, for the purpose of fitting the same to be more readily, securely, and neatly fastened to the bed-frame after the fabric has been separated into parts suitable for single bed-bottoms. To these ends a cast-iron section, T^2, of the table is arranged immediately at the rear of the carrier-case E^3, and preferably secured to said case in order to be longitudinally movable with it. Said section of the table is made of length equal to the required length of the coil, or, in other words, equal to the desired width of the fabric, and arranged so that as the fabric passes backward the raw edges slightly overhang the ends of said table T^2. Outside each end of this table T^2 is pivoted, at g, a compressing-jaw, G, which has its under face, g^4, inwardly extended to overhang said table to a distance of, say, an inch and a half, as best seen in the front view of the compressing-jaw shown in Fig. 7ª, said under face, g^4, being so directed as when lowered to a distance from the upper face of the table equal to, say, two thicknesses of the wire entering into the fabric, to stand parallel with said face of the table. Both jaws G are preferably connected with each other by a somewhat elevated bar, G', and said bar and jaws may desirably be cast in a single piece. The compressing-faces g^4 may be chilled or faced with hardened steel.

For the purpose of trimming off the edges of the fabric, each jaw G is provided with a steel knife, g^5, which is arranged to work like a shear in connection with the outer edge of

the table-section T^2, which may be steel-faced for this purpose. The jaws are brought down forcibly upon the edges of the fabric at times when the latter is at rest, and in their descent simultaneously flatten and trim its edges, a short section at a time. The following are suitable means for actuating the jaws G.

Referring to Figs. 1, 2, 3, and 6, D^6 is a peripheral cam-wheel, similar to the cam D^5, and affixed to the opposite end of the shaft D. G^4 G^4 are horizontal levers pivoted to the frame A at g' g', in position to engage with the peripheries of the several cams D^5 D^6 by a roller-pin, g^2, and at the inner ends of said levers are pivoted the connecting-rods G^3 G^3, which at their upper ends are also pivoted to the jaws G G at g^3. The projections d^4 d^4 on said cam-wheels D^5 D^6 strike the roller-pins g^2 and depress the free ends of the levers G^4, and thereby force the jaws G G downward upon the edges of the fabric beneath them and flatten it as desired. A spring, G^5, or an equivalent weight, G^6, (shown in dotted lines of Fig. 6,) raises the jaws when the cams have ceased to act and hold them up until again depressed in the manner described.

The fabric may be accumulated upon the drum F' to any desired amount, and any suitable registering mechanism may be employed to denote the quantity so accumulated. When a drum is filled, the fabric is severed near the drum and the latter is removed and replaced by another, the construction and mode of mounting the drum for this purpose being such as is well known in similar situations.

The fabric is separable into parts, each of size suited to a single bed-bottom, by the withdrawal of one of the transverse coils, which may be accomplished by drawing it out or by cutting it off near the points where it has been flattened by the jaws G, and rotating it like a screw, so as to carry it out of engagement with adjacent coils or by cutting it centrally or otherwise.

Usually the marginal coils of a fabric for each bed-bottom are made up of several wires. By the use of the hand-lever D^4 in the machine as here illustrated, these heavier marginal coils may be made to include any desired number of wires, and they may be joined by a single wire coil, which will mark the point of separation, or suitable automatic means of the character before suggested may be employed to give the heavy marginal coil and to connect them by a single coil. The necessary continuity of the fabric may be obtained by connecting the marginal coil of one bed-bottom with that of the next by means of short hooks or rings, by the removal of which the fabric is separated into parts. For the purpose of this patent such means of connecting sections of the fabric are to be understood as being the equivalent of the method above described, and as covered by the appended claims.

In putting the machine in operation, a short section of fabric is first made on the ledge T, or in another ordinary machine, and this section is arranged in the carrier-drum E, for which purpose the presser-bar E^4 is preferably made removable, as described, and lifted off its guide-pins.

In place of the feeding or carrier devices above described, a pair of rollers, longitudinally corrugated to fit the surface of the fabric, may be employed, being positively actuated or rotated to carry the fabric forward in substantially the same manner as described of the shaft E. Said rollers may be arranged in position to serve the purpose both of the carrier and of the tension-regulating presser E^6, and in this relation such rollers are shown in end elevation, and with the fabric between them in Fig. 8.

As above pointed out, the final coil of the fabric, in order to properly receive the new coil, needs to be governed in two particulars. First, it needs to be held in line parallel axially with the new coil to be inserted; and, second, to be longitudinally moved a short distance after the completion of the coil, in order that the end of the new coil may properly and surely enter the successive twists of said last marginal coil, or, in other words, in order that the coil being made may not escape from said last-formed coil while advancing from the coiler. In the machine described the final coil is brought into linear position by the feeding device, which, as here organized, sustains said coil in a dependent position. In the machine as shown, also, the final coil is moved endwise by the action of the devices concerned in feeding the fabric; but, obviously, the said final coil may be controlled in both these particulars by mechanism independent of the feeding devices. For example, the longitudinal movement of the final coil, in the machine described, is produced by an endwise movement of the feed cylinder or carrier E, the shell E^3, and the presser E^6. Separate means for this longitudinal movement of the final coil may manifestly be employed, actuated by the cam D^2, or otherwise; or, if desired, all means may be omitted from the machine for this purpose, and the desired movement may be made by the hand of an attendant.

I claim as my invention—

1. In a machine for making coiled-wire fabric for bed-bottoms, the combination, with mechanism for coiling the wire, of automatic means for bringing the final coil into linear position to receive the next coil, substantially as described.

2. In a machine for making coiled-wire fabric for bed-bottoms, the combination, with mechanism for coiling the wire, of mechanism for bringing the final coil of the fabric into linear position for the insertion of the next coil, and mechanism for moving the final coil of the fabric longitudinally after the completion of a coil, substantially as described, and for the purposes set forth.

3. An automatic machine for weaving coiled-wire fabric, embracing the following mechanisms, namely: a wire-coiler, means for arrest-

ing and starting the coiler at stated intervals, means for severing the coils when completed, and means for carrying the final coil of the fabric into position to receive the next coil to be added, said mechanisms being connected and driven to coact in due order and relation, substantially as set forth.

4. An automatic machine for weaving coiled-wire fabric, embracing the following mechanisms, namely: a wire-coiler, means for arresting and starting the coiler at stated intervals, means for severing the coil when completed, means for supporting the fabric in position to receive the coil to be added, and means for feeding forward the fabric preparatory to the insertion of a new coil, said mechanisms being connected and driven to coact in due order and relation, substantially as set forth.

5. In an automatic machine for weaving coiled-wire fabric, the combination of a coiler, mechanism for starting and stopping the coiler, mechanism for severing the coil, mechanism for moving the final coil of the fabric longitudinally, and mechanism for feeding the woven fabric forward, together with means for actuating these several mechanisms so as to secure their co-operation at proper intervals of time and in due order of sequence to produce a continuous fabric, substantially as described.

6. In an automatic machine for weaving coiled-wire fabric, the combination of a coiler, mechanism for starting and stopping the coiler, mechanism for severing the coil, mechanism for moving the final coil of the fabric longitudinally, mechanism for carrying the fabric forward, mechanism for flattening the edges of the fabric, and means for actuating these several mechanisms at proper intervals of time and in due order of sequence so as to produce a continuous fabric, substantially as described.

7. In an automatic machine for weaving coiled-wire fabric, the combination of a coiler, mechanism for starting and stopping the coiler, mechanism for severing the coil, mechanism for moving the final coil of the fabric longitudinally, mechanism for carrying the fabric forward, mechanism for flattening the edges of the fabric, mechanism for trimming the edges of the fabric, and means for actuating these several mechanisms at proper intervals of time and in due order of sequence so as to produce a continuous fabric, substantially as described.

8. In an automatic machine for weaving coiled-wire fabric for bed-bottoms, embracing a wire-coiler, the combination, with the coiler-driving shaft, of the loose pulley B^2, provided with the pinion B, the shaft b^4, provided with the pinion B^7 and with the worm b^5, the shaft C, provided with the worm C′ and cam C^2, the clutch-gland C^4, and the shifting-lever C^3, together arranged and operating substantially as described, to give the required intermittent movement to the coiler, as set forth.

9. In a machine for weaving coiled-wire fabric, the combination, with a wire-coiler and a shaft, C, of the mechanism for starting and stopping the coiler, the cam C^6 on the shaft C, and the reciprocating cutter H, suitably engaged with said cam and arranged to act when the coiler is at rest, substantially as described.

10. In combination with a wire-coiling mechanism having an intermittent motion, a carrier, E, having an intermittent movement for feeding the fabric forward and an intermittent longitudinal movement for bringing the final coil of the fabric into position to receive a new coil, together with suitable actuating mechanism, substantially as described.

11. In combination with the continuously-rotating shaft C, provided with the pinion C^5, and with the carrier E, suitably mounted to allow a rotary and a longitudinally-reciprocating movement thereof, and provided with the studs e^7 e^7 and ratchet E′, the shaft D, provided with the loose wheel D′, intermeshed with the pinion C^5, and also provided with cams D^2 and D^5, a clutch for engaging the shaft D with the wheel D′, and the pawl e^2, engaged with the ratchet E′, and actuated by cam D^5, substantially as described.

12. In an automatic machine for weaving coiled-wire fabric, comprising a coiling mechanism and a bodily-movable carrier for feeding the fabric and for shifting the final coil thereof longitudinally into position to receive an additional coil or coils, the combination of a shaft, D, a loose driving-spur, D′, thereon operated from the coiling portion of the machine and having a clutch-hub, a gland, D^3, feathered on the shaft D, and a lever, D^4, by which the spur may be released, and the carrying and shifting mechanism driven thereby may be allowed to stand while any desired number of coils are being run into the same coil of the fabric, substantially as described.

13. In combination with the table-section T^2 in a machine for weaving coiled-wire fabric having transverse coils, the jaws G, arranged and actuated to flatten the edges of the fabric, substantially as described.

14. In combination with the table-section T^2, the jaws G, provided with cutters g^5, arranged and operating in connection with said table-section to simultaneously flatten and trim the raw edges of the fabric, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

ORLANDO P. BRIGGS.

Witnesses:

JESSE COX, Jr.,

C. CLARENCE POOLE.