

(No Model.)

6 Sheets—Sheet-1.

C. KEHR.

MACHINE FOR WEAVING COILED WIRE FABRIC.

No. 463,993.

Patented Nov. 24, 1891.

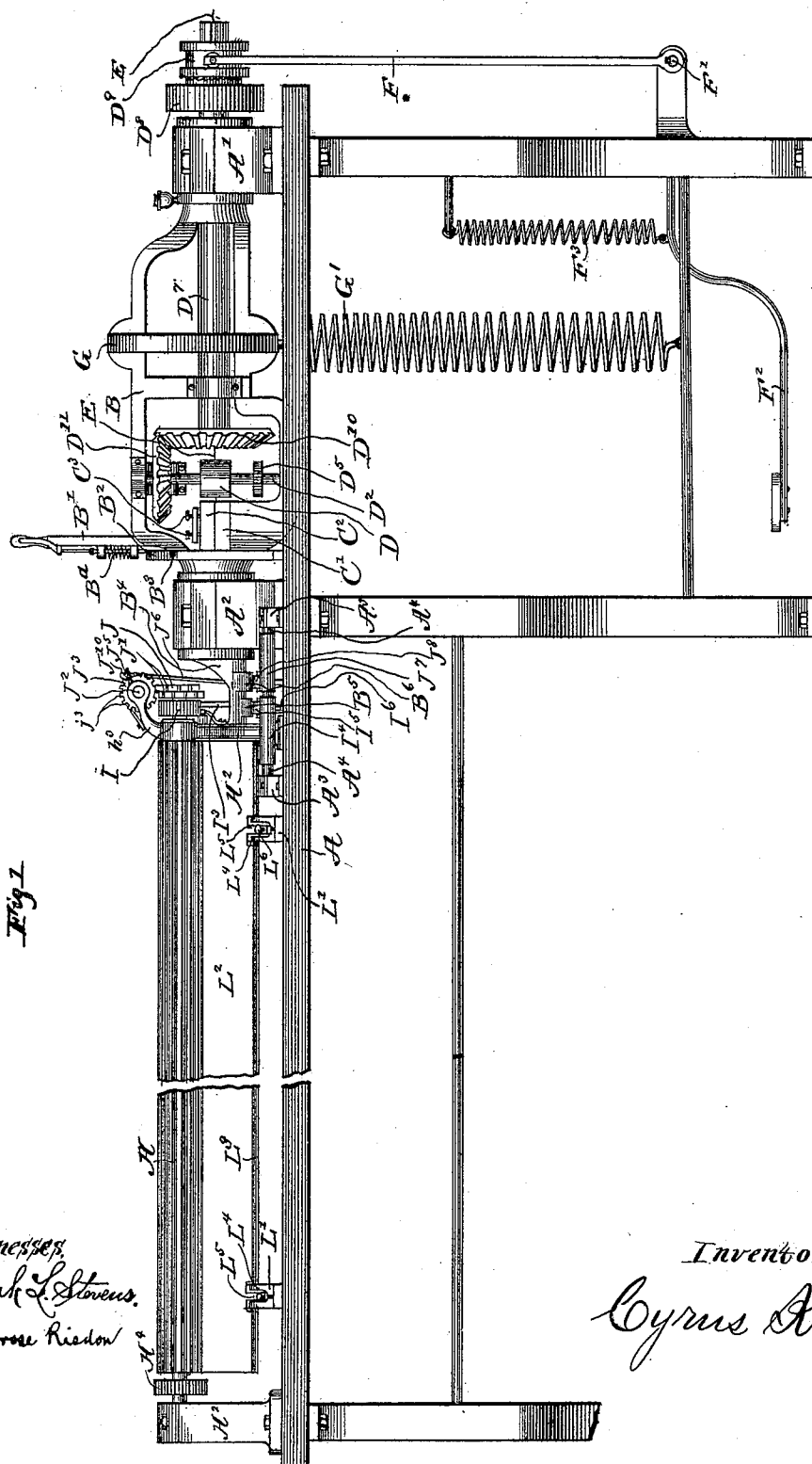


Fig. 1.

Witnesses,
Frank L. Stevens.
Ambrose Riedon

Inventor,
Cyrus Kehr.

(No Model.)

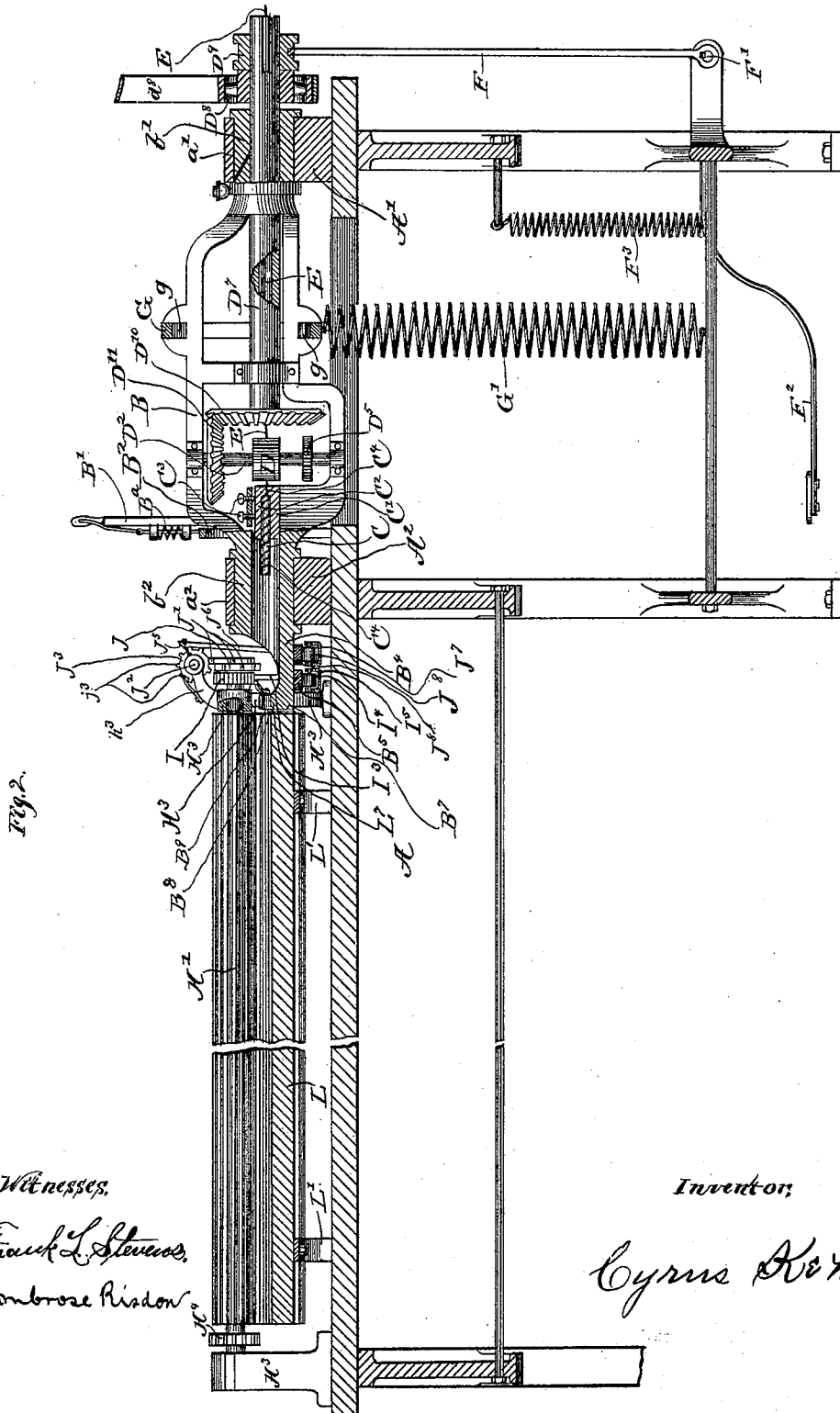
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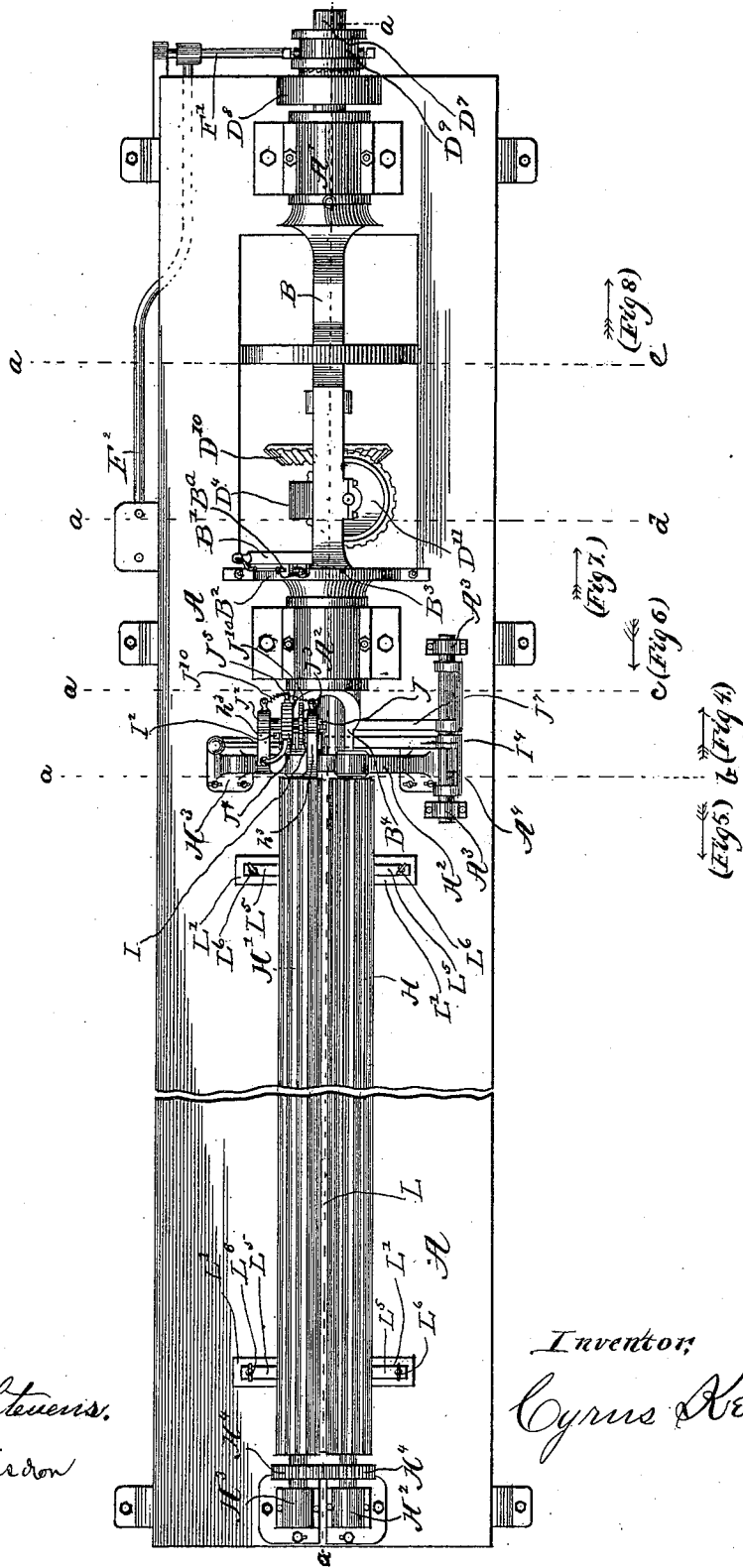
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Fig. 3.



Witnesses.

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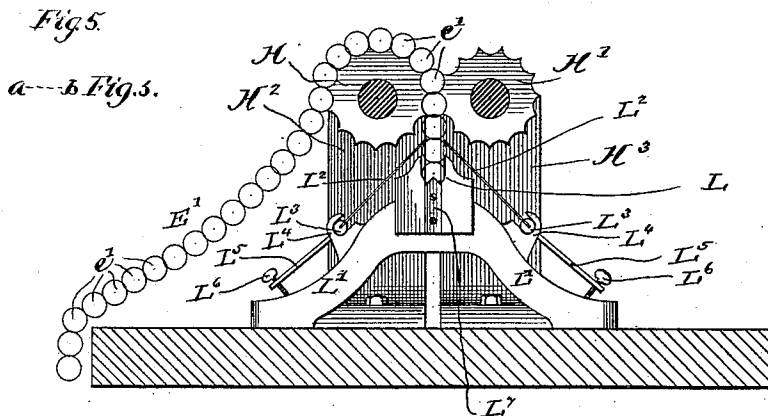
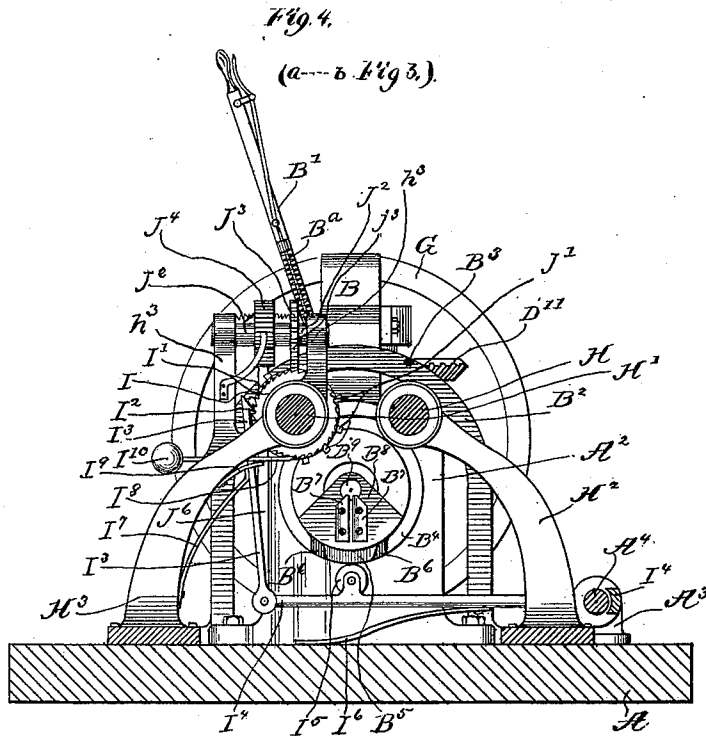
6 Sheets—Sheet 4.

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Fig. 6.
(a---c Fig. 3.)

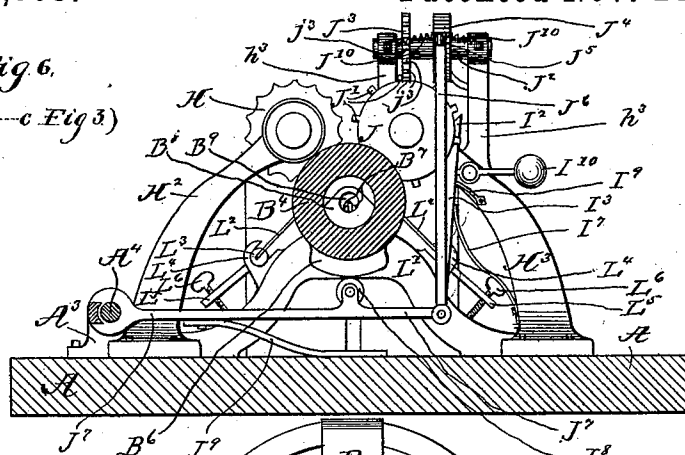


Fig. 7.
(a---d Fig. 3.)

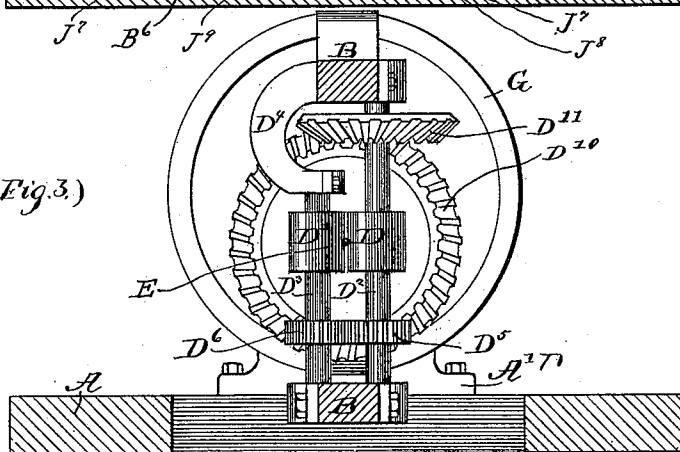
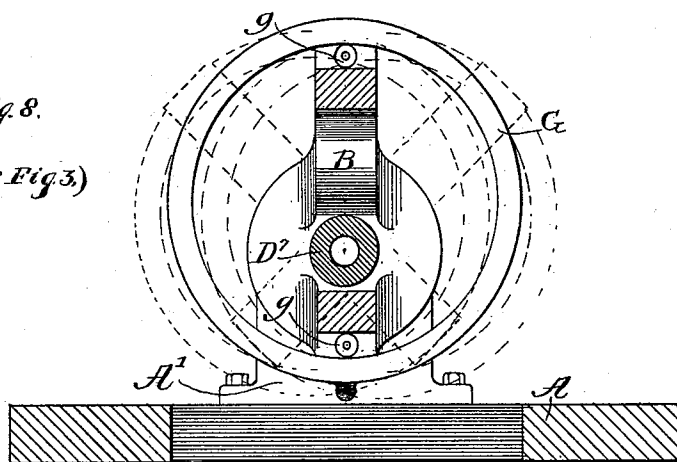


Fig. 8.
(a---c Fig. 3.)



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Fig. 9.

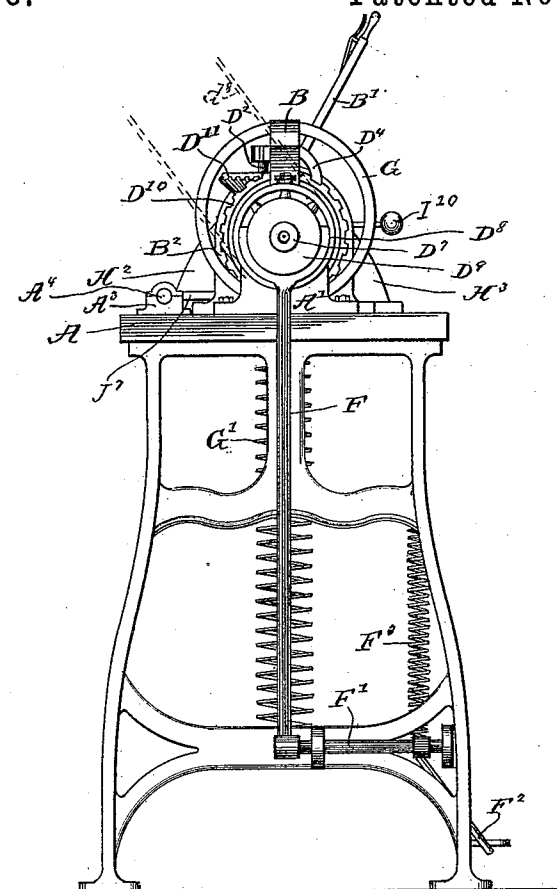


Fig. 10.

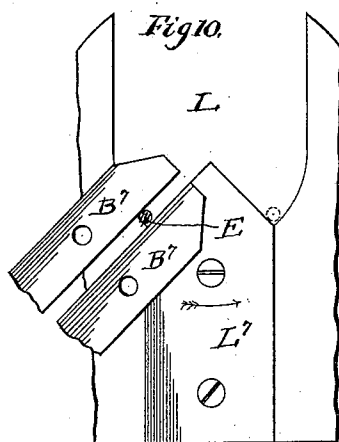


Fig. 11.

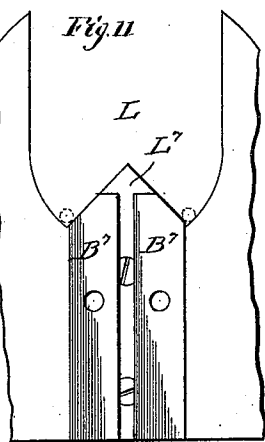
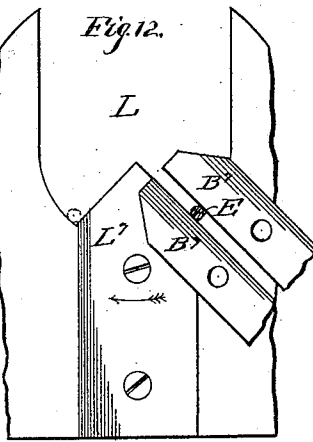


Fig. 12.



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UNITED STATES PATENT OFFICE.

CYRUS KEHR, OF LAKESIDE, ILLINOIS.

MACHINE FOR WEAVING COILED-WIRE FABRIC.

SPECIFICATION forming part of Letters Patent No. 463,993, dated November 24, 1891.

Application filed February 16, 1891. Serial No. 381,630. (No model.)

To all whom it may concern:

Be it known that I, CYRUS KEHR, a citizen of the United States, residing at Lakeside, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Weaving Coiled-Wire Fabric; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates, particularly, to the weaving of coiled-wire fabric for bed-bottoms and similar purposes, such fabric consisting of parallel longitudinal interlinked spiral wire coils.

The object of my invention is to render unnecessary the longitudinal shifting of the fabric after each new coil has been made. Heretofore it has been the custom to shift, either manually or mechanically, as much of the fabric as has been woven longitudinally toward the coiling-machine a distance equal to the distance traversed by the wire of the coils in making a half-turn and after the completion of the next coil to shift the entire fabric away from the coiler the same distance. The coiling-machine is usually arranged at one end of a table and the fabric formed upon such table by projecting the coils from the machine horizontally over said table, each new coil being made to intertwine at each turn with the last preceding coil, the coils already made being shifted back and forth by the hand of the operator. In a few machines the table or equivalent part supporting the fabric is arranged to be shifted back and forth toward and from the coiler by automatic mechanism. Such a table or supporting apparatus must necessarily be as long as or longer than the fabric, which is usually six feet, and such table and the mechanism thereto connected and the fabric form a heavy and awkward load to reciprocate. In my improved apparatus the weaving-machine is of itself of such construction as to avoid the necessity for this longitudinal reciprocation of the fabric. In this class of machines the wire is coiled by being forced through a spiral die or passage, and

such passage is made so accurate that the wire projected therefrom travels continuously forward in the same path, so that if sufficient wire for one length of coil of the fabric be projected from said coiler and the coiler stopped and the wire cut at the proper length and the coiler again started the new coil of wire now driven forward will go in exactly the path traversed by the wire just cut off, so that it cannot proceed over the length of the fabric without at every turn meeting the wire of the last coil, notwithstanding the fact that the last coil has been shifted laterally. The work can progress only by so shifting the finished coil longitudinally as to bring every portion of it out of the path in which it was formed. If the coil be merely shifted laterally away from the coiling-axis a sufficient distance to allow for the intertwining of the next succeeding coil, the coil so shifted will at every turn cut or almost cut through the path in which it was formed. The foregoing is the condition, because the coiling-path is constant as to location. By my improvement the radial relation between the last-completed coil and the coiler is changed after the completion of one coil and before the beginning of a new one.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a vertical longitudinal section in line *a a* of Fig. 3. Fig. 3 is a plan. Fig. 4 is a section in line *a b* of Fig. 3, looking toward the right. Fig. 5 is a section in same line, looking toward the left. Fig. 6 is a section in line *a c* of Fig. 3, looking toward the left. Fig. 7 is section in line *a d* of Fig. 3, looking toward the right. Fig. 8 is a section in line *a e* of Fig. 3, looking toward the right. Fig. 9 is an end view. Figs. 10, 11, and 12 are detail views of the cutting-knives.

For convenience in description the portion of the machine at the right in Figs. 1, 2, and 3 is called the "head" of the machine, while the portion at the left is called the "foot" of the machine, and for the same reason an imaginary line, of which the axis of the coiling mechanism and the axis of the path through which the wire being coiled is projected form a part, is called the "axis" of the machine. The portion of said line extending through the path traversed by the wire after

entering the coiler is also called the "coiling-axis."

A is a table which forms a support for the mechanism.

5 A' is a support rising from the head end of the table, and A² is a similar support rising from the table between the ends of the latter. Said supports terminate above in bearings a' a², respectively. In said bearings rests a rotary frame B, having trunnions b' b², extending through the bearings a' a², respectively.

10 B' is a lever rising from the frame B, and B² is a rack arranged at the side of the lever B' in a plane perpendicular to the axis of the frame B and having two notches B³ ninety degrees apart and of suitable form to alternately receive and hold the reciprocating bolt B³, supported by said lever. By means of this lever and rack the frame B may be given a quarter-rotation upon its axis and secured at the end of such quarter-rotation.

15 C is the coiling-spindle resting with its axis coincident with the coiling-axis and clamped between the parts C' and C² by one or more bolts C³, the part C' and the seat of the bolt or bolts being stationary upon the frame B and the part C² being relatively movable. A passage C⁴ extends between the parts C' and C² in the axis of the frame B to the coiling-spindle C, and thence spirally around the latter toward the fabric-supporting rollers. These parts constitute the coiler.

20 D and D' are wire-feeding rolls located near the rear end of the coiling-spindle at opposite sides of the axis of the machine, and the same are supported, respectively, by shafts D² and D³, arranged transversely in the frame B, and the former is supported in the sides of the said frame, while one end of the latter is preferably supported by the curved arm D⁴, extending inward from the side of the frame. Since this coiler has its axis coincident with the coiling-axis, it has, while at rest, a certain radial relation to the coiling-axis, and when the support of the coiler is turned upon its axis that radial relation is changed; and the rolls D and D' being located at opposite sides of the coiling-axis while the support of their shafts is at rest, they sustain a certain radial relation to the coiling-axis, and when said support is turned upon said coiling-axis said rolls are turned bodily around said coiling-axis and that radial relation is changed. At one side of said rolls spur-gears D⁵ and D⁶ are located, respectively, around the shafts D² and D³ and intermesh, so that if either of said shafts is rotated the other must also rotate. From a point near said rolls a hollow shaft D⁷ extends toward the head of the machine through and beyond the trunnion b', concentric to the axis of the machine and supports a loose wheel D⁸ and the feathered clutch D⁹, arranged to engage said loose wheel. The front end of the shaft D⁷ is secured to a skew bevel-gear D¹⁰, having an open end and meshing into another skew bevel-gear D¹¹, mounted upon the shaft D² or D³.

E is the wire to be coiled. This enters the head end of the hollow shaft D⁷ and passes forward through the latter and the wheel D¹⁰ 70 and between the rolls D and D' into the passage C⁴. The wheel D⁸ is rotated continuously by means of a belt d⁸ or otherwise; but since it is loose on the shaft D⁷ the latter will not be rotated by the wheel D⁸ without the aid of the clutch D⁹. Since the latter is feathered upon said shaft, it cannot be rotated without also rotating the shaft D⁷, but said clutch may be shifted forward and rearward upon said shaft into and out of engagement with 75 the wheel D⁸. When it is desired to drive the rolls D and D' so as to feed the wire E forward through the passage C⁴, the clutch D⁹ is thrown forward into engagement with the wheel D⁸, so that the latter in rotating will rotate said clutch and the shaft D⁷ and the skew-gear D¹⁰, and the latter will rotate the skew-gear D¹¹, shaft D², roll D, gears D⁵ and D⁶, shaft D³, and roll D'. The wire thus forced through the passage C⁴ is formed into 80 a spiral coil in the well-known form, and said coil is projected forward a distance equal to the length of the fabric to be woven.

Any suitable means may be employed for shifting the clutch D⁹. In the drawings I 95 show an arm F extending downward from said clutch to a transverse horizontal rock-shaft F', from which the foot-lever F² extends forward a convenient distance to the side of the machine at which the operator is to stand. 100 A spring F³ is connected by one end to a relatively-fixed portion of the machine and by the other end with the rock-shaft F', the arm F, or the foot-lever F² (as shown) in proper relation to normally raise said foot-lever and throw the arm F and said clutch rearward, so that said clutch is normally out of engagement with the wheel D⁸. By this arrangement the coiling mechanism is normally at rest and will operate only while the operator 105 presses the foot-lever F².

A portion of the frame B, as one of the sides of the latter, may be extended above the axis of the machine a convenient distance, and some yielding part made to bear down upon 115 said part so extended in order to aid in effecting the quarter-rotation of the frame B when the latter is turned sufficiently to bring said raised part over the axis of the machine. The drawings show for this purpose, a yoke 120 G surrounding said frame and bearing upon the upper portion of the latter and having joined to its lower portion a strong spring G', whose lower portion is secured to the table A. Said spring draws downward upon said 125 yoke, and whenever the frame B is rotated more than one-half of the quarter-turn the part of said frame upon which the yoke G bears passes over the axis of the machine, and said yoke then draws downward upon 130 said part of the frame and shifts the latter to the reverse position. By this means the operator need only draw the lever B' until the frame has been rotated a little more than one-

half of the quarter-turn and thereafter the yoke G and spring G' will complete the movement of said frame, and when such movement is completed such yoke and spring will continue to draw on that side of the axis of the machine and aid in retaining the frame B in position. Rollers gg may be placed upon the frame B between the latter and said yoke to reduce friction when said frame is turned.

It will be seen that if the spring G' is made strong enough the lever B' need not be provided with the locking-bolt. It is also to be noted that the spring G' may be omitted altogether.

The mechanism thus far described is sufficient for making the fabric if the latter is formed upon the ordinary stationary coiling-table and shifted laterally by hand. I have, however, devised an automatic rotary mechanism for supporting and giving movement to the fabric in a direction at right angles to the axis of the machine, and the same will be next described; but it will be understood that other mechanical means for this purpose may be used in lieu of those which I describe.

H and H' are fluted rolls located in a horizontal plane a short distance above the axis of the machine and parallel to and so near each other as to engage the finished fabric E' when the latter is passed between said rolls. The roll H is supported at its ends by standards H², rising from the table A, and the roll H' is supported in a similar manner by standards H³. The two rolls are made to operate in unison by means of intermeshing spur-gears H⁴, located upon the foot end of said rolls, so that if one of said rolls is rotated by extraneous means the other roll must also rotate, but in a direction reverse to that in which the other roll is rotated. When these rolls are arranged above the coiling-axis, as herein described, they must rotate so that their opposing faces will rise, in order that the fabric may be raised from the axis of the machine. I have devised mechanism by which movement is given to these rolls from the movement of the frame B. The movement of said rolls is of necessity intermittent and following the completion of each new coil through a sufficient number of degrees to raise the fabric through a distance equal to the diameter of one of the coils E'. The head end of the roll H' has its shaft or journal extended forward of the standard H³ a sufficient distance to receive a ratchet-wheel I and a double-toothed wheel J. Both of these wheels are fixed rigidly upon said shaft. The teeth I' on the ratchet-wheel I are directed rearward with reference to the rotation to be given to said wheel and roll. A pawl I² is arranged at the side of the wheel I farthest from the roll H to engage the teeth I' and is secured to or a part of a vertical arm I³, which extends downward, and is connected to a horizontal arm I⁴, extending beneath the forward extension B⁴ of the frame B and hinged by its opposite end to the table A. The draw-

ings show this as being accomplished by securing two standards A³ to the table in a line parallel to the axis of the machine and at right angles to said arm I⁴ and extending a shaft A⁴ from one of said standards A³ to the other and through the end of said arm I⁴, the latter being loose on said shaft. An anti-friction roller I⁵ is preferably placed upon the arm I⁴ beneath the axis of the machine. The extension B⁴ of the frame B has on its lower side and above the arm I⁴ a cam B⁵, so located as to be directly beneath the axis of the machine when the frame B is moved to a point midway between its two extremes of movement, and said cam extends far enough from the axis of the machine to press upon the anti-friction roller I⁵ sufficiently to draw the arms I⁴ and I³ and the pawl I² far enough downward to cause said pawl to turn the rolls H and H' the proper number of degrees to move their surfaces through a distance equal to the diameter of one of the coils E'. A spring I⁶ is located between the arm I⁴ and the table A and serves to press the arm I⁴ as far as allowed by the cam B⁵ and the adjacent portion of the extension B⁴ of the frame B, and a spring I⁷ is shown located between the standard H³ and the arm I³ to press the latter toward the wheel I and force the pawl I² into engagement with the teeth I' of said wheel.

From the foregoing it will be obvious that with each shifting of the frame B the rolls H and H' will be given a partial rotation and will feed the wire fabric forward in a direction at right angles to the axis of the machine. To prevent the rolls from turning after they have been given a forward movement by the pawl I², another pawl I⁸ is hinged by one end to a relatively stationary part, as the standard H³, and the other end arranged to fall behind one of the teeth I' upon the instant that the forward movement of the roll ceases. Then any tendency on the part of the rolls to return is stopped by said pawl I⁸. Said pawl may have a spring I⁹ arranged to press the free end of said pawl against the wheel I, or said pawl may be extended beyond its hinge in the direction opposite the wheel I and there provided with a weight I¹⁰, which shall tend to tilt the pawl and press the end nearest the wheel against the periphery of the latter. (Both I⁹ and I¹⁰ are shown in Figs. 4 and 6.)

In addition to the mechanism already described for turning the rolls forward and preventing their return, I have devised means for preventing the rolls from moving farther than the distance measured by the length of one of the ratchet-teeth I'. This I accomplish by a locking mechanism, of which the wheel J forms a part. Said wheel has two sets of teeth J', one set being arranged radially upon said wheel in one plane and the other set being arranged radially upon said wheel in another plane, the spacing being alternate from one side to the other, and the

radial distance from one tooth to the other being equal to the radial distance through which the rolls H and H' are to be turned.

J² is a horizontal shaft located above the wheel J in bearings in the branches h³ of the standard H³, and J³ is a wheel surrounding and rigidly fixed upon the shaft J² and of sufficient diameter to reach the periphery of the wheel J between the teeth J' of said wheel J. Said wheel J³ has radial teeth j³ with sufficient space between each two teeth to allow the passage of one of the teeth J'.

J⁴ is a ratchet-wheel fixed upon the shaft J².

J⁵, J⁶, J⁷, and J⁸ are respectively a pawl and arms and a friction-roller similar in nature to the parts I², I³, I⁴, and I⁵, the end of the arm J⁷ opposite the arm J⁶ being hinged to some relatively stationary part—as, for example, the shaft A⁴, to which the arm I⁴ is hinged, and said pawl being arranged to engage the teeth of the ratchet-wheel J⁴ and said arm J⁷ may be kept in its elevated position by a spring J⁹, similar to the spring I⁶, which keeps the arm I⁴ in its elevated position, and two coiled springs J¹⁰ may each be secured by one end to the rear face of one of the branches h³ of the standard H³ and by the other end to the arm J⁶, so as to hold the pawl J⁵ against the ratchet-wheel J⁴. The forward extension B⁴ of the frame B has above the anti-friction roller J⁸ a cam B⁶ of proper depth to cause said anti-friction roller J⁸ and the arm J⁷ to be depressed sufficiently to cause the pawl J⁵ to turn the wheel J⁴ a radial distance equal to the distance between two ratchet-teeth on said wheel J⁴, and said ratchet-teeth are equal in radial spacing to the radial spacing of the teeth j³ on the wheel J³. The relation of these parts is such as that one of the teeth j³ on the wheel J³ will normally stand in the path of one set of teeth J' on the wheel J and against one of said teeth and the forward side of the latter, while a space between two teeth j³ is in the path of the other set of teeth J'. From the foregoing it will be seen that while the wheel J³ is in this position the wheel J and consequently the rolls H and H' are locked against forward movement, and that at the same time the pawl I⁸ prevents backward movement. Thus the said rolls are held rigidly while it is desired that they shall not move, and a forward movement cannot be produced by the pawl I² until the tooth j³, which is in engagement with one of the teeth J', is turned out of the path of the latter. This is accomplished by the pawl J⁵ in advance of the movement of the pawl I². To effect this prior movement the cam B⁶ is made so long radially as to throw the anti-friction roller J⁸ and the arm J⁷ away from the axis of the machine before the cam B⁵ can turn the anti-friction wheel I⁵ away from the axis of the machine. To this end the middle of the cam B⁶ is in line with the middle of the cam B⁵, but the former extends laterally beyond the cam B⁵. This is illus-

trated particularly in Fig. 4 of the drawings, where B⁵ is seen in front of and smaller than B⁶. When the pawl J⁵ thus turns the wheel J³, the tooth j³, which was in contact with one of the teeth J', moves out of the path of the latter tooth and one of the spaces between that tooth and another is then in line with the tooth J, which was last held, and another tooth j³ is thrown into the path of the other set of teeth J', and the next succeeding tooth of said second set is, upon the next movement of the wheel J, thrown into contact with the tooth j³ then in the path of the teeth J', so that neither the momentum of the rolls H and H' nor the momentum or weight of the fabric already woven can turn the rolls farther forward than the radial distance equal to the diameter of one of the coils of the fabric.

L is a trough, having its bottom preferably rounded on an axis which substantially coincides with the axis of the machine, and said trough is of a diameter only a little larger than the external diameter of the coils to be formed. This trough leads from end to end of the rolls H and H', and its sides are preferably formed higher than the diameter of one coil. (See Fig. 5.) The coil is projected from the coiling-spindle into this trough, and the latter serves as a guide for said coil. When one coil has been completed, the rolls are turned so as to raise the last coil, so that its lower side will be a short distance above the axis of the machine. Then the next coil will be guided horizontally and laterally by said trough, and at each turn the new coil will intertwine with one of the turns of the last previous coil. By the aid of this trough a very accurate movement of the new coil is insured. Said trough is preferably supported by standards L', arranged at its sides and also intermediate points, if so desired, upon the table A.

While the new coil is being projected through the trough L and the last-finished coil it is desirable that the latter be held firmly against vibration or other movement. To thus hold said coil I have arranged at each side of and above the trough L a presser L², having a straight edge resting upon the upper side of the last-finished coil. The drawings show a bar L³, journaled in ears L⁴, rising from the standards L', and the sides of the pressers L², which are farthest from the axis of the machine, are secured to said bar. Thus said presser is hinged and the weight of the free side causes the free edge to press down upon the last-finished coil and hold the latter in place while the new coil is being formed. The pressure due to the weight of the presser may be supplemented by any suitable means—as, for example, a screw I⁵, extending through an arm L⁵, projected outward from the bar L³, said screw being arranged to press upon an adjacent portion of the standards L' or the table A. As will be seen from an inspec-

tion of the drawings, the space between the free edges of the pressers L^2 is less than the diameter of the coils e' ; but as said pressers are yielding their edges will separate sufficiently to allow the last-finished coil to rise between them when the fabric is shifted by the turning of the rolls H and H'.

L^7 is a knife secured flatwise to the rear end of the trough L and extending above the bottom of the latter and almost to the axis of the machine and having a cutting-edge at each side substantially radial to the axis of the machine and separated from each other a little less than ninety degrees. Upon the front end of the forward extension B^4 of the frame B are secured two knives B^7 , such knives being arranged in a plane parallel to and in contact with the face of the knife L^7 , and said knives B^7 having cutting-edges directed toward each other and substantially radial to the axis of the machine and separated a little more than the thickness of the wire. The position of the passage C^4 on the spindle C is to be such as to bring the wire E first beside one edge of the knife L^7 and on the other side of said knife when the frame B is in its other position, and the position of the pair of knives B^7 upon the end of the extension B^4 is to be such that one of said knives shall be opposed to and a little away from the edge of the knife L^7 by which the wire of the last-made coil is passed, and that the other of said pair of knives will be opposed to and a little away from the opposite edge of the knife L^7 which the wire of the last coil has passed and said other edge of the knife L^7 , the purpose being to always pass the wire between two knife-edges, in order that the wire may be cut as soon as the coiling mechanism is stopped and the frame B turned. These knives are illustrated in detail in Figs. 10, 11, and 12. From the extension B^4 a projection B^8 may rise and have extending through it a passage B^7 axially in line with the axis of the machine. This passage will serve as a guide for the coil coming from the spindle C and will serve to direct said coil into the trough L.

I claim as my invention—

1. The method of weaving coiled-wire fabric, which method consists in forcing the wire through a spiral passage by means of rolls, then cutting the resulting coil and supporting it parallel with and eccentric to the coiling-axis and changing the radial relation between path traversed by the last-completed coil on the one hand and the said spiral passage and rolls on the other hand, and then forcing more wire through said spiral passage to form another coil intertwined with the last-completed coil, substantially as shown and described.

2. The method of weaving coiled-wire fabric, which method consists in forcing the wire through a spiral passage by means of rolls, then cutting the resulting coil and supporting it parallel with and eccentric to the coiling-

axis and turning said spiral passage and rolls radially upon the coiling-axis, and then forcing more wire through said spiral passage to form another coil intertwined with the last-completed coil, substantially as shown and described.

3. In a machine for weaving coiled-wire fabric, the combination of a coiler having a spiral passage, mechanism for forcing the wire through said passage, and mechanism for supporting the coils formed by the passage of the wire through said spiral passage, and means for changing the radial relation upon the coiling-axis of said coiler, and wire-forcing mechanism on the one hand and said supporting mechanism on the other hand, substantially as shown and described.

4. In a machine for weaving coiled-wire fabric, the combination of a coiler having a spiral passage, mechanism for forcing the wire through said passage, and mechanism for supporting the coils formed by the passage of the wire through said spiral passage, said coiler and said wire-forcing mechanism being provided with means for changing their radial position upon the coiling-axis, substantially as shown and described.

5. In a machine for weaving coiled-wire fabric, the combination of the coiler arranged in the coiling-axis and having a spiral passage through it, a frame supporting said coiler and journaled axially in line with the coiling-axis, rollers for forcing the wire through said spiral passage, and mechanism for supporting the coils resulting from the forcing of the wire through said spiral passage, substantially as shown and described.

6. In a machine for weaving coiled-wire fabric, the combination of the coiler arranged in the coiling-axis and having a spiral passage through it, a frame supporting said coiler and journaled axially in line with the coiling-axis, rollers for forcing the wire through said spiral passage, mechanism for supporting the coils resulting from the forcing of the wire through said spiral passage, and means for locking said frame in two radial positions, substantially as shown and described.

7. In a machine for weaving coiled-wire fabric, the combination of the coiler arranged in the coiling-axis and having a spiral passage through it, a frame supporting said coiler and journaled axially in line with the coiling-axis, and rollers also supported by said frame, and mechanism for supporting the coils resulting from the forcing of the wire through said spiral passage, substantially as shown and described.

8. In a machine for weaving coiled-wire fabric, the combination of the coiler arranged in the coiling-axis and having a spiral passage through it, a frame supporting said coiler and journaled axially in line with the coiling-axis, rollers for forcing the wire through said spiral passage, mechanism for supporting the coils resulting from the forcing of the wire through said spiral passage, and means for mechani-

cally drawing said frame to the limits of its movements, substantially as shown and described.

9. In a machine for weaving coiled-wire fabric, the combination of the frame B, having trunnions b' and b^2 resting, respectively, in bearings a' and a^2 , a coiler supported by said frame axially in line with said trunnions, wire-feeding rolls, also supported by said frame, a shaft D^7 , extending from a point near said rolls through said frame and the trunnion of the latter to the head of the machine, a power-receiving wheel upon said shaft, and gears connecting said shaft with the shafts supporting the wire-feeding rolls, substantially as shown and described.

10. In a machine for weaving coiled-wire fabric, the combination of the frame B, having trunnions b' and b^2 resting, respectively, in bearings a' and a^2 , a coiler supported by said frame axially in line with said trunnions, wire-feeding rolls, also supported by said frame, a hollow shaft D^7 , extending from a point near said rolls through said frame and the trunnions of the latter to the head of the machine, a power-receiving wheel upon said shaft, and gears connecting said shaft with the shafts supporting the wire-feeding rolls, substantially as shown and described.

11. In a machine for weaving coiled-wire fabric, the combination of the frame B, having trunnions b' and b^2 resting, respectively, in bearings a' and a^2 , a coiler supported by said frame axially in line with said trunnions, wire-feeding rolls, also supported by said frame, a hollow shaft D^7 , extending from a point near said rolls through said frame and the trunnions of the latter to the head of the machine, a power-receiving wheel upon said shaft, and skew-gears connecting said shaft with the shafts supporting the wire-feeding rolls, substantially as shown and described.

12. In a machine for weaving coiled-wire fabric, the combination of the coiler, the frame having hollow trunnions resting in bearings axially in line with said coiler, and a rack and locking-lever for securing said frame in two radial positions, and rolls for forcing wire through said coiler, substantially as shown and described.

13. In a machine for weaving coiled-wire fabric, the combination, with a coiler and a journaled frame supporting said coiler, of a yoke G, engaging said frame, and a spring G' , joined to said yoke and a relatively fixed object, substantially as shown and described.

14. In a machine for weaving coiled-wire fabric, the combination of the coiler, a rotatable frame supporting said coiler, rolls D and D' for forcing wire through said coiler, shafts supporting said rolls and supported by said frame, one of said shafts having at one end and within the frame a gear extending into the axial line of the other shaft, and said other shaft being shorter at that end than the first-mentioned shaft and being supported

by an arched arm D^4 , extending from said frame, and a gear arranged to transmit power to the above-mentioned gear and having a relatively fixed axis, substantially as shown and described.

15. In a machine for weaving coiled-wire fabric, the combination of a rotatable frame B, a coiler supported by said frame, mechanism for forcing wire through said coiler, and a guide B^8 for controlling the course of the wire coil leaving said coiler, substantially as shown and described.

16. In a machine for weaving coiled-wire fabric, the combination of a rotatable frame B, a coiler supported by said frame, mechanism for forcing wire through said coiler, and a guide B^8 , supported by said frame for controlling the course of the wire coil leaving said coiler, substantially as shown and described.

17. In a machine for weaving coiled-wire fabric, the combination of blocks C' and C^2 , supported by a rotatable frame and arranged to be pressed upon each other by screws C^3 , a coiling-spindle held between said blocks in line with the axis of the machine, and a passage C^4 , extending between said blocks from the portion of the latter toward the head of the machine axially in line with the latter, and rolls for forcing wire through said passage and around said spindle, substantially as shown and described.

18. In a machine for weaving coiled-wire fabric, the combination of a coiler having a spiral passage, means for forcing the wire through said passage, and mechanism for supporting the coils formed by the passage of the wire through said spiral passage, and wire-cutting knives controlled by said coil-supporting mechanism and said coiler being provided with means of changing their radial relation upon the coiling-axis, substantially as shown and described.

19. In a machine for weaving coiled-wire fabric, the combination of a rotatable frame, a coiler supported by said frame, means for forcing wire through said coiler, and wire-cutting knives actuated by said frame, substantially as shown and described.

20. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, means for forcing wire through said coiler, a stationary knife, and a movable knife controlled by said frame, substantially as shown and described.

21. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, means for forcing wire through said coiler, a stationary knife, and a movable knife supported by said frame, substantially as shown and described.

22. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, means for forcing wire through said coiler, a trough axially in line with said frame, a coiler for receiving the coil made by forcing wire through

said coiler, a knife on said trough, and a knife controlled by said frame, substantially as shown and described.

23. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, means for forcing wire through said coiler, a rotary fabric-supporter, and a pawl for turning said rotary fabric-supporter, said pawl being controlled by said journaled frame, substantially as shown and described.

24. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, means for forcing wire through said coiler, a trough for receiving the coil formed by forcing wire through said coiler, a rotary fabric-supporter, and a pawl for turning said rotary fabric-supporter, said pawl being controlled by said frame, substantially as shown and described.

25. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, a rotary fabric-supporter, a pawl for turning said rotary fabric-supporter, and suitable arms and levers connected with said pawl and in engagement with a cam upon said frame, substantially as shown and described.

26. In a machine for weaving coiled-wire fabric, the combination of the journaled frame, a coiler supported by said frame, means for forcing wire through said coiler, a trough for receiving the coil formed by forcing wire through said coiler, pressers arranged adjacent to said trough for holding the last-finished coil, a rotary fabric-supporter, and a pawl for turning said fabric-supporter, said pawl being controlled by said journaled frame, substantially as shown and described.

27. In a machine for weaving coiled-wire fabric, the combination, with a coiler, of mechanism for drawing the fabric from the coiling-axis, a guide for the coil being formed by the coiler, and pressers arranged to engage the side of the last-finished coil farthest from the coiling-axis and to hold the last-finished coil in a fixed relation to the coiling-axis while the next coil is being formed, substantially as shown and described.

28. In a machine for weaving coiled-wire fabric, the combination, with the coiler, of mechanism for drawing the fabric from the coiling-axis, a guide for the coil being formed by the coiler, and yielding pressers arranged to engage the side of the last-finished coil farthest from the coiling-axis and to hold the last-finished coil in a fixed relation to the coiling-axis, substantially as shown and described.

29. In a machine for weaving coiled-wire fabric, the combination, with the coiler, of mechanism for drawing the fabric from the coiling-axis, a guide for the coil being formed by the coiler, and adjustable pressers arranged to engage the side of the last-finished coil farthest from the coiling-axis and to hold the last-finished coil in a fixed relation to the

coiling-axis, substantially as shown and described.

30. In a machine for weaving coiled-wire fabric, the combination, with a coiler, of mechanism located above the coiling-axis for drawing the fabric from the coiling-axis, a guide for the coil being formed by the coiler, and pressers arranged to engage the side of the last-finished coil farthest from the coiling-axis and to hold the last-finished coil down in fixed relation to the coiling-axis, substantially as shown and described.

31. In a machine for weaving coiled-wire fabric, the combination, with a coiler, of mechanism located above the coiling-axis for drawing the fabric from the coiling-axis, a guide for the coil being formed by the coiler, and yielding pressers arranged to engage the side of the last-finished coil farthest from the coiling-axis and to hold the last-finished coil down in fixed relation to the coiling-axis, substantially as shown and described.

32. In a machine for weaving coiled-wire fabric, the combination, with a coiler, of mechanism located above the coiling-axis for drawing the fabric from the coiling-axis, a guide for the coil being formed by the coiler, and adjustable pressers arranged to engage the side of the last-finished coil farthest from the coiling-axis and to hold the last-finished coil down in fixed relation to the coiling-axis, substantially as shown and described.

33. In a machine for weaving coiled-wire fabric, the combination, with the coiler, of a rotary fabric-supporting mechanism, ratchet mechanism for progressing said fabric-supporting mechanism, and locking mechanism independent of said ratchet mechanism to prevent untimely and excessive progression of said fabric-supporting mechanism, substantially as shown and described.

34. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, a rotary fabric-supporting mechanism, ratchet mechanism for progressing said fabric-supporting mechanism, and a locking mechanism to prevent untimely or excessive progression of said fabric-supporting mechanism, said ratchet mechanism and said locking mechanism being both controlled by said journaled frame, substantially as shown and described.

35. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, a rotary fabric-supporting mechanism, a ratchet mechanism for progressing said fabric-supporting mechanism, and locking mechanism to prevent untimely or excessive progression of said fabric-supporting mechanism, and wire-cutting knives, said ratchet mechanism, locking mechanism, and cutting mechanism being each controlled by a single and the same movable member of the machine, substantially as shown and described.

36. In a machine for weaving coiled-wire fabric, the combination of a journaled frame,

a coiler supported by said frame, a rotary fabric-supporting mechanism, a ratchet mechanism for progressing said fabric-supporting mechanism, a locking mechanism to prevent untimely or excessive progression of said fabric-supporting mechanism, and wire-cutting knives, said ratchet mechanism, locking mechanism, and cutting mechanism being each controlled by said journaled frame, substantially as shown and described.

37. In a machine for weaving coiled-wire fabric, the combination of a journaled frame, a coiler supported by said frame, a rotary fabric-supporting mechanism, a ratchet-wheel and locking-wheel on the shaft of the rotary fabric-supporting mechanism, a pawl and its connections arranged in relation to said ratchet-wheel, and a mechanism for intermittently engaging said locking-wheel, and suitable

connections for actuating said mechanism, substantially as shown and described.

38. In a machine for weaving coiled-wire fabric, the combination, with a fabric-supporting roll, of a ratchet-wheel I, a pawl and suitable connections for operating said pawl, a wheel J, having alternating teeth, a wheel J³, journaled transversely to said roll and having teeth j³ to stand in the path of the teeth J' of the wheel J, and suitable mechanism for intermittently rotating said wheel J³, substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 11th day of February, 1891.

CYRUS KEHR.

Witnesses

AMBROSE RISDON,
FRANK L. STEVENS.