No. 688,843. Patented Dec. 17, 1901.

J. F. GAIL.

MACHINE FOR MAKING COILED WIRE FABRIC.

(Application filed Aug. 28, 1901.)

(No Model.) 3 Sheets—Sheet 1.

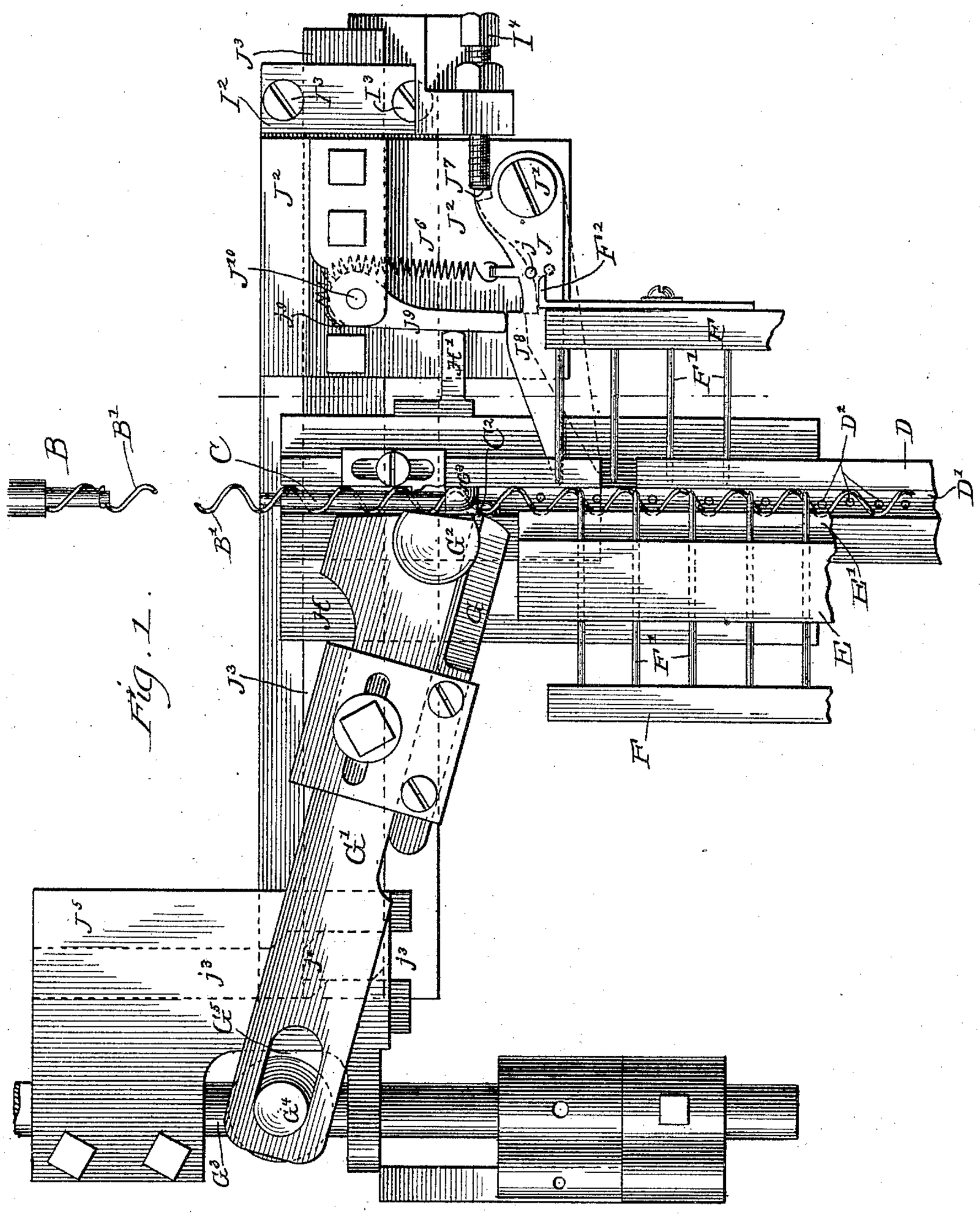

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

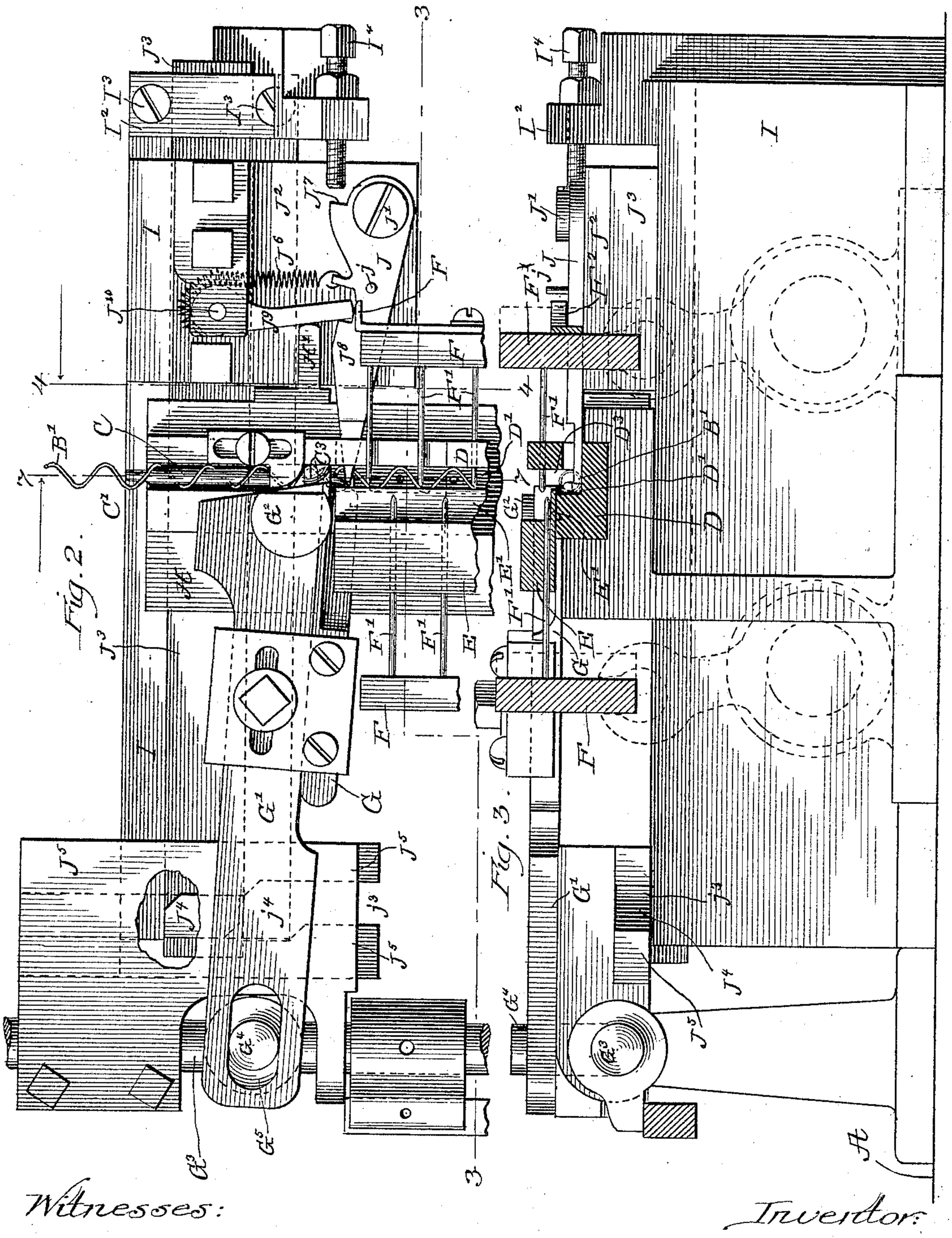

Fig. 2.

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 4.

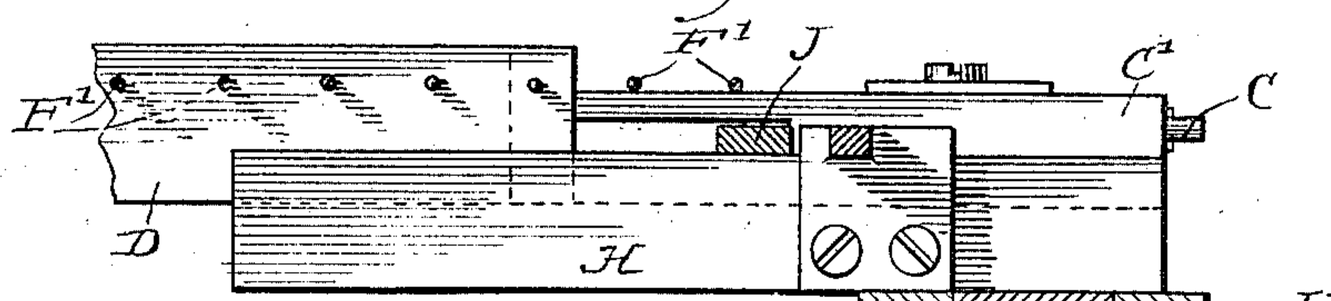


Fig. 5.

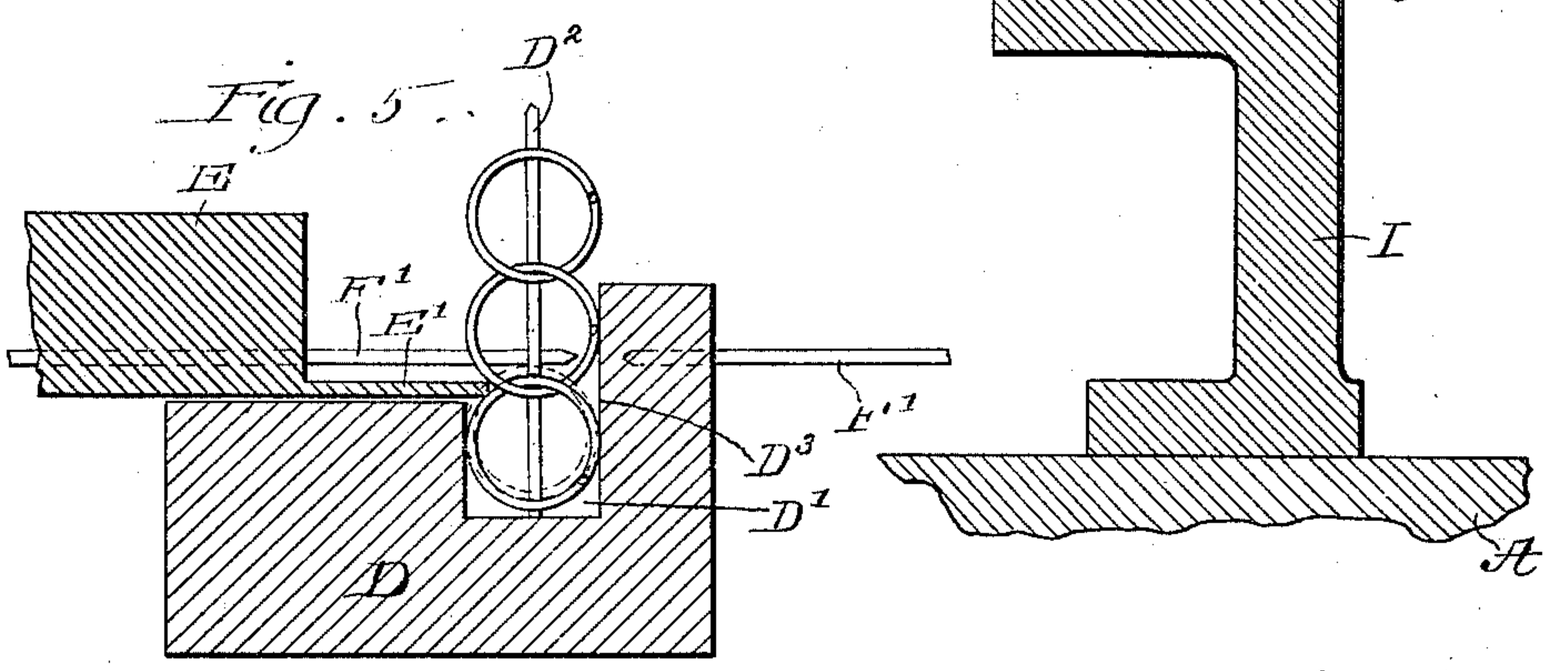


Fig. 6.

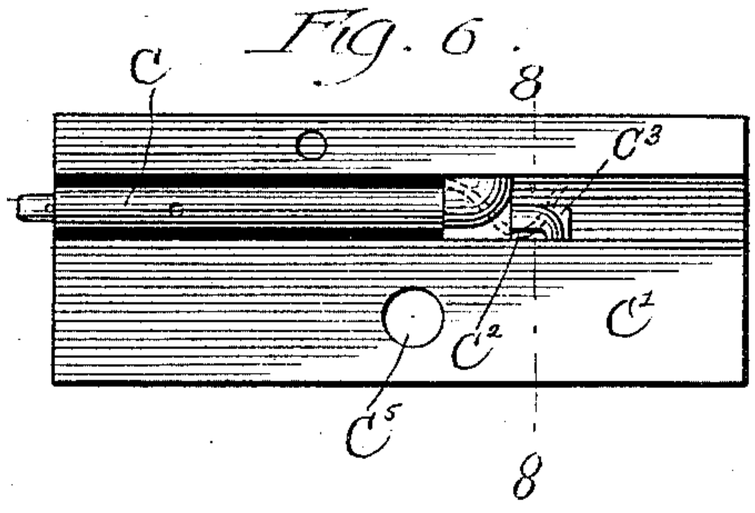


Fig. 7.

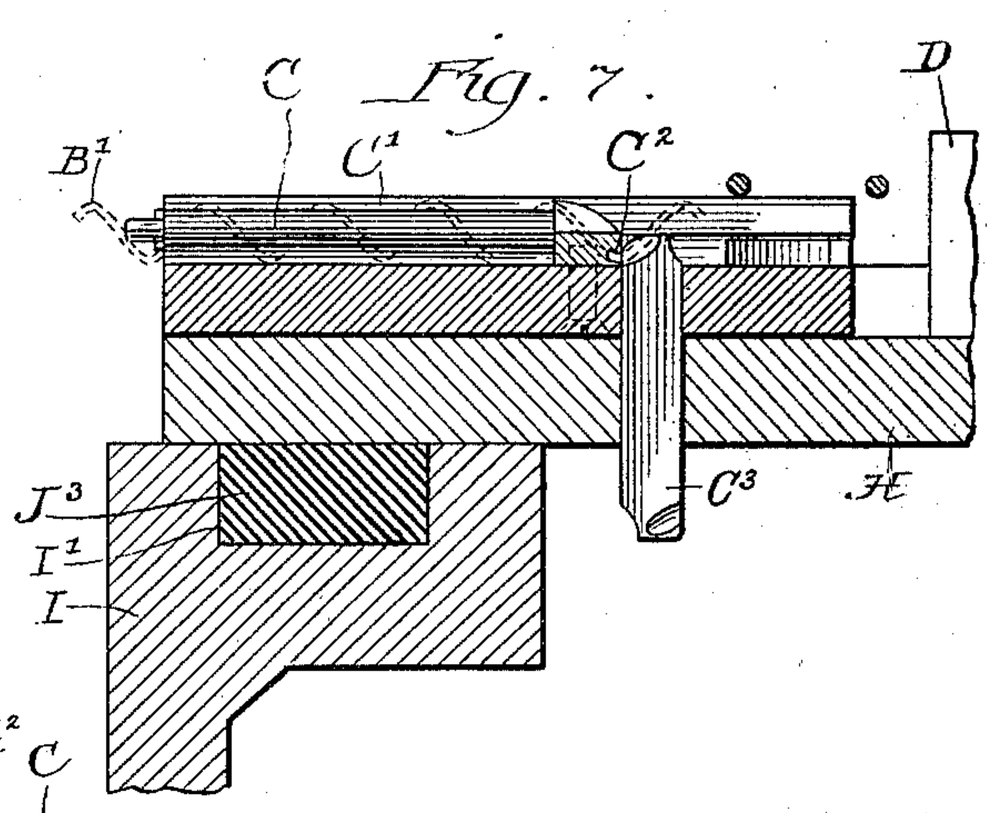
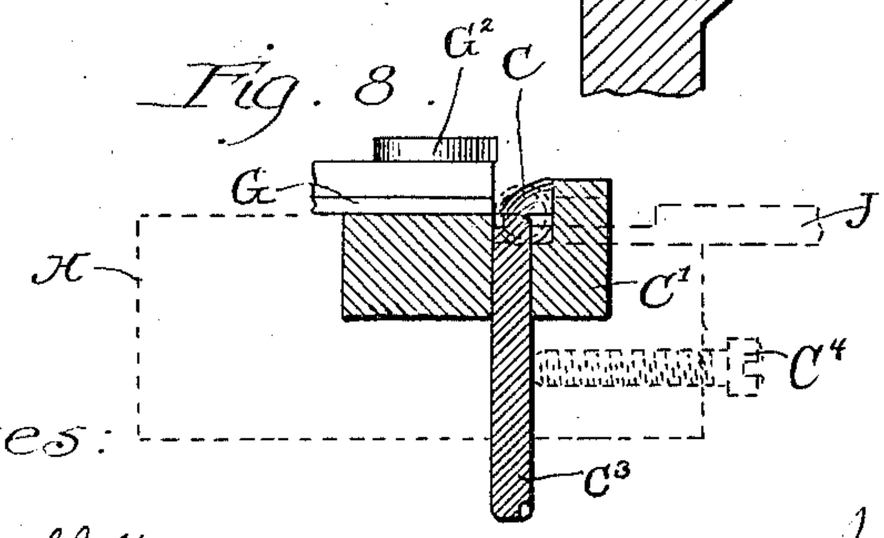


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN F. GAIL, OF KENOSHA, WISCONSIN, ASSIGNOR TO THE SIMMONS MANUFACTURING COMPANY, OF KENOSHA, WISCONSIN, A CORPORATION OF WISCONSIN.

MACHINE FOR MAKING COILED-WIRE FABRIC.

SPECIFICATION forming part of Letters Patent No. 688,843, dated December 17, 1901.

Application filed August 28, 1901. Serial No. 73,561. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. GAIL, a citizen of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, have invented certain new and useful Improvements in Machines for Making 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.

My invention relates particularly to machines for the manufacture of such coiled-wire fabrics as are used in the manufacture of woven-wire bed-bottoms. With such machines the coils are formed by pushing the wire through a spiral die, and the fabric is formed by rotating and progressing the new coil longitudinally, so as to cause it to intertwine at each rotation with the last preceding coil, and my invention is specially though not exclusively adapted to embodiment in automatic machines for the making of such fabrics.

The first and chief object of my invention is to meet the commercial demands for a more rapid machine than those heretofore in use in this art.

A second object of my invention and one that is attained incidentally with the attainment of the first is the greater uniformity in the product of the machine and the reduction of waste of wire.

A third object of my invention is the production of a machine requiring a minimum of skilled attendance.

For commercial reasons it is desirable to operate such machines at a relatively high speed. Such high speed has long been sought. This is attested by the history of experiments in various factories and by the prior patents relating to this art. Heretofore such machines have not in daily practice woven more than thirty-five fabrics of average size in a day of ten hours. With machines embodying the improvements set forth in this application and the improvements described by me in two other applications eighty such fabrics per day of ten hours have been and are being woven in daily practice and with less trouble than heretofore, and I believe that a proportionate share of said increase of production is due to the improvement herein described. The machine is now operated at a higher rate of speed, and the stops due to defective operation are now less frequent and of shorter duration.

The above-mentioned objects are attained in part by means for temporarily positively keeping the last fabric coil in its relative longitudinal position when it is being cut and until it has been shifted longitudinally in the normal manner, as hereinafter described. Heretofore such coil has been left free to shift longitudinally in response to tension when it was freed by the cutting-knife, excepting as it was put under restraint during formation by the mechanism along its path. When the said coil is unrestrained, there is always some accidental longitudinal shifting when the coil is cut, sometimes to the extent of several inches. When the final coil thus shifts longitudinally to the extent of, for example, two inches, then at one end margin of the fabric that much of the coil is lacking to make the margin even and at the opposite end that much of the coil goes beyond what is needed to make the margin even. If similar unevenness occurs occasionally as the fabric is formed, pains must be taken to push all the coils longitudinally one way or the other until the margins are even. This requires labor; but such additional labor is not the greatest annoyance arising from such longitudinal shifting of the coils. The marginal or new coil of the fabric is usually normally engaged by mechanism located along the path of the incoming coil, and the weight of the fabric or an external tension mechanism draws transversely on the last several coils, tending to draw said marginal coil transversely away from said engaging mechanism. Whenever under normal action a new coil is completed, said engaging mechanism releases the last preceding coil and trans-

fers its engagement to such new coil; but if such new coil does not extend to the margin of the fabric at one end then along the space not covered by said last coil the engaging mechanism loses its grasp upon the fabric, and along such space the fabric is unduly drawn away from the coiling-path, so that the coil next formed is likely to come into contact with the wire of the then last coil and have its end deflected out of the coiling-path or meet such resistance at its end as to bend or "buckle" laterally between the coil-receiving mechanism and the coil-forming mechanism, so that the coil utterly fails to advance through the coiling-path in the coil-receiving mechanism. Whether the end of the incoming coil is thus deflected or whether it thus meets resistance the normal operation ceases and the machine must be stopped for correction. If the last-finished coil on being cut thus shifts longitudinally the length of only one or two turns of the coil, the abnormal action above described may result. This accidental movement of the coil has heretofore been obviated to some extent by confining such coil closely by mechanism along the path traversed by said coil along the margin of the fabric. This method has been found objectionable, for the reason that when the coil must traverse such a restricted path it meets so much frictional resistance as to frequently cause the wire to bend at or adjacent to the beginning of such path, progression in such path then ceasing and the wire issuing from the coiler going out sidewise into space until the action of the coiler has been stopped. Then the incomplete coil and the coiled wire so run out of said path must be removed and thrown aside as waste. To this waste wire must be added the loss of time involved in correcting this faulty operation. I have found that during the forming of the coil its path should be limited only enough to cause it to intertwine with the last-preceding coil, and I have also found that by grasping and holding such last coil at or near the cutter while it is being cut and shifted its accidental longitudinal shifting due to tension is practically eliminated. To such degree is this accomplished that the mechanism along the path to be traversed by the coil while entering the fabric need not so limit such path as to make such frictional contact as will produce objectionable resistance to progression.

In some machines a series (or a double series) of pins extend along the path of the new coil, and the latter crosses one such pin at each turn. In the operation of such machines it has been the practice to shorten the pitch of the coils, so as to produce a slight tension on the coil when the latter crosses said pins, to the end that there might be some engagement of the coil with said pins along its entire length at the time of cutting and during the regular shifting. Making such engagement between the coil and said pins when sufficient to substantially prevent the accidental longitudinal movement of the coil produces so much friction as to occasionally stop the progress of the coil even when the machine is being operated at a moderate speed, and when it is attempted to operate the machine rapidly such resistance more frequently stops the progress of the coil in its path and necessitates the stopping of the machine to correct the work.

If provision is made for positively engaging and relatively holding the last coil during the period of cutting and shifting, said coil may be given a relatively free path, so that resistance to its longitudinal progression during the period of formation can be so much reduced as to greatly limit the cases of stopping of the progress of the wire in its path due to contact with devices along said path intended to limit or restrict the course of said coil.

The foregoing general statement of the nature and functions of my invention is made to aid in the ready comprehension of the details of the construction and operation, which I shall now set forth by reference to the accompanying drawings, in which—

Figure 1 is a plan illustrating a portion of a machine embodying my improvement, the coil being ready for the cutter. Fig. 2 is a similar view taken after the new coil has been severed. Fig. 3 is a section on line 3 3 of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 3. Fig. 5 is an enlarged transverse section of a portion of the coil-receiving mechanism. Fig. 6 is a plan of the coil-guide. Fig. 7 is a vertical section along the first portion of the coil-receiving mechanism. Fig. 8 is a detail transverse vertical section adjacent to the coil-severing mechanism.

Inasmuch as the general construction of machines of this class is well known, I deem it unnecessary to illustrate and describe more than the parts immediately concerned with my improvement.

A is a portion of the bed or frame of the machine.

B is the portion of the coil-forming mechanism nearest the coil-receiving mechanism. B′ is the coil coming from said coil-forming mechanism.

C is a cylindric guide for directing the coil to the coil-receiving mechanism.

The coil-receiving mechanism consists of, first, a pin-bar D, having a longitudinal channel D′ in its upper surface and bearing in said channel a longitudinal series of vertical pins D^2; second, a knife-bar E, and, third, two horizontal pin-bars F F, bearing horizontal transverse pins F′, the pins of each of said bars being in a horizontal plane and directed toward the other of said bars; but the pins on one bar alternate horizontally with the pins on the other bar. Said pin-bar D and said pin-bars F F and said knife-edge bar E are arranged to simultaneously reciprocate longitudinally a distance equal to one-half the length of one turn of the coils each

time the fabric is shifted transversely. Such reciprocation is not new, and the mechanism for producing it is not shown. Said channel D′ in the upper face of said pin-bar D is the coil-receiving channel, and it is of proper width and depth to contain one coil in the horizontal position. Said pins D^2 stand in a row parallel to the walls of said channel and are so spaced as to stand between the turns of the coil occupying said channel. The knife-edge bar E is located just above the bar D and at the side of said channel D′, and it supports the knife-edge E′, which edge extends laterally to and normally partially over said channel. The wall D^3 of said channel opposite said knife-edge is preferably extended above the level of said knife-edge. Said bar E is arranged to periodically reciprocate transversely to its length and in a horizontal plane through a limited space. In its normal position said knife-edge extends sufficiently over the channel D′ to reduce the upper opening of the latter to less than the diameter of the coil. Any suitable mechanism may be employed for drawing the fabric vertically away from said channel D′. Said mechanism places the fabric under continuous tension, and said knife-edge and said pins F′ hold the margin of the fabric in said channel. This of course involves the transference of the engagement of said pins and knife-edge from one coil to another as more coils are added to the fabric. The relation between the depth of said channel and the height of the knife-edge E′ and the elevation of the pins F′ is such as that when the coil-receiving mechanism is receiving a coil the last-finished coil is pressed downward by the knife-edge E′, so that it almost touches the bottom of the channel D′, and said last-finished coil and the last preceding coil are lowered a little out of engagement with the set of pins F′ then extending over said channel. The new or incoming coil runs on the bottom of said channel, and thus clears the knife-edge. At each turn the wire of said coil passes between two of the vertical pins D^2 and crosses one of the turns of the finished coil then resting in said channel. When the new coil has been completed and cut, the knife-edge moves horizontally away from the coils sufficiently to make the opening of said channel large enough to allow the last preceding coil to rise out of said channel when otherwise free to do so; but when said coil rises it first comes into engagement with the set of pins F′ then extending over said channel. Then said pins recede from the fabric and release said coil. At the same time the other set of pins F′ move over said channel in time to engage the coil next below the one just released. During the interval required for this shifting of the engagement of the pins F′ said bar D, bars F F, and the knife-bar E normally move lengthwise a distance equal to half a turn of one of the coils of the fabric. This movement is made in order to take the last-finished coil out of the path for the incoming coil. These horizontal movements of said bars alternate in direction.

All the mechanism and operations thus far described are old, as will be ascertained by examination of the patents to which reference has already been herein made, and said mechanism and operations are herein described only for the purpose of showing the application of my improvement.

The coil-guide C is mounted upon a base C′, and said base is seated in a plate H, and said plate in turn rests upon a chair I, and said chair rests upon the upper face of the bed-plate A of the machine. The spiral path of the coil extends through said guide and emerges from the latter at C^2 at the beginning of the coil-receiving channel immediately in front of the upper knife G. The lower coil-cutting knife C^3 extends upward through the plate H and the base C′ to the point C^2 and is adjustably and removably secured by a set-screw C^4.

G is the upper knife. This is suitably secured to the knife-arm G′, which is hinged on the vertical headed wrist G^2, extending through the aperture C^5, Fig. 6, in the base C′ into the plate H. The knife-arm is vibrated by the longitudinal reciprocation of a shaft G^3, with which said knife-lever is connected by a pin G^4, extending upward from said shaft into a slot G^5 in said knife-arm. The movement of said knife-arm is so timed as to drive the knife G past the point C^2 when the new coil has been formed and the coiling mechanism has been stopped, so that the coil is no longer advancing, and the knife-lever is then returned to its normal position before the coiling mechanism is again set into operation to drive forward a new coil. The knife-arm and the coil-guide thus briefly described are also old in the art of wire-coiling and for that reason are not specifically described herein.

As briefly set forth in the introduction to this specification, my improvement relates to means for engaging and holding the new coil before it is cut and until it is engaged transversely to its length by the last preceding coil of the fabric, such latter engagement producing sufficient frictional resistance to prevent objectionable longitudinal movement of the last coil when it is freed by cutting. The mechanism which I employ for this purpose engages the coil adjacent to the said knife G and at the side thereof opposite the coil-guide. The end of the coil adjacent to this point is to be kept from longitudinal movement whatever the position of the opposite end of the coil may be—that is to say, whether the opposite end of the coil may or may not be accurately in line with the adjacent end margin of the fabric the cutting-point is in line with the margin at that end of the fabric, and if the coil is always held adjacent to said point said end margin of the fabric necessarily becomes even. As has already been suggested, it sometimes happens that the oppo-

site end of the coil (the end away from the cutting-point) is out of position, because of resistance met in the coiling-path, so that the coil becomes more or less compressed lengthwise. If the coil is then cut so as to free the end adjacent to the cutter, the coil will, if it is not grasped, expand and move in the direction of the coiling mechanism; but by holding the coil adjacent to the point of cutting until the cut has been made and the coil-shifting mechanism is set into operation the opposite end of the coil becomes freed from the restraint which caused its compression, and it may then expand in the direction opposite the coiling mechanism and assume its proper position in line with the adjacent end margin of the fabric. This will be better appreciated if it is remembered that at the very beginning of the shifting operation the last preceding coil is raised so as to engage and lift the new coil, the last preceding coil making contact with the new coil at every turn or convolution. This makes points of frictional resistance equaling in number the number of convolutions in the coils. The aggregate of this frictional resistance is sufficient to practically prevent the longitudinal thrust or propulsion of the last-completed coil when the latter is freed, so as to expand when it has been compressed or when it is freed, so as to contract when it has been expanded while being driven along the coil-path.

As stated in the introduction to this specification, it is desirable that the coil-path afford the greatest freedom to the ingoing coil consistent with reliable intertwining of said coil with the last preceding coil in order to reduce the resistance to the progress of the wire as it is driven forward by the coiling mechanism. Such resistance must not be sufficient to cause the wire to bend laterally between the coil-guide and the coiling mechanism or in the coil-receiving mechanism; but when the coil-path affords such freedom there is more freedom for the coil to move endwise when it is freed by cutting, such movement being in one direction or the other, as the coil may have become slightly compressed or expanded during its formation, and even when the coil is not under strain the coil-severing knife tends to drive the coil endwise away from the cutting-point. It has heretofore been attempted to overcome this endwise movement of the coil by making its pitch sufficiently short to require the advancing end of the coil to slightly engage each pin D^2 and slightly draw on the latter at the point of crossing, thus placing each turn of the coil when completed into slight engagement with the adjacent pin D^2. While this has proven more or less effective in preventing the accidental endwise movement of the coil, it at the same time added so much resistance to the progress of the coil while being driven forward by the coiling mechanism as to cause the wire to bend laterally between the coil-guide and the coiling mechanism or in the coil-receiving mechanism and altogether stop the progress of the coil in the proper path. In former practice this has occurred to an objectionable degree even when the machine was operated at moderate speed, and when it has been attempted to operate the machine at a higher speed the frictional resistance has increased so much as to utterly prevent normal action.

The vital part of my improvement is a member which stands normally adjacent to the coil-path near the cutting-point and is ready to move into contact with the coil and press it against the adjacent wall of the coil-guide or any similar surface or otherwise suitably engage said coil. This member may obviously be made in a variety of forms. It might, for example, consist of two opposing jaws adapted to grasp the wire between them. In the accompanying drawings it is shown in the form of an elongated bar or finger J. Said finger is hinged upon the vertical headed wrist J′, which is fixed upon the plate J^2. Said plate is bolted upon a reciprocatory bar J^3, which rests in the channel I′, formed in the upper face of the chair I, transversely to the coil-receiving channel. Said bar J^3 extends beneath the stationary plate H and almost to the shaft G^3. Upon said bar J^3, near the shaft G^3, is fixed a lug J^4. To the shaft G^3 is secured a block J^5, extending over the adjacent portion of said bar J^3 and having on its lower face a channel j^3, into which the lug J^4 extends. Said channel is mainly parallel to the shaft G^3, but it has a horizontal oblique offset j^4, whereby the lug J^4 and the bar J^3 are reciprocated lengthwise of the channel I′ when the shaft G^3 and the block J^5 are reciprocated, the line of the latter reciprocation being perpendicular to the reciprocation of said bar J^3. Such reciprocation of said bar causes the reciprocation of the plate J^2 and the finger J toward and from the coil-path, as will be obvious from an inspection of the drawings. In Fig. 1 said finger is at one limit and in Fig. 2 at the other limit of such reciprocation. In addition to such reciprocation said finger is arranged to partially rotate in a horizontal plane, with the wrist J′ for an axis. During the operation of the machine said finger assumes at different times three different positions within said range of movement, as will be hereinafter described. A spring J^6, attached by one end to a relatively fixed point on the plate J^2 and by the other to said finger, tends to draw the latter to its limit next the cutting mechanism. A bar I^2 extends across the chair I at the side of the plate J^2 opposite the coil-guide and is suitably secured to said chair, as by screws I^3 I^3. At the end next the finger J said bar is extended beyond said chair, and a set-bolt I^4 extends transversely and horizontally through said bar in proper position to abut against a shoulder J^7 on the finger J when the latter approaches the adjacent limit of its movement. Said shoulder J^7 is at the side of the hinge of said finger toward the coil-guide,

and it follows that the finger is turned away from the said coil-guide when the bar J^3 carries the finger to its limit away from the coil-path. The set-bolt I^4 is to be adjusted to cause the turning of said finger precisely to its intermediate position. Said spring J^6 constitutes a yielding means for moving said finger in opposition to said set-bolt. On the edge of said finger toward the bar J^3, about midway between its ends, is a lateral extension J^8. Opposite said extension and in the same horizontal plane an arm J^9 is hinged upon a vertical axis at J^{10} and extends from said hinge to said finger. A suitable spring is employed to turn the free end of the arm J^9 toward the coil-path. In the drawings the spring J^6 (which also controls the finger J) is attached by its end opposite the finger J to a stud j^9, seated on the arm J^9. The length of said arm is such as to cause it to abut against the edge of said finger at the side of said extension toward the hinge of said finger when the latter is in its position nearest the coil-guide, and the extension J^8 is sufficient to abut against the free end of the arm J^9 when the finger is in its intermediate position. The intermediate of the said three positions of the finger J assumed by rotation on the wrist J′ (which position is shown by solid lines in Fig. 1) may be termed the "normal" position of said finger, for this is the position of rest, the position occupied while the coil-receiving mechanism and the coil-cutting mechanism are at rest and the coil-forming mechanism is driving the coil forward into the coil-channel. Said position may also be regarded as the first of said three positions. Said finger is put into this position by the movement of the bar J^3 to the right, bringing the shoulder J^7 of said finger into contact with the set-bolt I^4, whereby said bolt causes said finger to turn away from the coil-guide sufficiently to allow the free end of the arm J^9 to slip over the extension J^8 toward the coil-path. Said set-bolt is so adjusted as to turn said finger no farther than just described, and the spring J^6 holds said finger against the end of the arm J^9. From the plate H a rigid finger H′ extends laterally toward the arm J^9 a sufficient distance to abut against said arm when said finger J is in its first or normal position. The spring J^6, attached to said arm J^9, may be termed a "yielding" means for moving said arm J^9 in opposition to said rigid finger H′. Assuming now that the new coil has been completed and it is to be shifted the length of a half-turn toward the coiler when the coil has been cut, then the bar J^3 moves toward the left, carrying with it the plate J^2, the finger J, and the arm J^9, the shoulder J^7 moving away from the set-bolt I^4, so that the finger J will be free to turn toward the coil-guide in response to the stress of the spring J^6 when the arm J^9 becomes removed from the extension J^8. Since the said arm J^9 abuts against the rigid finger H′, mounted on the stationary plate H, the advancement of the plate J^2 will cause the turning of the arm J^9 on its axis, such turning being to the right, until the end of said arm slips clear of the extension J^8. This latter step is so timed that it occurs when the finger J has moved so far to the left that it extends across the coil-receiving channel. When thus freed from said arm J^9, said finger turns horizontally toward the coil-guide and against the coil. The lower face of the end of said finger is low enough to bear down closely upon the coil, as well as to bear laterally against said coil. This is termed the "second" position of said finger. Said finger then remains stationary until the pin-bars D and F F have moved longitudinally toward the coil-guide and until the said bars F F have shifted horizontally, so as to transfer engagement from one coil of the fabric to the next lower coil. Then the bar J^3 again moves to the right, and the finger J is again set into its normal or first position by coming into contact with the screw-bolt I^4, the arm J^9 being again drawn into place against the extension J^8.

In Fig. 2 the operation last-above described is shown so far completed that the time has come for the bar J^3 to shift to the right and carry with it the plate J^2 and the finger J.

Both Fig. 1 and Fig. 2 show on the right-hand pin-bar F a hook F^2, which is directed horizontally away from the coil-path. On the upper face of the finger J is an upright stud *j*. With the pin-bars in their position away from the coil-guide the hook F^2 just clears the stud *j*, when the latter is carried to the left by the movement of said finger in that direction; but when said pin-bars are in their position toward the coil-guide, as shown in Fig. 2, then the hook F^2 is on the other side of the path of the stud *j*, so that when the finger and said stud have moved to their limit toward the left and the pin-bars F then shift to the right the stud *j* is in the path of said hook when the time comes for again shifting the pin-bars longitudinally away from the coil-guide. When said bars are then so shifted longitudinally, said hook engages said stud and carries said finger simultaneously with said bars away from the coil-guide to and beyond the normal or first position of said finger, as indicated by the dotted lines in Fig. 1. Thus the third position of said finger is attained, and said position then continues until said finger J and said stud *j* are carried far enough to the right to cause said stud to slip out of engagement with the hook F^2. The arm J^9 has by that time assumed its normal position and the extension J^8 then abuts against the end of said arm. Thus said finger again assumes its first or normal position. After the next coil has been formed the shift of the finger J is again to its second position—namely, across the coil-channel and toward the coil-guide. Then it again shifts to the normal position. Then it again goes to the second position and from that to the third position and thence to the first position. The movement from

the first position is always to the second, and from the second position the movement is alternately directly to the first position and to the first position by way of the third position; but the aforesaid alternation ceases when coils are to be manifolded to form "cords" at intervals in the fabric. Then the movement is direct between the first and second positions until the "cord" has been completed. Such "cording" is an old process in this art. In automatic machines of this class this is accomplished by suspending the action of the fabric-shifting mechanism during the formation and cutting of as many coils as it is desired to put into a cord. Mechanism for effecting such suspension is described in the patents already herein mentioned.

While the fabric herein mentioned is specified as being coiled-wire fabric for bed-bottoms, it is to be understood that my improvement is applicable to the manufacture of similar fabric to be used for other purposes.

I claim as my invention—

1. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for separating the coil-path and the last-completed coil, of mechanism for engaging and holding the last-completed coil while said coil and the coil-path are being separated, substantially as described.

2. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for bringing the final coil endwise into linear position to receive the next coil, of mechanism for engaging and holding the completed coil while it is being severed and brought into linear position to receive the next coil, substantially as described.

3. In a machine for making coiled-wire fabric for bed-bottoms, the combination with automatic mechanism for bringing the final coil endwise into linear position to receive the next coil, of automatic mechanism for engaging and holding said last-finished coil while it is being brought into linear position to receive the next coil, substantially as described.

4. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for severing the completed coil, of mechanism for positively engaging and holding the completed coil while it is being severed by said severing mechanism, substantially as described.

5. In a machine for making coiled-wire fabric for bed-bottoms, the combination with automatic mechanism for severing the completed coil, of automatic mechanism for positively engaging and holding said coil while it is being severed, substantially as described.

6. In a machine for making coiled-wire fabric for bed-bottoms, the combination with 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 the coil, of mechanism for engaging and holding said coil while it is brought into such linear position and moved longitudinally, substantially as described.

7. In a machine for making coiled-wire fabric for bed-bottoms, the combination with automatic mechanism for bringing the final coil of the fabric into linear position for the insertion of the next coil and automatic mechanism for moving the final coil of the fabric longitudinally after the completion of a coil, of automatic mechanism for engaging and holding said coil while it is being brought into such linear position and moved longitudinally, substantially as described.

8. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for severing the completed coil, of a member located adjacent to the path of the coil and automatic mechanism for moving said member into contact with the completed coil before said coil is severed, substantially as described.

9. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for severing the completed coil, of a member located adjacent to the coil-path, and mechanism for moving said member transversely to said path and also toward said cutting mechanism, substantially as described.

10. In a machine for making coiled-wire fabric for bed-bottoms, the combination with automatic mechanism for severing the completed coil, of a member located adjacent to the coil-path, means for moving said member transversely over the coil-path before the coil is severed and mechanism for moving said member away from said severing mechanism simultaneously with the movement of the last completed and severed coil away from said severing mechanism, substantially as described.

11. In a machine for making coiled-wire fabric for bed-bottoms, the combination with automatic means for bringing the final coil into linear position to receive the next coil, of a member located adjacent to the coil-path, and mechanism for shifting said member transversely over the coil-path into engagement with the completed coil before the latter is severed, substantially as described.

12. In a machine for making coiled-wire fabric for bed-bottoms, the combination with automatic means for bringing the final coil into linear position to receive the next coil, of a member located adjacent to the coil-path, and mechanism for shifting said member transversely over the coil-path and in a direction parallel to said coil-path, substantially as described.

13. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for severing the completed coil, of a member located adjacent to the coil-path, a support for said member shiftable transversely to said coil-path, and mechanism for

shifting said support prior to the operation of said cutting mechanism, substantially as described.

14. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for receiving the new coil, of mechanism for engaging and holding said coil when completed and until the machine is about to form another new coil, substantially as described.

15. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for receiving the new coil, of a member adapted to be shifted into three positions as herein described, and mechanism for shifting said member into said three positions, substantially as described.

16. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for receiving the new coil, of a member adapted to be shifted into three positions as herein described, mechanism for shifting said member into said three positions, said shifting mechanism being adapted to at intervals omit the third position of said member, substantially as described.

17. In a machine for making coiled-wire fabric for bed-bottoms, the combination with mechanism for receiving the new coil, of a member or finger, J, located adjacent to said mechanism for receiving said coil and hinged upon a support, J^2, said support being shiftable transversely to the coil-path, and means for turning said member, J, on its hinge when said support, J^2, reciprocates, substantially as described.

18. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism of a member or finger, J, hinged to the shiftable support, J^2, a relatively stationary stop, J^4, for engaging and turning said finger, and yielding means for moving said finger in opposition to said stop, substantially as described.

19. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism, of a member or finger, J, located adjacent to said coil-forming mechanism and hinged upon the support, J^2, and shiftable transversely to said coil-path, said finger having a shoulder, J^7, and a relatively stationary stop, J^4, for engaging such shoulder when said support, J^2, is shifted away from the coil-path, and yielding mechanism for turning said finger in opposition to said stop, substantially as described.

20. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism, of a member or finger, J, located adjacent to said coil-receiving mechanism and hinged to a support, J^2, which is shiftable transversely to the coil-path, a relatively stationary stop for engaging and turning said finger when said support, J^2, is shifted away from said coil-path, yielding mechanism for turning said finger in opposition to said stop, and mechanism for periodically shifting said finger in opposition to said yielding mechanism to a greater degree than said finger is shifted by said stop, substantially as described.

21. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism, and mechanism for shifting the fabric, of a member or finger, J, a shiftable support for said member, the movement of which support is adapted to shift said member over the coil-path, yielding means for moving said member toward the point of entrance of the coil to said coil-receiving mechanism, and mechanism supported by said fabric-shifting mechanism for engaging said finger and shifting it parallel to the coil-path in opposition to said yielding mechanism, substantially as described.

22. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism, of a shiftable support, J^2, and a relatively stationary stop, J^4; a finger, J, and arm, J^9, hinged to said support, and yielding mechanism for moving said finger and arm to their normal positions, substantially as described.

23. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism, of a shiftable support, J^2, the finger, J, hinged upon said support, and a relatively stationary stop for engaging said finger, and an arm, J^9, also hinged to said support and adapted to engage said finger, and a relatively stationary stop for engaging said arm, J^9, when the support, J^2, is shifted toward the coil-path, substantially as described.

24. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism, of a reciprocatory member, J^3, arranged transversely to the coil-path, a support, J^2, attached to said bar, and a member or finger, J, located upon said support, and suitable devices for shifting said finger in a direction parallel to said coil-path in addition to the movement imparted to said finger by the reciprocation of said member, J^3, and support, J^2, substantially as described.

25. In a machine for making coiled-wire fabric for bed-bottoms, the combination with the coil-receiving mechanism, of a support, J^2, reciprocable transversely to the coil-path, a finger, J, hinged upon said support and having a shoulder, J^7, and an extension, J^8, a relatively stationary stop, I^4, for engaging said shoulder, J^7, and an arm, J^9, hinged to said support and arranged to normally rest against said extension, J^8, a spring tending to hold the said arm, J^9, in its normal position, and a stationary stop for forcing said arm, J^9, out of its normal position and out of engagement with said extension, J^8, when said support, J^2, moves toward the coil-path, substantially as described.

26. In a machine for making coiled-wire fabric for bed-bottoms, the combination with the coil-receiving mechanism, of a support, J^2, re-

ciprocable transversely to the coil-path, a finger, J, and an arm, J^9, hinged upon said support, and a tension-spring joined to said finger, J, and said arm, J^9, and tending to draw said finger and arm to their normal positions, substantially as described.

27. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism and cutting mechanism, of mechanism for engaging and holding the completed coil, and mechanism for first shifting said holding mechanism into action and then actuating said cutting mechanism, substantially as described.

28. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism and cutting mechanism, of a shiftable member for engaging and holding the completed coil, a shiftable support for said member, and a reciprocatory member engaging said support and said cutting mechanism, said engagement being suitably timed for first bringing said holding member into engagement with the completed coil, and then actuating said cutting mechanism, substantially as described.

29. In a machine for making coiled-wire fabric for bed-bottoms, the combination with coil-receiving mechanism and a shiftable member adapted to engage and hold the completed coil, of a reciprocable support for said holding member, and a reciprocatory shaft, and suitable connection between said shaft and said reciprocable support and said cutting mechanism, said connections being so timed as to first put said holding member into action and then actuate said cutting mechanism, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 20th day of July, in the year 1901.

JOHN F. GAIL.

Witnesses:
LOUIS J. HAMMOND,
CHAS. E. SANBORN.