(No Model.) 3 Sheets—Sheet 1.

F. L. BRYANT.

MACHINE FOR MAKING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 432,071. Patented Sept. 6, 1892.

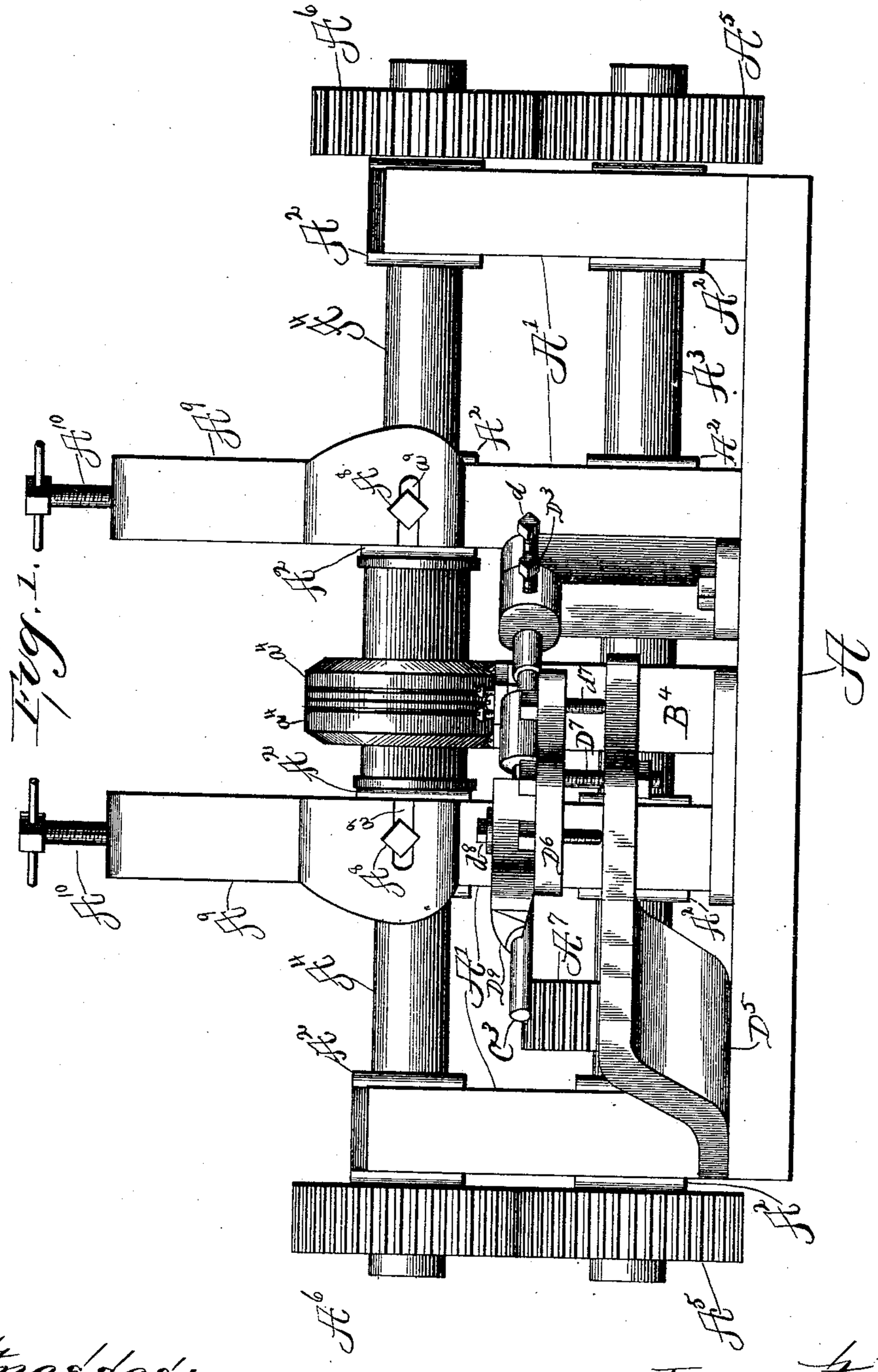

Fig. 1.

Witnesses:
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By Cyrus Kehr.
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(No Model.) 3 Sheets—Sheet 2.

F. L. BRYANT.

MACHINE FOR MAKING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 482,071. Patented Sept. 6, 1892.

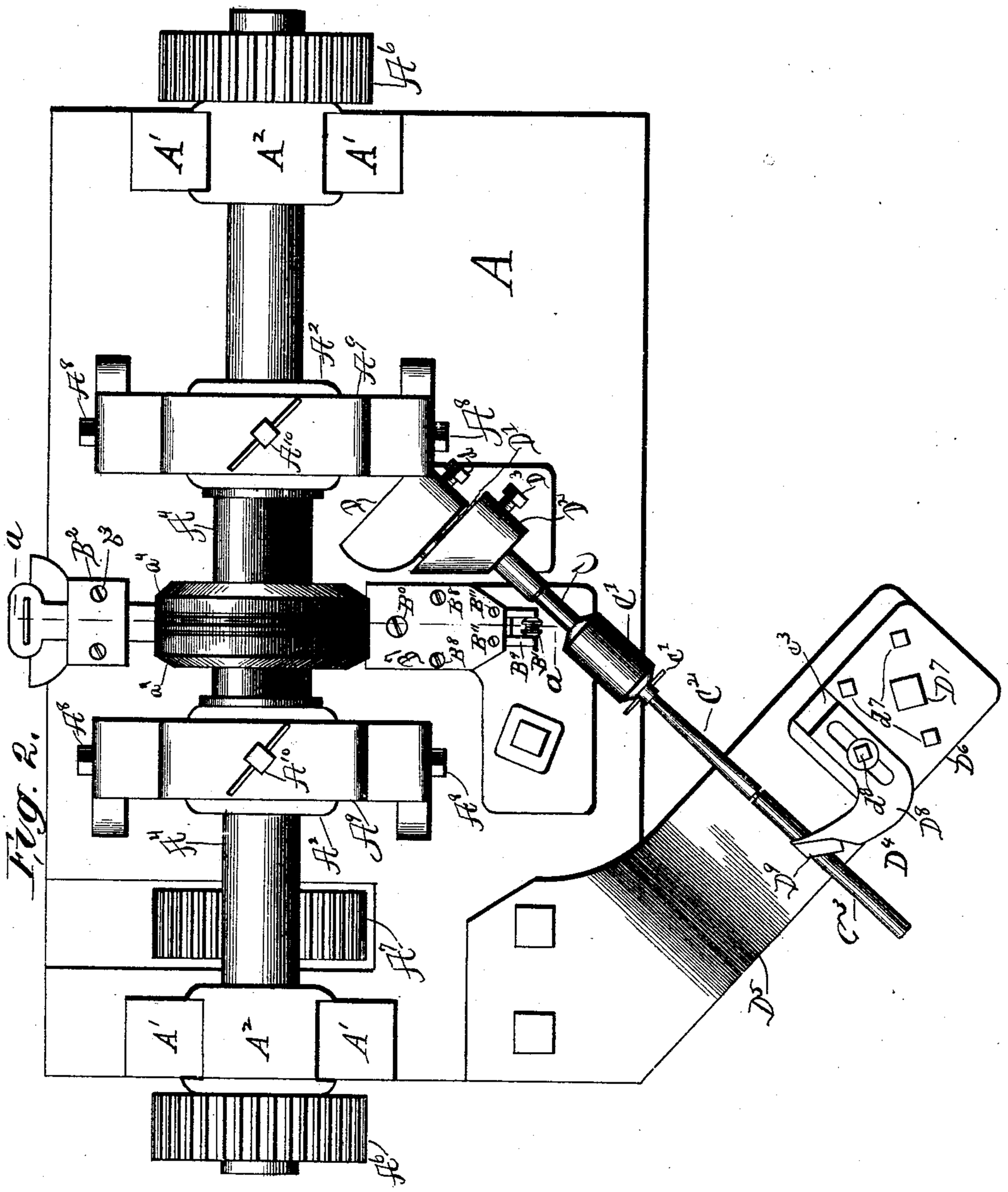

Fig. 2.

Witnesses:
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(No Model.) 3 Sheets—Sheet 3.

F. L. BRYANT.

MACHINE FOR MAKING COILED WIRE FABRIC FOR BED BOTTOMS.

No. 482,071. Patented Sept. 6, 1892.

Fig. 7.

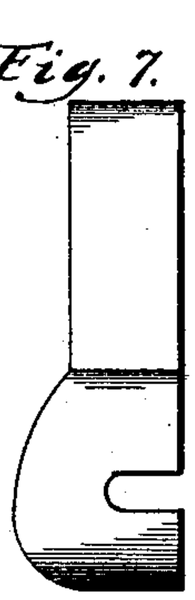


Fig. 5.

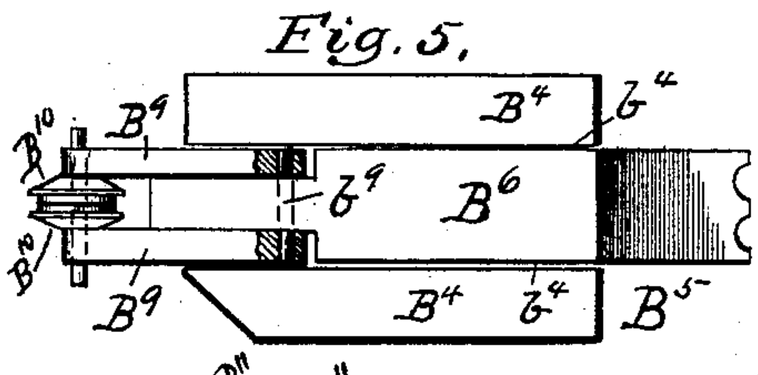


Fig. 6.

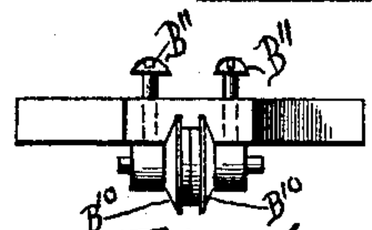


Fig. 3.

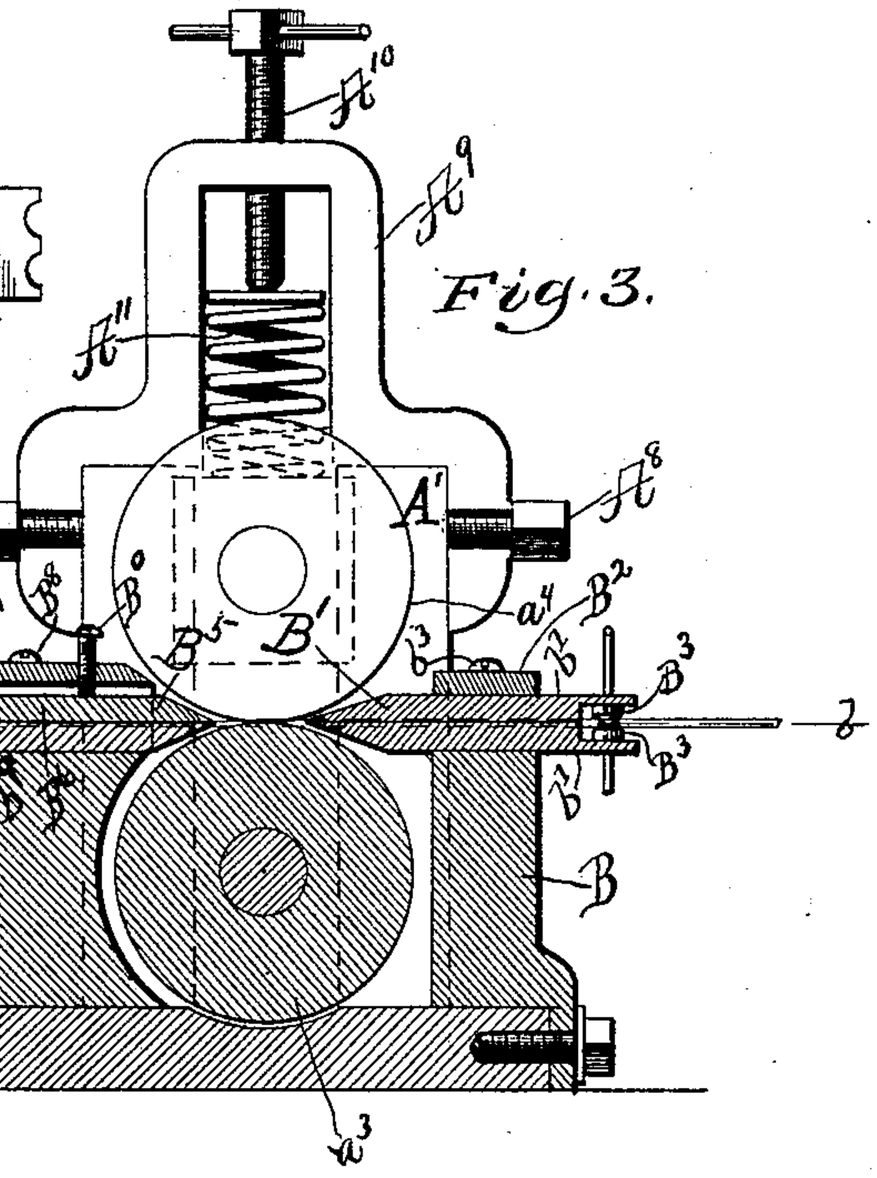


Fig. 4.

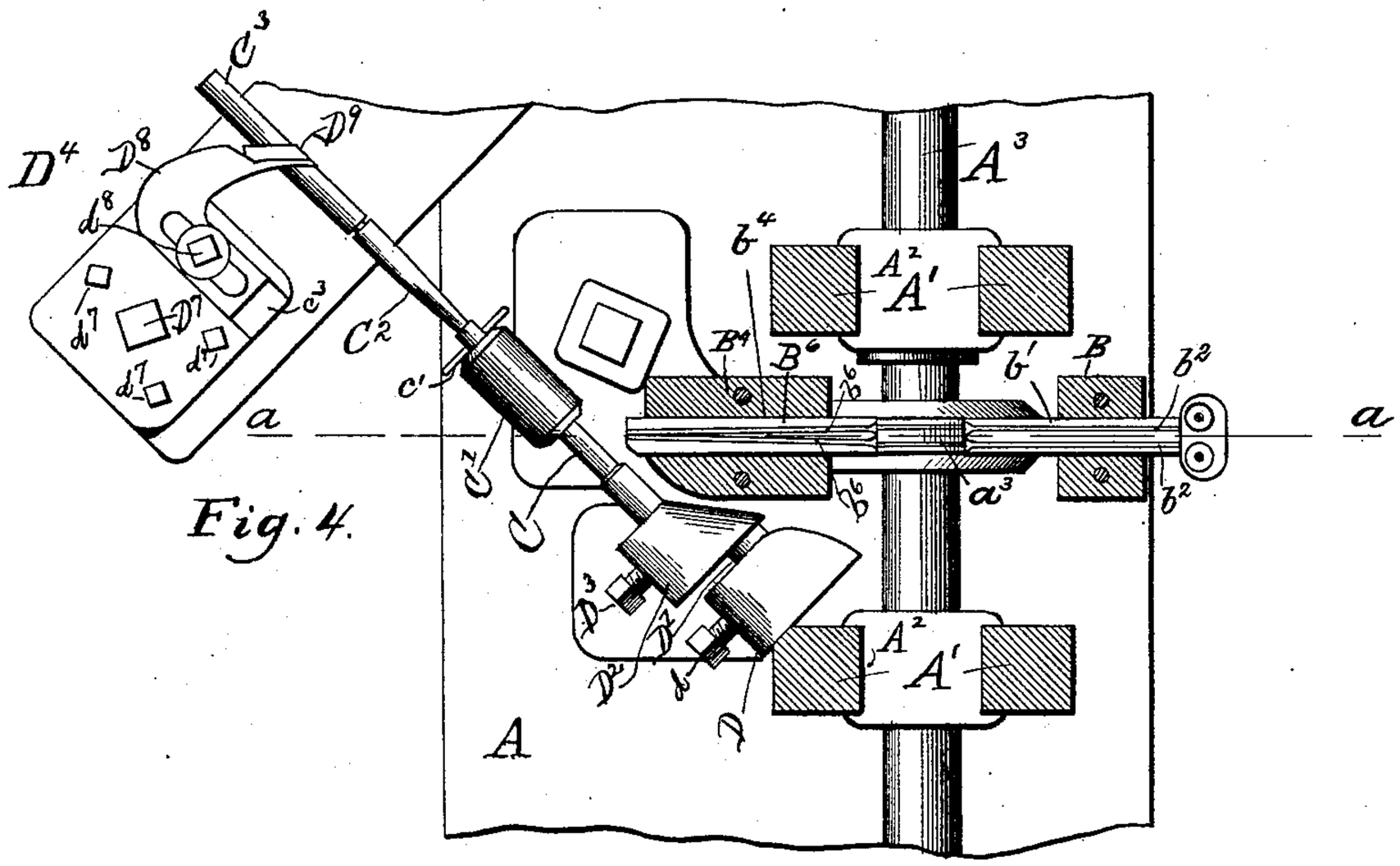
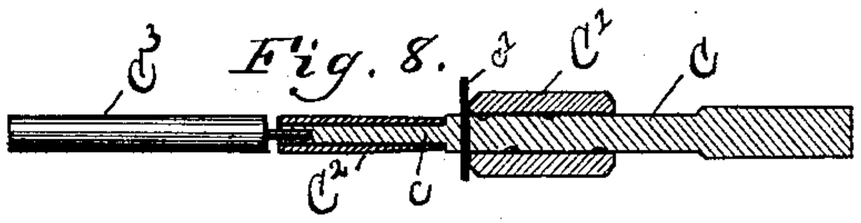


Fig. 8.



Witnesses.
Ambrose Risdon
Frank L. Stevens.

Inventor:
Fred L. Bryant
By Cyrus Kehr
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UNITED STATES PATENT OFFICE.

FRED L. BRYANT, OF CHICAGO, ILLINOIS.

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

SPECIFICATION forming part of Letters Patent No. 482,071, dated September 6, 1892.

Application filed October 1, 1891. Serial No. 407,439. (No model.)

To all whom it may concern:

Be it known that I, FRED L. BRYANT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making Coiled-Wire Fabric for Bed-Bottoms; 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 consists in certain additions to and improvements of the machine described in Letters Patent of the United States No. 296,551, granted to Abel H. Frost and myself April 8, 1884.

One of the features of the improvement relates to the arches in which the wire-forcing rolls are located, the upper portion of the arch being made removable. Another feature of the improvement relates to rolls for deflecting the wire before the latter passes upon the coiling-spindle. Another feature of the improvement relates to the eccentric mounting of the coiling-spindle, whereby the latter may be adjusted with reference to the guide delivering the wire to said spindle. Another feature of the improvement consists in mechanism and a method for modifying the coil after the latter leaves the spiral die of the coiling-spindle and before it enters the last-finished coil of the fabric. All these features and details noted above will be fully described hereinafter, and then particularly specified in the appended claims.

In the accompanying drawings, Figure 1 is an elevation view of a coiler embodying my improvement. Fig. 2 is a plan of said coiler. Fig. 3 is a vertical section of the coiler in the line *a a* of Figs. 2 and 4. Fig. 4 is a horizontal section in line *a b* of Fig. 3. Fig. 5 is a plan of the front wire-guide of the coiler. Fig. 6 is a front view of said guide and the plate located above said guide. Fig. 7 is a detail front view of one of the arches extending over the horizontal shafts of the coiler. Fig. 8 is a longitudinal section of the coiling-spindle and shell.

A is a base upon which the other parts of the coiler are mounted. From the base A rise four bearing-posts A′, each of which has extending from its upper end downward through its middle a space, in which are the bearing-blocks A^2. Said bearing-blocks A^2 form bearings for the horizontal and parallel shafts A^3 and A^4.

A^3 designates the lower shaft, which is continuous through the four bearing-posts and extends sufficiently beyond the outer of said posts to receive at each end a spur-gear A^5.

A^4 designates two shafts axially in line with each other and parallel to the shaft A^3, and one extending through the two bearing-blocks A^2 toward the head of the machine and the other extending through the two bearing-blocks A^2 toward the foot of the machine, and the ends of said shafts meeting between the inner bearing-blocks A^2 above the middle of the shaft A^3. Each of said shafts A^4 has at its outer end the spur-gear A^6, meshing into the adjacent spur-gear A^5.

A^7 is a spur-gear located upon the shaft A^3 and by means of which motion may be imparted to the machine, or motion may be transmitted to the machine in any other convenient manner.

Surrounding the shaft A^3 and beneath the meeting ends of the shafts A^4 is a forcing-roller a^3, and directly above said roller and pressing upon the latter a roller a^4 is mounted upon each of the meeting ends of the shafts A^4. The rollers a^4 need each be only half as wide in the direction of their axes as is the roller a^3.

A^8 A^8 are studs or screw-bolts extending laterally into the upper portion of each of the middle posts A′ from each side. An arch A^9 is located above each of the middle posts A′ and extends down over the side of the latter and is provided with a lateral notch a^9, into which the studs A^8 may extend for the purpose of anchoring said arches.

A^{10} is a vertical screw extending downward through the arch A^9 and bears upon an expanding spring A^{11}, which spring in turn bears upon the upper bearing-block A^2, located in the adjacent bearing-posts A′. The lower bearing-blocks A^2 have fixed positions in the lower portions of the channels or vertical spaces in the posts A′, so that the positions

of the spur-gears A^5 and the wire-forcing roll a^3 are unyielding. Driving the screw A^{10} downward will cause the spring A^{11} to press the adjacent upper bearing-block A^2 downward upon the shaft extending through said bearing-block and said shaft will be pressed down, so that the spur-gear A^6 and the forcing-roller a^4 upon said shaft will bear, respectively, upon the adjacent spur-gear A^5 and upon the forcing-roller a^3. In these machines each coil is composed of two wires, and one of said wires is to pass beneath one roller a^4 and the other wire beneath the other roller a^4. Tightening the screws A^{10} will cause the rollers a^3 and a^4 to press the harder upon the wires, the pressure upon each individual wire being dependent upon the pressure given to the particular roller a^4 above it by the corresponding screw A^{10}. This separate adjustment is provided in order that the machine may be accommodated to wires differing in thickness. This particular adjustment is, however, not embodied herein, for it is disclosed in the said patent granted to A. H. Frost and myself; but in said patent each bearing-post is itself in the form of an arch, and an adjusting-screw is extended through each such arch. I find it unnecessary to use more than one screw at each of the shafts A^4, and I find it a convenience in removing the shafts and other parts to have the arches absent from the outer posts A'. For the same reason the arches A^9 are made removable. When it is desired to remove the wire-forcing rolls and the guides located at each side of said rolls or to adjust the wire in said guides, it is only necessary to loosen the screws A^{10} and then push the arches A^9 from the studs A^8. Thereafter the shafts A^4 and the gears and forcing-rolls and bearing-blocks thereto attached may be lifted from the posts A', and on removing the guides for the wire the shaft H^3, with all the parts thereto attached, may be lifted from the posts A'.

B is a post rising from the base A at the rear of the rolls a^3 and a^4 into the plane in which the rolls a^4 meet the roll a^3. A guide B', consisting of two superposed guide-plates b', having two channels b^2 extending between them, each of sufficient diameter to allow the passage of one of the wires from which the coils are to be made, is sunk into the upper end of said post to a level with said end and there secured by a plate B^2, applied over said plates and there secured by screws b^3. At the front said guide tapers, as shown in Fig. 3, so as to extend close to the meeting-line of the rolls a^3 and a^4. At the rear end of said guide are located two vertical rollers B^3, between which the wires pass before entering the passages b^2. At the front of said roll a^3 and bolted to the base A is a post B^4, rising almost to the level of the upper portion of said roll and supporting at its upper end in a channel b^4 the guide B^5. Said guide consists of two superposed plates B^6, having between them passages b^6, similar to the passages b^2 in the guide B'. The rear end of said guide B^5 is tapered, so as to extend close to the meeting-line between the rolls a^3 and a^4. A plate B^7 extends over the upper end of the post B^4 and the guide B^5 and is secured to said post at each side of the channel b^4 by a screw B^8. A screw B^0 extends vertically through the plate B^7 and bears upon the upper face of the upper plate B^6 and presses said upper plate down upon the lower plate B^6, thus clamping both said plates to the post B^4. The wires pass through the channels b^6 after passing between the forcing-rolls. Thence they go to the coiling-spindle C. At the right and at the left the upper guide-plate B^6 is cut away at each side to make room for an arm B^9, hinged at its rear end by a horizontal axis to said guide-plate, so that the front end of said arm may move up and down in a vertical plane. Said hinging is preferably effected by a loose pin b^9, extending through said arms into the plate B^6, said arms and pins being held together by the walls of the channel b^4. The front end of said arms B^9 extend forward beyond both guide-plates B^6 and beyond the clamping-plate B^7, and each bears at the side directly toward the other of said arms a small roller B^{10}, arranged in a plane which is perpendicular and parallel to said arms and extends when its arm is in the horizontal position a short distance below the plane of the meeting faces of the guide-plates B^6, so that the wire in passing beneath said roller after issuing from the passages b^6 must bend downward a short distance. It is obvious that if the arms B^9 are left free to rise and fall the wire in issuing from said passages b^6 will push said rollers B^{10} upward sufficiently to allow the wires to run in a straight line; but above each arm B^9 a screw B^{11} extends through the clamping-plate B^7 and may be turned down to bear upon the adjacent arm B^9, so that the corresponding roller B^{10} is forcibly held below the plane of the meeting faces of the plates B^6. Either roller may be thus depressed independently of the other before reaching said spindle, according to the method described in the patent above mentioned.

The spindle C is a cylindric shaft with a spiral groove in its surface and is supported adjacent to the front end and obliquely to the guide B^5 and is surrounded by a loose shell C', between which and said spindle the wires pass after leaving the guide B^5. Said shell is retained in position by a pin c', extending into or through the spindle C. Said shell and spiral passage constitute a spiral die. Upon the prolongation c of the spindle C is mounted a shell C^2, which is tapering and has its smaller end directed toward the shell C', the smaller end being of less diameter than the interior diameter of the coil on leaving the shell C' and the larger end being about equal in exterior diameter to the interior diameter of said coil. To and axially in line with the prolongation c is secured rigidly the guiding-spindle C^3, which leads from said

extension to the coil-receiving mechanism and is of a diameter a trifle less than the interior diameter of the last-finished coil.

A post D, rising from the base A, receives a wrist D′ of an eccentric block D^2, and said wrist is secured in said post D by means of a set-bolt *d*. Said wrist is in a line parallel to the spindle C. The right end of said spindle enters the eccentric block D^2 at a short distance forward of the wrist D′ and is there secured by a set-bolt D^3. This eccentric mounting allows a slight vertical adjustment of the spindle C, so that the elevation of said spindle and the guide B^5 may be varied as may be required for accurate operation of the mechanism.

D^4 is a device for modifying the coil after the latter has left the coiling-spindle C. Suppose the pitch of the coil has decreased to less than the adopted standard. Then it is desirable to draw or stretch the coil, so as to lengthen the pitch before entering the last-finished coil.

D^5 is a bracket rising from the base A, and D^6 is a finger-supporting plate supported above the bracket D^5 by a bolt D^7, which extends through said bracket and said plate and tends to draw said bracket and plate together, and three set-bolts d^7, which are threaded through the plate D^6 and bear upon the upper face of the bracket D^5 and tend to elevate said plate. By a suitable adjustment of these bolts the elevation in a direction at right angles to said spindle and the inclination of said finger-plate may be varied. At the rear of the upper face of said plate D^6 and parallel to the guiding-spindle C^3 is a channel c^3, which receives the slotted finger-block D^8, and a bolt d^8, extending through the slot of said finger-block into the plate D^6, is a means for securing said finger-block to the plate D^6. Upon loosening said bolt said finger-block may be shifted back and forth in the channel c^3 and secured in any position in a line parallel to the spindle C^3. From said finger-block a finger D^9 extends to and curves obliquely over the portion of the spindle C^3 in such proximity with the latter as to prevent the wire from passing between said finger and said spindle, such obliquity being of proper degree and in proper direction to make said finger substantially parallel to the adjacent turns of the coil at each side of said finger. Hence the movement of said finger longitudinally with reference to the axis of the spindle will bring said finger into contact with one or the other of said turns of the coil, and if the finger is moved farther after such contact said turn will be moved also and the coil compressed or stretched longitudinally, according to the direction of movement of the finger. In other words, on any portion of the face of the spindle C^3 there are oblique spaces between the turns of the coil, and the finger D^9 rests in one of said spaces between two adjacent turns of said coil and so near said spindle as to prevent the passage of any portion of the coil between said finger and said spindle. It will be seen, then, that the longitudinal movement of said finger toward the coiler will cause contact between said finger and a turn of the coil toward the coiler and cause the longitudinal compression of the portion of the coil between said finger and the coiler, so that the pitch of that portion of the coil is reduced and said portion of the coil is shortened. If the finger is moved longitudinally away from the coiler, the turn of the coil at the side of the finger opposite the coiler is engaged and moved away from the coiler, so that the portion of the coil between said finger and the coiler is stretched and the pitch thereof increased. Thus the coil is forced to traverse a path so far removed longitudinally from the normal as to bend and thereby permanently modify the pitch of the coils. When the exact position of said finger for modifying the coils to the desired pitch has been ascertained, said finger is fastened by the bolt d^8. Said finger may also be termed a "guide."

I claim as my invention—

1. In a wire-coiler, the combination, with the wire-forcing rolls, and shafts bearing said rolls, and bearing-posts receiving said shafts, of studs extending laterally from the upper ends of said posts, arches located above said posts and having notches receiving said studs, and screws extending downward through said arches to bear upon said shafts or rolls, substantially as shown and described.

2. In a wire-coiler, the combination, with the base A, posts A′, shaft A^3, bearing a roll a^3, shafts A^4, each bearing a roll a^4, and bearing-blocks A^2, surrounding said shafts and resting in said posts, and gears A^5 and A^6, applied to said shafts, of studs extending laterally from the upper ends of said posts, and arches located above said posts and having notches receiving said studs, and screws extending downward through said arches to bear upon said shafts or rolls, substantially as described.

3. In a wire-coiler, the combination, with wire-forcing rolls and a coiling-spindle, of a guide B^5, extending from said rolls to said spindle and consisting of two superposed plates B^6, having a wire-passage between them and having arranged at the front of them a pair of rolls B^{10}, separately adjustable with reference to the paths of the wires, substantially as shown and described.

4. In a wire-coiler, the combination, with the wire-forcing rolls and the coil-forming spindle, of a post rising between said rolls and said spindle, a guide supported upon said post and consisting of two superposed guide-plates having a wire-passage between them, and two arms B^9, hinged to said guide in planes perpendicular to the plane common to both wires and each supporting a roller B^{10}, adjacent to a similar roller on the other of said arms, and means for forcing either of said rollers into the path of the adjacent wire

independently of the other of said rollers, substantially as shown and described.

5. In a wire-coiler, the combination, with wire-forcing rolls and a coil-forming spindle, of a channeled guide-support located between said rolls and said spindle, a guide located upon said support in the channel thereof and consisting of two superposed guide-plates having a wire-passage between them, one of said plates being cut away at its sides at the front sufficiently to receive at each side an arm B^9, and an arm B^9, located at each side of the plate and hinged thereto at the rear end, and rollers B^{10}, located between and each independently journaled to the adjacent arm B^9, the rear ends of said arm B^9 extending into and confined by the walls at the side of the channel in said guide-support, substantially as shown and described.

6. In a wire-coiler, the combination, with wire-forcing rolls and a coil-forming spindle, of a channeled guide-support located between said rolls and said spindle, a guide located upon said support in the channel thereof and consisting of two superposed guide-plates having a wire-passage between them, one of said plates being cut away at its sides at the front sufficiently to receive at each side an arm B^9, and an arm B^9, located at each side of said plate and removably hinged thereto by a pin b^9, extending through said arms and said guide-plate, and rollers B^{10}, located between and each independently journaled to the adjacent arm B^9, the rear ends of said arms B^9 extending into and confined by the walls at the side of the channel in said guide-support, substantially as shown and described.

7. In a wire-coiler, the combination, with the wire-forcing rolls and a guide for conducting the wire from said rolls, of a coil-forming spindle secured by an adjustable eccentric mounting, substantially as shown and described.

8. In a wire-coiler, the combination, with the wire-forcing rolls and a guide for conducting the wires from said rolls, of a post D, an adjustable eccentric block D^2, supported by said post D, and a coil-forming spindle located adjacent to said wire-guide and supported by said eccentric block eccentrically to the wrist of said eccentric block, substantially as shown and described.

9. In a wire-coiler, the combination, with wire-forcing rolls and a guide for leading the wire from said rolls, of a spirally-grooved spindle C, a shell C′, surrounding said spindle, a prolongation *c*, a tapering loose shell C^2, surrounding said prolongation, and a guide-spindle C^3, secured endwise to said prolongation *c*, substantially as shown and described.

10. In a wire-coiler, the combination, with a spiral die, and means for forcing the wire through said spiral die, and a substantially cylindric coil-guide, of a plate D^6, a suitable support for said plate, a finger-block adjustably secured to said plate, and a finger extending from said finger-block into substantial contact with said coil-guide, substantially as shown and described.

11. In a wire-coiler, the combination, with a spiral die, mechanism for forcing the wire through said spiral die, and a substantially cylindric coil-guide leading from said spiral passage, of a block D^6, a suitable support for said block, bolts D^7 and d^7 for adjustably securing said plate to said support, and a coil-engaging device adjustably secured to said plate and extending into the path of the coil, substantially as shown and described.

12. The combination, with a wire-coiler, of an obliquely-curved guide in front of said coiler and against which the wire bears as it leaves the coiler and means for adjusting said guide longitudinally and also in a direction at right angles to the axis of the coiler, substantially as shown and described.

13. In a wire-coiler, the combination, with devices forming a spiral passage and mechanism for forcing wire through said spiral passage, of coil-modifying mechanism embodying an engaging device arranged to extend from the outside of into the cylindric space occupied by the coil and being adjustable in a direction substantially parallel to the coiling-axis and also at right angles to said coiling-axis, whereby said engaging device may force the coil to traverse the path longitudinally out of the normal sufficiently to bend and permanently modify the pitch, substantially as shown and described.

14. In a wire-coiler, the combination, with devices forming a spiral passage, and mechanism for forcing wire through said spiral passage, and a spindle axially in line with said spiral passage and adapted to have the coil travel around it as said coil issues from said spiral passage, of coil-modifying mechanism embodying an engaging device arranged to extend obliquely over and partially embrace said spindle in a direction parallel to the adjacent portions of the coil and being adjustable in a space parallel to the surface of said spindle, substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 22d day of September, in the year 1891.

FRED L. BRYANT.

Witnesses:
CYRUS KEHR,
AMBROSE RISDON.