

No. 730,516.

PATENTED JUNE 9, 1903.

F. S. CULVER.
LOOP BANDING MACHINE.
APPLICATION FILED MAY 15, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2.

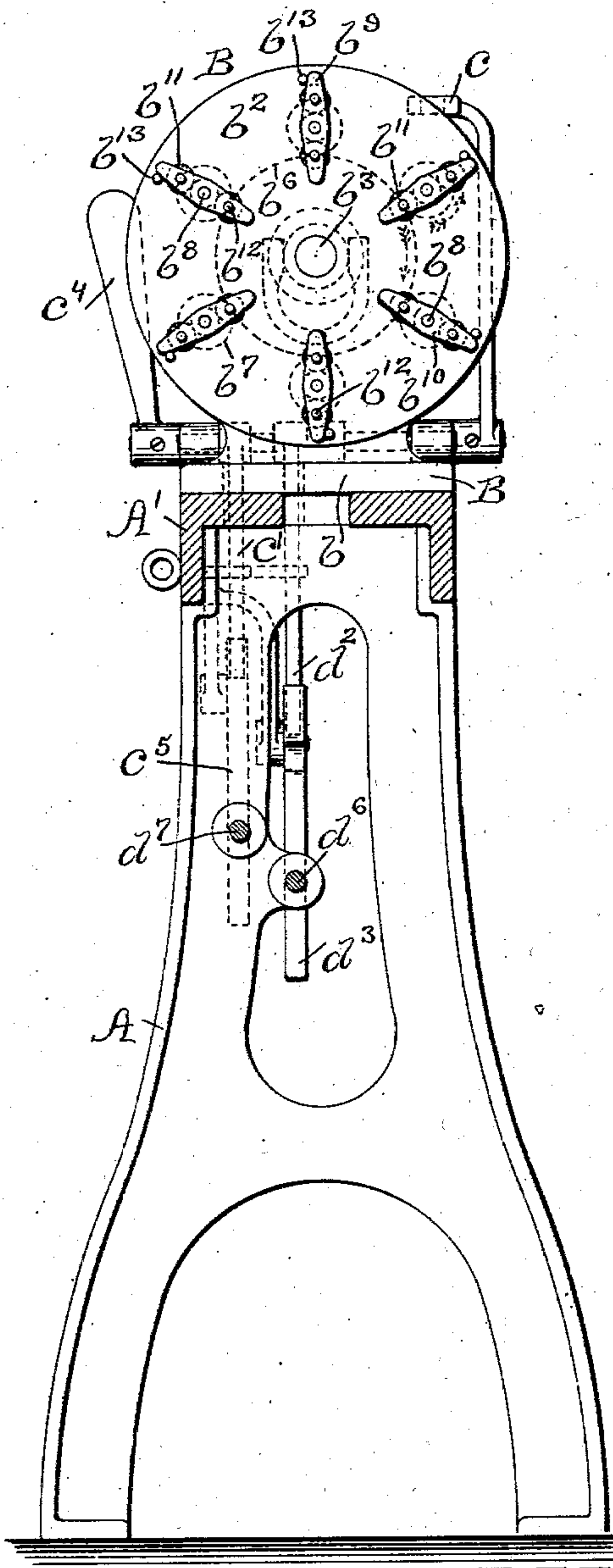
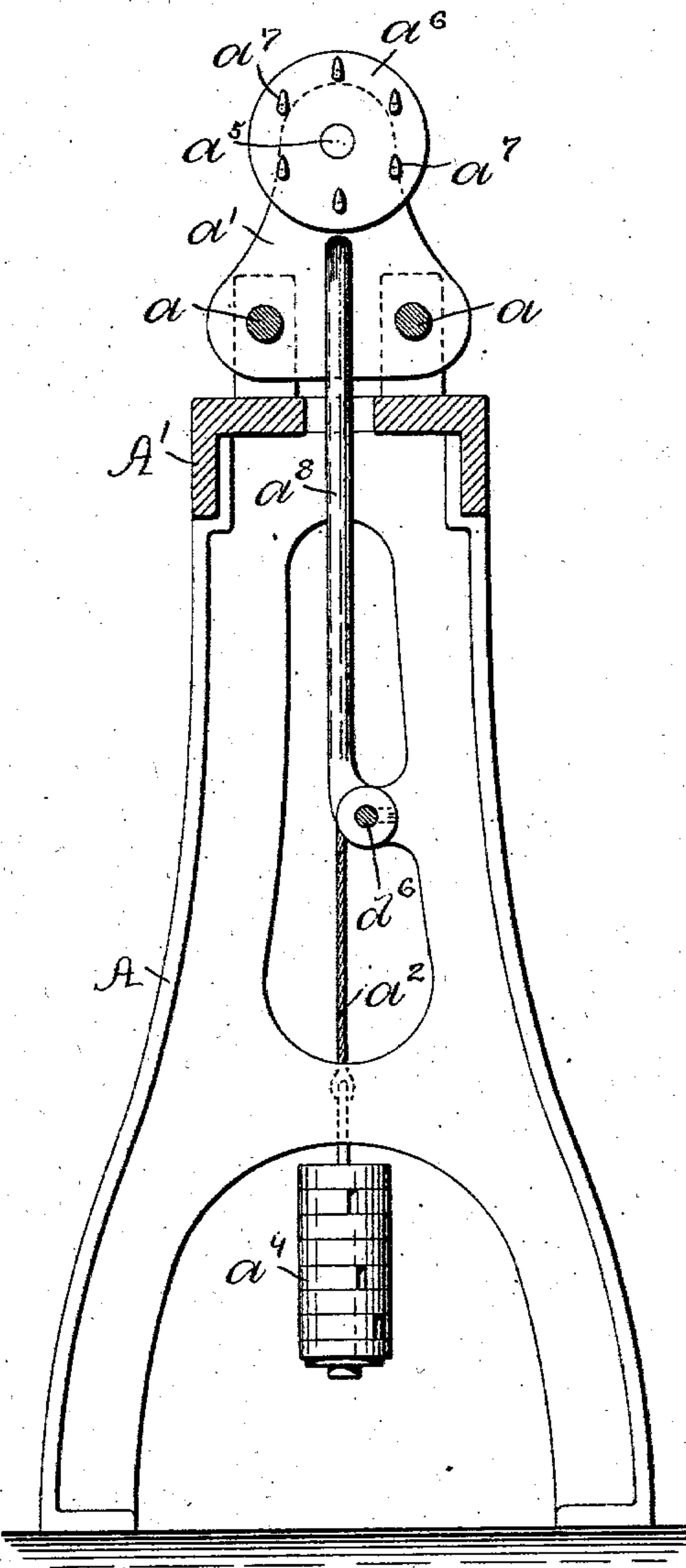


Fig-3.



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3 SHEETS—SHEET 3.

Fig. 4.

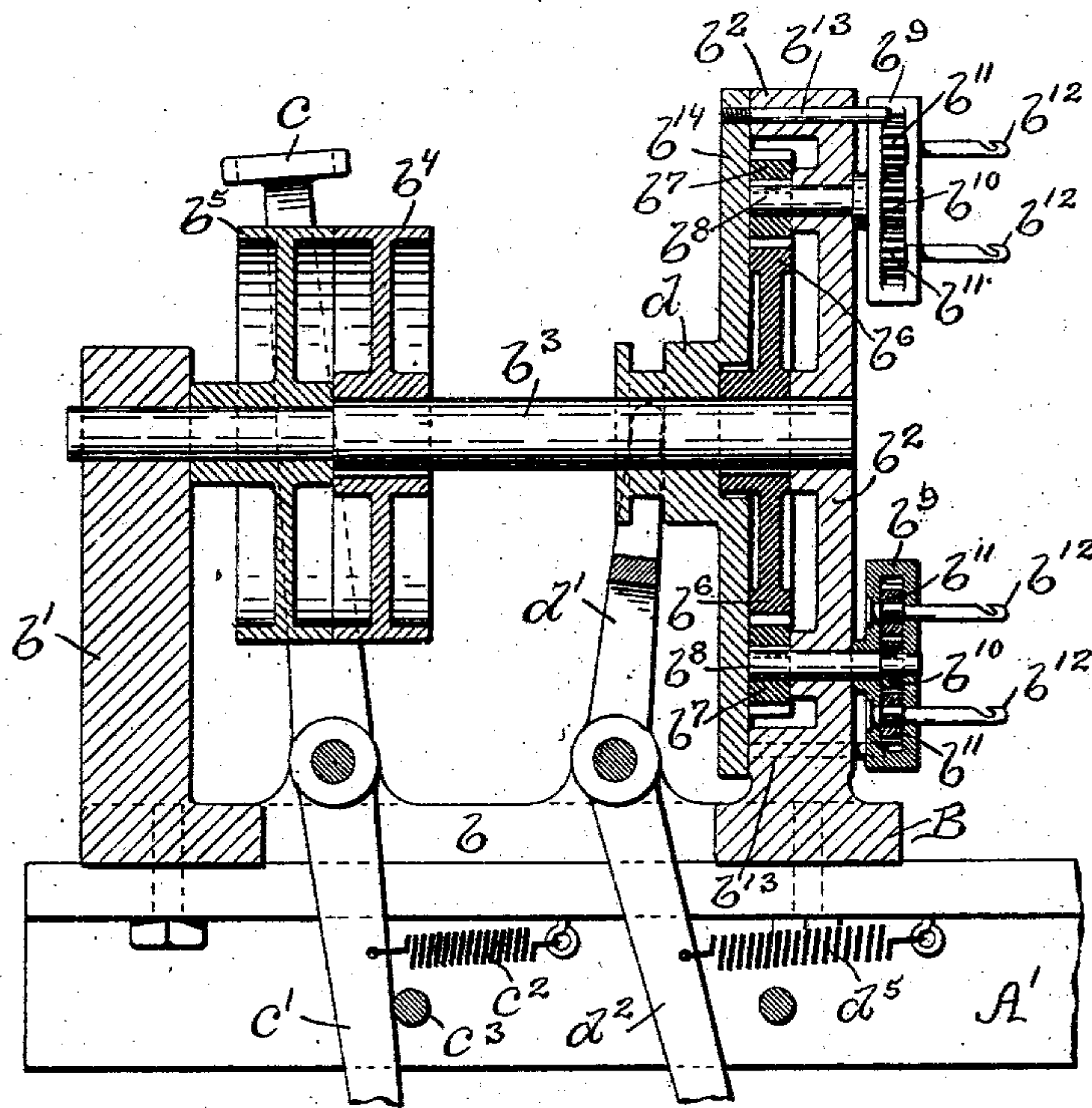


Fig. 5.

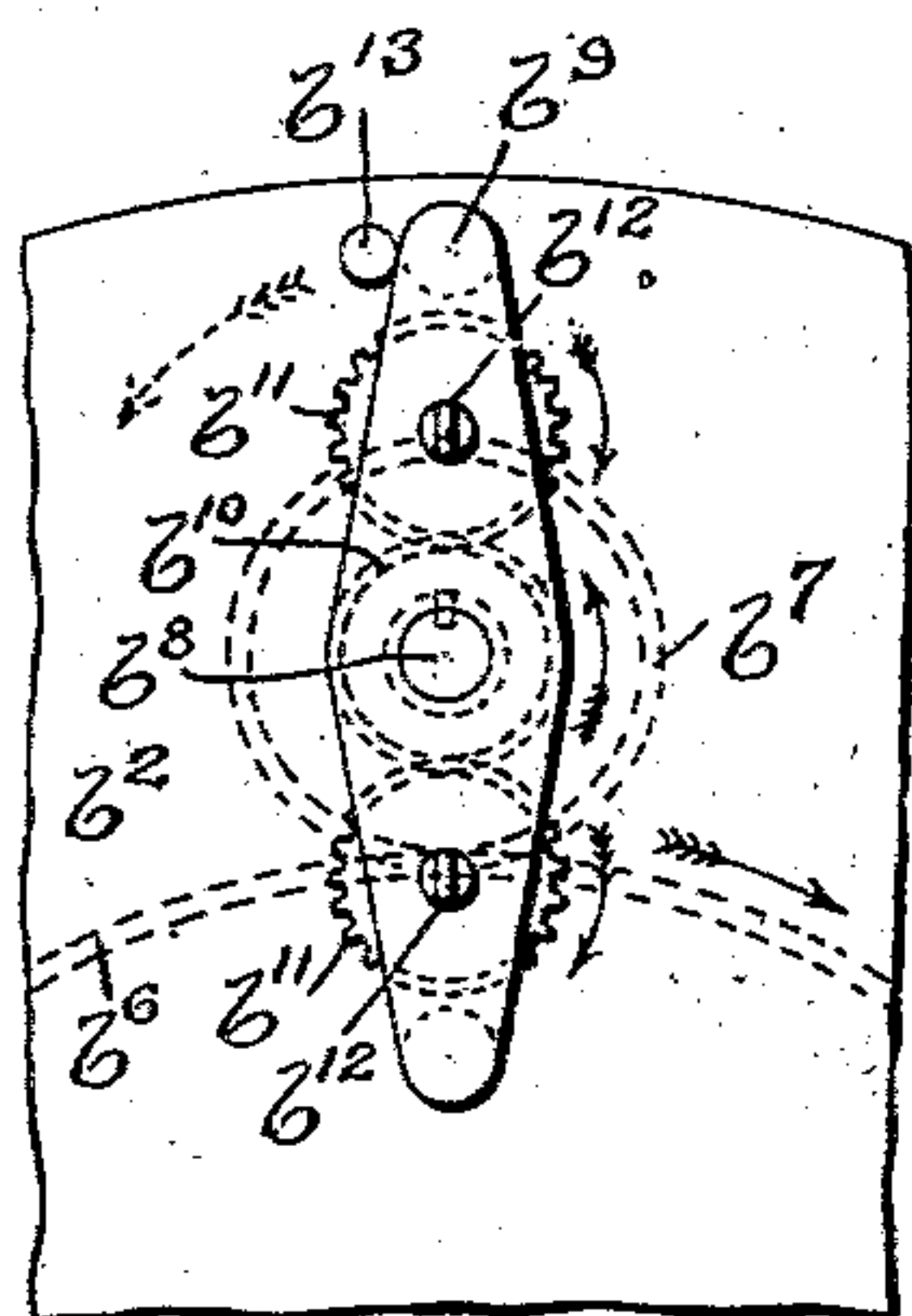


Fig. 6.

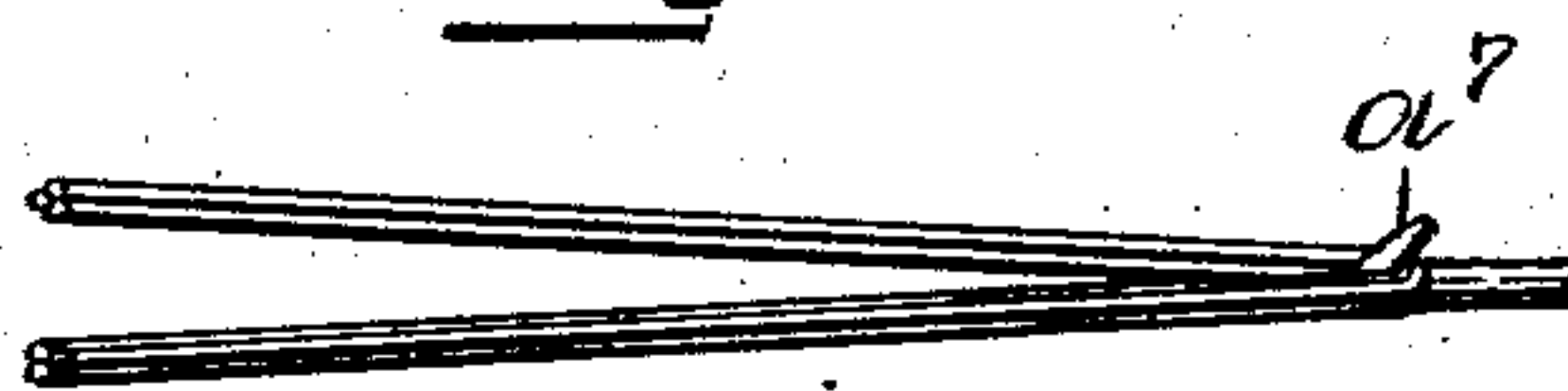


Fig. 7.

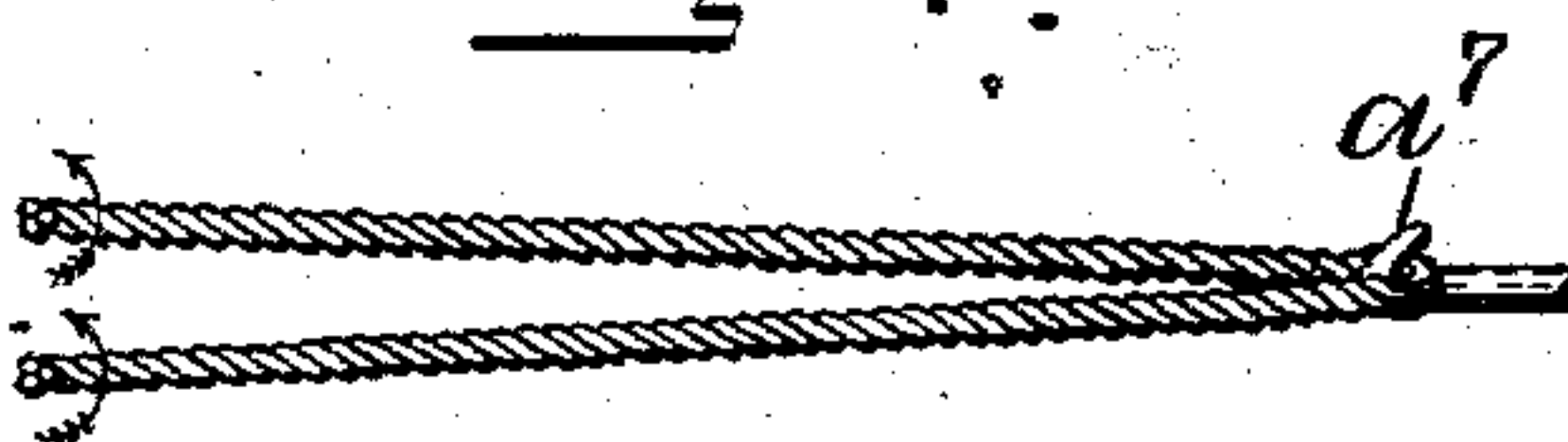
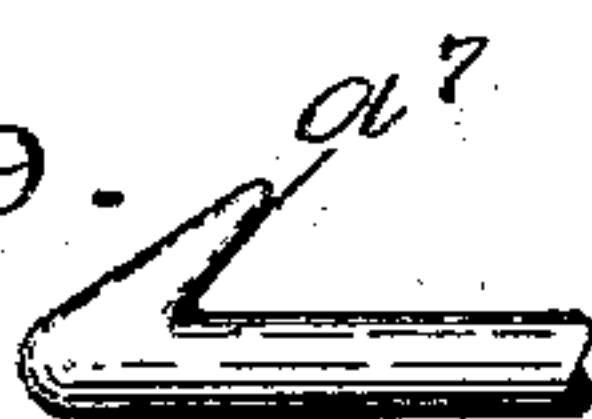


Fig. 8.



WITNESSES:

Fig. 9.



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UNITED STATES PATENT OFFICE.

FREDERICK S. CULVER, OF TAUNTON, MASSACHUSETTS.

LOOP-BANDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 730,516, dated June 9, 1903.

Application filed May 15, 1902. Serial No. 107,393. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK S. CULVER, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Loop-Banding Machines, of which the following is a specification.

This invention has reference to an improved machine for making the loop-bands used for driving the spindles of spinning and twisting machines and other parts of textile machinery. Such bands are composed of cotton cord or yarn suitably twisted and doubled to form a loop at one end of the band by which the securing of the banding on the machine is facilitated.

My improved machine is organized to twist and double a number of the loop-bands at one operation, and as far as I am aware it is the first machine in which two or more bands can be made simultaneously.

The object of my invention is to produce a loop-banding machine of simple construction in which a number of bands may be produced at one operation.

To this end the invention consists in the peculiar and novel construction and the combination of parts whereby a series of loop-bands may be twisted and doubled automatically, as will be more fully set forth hereinafter.

Figure 1 is a side view of my improved loop-banding machine. To illustrate the parts of the machine more clearly, the length of the machine is shown somewhat reduced to show the relative proportions of the parts more clearly within the limited space. Fig. 2 is a transverse sectional view of the machine looking toward the twister end. Fig. 3 is a transverse sectional view of the machine looking toward the tail end. Fig. 4 is a longitudinal sectional view of the twister-head. Fig. 5 is a front view of one of the twisters, the solid arrows indicating the movements of the gears in twisting and the arrow in broken lines the movement in doubling the bands. Fig. 6 is a perspective view showing the cord or yarn loop supported on the hook. Fig. 7 illustrates the operation of twisting the two strands of cord or yarn, and Fig. 8 the doubling of the banding. Fig. 9 is a side view of one of the loop-forming hooks.

Similar marks of reference indicate corresponding parts in all the figures.

In the drawings, A indicates the standards forming the support of the machine, and A' the bed of the machine; *a a*, two rods supported on the bed A', forming ways on which the block *a'* slides. To the block *a'* is secured the cord *a²*, which extends over the pulley *a³*, journaled in bearings supported on the bed A'. To the cord is secured the weight *a⁴*, formed of a series of disks, so that the weight may be adjusted. In the block *a'* the bar *a⁵* is adjustably secured. The disk *a⁶* on the end of the rod *a⁵* is provided with a series of loop-hooks *a⁷*. In the organized mechanism shown in the drawings six of the loop-hooks *a⁷* are shown. In the preferred form the loop-forming hooks *a⁷* are formed in the shape of a barb projecting from one side of the rod connecting the barb with the disk *a⁶*. The wedge or barb shaped head greatly facilitates the removal of the twisted bands. I find in practice that the loop-band twisted and doubled on such a hook will be provided with a more distinct and open loop and that this loop facilitates materially the tying when the band is placed on the machine.

Referring now to the opposite end of the machine, where the twister-head is located, I have secured to the bed A' the head-stock B, consisting of a bed-plate *b*, the standard *b¹*, and the disk-shaped standard *b²*. In the standards *b¹* and *b²* the driving-shaft *b³* is journaled, provided with the tight pulley *b⁴* and the loose pulley *b⁵*. On the shaft *b³* is secured the gear *b⁶*, which engages with the series of gears *b⁷ b⁷*, each one of which is secured to the short shafts *b⁸*, journaled in the standard *b²*. On each one of the shafts *b⁸* a frame *b⁹* is supported, and within the frame *b⁹* a pinion *b¹⁰* is secured, which engages with the two pinions *b¹¹ b¹¹*, journaled in the frame *b⁹*, each provided with the twister-hook *b¹²*. The frames *b⁹* are held against rotation with the shafts *b⁸* by the pins *b¹³*, secured to the disk *b¹⁴*, which is loose on the shaft *b³* and is controlled by a shipper mechanism, more particularly referred to hereinafter. The belt-shipper *c* is pivotally supported on the bed-plate *b* and has an arm *c'* extending below the bed A' of the machine, which arm is held by the spring *c²* against the stop *c³* when

the belt is on the loose pulley. The hand-lever c^4 is also connected with the rocking support of the belt-shipper and is used to move the belt from the loose onto the tight pulley, and in doing this the arm c' of the belt-shipper, which engages with the bell-crank lever c^5 , is moved to and engages with the second notch of the bell-crank lever c^5 , which is held in engagement by the over-weight c^6 and holds the belt on the tight or driving pulley until the belt-shipper is knocked off and the spring c^2 draws the arm c' against the stop c^3 , thereby moving the belt from the driving-pulley to the loose pulley.

The disk b^{14} , which carries the series of pins b^{13} and by these pins holds the frames b^9 against rotation, is provided with a grooved hub d , with which the fork of the lever d' engages. The lever d' is pivotally supported on the bed-plate b and is provided with the arm d^2 , the lower end of which engages with the notched bell-crank lever d^3 , pivotally supported on a bracket extending from the bed of the machine and held in engagement with the arm d^2 by the counterweight d^4 . The spring d^5 is connected with the arm d^2 at one end and the bed A' on the other end. When now the bell-crank lever d^3 is knocked off from the arm d^2 , the spring d^5 acts to draw the disk b^{14} backward and the pins b^{13} inward, thereby releasing the frames b^9 and permitting these frames to revolve and cause the doubling of the twisted strands into one complete band. The machine when once started is automatically controlled by the knock-off rods d^6 and d^7 , which are adjustably connected by the rod d^8 with the block a' . The spools ee , containing the coarse yarn or thread out of which the loop-bands are to be twisted, are supported on a suitable frame e' , and the ends of the threads are secured by a clamp in a convenient position on the bed of the machine.

To enable others skilled in the art to operate and use my invention, I will now describe the operation of the same more fully.

The machine having been adjusted to twist and double loop-banding of the desired length, the operator now secures the desired number of coarse threads to one of the twister-hooks b^{12} , then hooks the same threads over the corresponding loop-hook a^7 , and secures the other ends of the threads to the other twister-hook b^{12} . Having thus formed one loop the ends of which are fastened to the two twister-hooks of the same frame b^9 , the operator proceeds to secure in the same manner the other five strands of thread to the twister-hooks of the several twister-frames. The operator now starts the machine by moving the belt from the loose onto the tight pulley and at the same time moving the arm c' one notch on the bell-crank lever c^5 . The power transmitted through the shaft b^3 and the gear b^6 is communicated to the six pairs of twister-hooks b^{12} b^{12} through the gears b^7 and the pinions b^{10} and b^{11} in each of the

twister-frames, thereby twisting in a machine, as shown in the drawings, simultaneously twelve strands. The twisting of these strands acts to contract the same and draws the block a' and the weight a^4 toward the head-stock B. The block a' is moved thereby on the rods a , and this motion is transmitted through the rod a^8 to the rod d^6 until the end of the rod d^6 engages with the bell-crank lever d^3 and knocks off the arm d^2 . The spring d^5 now acts through the lever d' to draw back the disk b^{14} and withdraw the pins b^{13} out of the way of the twister-frames b^9 , thereby permitting the rotation of the twister-frames b^9 and the doubling of each of the pairs of strands into one band. The doubling of the bands continues to draw the block a' forward until the end of the rod d^7 engages with the bell-crank lever c^5 to knock off the shipper and stop the machine. The operator now removes the twisted and doubled loop-banding from the machine and then repeats the operation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a loop-banding machine, a fixed standard, driving-gears on the same, a plurality of twister-frames journaled in the standard, means for rotating the twister-frames, twister-hooks rotatably mounted in the twister-frames, means for rotating the twister-hooks, means for holding the twister-frames against rotation during the twisting of the strands, and means for releasing the same, as described.

2. In a loop-banding machine, the combination with a driving-shaft journaled in a standard, a gear on the driving-shaft, a series of gears engaging with the gear on the driving-shaft, a series of short shafts journaled in the standard and rotated by the series of gears, a multiple of twister-frames rotatably supported on the series of short shafts, two twister-hooks rotatably supported in the twister-frames, and gears driven by the short shafts to rotate the twister-hooks, of a series of pins and means for operating the pins whereby the twister-frames may be held against rotation to twist the separate strands of each loop and released to double the strands, as described.

3. In a loop-banding machine, the combination of the following instrumentalities: a driving-shaft, a gear on the driving-shaft, a series of gears engaging with the gear on the driving-shaft, a fixed standard, a plurality of twister-frames journaled in the fixed standard, a pair of twister-hooks rotatably mounted in each of the twister-frames, means for rotating the twister-hooks, means for controlling the rotation of the twister-frames, and a series of non-rotatable loop-hooks, as described.

4. In a loop-banding machine, the combination with a plurality of rotatably-mounted twister-frames, a pair of twister-hooks in each

of the twister-frames, stops for holding the twister-frames against rotation, and driving mechanism for rotating the twister-hooks, of a knock-off mechanism controlling the stops, whereby the twister-frame may be released, as described.

5. In a loop-banding machine, the combination with a yielding and counterweighted support for a plurality of loop-hooks, of a head-stock, a multiple of twister-frames rotatably mounted on the head-stock, twister-hooks in the twister-frames, means for rotating the twister-hooks, pins sliding in the head-stock, and means for moving the pins into or out of the path of the twister-frames, as described.

6. In a loop-banding machine, the combination with a head-stock, a driving-shaft, a loose and a tight pulley, and a gear on the driving-shaft, a multiple of twister-frames rotatably mounted on the head-stock, stops

for controlling the rotation of the twister-frames, mechanism for operating the stops, and a knock-off mechanism acting to release the stop-operating mechanism, as described.

7. A loop-banding machine having a counterweighted support for a multiple of loop-hooks, a multiple of twister-frames rotatably mounted in the head-stock, twister-hooks rotatably mounted in the twister-heads, means for holding the twister-frames against rotation, in combination with a knock-off mechanism whereby the two strands of a loop may be separately twisted and then doubled, as described.

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

FREDERICK S. CULVER.

Witnesses:

J. A. MILLER, Jr.,
BELLE SIMMS WEBSTER.