

(No Model.)

4 Sheets—Sheet 1.

A. CLEGHORN.

MACHINE FOR WINDING YARNS FROM CHAINS UPON SPOOLS.
No. 387,396.

Patented Aug. 7, 1888.

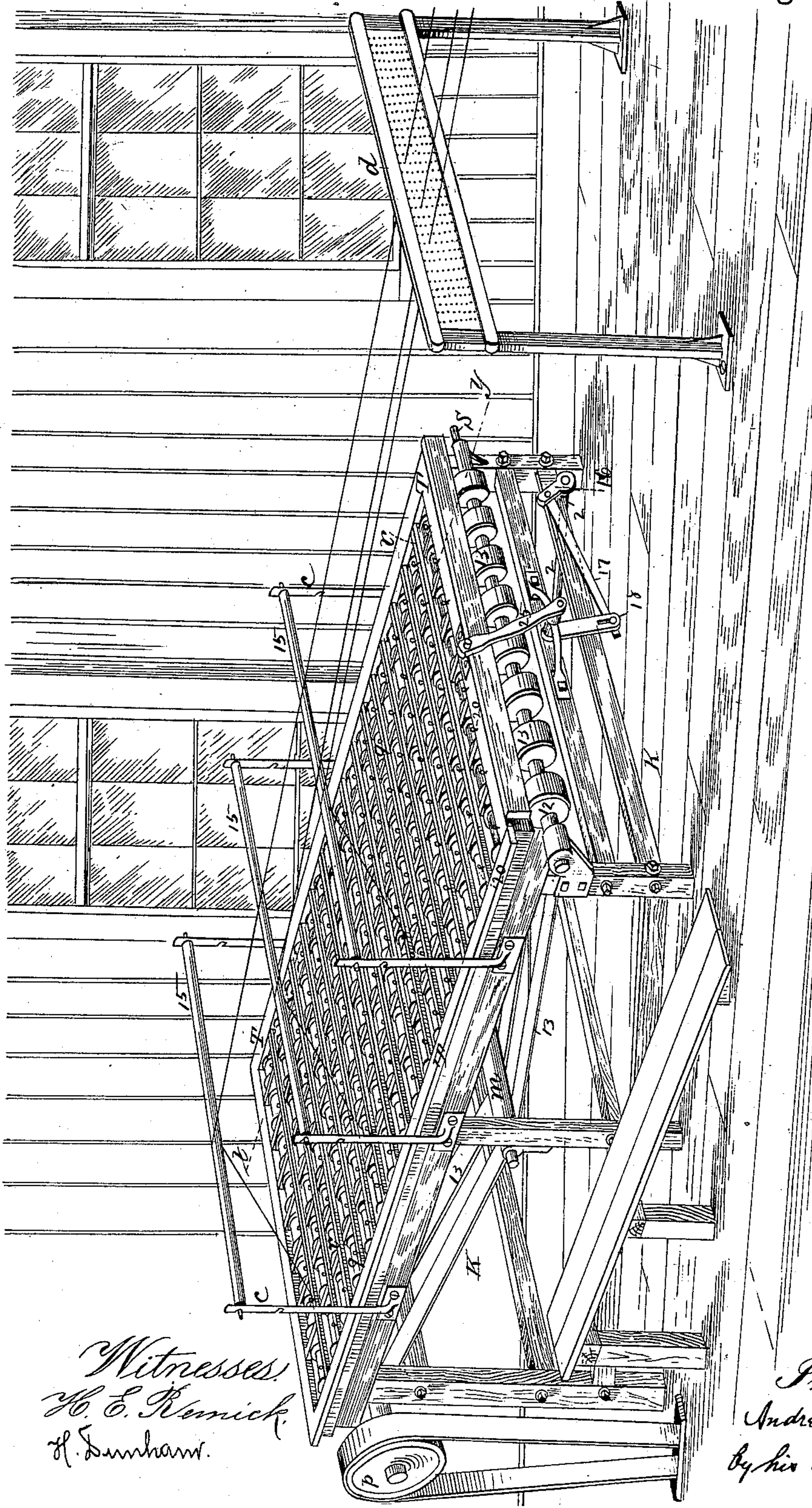


Fig. 1. A.

Witnesses:
H. E. Kennick.
H. Dunham.

Inventor:
Andrew Cleghorn.
By his Attorney,
Wm. Bamy, Owm.

(No Model.)

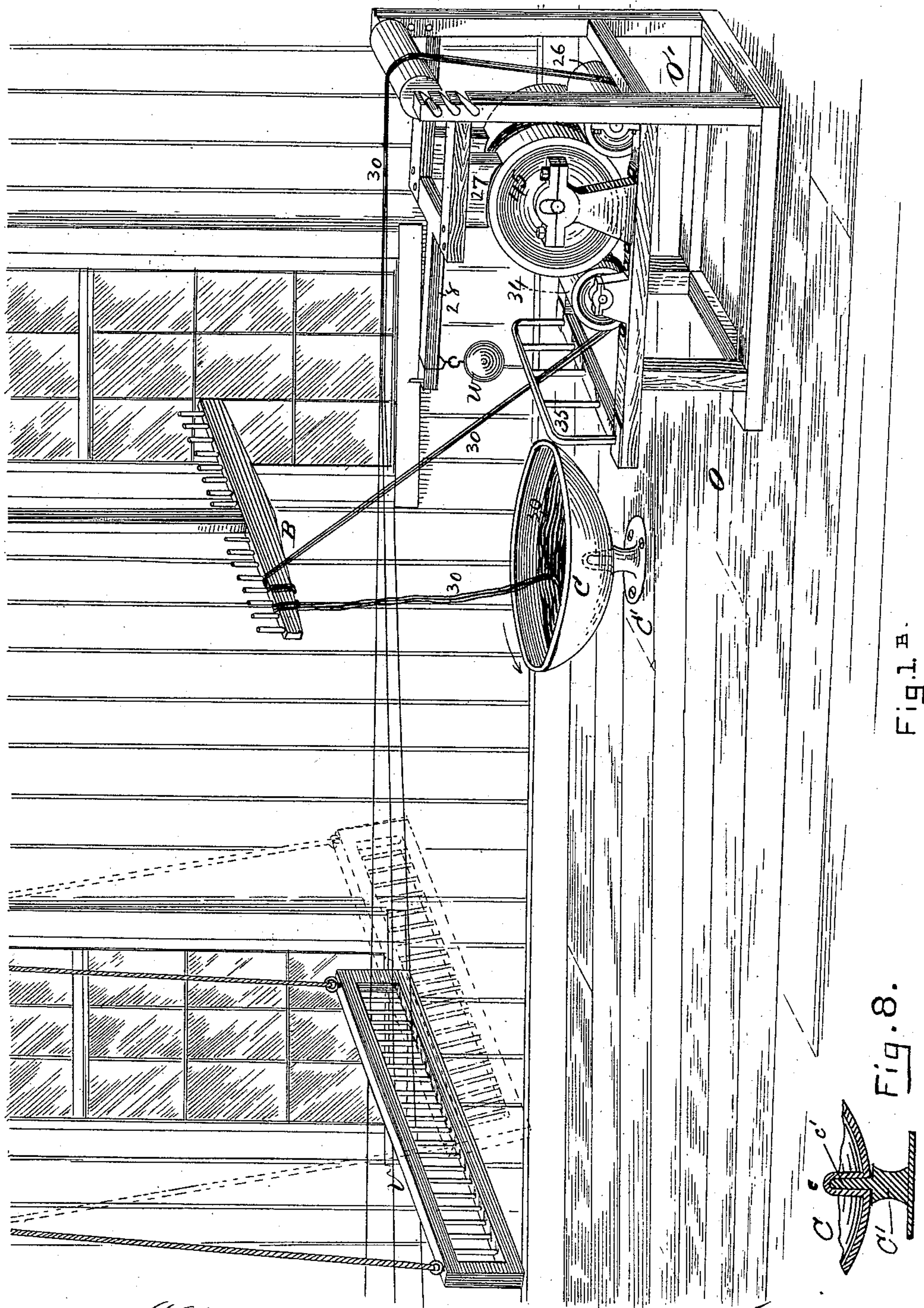
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Inventor:
Andrew Cleg horn.
by his Atty Wm Barry Owen.

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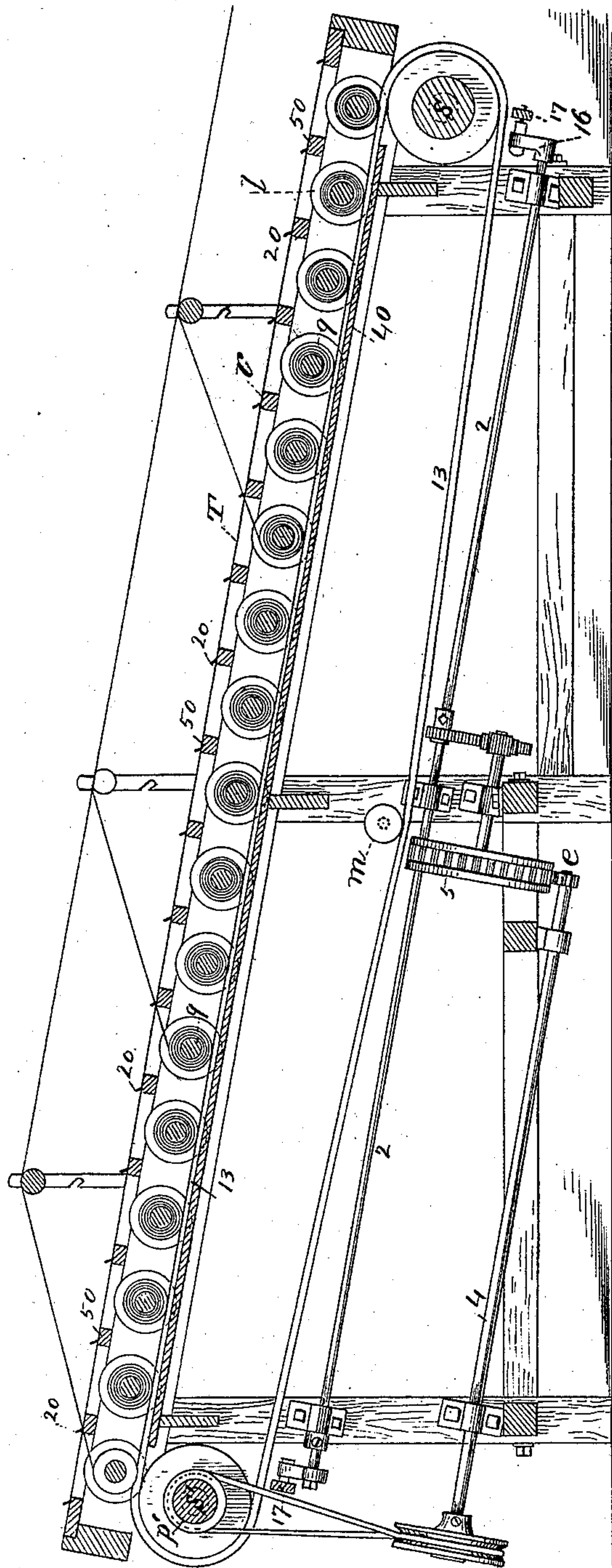


Fig. 2.

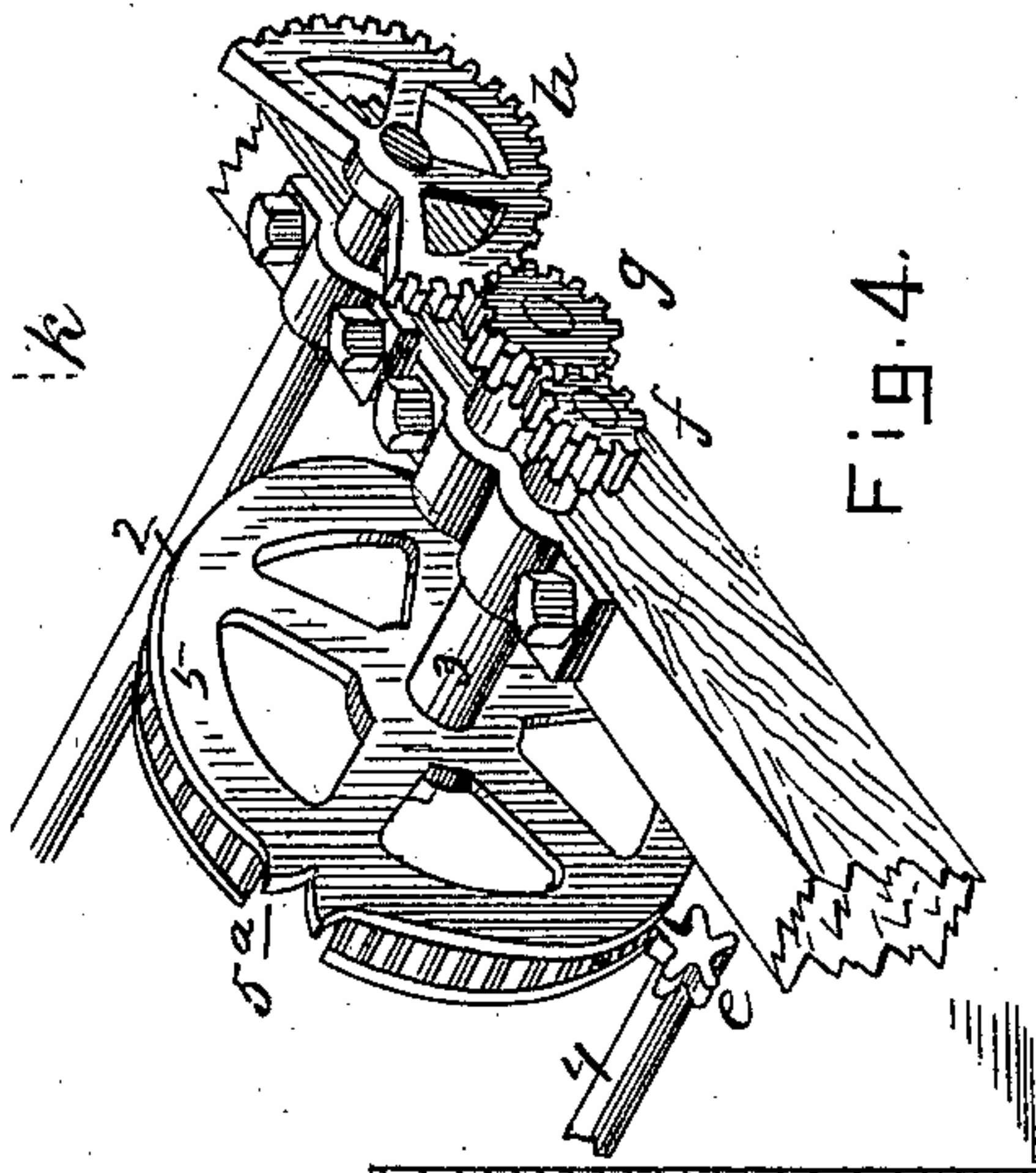


Fig. 4.

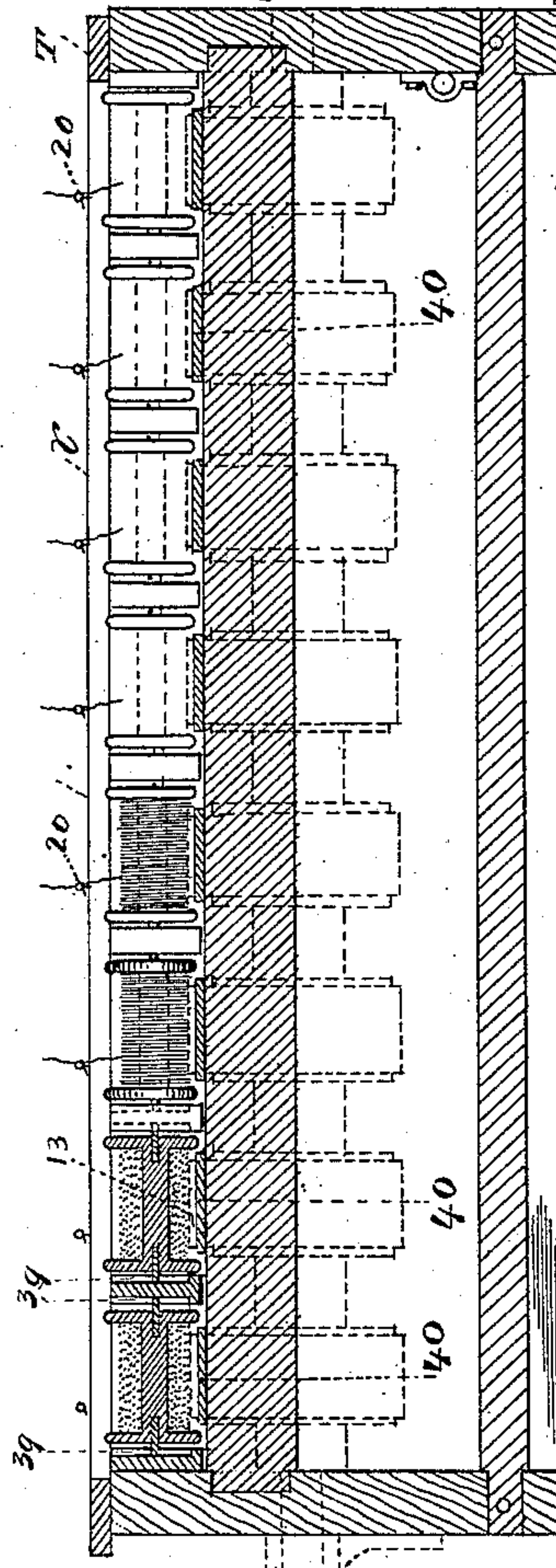


Fig. 7.

Witnesses:
H. C. Krumpholtz.
H. Dunham.

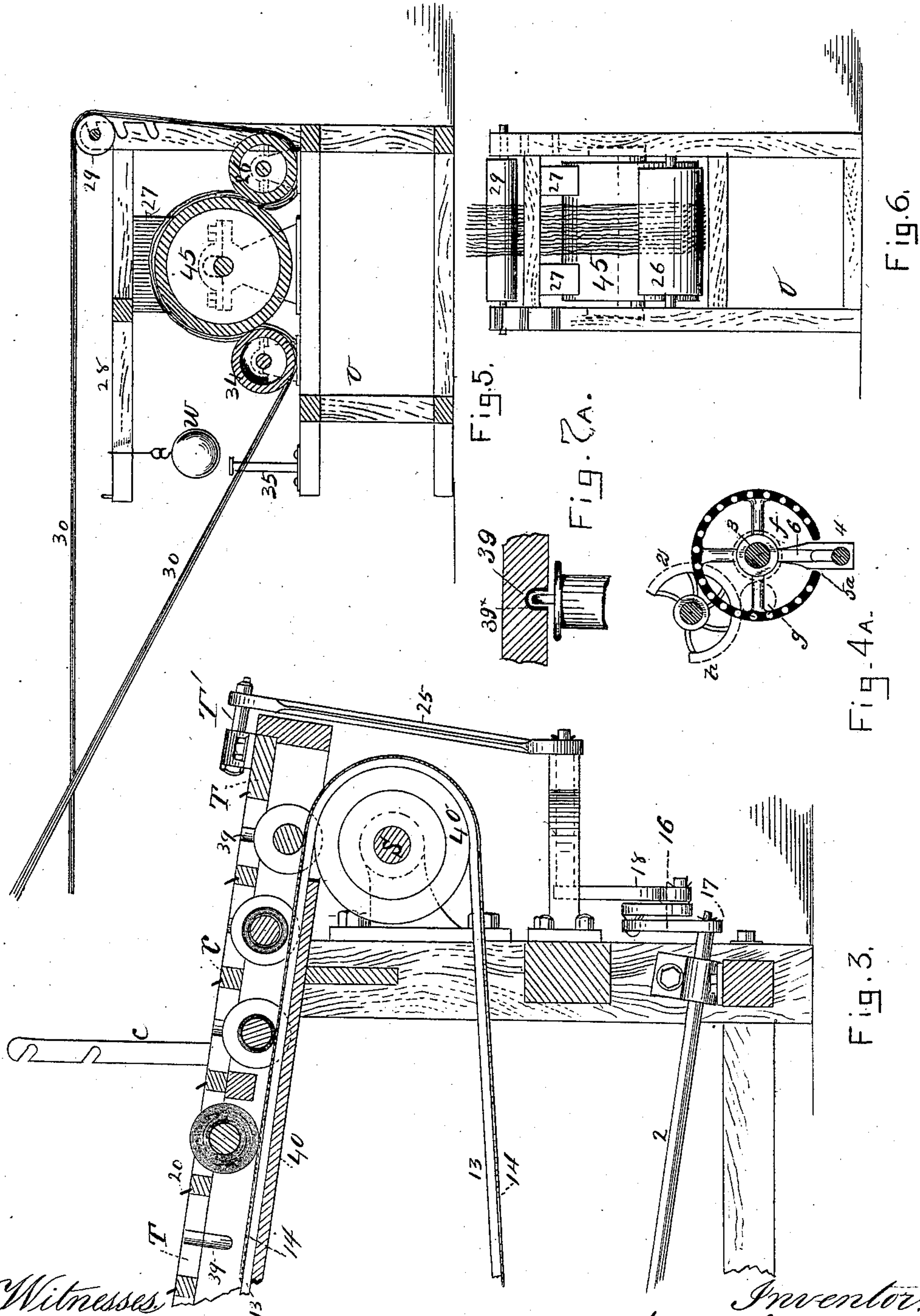
Inventor.
Andrew Clegghorn.
By his Atty - W. T. Barry, Clerk.

(No Model.)

4 Sheets—Sheet 4.

A. CLEGHORN.

MACHINE FOR WINDING YARNS FROM CHAINS UPON SPOOLS.
No. 387,396. Patented Aug. 7, 1888.



Witnesses
H. E. Pernick,
H. Dunham.

Inventor,
Andrew Cleg horn,
by his Atty W. B. Owen.

UNITED STATES PATENT OFFICE.

ANDREW CLEGHORN, OF FITCHBURG, MASSACHUSETTS.

MACHINE FOR WINDING YARNS FROM CHAINS UPON SPOOLS.

SPECIFICATION forming part of Letters Patent No. 387,396, dated August 7, 1888.

Application filed June 27, 1887. Serial No. 242,671. (No model.)

To all whom it may concern:

Be it known that I, ANDREW CLEGHORN, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Winding Yarns from Chains upon Spools, of which the following, taking in connection with the accompanying drawings, is a specification, in which—

Figures 1^a and 1^b, when placed together, represent a perspective of the whole machine in operation. Fig. 2 represents a sectional elevation through the line *xy* of Fig. 1^a. Fig. 3 is a side view of one end of the machine, partly in section. Fig. 4 is a perspective view of the gears controlling the traverse-levers shown in Fig. 3. Fig. 4^a is a sectional view of the same. Fig. 5 is an enlarged sectional elevation of the tension mechanism. Fig. 6 is a rear elevation of Fig. 5. Fig. 7 is a section of Fig. 2 through the line *kl*. Fig. 7^a is an enlarged detail view of one of the metal-lined notches in which the gudgeons of the spools rotate. Fig. 8 is a sectional view of the stand and part of the chain-cup.

All letters and figures represent the same parts wherever found.

My invention relates to improvements in spooling-machines which wind yarn of cotton or wool used for the filling or woof of cloth in the process of weaving upon spools preparatory to its being wound off upon the bobbins; and the object of my invention is to be able to spool the yarn-filling direct from the chain.

The method now in common use consists of the following steps: The yarn is taken in skeins and dyed by hand. This dyeing by hand gives very poor results in color, it often being very uneven. The skeins are then dried and put upon swifts and spooled. In the spooling of the skeins from the swifts four per cent. of the stock is wasted. Some others use this method: They die the chain of filling as they do the chain for the warp—by machine—getting a perfect color; but they have to “beam” this filling-chain before spooling it. This beaming is so expensive that they gain nothing besides the color.

As far as I know, I am the first who has successfully spooled the yarn directly from the chain. The advantages of this invention are: the ability to get an even color, as the chain can be dyed by machine; second, the waste of stock

is reduced to a minimum, and, third, by using my machine there are few knots in the thread caused by breaking in spooling, while by the old machines they are frequent. It is estimated that this will increase the daily product of the loom eight to ten per cent.

In order that those skilled in the art may more fully understand my invention, I will now proceed to describe in detail how I have carried it out.

As shown in Fig. 1^a, I have constructed a frame, *K*, to which is attached the shaft *S*, provided with eight pulleys exactly alike, the first of which is marked 12. At the other end of the frame is a similar shaft, *S'*, to which the pulley *P* is attached, and at this pulley *P* all the power is applied to drive the machine. The shaft *S'* is also supplied with eight pulleys exactly similar to the eight pulleys upon shaft *S*. These pulleys upon shafts *S* and *S'* are connected by eight belts, 13. At *m* is another pulley, which is merely to tighten the belts when necessary. Above these belts spools 9 are placed in the frame, which are commonly used to wind off yarn-filling from swifts preparatory to running it off onto the bobbins. There are eight spools 9 in a row from side to side, and thirty-two in a row from front to back, making two hundred and fifty-six spools; in a practical machine. The gudgeons of these spools are placed in notches 39 of sufficient depth that, whether full or empty, they will rest upon the surface of the belt, and never upon the bottom of the notches. Repeated experiment has shown that in order for spools to rotate always and evenly, thereby never allowing any slack of the thread between the spool and the tension mechanism, it is necessary to cover the belt with some substance to increase the friction. I have found that felt would answer the purpose better than anything else.

39 in Fig. 7 shows a section of such a notch as just mentioned, which is lined with metal, 39^x, so that the spool may run more perfectly and be less subject to wear.

In Fig. 7 is shown a section across the line *kl* in Fig. 2. This is designed to show an important element of the invention. 13 is a section of the belt as it passes under the spools, the side next the spool being faced with felt, 14. I found it essential for good results to insure the maintenance of a straight line by the upper surface of the belt upon which the

spools rested. This I accomplished by having a narrow board under each belt for it to run on. 40 is a section of this board. This is also shown by 40 in Fig. 3.

5 On the top of the frame-work *k* above the spools is a traverse-board, *T*, with rods *r* running from side to side between each row of spools. Before each spool in said cross-rods *r* is a leader, 20. (Shown best in Fig. 2.)
10 Thus by a lateral movement of the traverse-board *T* the yarn is wound evenly upon the spools.

The lateral motion is given to the traverse by means of the following devices: Secured to
15 the frame is a shaft, 4, on one end of which is a pulley, *n*, receiving power from a pulley, *p'*, on shaft *S'*. On the other end of shaft 4 is the pinion *e*, which meshes with the inside and outside gear-wheel 5, mounted on the counter-
20 shaft 3. This wheel is mutilated at 5^a, and the shaft 4 revolves in a slotted bearing, 6, the result being that when the pinion *e* reaches the break 5^a it passes from the outside gear to the inside gear of the wheel 5, or vice versa,
25 thereby reversing the direction of rotation of wheel 5. By means of cogs *f* and *g* and the sector-wheel *h* the oscillating motion of wheel 5 is communicated to shaft 2 and transmitted through arm 16, rod 17, and rock-arms 18 25
30 to the frame *T*, which is thereby given the required lateral motion. A similar arrangement of rocking arms at the other end of the machine insures an even and steady movement of frame *T*. The arm 25 is connected
35 with the frame *T* by means of a stud, *T'*, projecting from the frame and engaging with an opening in the upper end of arm 25.

Over the frame in Fig. 1^a are three rods, 15, attached to stanchions *c* on the side of the
40 frame, called "separators," to assist in conducting the threads along to the rear spools. About four feet from the lower end of the spool-frame is situated the splitting copper *d*. This is a frame holding a metal plate, in which
45 there are two hundred and fifty-six holes in the practical machine, eight in a line from top to bottom and thirty-two from side to side. A thread runs through each of these holes and then through its leader 20 in the traverse-
50 frame to the spools 9. Back of the splitting copper in Fig. 1^b is represented a suspended raddle, *V*, which is provided with thirty-two divisions in the practical machine, containing eight threads each. A man stands and swings
55 this raddle slowly backward and forward, to separate the thread of the chain as it comes from the tension mechanism *O*.

The tension mechanism *O* consists of the suspended arrangement *B* and machine *O'*.
60 (Shown in Fig. 1^b.) The arrangement *B* consists of a T-shaped frame suspended upside down with pegs inserted, as shown in the drawings, Fig. 1^b. The machine *O'* consists of the frame shown in Fig. 5, supplied with the leader
65 35 and the three drums 34, 45, and 26. The large drum 45 runs in a slot and is free to move up and down, but is held in its place by the

arm 28, provided with the pieces or brakes 27, a rear elevation of which is shown in Fig. 6. The brakes 27 also serve to retard the rotation
70 of the drum 45, and in this way, and also by pressing the drum 45 closely upon the rolls 34 and 26, to put a tension on the chain 30.

29 is a simple roll, over which the chain 30 passes.

The counter-balance *W*, moved upon the arm
75 28, regulates the tension, together with the frame *B*. (Represented in Fig. 1^b.) The less the number of times the chain 30 is wound around the frame *B* the less the tension; also, to move
80 the counter-balance *W* toward the large drum 45 lessens the tension, while to move it toward the end of the arm 28 tightens it.

At any convenient point, preferably beneath the suspended frame *B*, there is fastened to
85 the floor a standard, *C'*, from the top of which projects a short upright post, *c'*. On this post is received a sleeve, *c*, formed integral with or attached to the chain-cup *C*, in which is placed the chain 30 of wool or cotton yarn.
90 As shown in the drawings, the sleeve *c* consists of a hollow stud or nipple extending up into the cup at the center; but it may project below the cup or be arranged in any desirable manner. By this construction the chain-cup
95 is rendered rotatable in order to untwist the chain 30. The chain is conducted from the cup *C* around the frame *B* the necessary number of times; thence through the leader 35, under the drum 34, over the drum 45, under
100 the drum 26, over the pulley 29, through the suspended raddle *V*, and through the splitting copper *d* to the spools 9.

Having fully described my invention, what I claim as new, and desire to secure by Letters
105 Patent, is—

1. An organized mechanism for spooling thread directly from the chain, consisting of a rotatable chain-cup, a tension device, a sus-
110 pended raddle, a splitting copper, and a frame supporting the spools and provided with a traversing board, with mechanism, substantially as described, for giving it a lateral re-
115 ciprocating movement, and one or more endless belts, upon which the spools rest and by which they are revolved, substantially as set forth.

2. The improved tension device hereinbefore shown and described, consisting of the bar *B*, having a series of pegs, the rolls 34 and
120 26, lying in substantially the same horizontal plane, the drum 45, resting upon said rolls and having its shaft journaled in vertical slots, and suitable means, substantially as shown and described, for applying pressure upon the periph-
125 ery of said drum, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 14th day of June, A. D. 1887.

ANDREW CLEGHORN.

Witnesses:

DANIEL DOWLING,
CHARLES D. SCOTT.