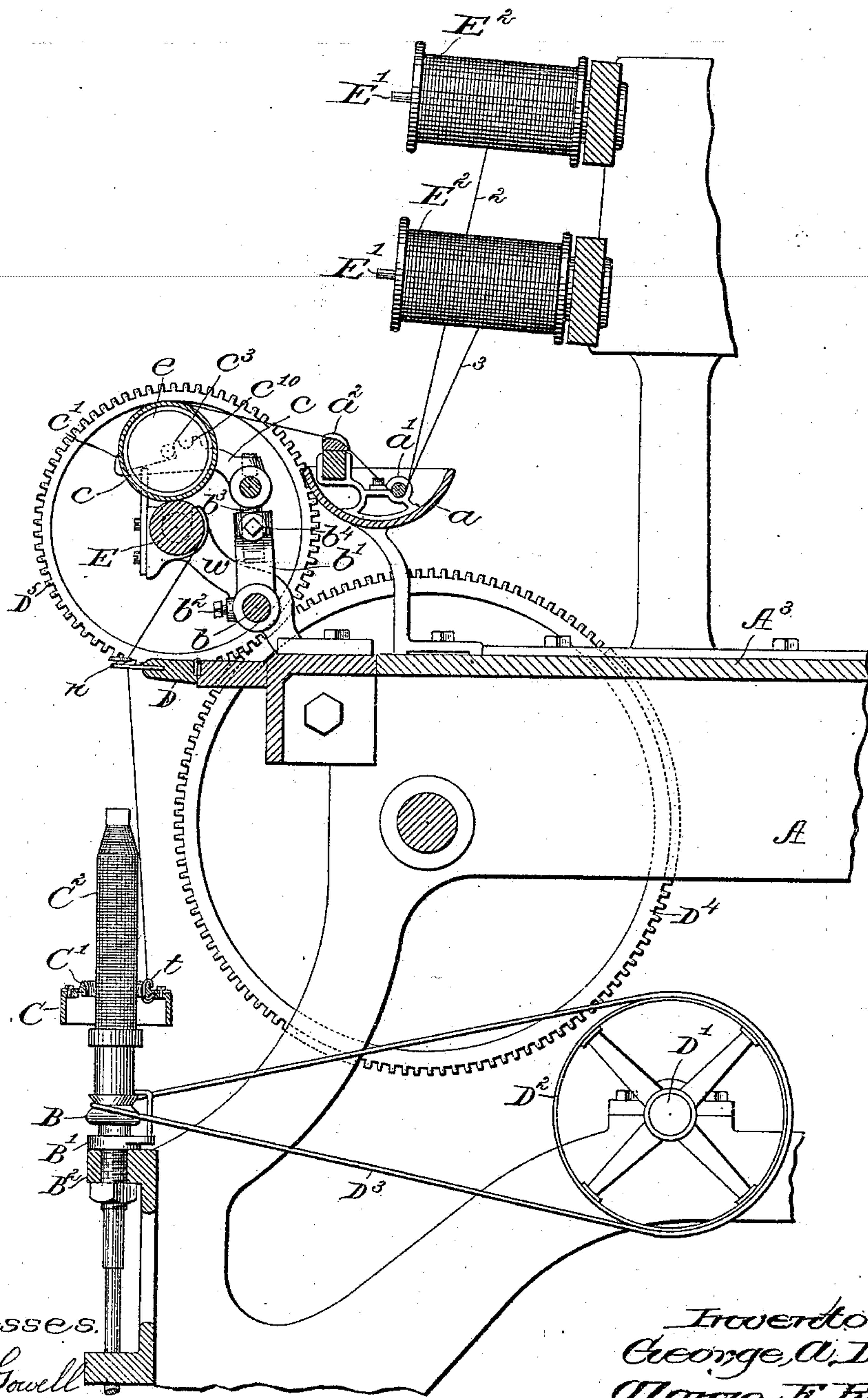


2 Sheets—Sheet 1.

Patented Aug. 22, 1893.

Fig: 1.



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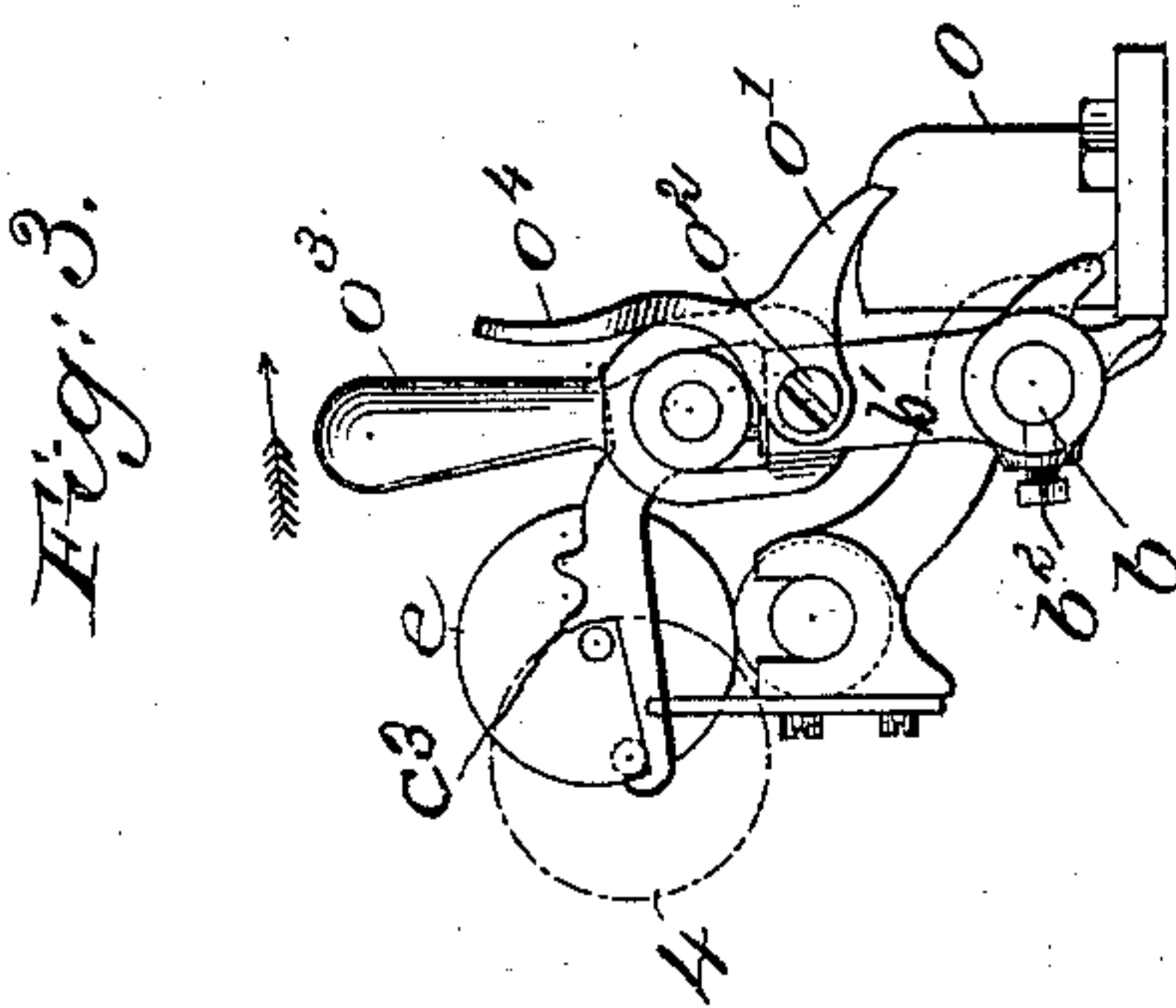
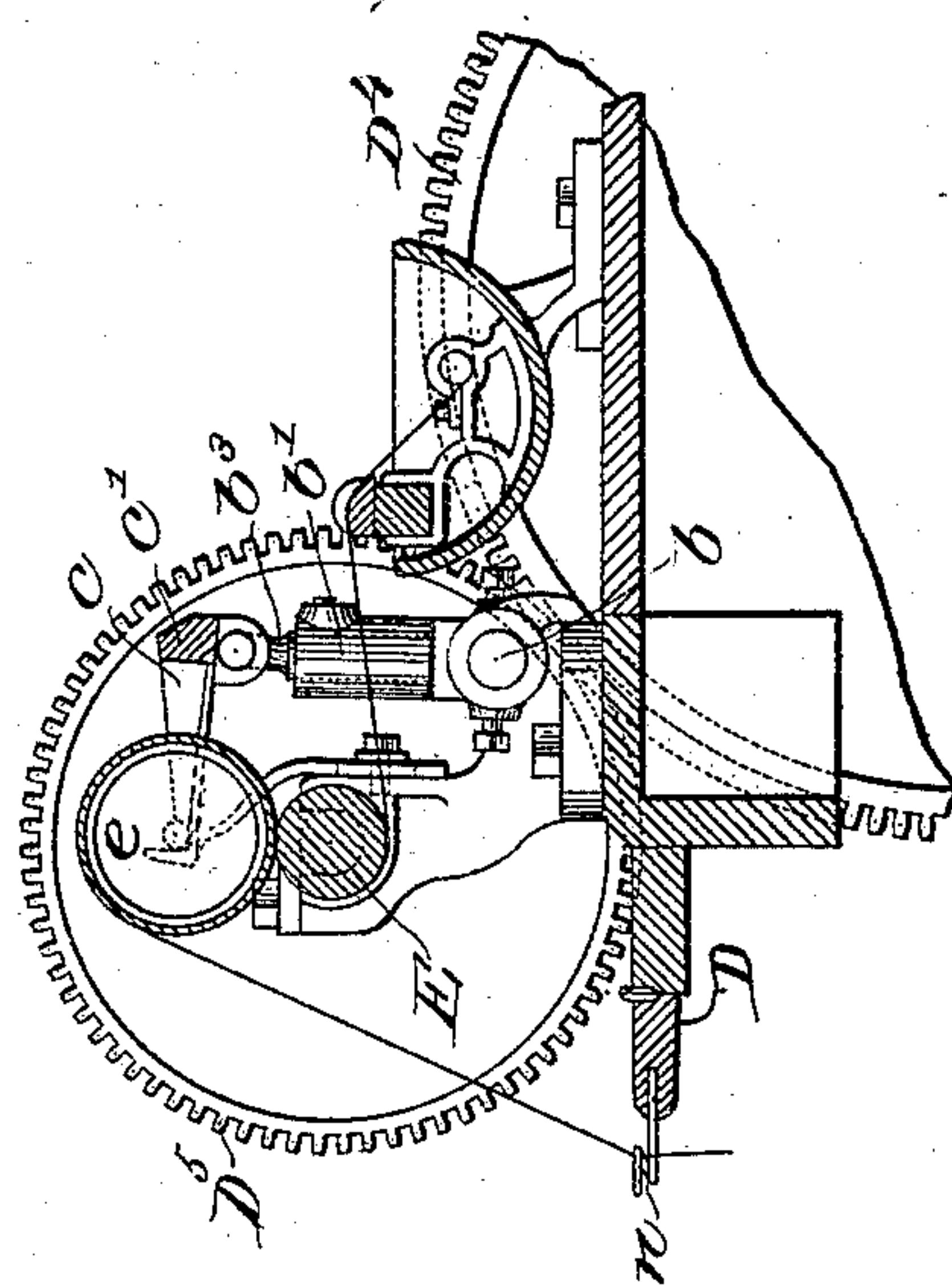
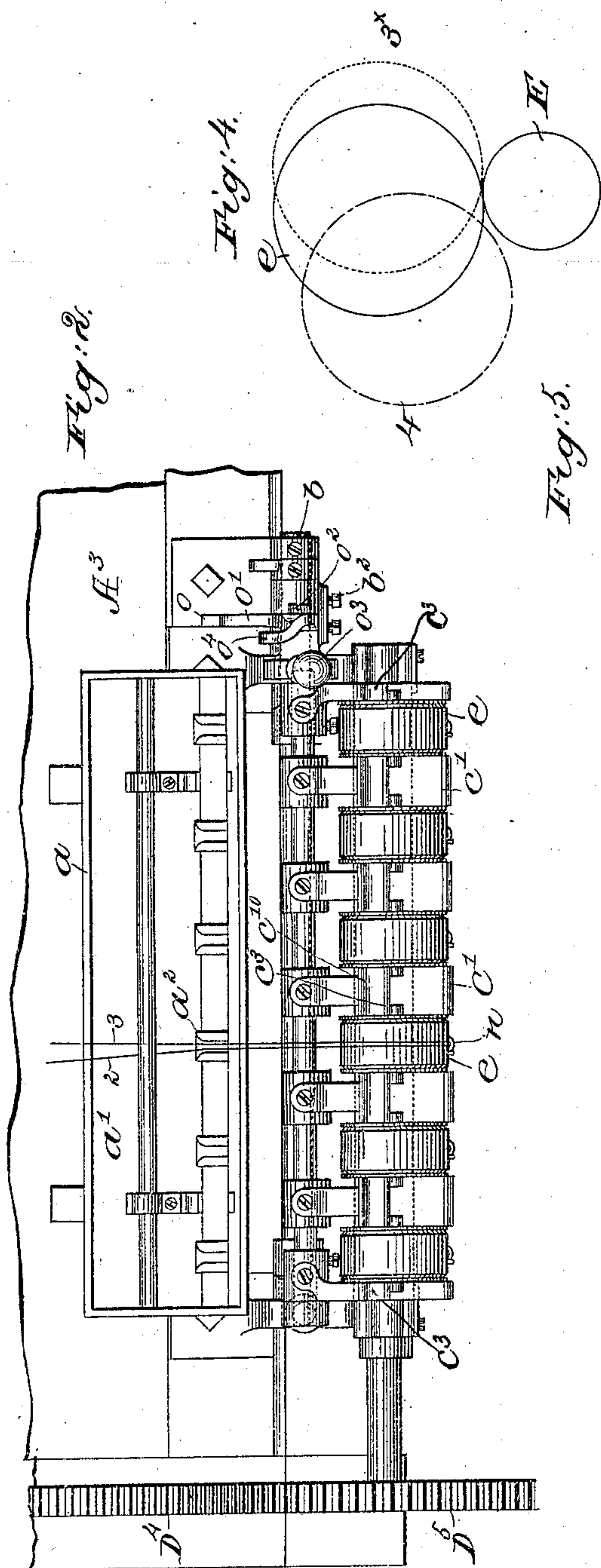
(No Model.)

2 Sheets—Sheet 2.

G. A. DRAPER & A. E. RHOADES.
MACHINE FOR TWISTING OR DOUBLING YARN.

No. 503,905.

Patented Aug. 22, 1893.



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UNITED STATES PATENT OFFICE.

GEORGE A. DRAPER AND ALONZO E. RHOADES, OF HOPEDALE, MASSACHUSETTS, ASSIGNORS TO THE HOPEDALE MACHINE COMPANY, OF SAME PLACE.

MACHINE FOR TWISTING OR DOUBLING YARN.

SPECIFICATION forming part of Letters Patent No. 503,905, dated August 22, 1893.

Application filed May 28, 1891. Serial No. 394,407. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. DRAPER and ALONZO E. RHOADES, both of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Machines for Twisting or Doubling Yarn, &c., of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

In machines for twisting and doubling yarn or thread as said machines are now commonly constructed, whenever a yarn or thread breaks the end so formed winds about one of the usual front rolls and the yarn or thread is thereby pulled from its source of supply and wasted. To prevent this waste of valuable yarn or thread whenever the same is broken, we have devised means which will be hereinafter described.

Our improved machine contains a series of top rolls, one for each series of yarns or threads being twisted together. The journals of these top rolls are mounted upon inclined tracks or supports, the yarns being twisted acting on the said rolls to keep their journals at the upper ends of the said tracks except when one or more yarns or threads break, at which time the journals of the said top roll roll down said inclined tracks and in so doing carry with them the yarn or thread, and in the movement of the top roll as described, it is sufficiently removed from contact with the bottom roll to prevent further feed of the yarn or thread by and between the top and the bottom roll. The tracks referred to are mounted upon rods or feet vertically adjustable in or with relation to arms, in turn preferably made adjustable upon a rock-shaft to be described, so that by turning the latter all the top rolls, which, during the operation of the machine in twisting, normally stand at one side of the longitudinal center of the bottom roll, may be moved so that their centers will be at the other side of the longitudinal center of the bottom roll. The top roll track is moved in this manner whenever the machine is to be stopped and left inactive, and at such time the threads will be properly held so as to avoid any slack twist.

Our invention, among other things, consists in a twisting frame containing the following instrumentalities, viz:—a bottom roll; a series of top rolls; a track to support the said top rolls normally at one side of the longitudinal center of the bottom roll to enable the top roll to move away from the bottom roll when the yarn breaks; and means to move the said track to place the top rolls at the opposite side of the longitudinal center of the bottom roll when the machine is stopped, the said top rolls in such position continuing to nip the yarn between them and the bottom roll, substantially as will be described.

Figure 1 shows in section a sufficient portion of a twisting frame to enable our invention to be understood; Fig. 2, a partial top or plan view of the machine shown in Fig. 1, the spools supplying the yarns or threads to be twisted being omitted, as well as the spindles. Fig. 3 is a partial right hand end view of the parts shown in Fig. 2; Fig. 4, a diagram showing different positions of the top roll with relation to the bottom roll, and Fig. 5 shows a modification of our invention.

The frame-work A, having the top plate A³, the sleeve whirl-spindle B, the spindle-support B', the spindle rail B², the ring-rail C, having rings C' provided with travelers t, the bobbin C², the guide-board D having usual eyes, the drum-shaft D' having the drum D² driving the bands D³ for rotating the spindles, the toothed gear D⁴ for engaging and rotating the smaller toothed gear D⁵ connected with the lower front roll E, and the studs E' for supporting the spools E² containing the threads 2 and 3 to be twisted or doubled, are and may be all as usual in twisting frames. The bottom roll has its journals supported in the usual roller stands w, the said stands also having suitable bearings for a rock-shaft b having arms b' attached thereto by suitable set-screws b². These arms are represented as hollow to receive posts b³, which may be adjusted vertically in the arms and may be secured in adjusted position by suitable set-screws b⁴. The posts support, at their upper ends, the tracks c in such position that normally the tracks incline a little downwardly toward the shoulder c' thereof. By adjusting

the arms b' more or less about the rock-shaft b as a center, the lug or projection c^3 , at the higher end of the track may be so placed as to stop the top roll, acted upon by the yarn 5 being twisted, with its journals or centers at one side of the longitudinal center or axis of the bottom roll.

In this instance of our invention it is supposed that the frame is adapted for twisting 10 threads or strands when wet, and the trough a , containing water or other moistening fluid, has in it a glass guide-rod a' under which the threads or strands 2, 3, pass, the trough near its front portion having a series of glass guides 15 a^2 over which the yarns are conducted, thence, as shown in Fig. 1, over the front roll, down in front of and under and between said top roll and the bottom roll, thence to the usual guide-eye n , to the traveler t , and upon the 20 bobbin. In Fig. 1, should one or both threads break, the top roll e , co-operating with the bottom roll to feed the said threads, will roll to the left and carry the broken ends with it, so that the feeding of the yarns or threads be- 25 tween the top roll and the bottom roll will be arrested and the broken ends will not be wound about the rolls or be caught by other adjacent traveling threads.

Erected upon the table or head a^8 is a stud 30 o , see Fig. 3, having at its upper end a shoulder or projection which is engaged by a pawl o' pivoted at o^2 on the hand lever o^3 attached to the rock-shaft b , the said pawl, when in engagement with the said projection, as repre- 35 sented in Figs. 2 and 3, keeping the series of top rolls in operative position, as represented by full lines.

When the operator desires to stop the machine, he will engage the handle and in so 40 doing turn the pawl o' , it having a rearwardly extended arm o^4 , releasing the said pawl from the said projection, when, by a movement of the handle in the direction of the arrow, Fig. 3, the top roll may be carried to the other side 45 of the longitudinal center of the bottom roll, or to the right viewing said figure. When this is done, the top roll assumes the position represented by the dotted circle 3^x , Fig. 4, and the yarns 2, 3 coming over them, being re- 50 lieved from the traveler strain, the said top roll will continue to nip the twisted yarn between itself and the bottom roll, and in this position the top roll cannot roll on the said track away from the bottom roll, and as a result of this continued nipping, the yarn can- 55 not become slack upon the top roll and be displaced thereon. When, however, the yarn breaks, the roll goes into the dotted line position 4, Fig. 4.

60 In the modification, Fig. 5, the construction is the same as in Fig. 1, with the exception that the yarns or threads to be twisted are first led under the bottom front roll, thence between it and the top roll, over the top roll 65 and down in front of the same, through the guide-eye n , through the traveler, and to the bobbin.

In the modified form of apparatus, the normal position of the top roll is opposite that shown in Fig. 1, and when the yarn breaks 70 between the top roll and traveler, the said roll will roll down the track as before, but in this instance, back from its working position, and in so doing will keep the broken end from being acted upon to draw the thread or yarn 75 from the spindle or delivery source. But in the plan shown in Fig. 5, when the rock-shaft b is turned to carry the top roll to the front from the position therein shown when the machine is to be left at rest, the doubled yarn or 80 thread slacks, and changes its position somewhat owing to the twist, and owing to this change, the yarn is liable to become so slack as to slip off the ends of the narrow top roll, and to prevent this escape of the twisted 85 yarn from the said top roll, we have provided each with an annular groove near each end, as represented best in Fig. 2. When, however, the yarn to be twisted is passed over the top roll before it is grasped between 90 the said roll and the bottom roll, as represented in Fig. 1, then the grooves on the top roll may be omitted, as they will not be necessary.

In Fig. 1 the tracks near the shoulder c^3 95 are provided with notches c^{10} , in which may be set the journals of the top rolls whenever it is desired to piece up the yarns and keep the top rolls from contact with the bottom 100 roll.

It will be noticed in the form of our invention represented in Figs. 1 and 4 that the track for the journals of the top roll is so inclined that the top roll, when released by the break- 105 age of a yarn or thread, will roll down the track toward the spindle, and the periphery of the top roll will roll away from the periphery of the bottom roll and stop the feeding of the yarn or thread.

We claim— 110

1. A twisting frame containing the following instrumentalities, viz:—a bottom roll; a series of top rolls; a track to support the said top rolls normally at one side of the longitudinal center of the bottom roll to enable the top 115 roll to move away from the bottom roll when the yarn breaks; and means to move the said track to place the top rolls at the opposite side of the longitudinal center of the bottom roll when the machine is stopped, the said top 120 rolls in such position continuing to nip the yarn between them and the bottom roll, substantially as described.

2. In a twisting frame, a bottom roll; a series of top rolls; a series of tracks upon which 125 the journals of the said top rolls may travel, combined with a rock-shaft for supporting the said tracks, substantially as described.

3. The rock-shaft b having the adjustable arms, and tracks moved in unison with the 130 said arms, combined with a bottom front roll, and with a top roll having its journals mounted to travel on the said track, substantially as described.

4. In a twisting frame, a rotating bottom front roll; a top roll; an inclined track upon which the journals of the said roll may travel, combined with a swinging support for the said track, and with means to swing the said support to positively carry the top rolls out of a line drawn vertically through the center of rotation of the bottom front roll, as and for the purpose set forth.

10 5. In a twisting frame, a bottom roll; a series of top rolls; and a series of inclined tracks upon which the journals of the top rolls may travel; and means for adjusting said tracks to the desired inclination, substantially as described.

15 6. A bottom roll; a series of top rolls having journals; a series of inclined tracks to support the journals of the said top rolls, the said

tracks being movable about a common center, combined with a pawl or locking device to retain the tracks in position to maintain the journals of the top rolls substantially in vertical line with the center of the bottom roll, the release of the locking device permitting the tracks to be swung in a direction to move the journals of the top rolls out of vertical line with the center of the bottom roll, as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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ALONZO E. RHOADES.

Witnesses:

FRANK J. DUTCHER,

C. E. LONGFELLOW.