

J. D. WHYTE.
 MEANS FOR TWISTING AND CABLING YARNS.
 APPLICATION FILED NOV. 9, 1909.

968,723.

Patented Aug. 30, 1910.

5 SHEETS—SHEET 1.

FIG. 1.

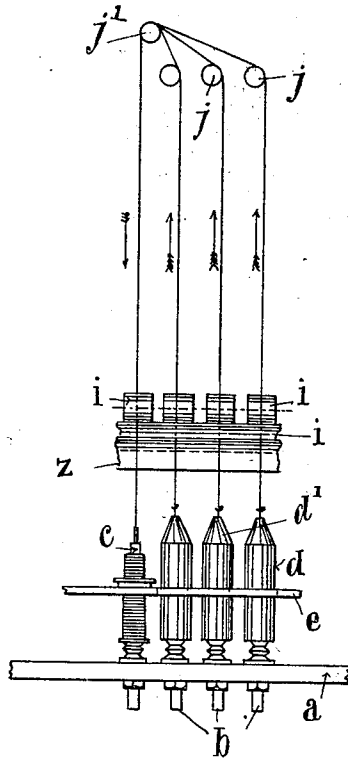
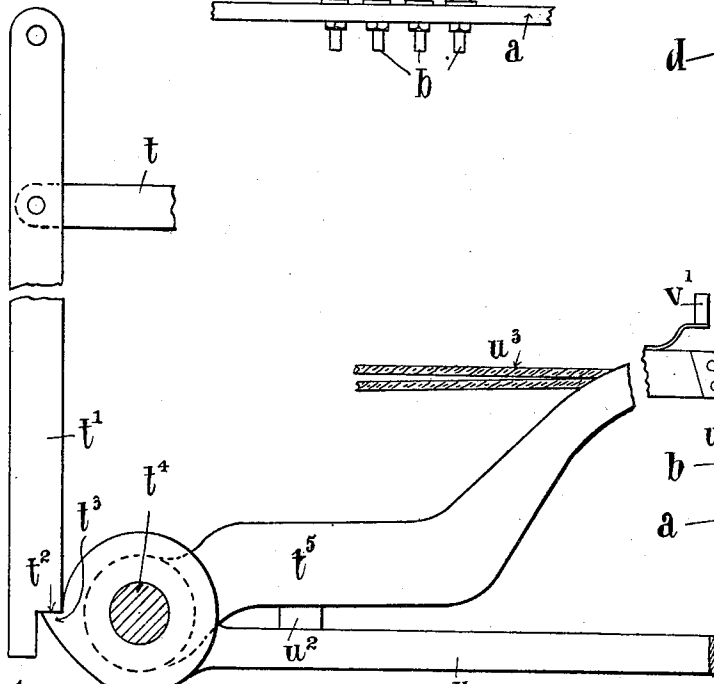
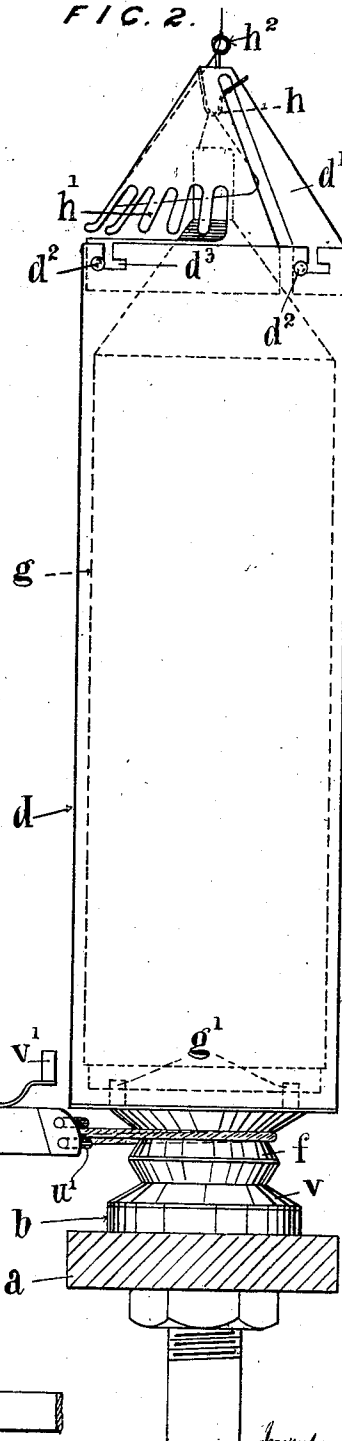


FIG. 2.



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FIG. 3.

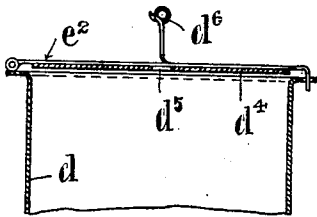


FIG. 4.

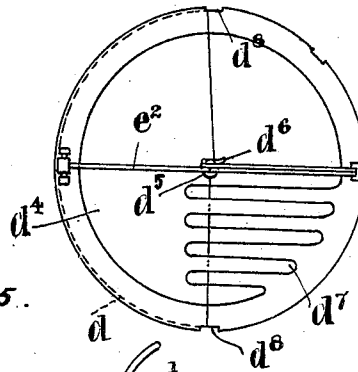
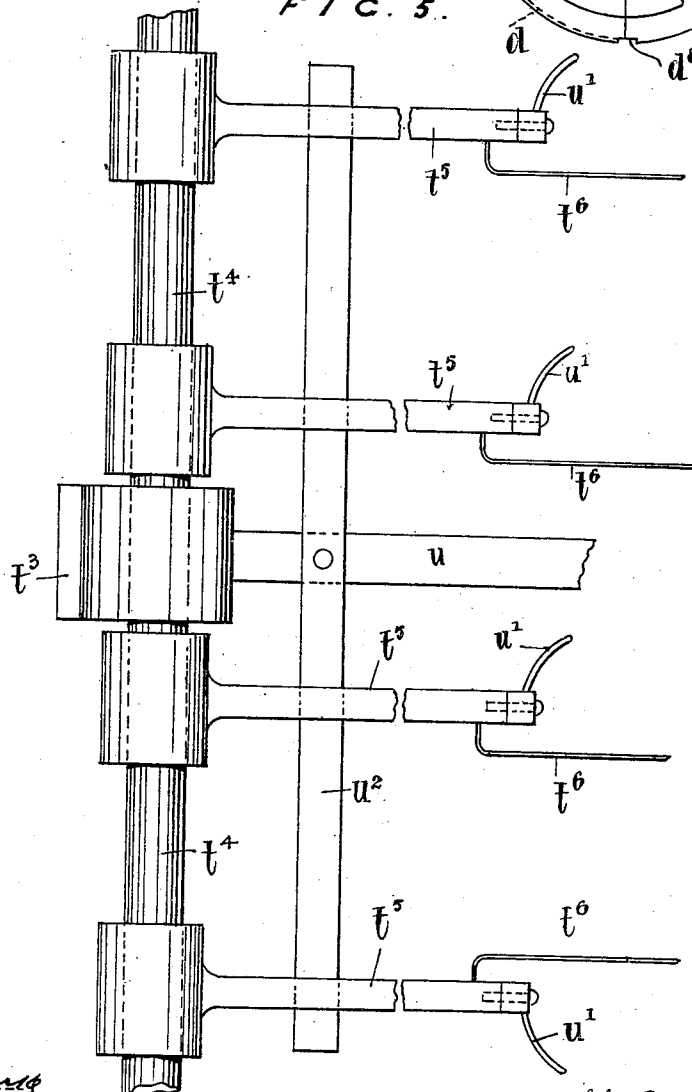


FIG. 5.



Witnesses
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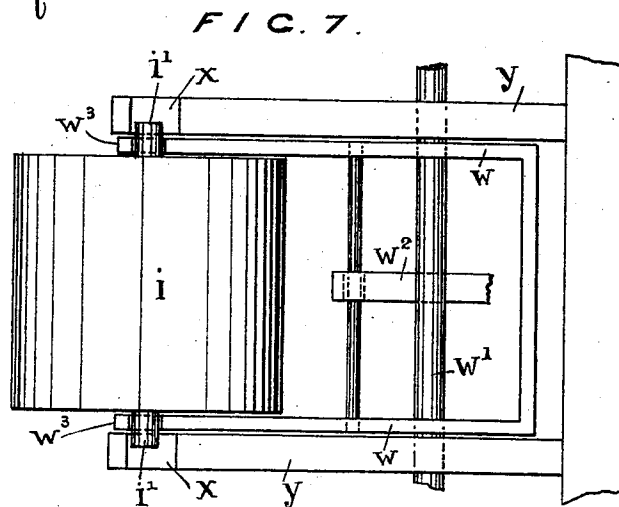
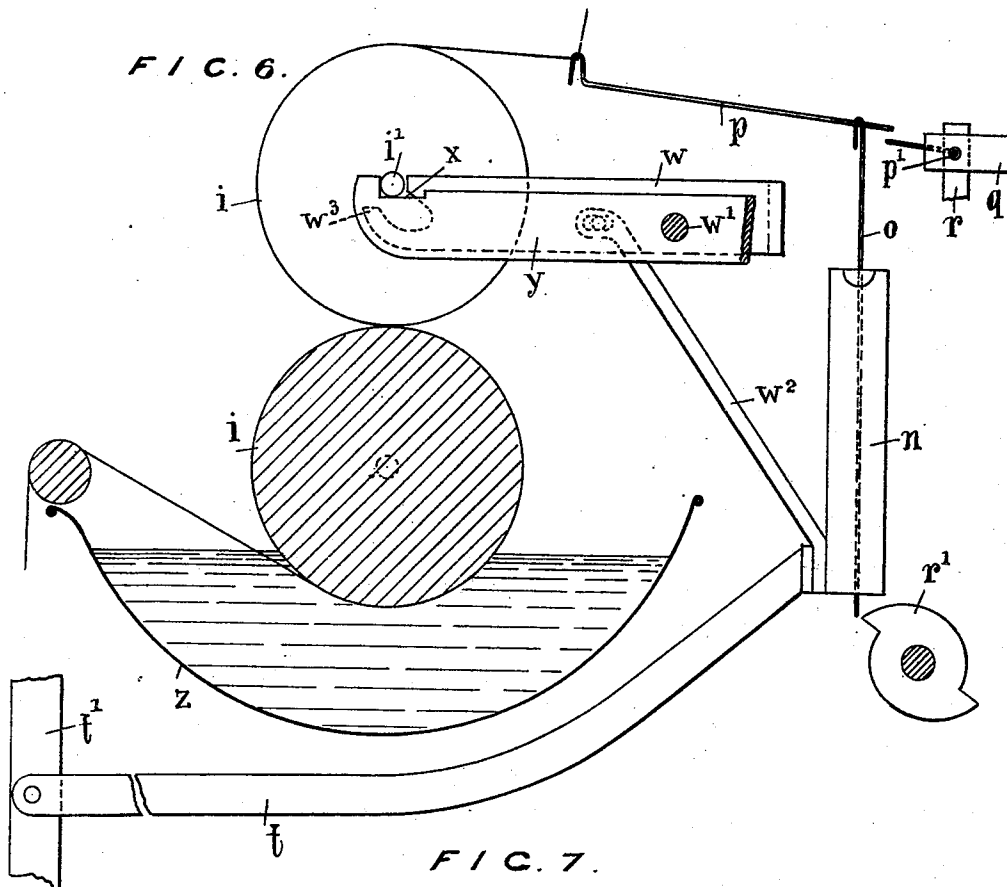
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5 SHEETS—SHEET 3.



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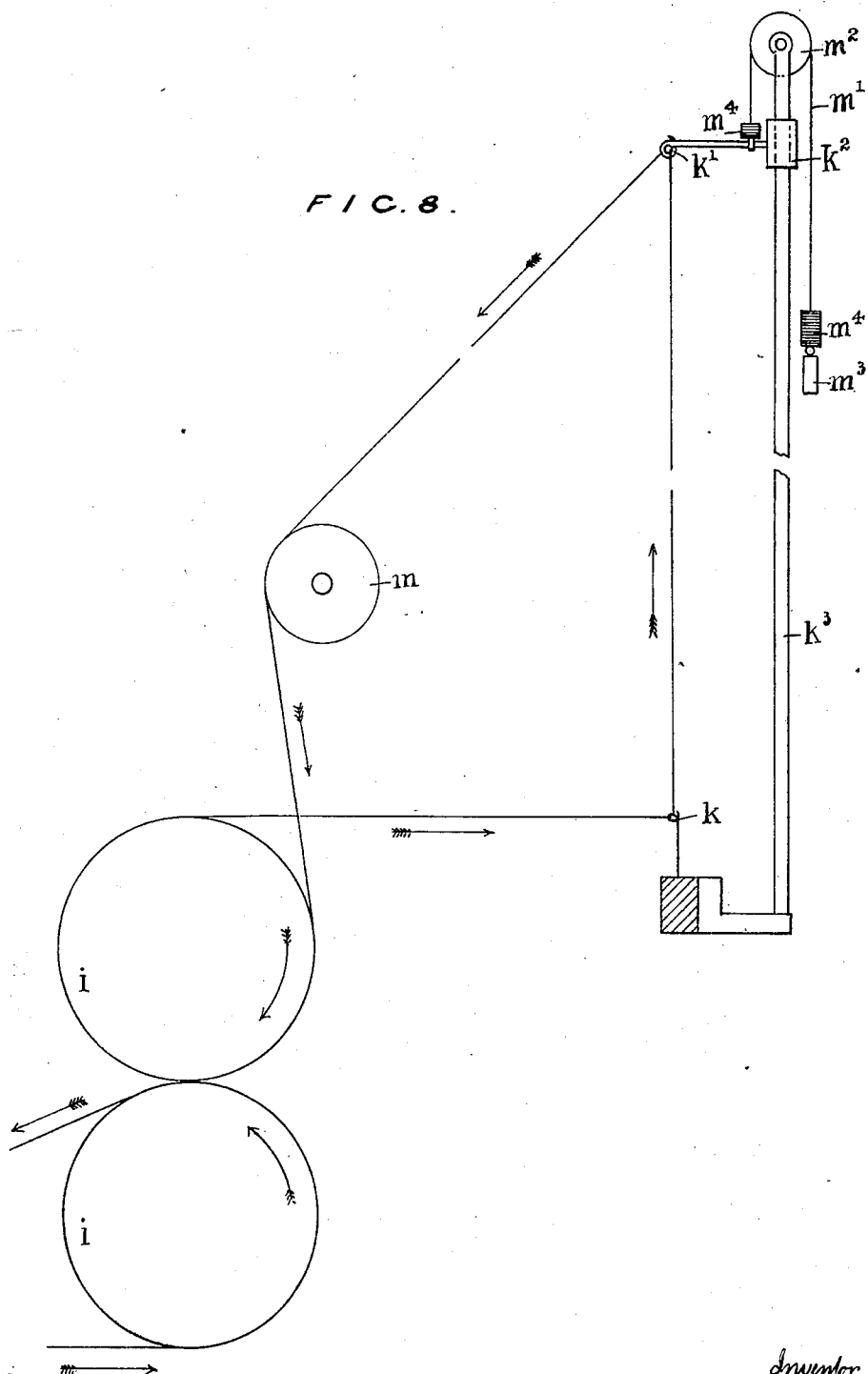
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5 SHEETS—SHEET 4.



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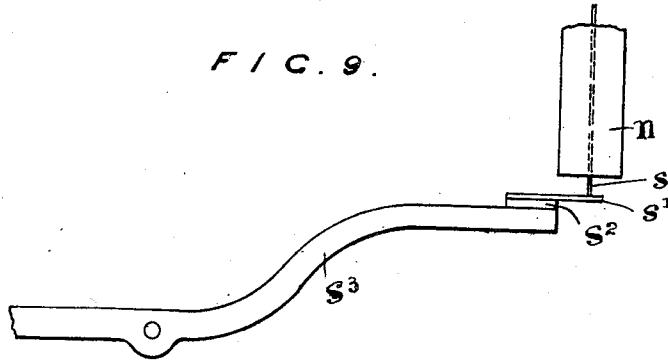
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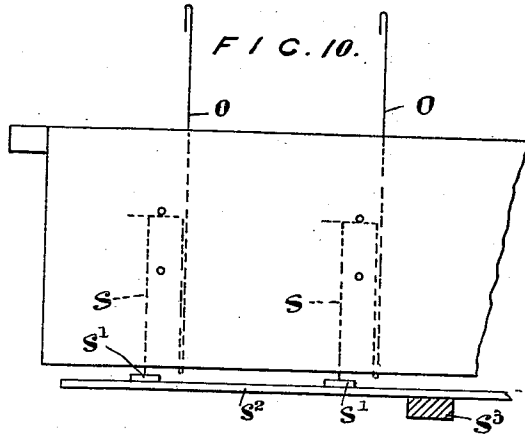
Patented Aug. 30, 1910.

5 SHEETS—SHEET 5.

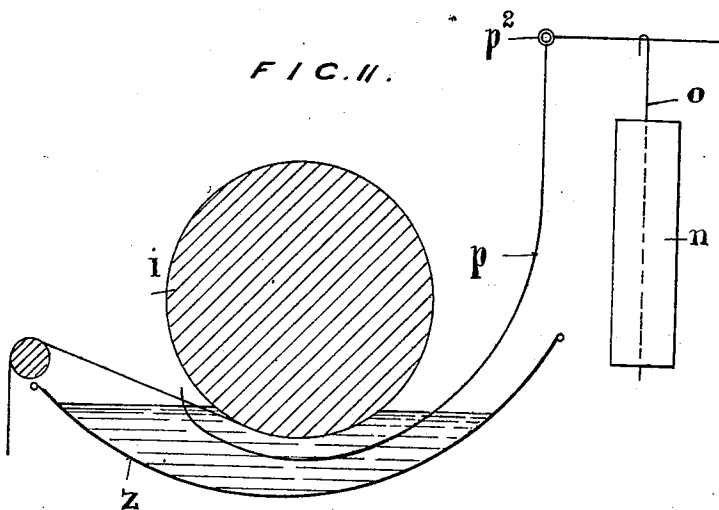
F I C . 9 .



F I C . 10 .



F I C . 11 .



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN DEMPSTER WHYTE, OF MANCHESTER, ENGLAND.

MEANS FOR TWISTING AND CABLING YARNS.

968,723.

Specification of Letters Patent. Patented Aug. 30, 1910.

Application filed November 9, 1909. Serial No. 527,082.

To all whom it may concern:

Be it known that I, JOHN DEMPSTER WHYTE, a subject of the King of Great Britain and Ireland, residing at 73 Acomb street, Greenheys, Manchester, in the county of Lancaster, England, textile engineer, have invented new and useful Improvements in Means for Twisting and Cabling Yarns, of which the following is a specification.

My invention relates to improvements in apparatus for performing simultaneously on one twisting frame two twisting operations which are usually done on separate frames at separate times with a winding process between them.

Usually in cabling yarns, for example in making sixcord thread, two ends of single yarn are first twisted together on one twisting frame, then secondly three of those twisted twofolds are wound together on a doubling-winding machine, and thirdly those three twisted twofolds are twisted together, making one sixcord thread.

According to my invention, the two ends of single yarn are wound in cop form and are twisted together while they are being unitedly withdrawn from the cop on a rotating spindle. While they are being so withdrawn by and passed through the rollers toward the middle of the frame (the reverse way from that which is usual in ordinary twisting frames) three of them are guided as hereinafter described back to and through the rollers (the usual way) to an ordinary cabling spindle. Thus in one operation three strands of yarns, each composed of two singles, are being twisted individually into twofolds, and at the same time are being twisted collectively into one sixcord. In the following explanation of my method of accomplishing this, reference is made to three twofolds as cabled into sixcord, but it will be understood that any other relative numbers of strands for twisting or cabling may be similarly arranged for. The yarns have been wound as is usual, two ends together, but, for my purpose, on a machine winding into long and large cop form on pirn bobbins or tubes. On their withdrawal from off the delivery twisting spindles upon which they are placed, they pass through a tension device, hereinafter described, which does not retard their free passage forward therefrom, while it effectively confines the twist to the unchanging definite length between that appliance and

the nip of the rollers, thereby insuring perfect uniformity of twist. And in order that my invention may be fully understood I have attached drawings hereto to which I will refer in the following detailed description of my invention.

Figure 1 is a diagram showing my invention for cabling three twofolds into sixcord. Fig. 2 is a view on an enlarged scale of a spindle carrying a cop of two fold yarn. Fig. 3 is a sectional view of a modified tension device. Fig. 4 is a plan of Fig. 3. Fig. 5 shows in plan view a part of the stop motion for the spindles. Figs. 6 and 7 show respectively in elevation and plan another portion of the stop motion. Fig. 8 shows the method of putting tension on the thread. Figs. 9, 10 and 11 also show detail parts of the stop motion.

As shown in the diagram Fig. 1, for cabling three two folds into six cord, the spindle rail *a* carries three spindles *b b b* having each a large cop of doubled yarn, and also an ordinary cabling spindle *c*. Any form of suitable spindle and footstep bearing may be used. Any suitable number of such combination of 4 spindles may be used in a frame as will be understood. Secured to each spindle *b* is a tube *d* the three tubes passing through a cut out recess in the ring rail *e*, the tubes extending upward from the fixed pulley *f*, and being of sufficient diameter and length to inclose the pirn of yarn *g* as shown in Fig. 2. In case of very long tubes the tube may be additionally supported by an upper bearing. Driving contact of the pirn *g* with the spindle is insured in any suitable manner such as by pegs *g'* engaging with recesses in the bottom of the pirn. A tension device for the two fold yarn is provided by a removable conical cap *d'* held on to the tube *d* by pins *d²* passed through vertical slots and occupying recesses *d³*, the initial rotation of the spindle causing the cap to partly rotate and sending the pins to one side or other of the recesses *d³* so that the cap cannot fly off. The yarn is threaded in the loop *h* and under and over any desired number of tension fingers *h'* around in surface contact with the cap and up to the eye *h²* secured to the top of the cap in line with the vertical axis of the spindle.

A modification of the tension device is shown in sectional elevation in Fig. 3 and in plan view in Fig. 4. The tube *d* in this case

is provided with a flat cover d^4 with a central hole d^5 . Hinged to the top of the tube is a wire e^2 secured to the cover d^4 and extending across the cover and over the hole d^5 .

5 The wire at the side of the tube d opposite to the hinge is bent downward and returns to the center of the cover and is there turned up and formed into an eye d^6 above the central hole d^5 and in line with the vertical

10 axis of the spindle. The cover d^4 is secured to the tube d by snapping the bent doubled end of the wire into a recess in the flange of the tube or in any other suitable manner. The cover is cut away to form fingers d^7

15 and the doubled yarn is fed from the pirn through the hole d^5 and over and under any suitable number of the fingers d^7 and into a notch d^8 and then underneath the flange at the top of the tube d , out through another

20 notch d^8 and is then threaded through the eye d^6 . Notches d^8 may be formed at various intervals in the flange to wind the threads more or less around the flange. The passing of the yarn around and in contact with

25 the flange insures that the twist will not pass down beyond where the yarn emerges from the final notch d^8 . Regularity of twist is thereby insured. The yarn passes from the eye h^2 in the center of the conical cap,

30 or from the eye d^6 as in Figs. 3 and 4, to the drawing rollers i i the lower one of which is driven in the usual or any convenient manner. After passing through the rollers i i and receiving the twist by the

35 revolution of the spindles the separate twisted two folds are passed around guide pulleys j and are all three then directed around another guide pulley j' , again through the rollers i i which now act as delivery rollers, to the ordinary cabling

40 spindle c the three twisted two folds being thus cabled into six cord, as shown in Fig. 1. Before passing the twisted twofolds again through the delivery rollers i i they may be kept in equal tension by each two fold being

45 conducted through an eye k and up through a separate guide eye k' for each twisted twofold, carried by a sleeve k^2 free to slide on a rod k^3 as shown in Fig. 8. The guide

50 eye k' is weighted to suit the strength of the yarn which is being twisted, so that the three twisted twofolds as they are gathered together and carried to and over a light carrier pulley m to be thence conveyed back

55 through the delivery rollers i i to the cabling spindle are equal in tension. These guide-eyes k' have an available length of rise or fall, each independently of the other, so that any difference in the length of three twofolds behind the rollers will not affect the

60 equality of tension as each weighted guide-eye k' provides separate tension. Preferably a small cord m' extending from the stem of the guide-eye k' up and over a small

65 runner m^2 on the top of the supporting rod

hangs down behind the same with a small counterbalancing weight m^3 thereon. Small washer-shaped weights m^4 on the said cord are transferable from the guide-eye end of it to the other weighted end, or vice versa, so

70 that the tension may be easily varied, the weight on each twofold being reducible from anything down to *nil*.

It is necessary that there shall be a stop-motion to stop the four spindles simultaneously when any one of the three twofolds or

75 the one sixcord shall break. I provide a pivoted drop-wire box n of the ordinary type see Fig. 6, but long enough to serve the four spindles and which shall have one

80 drop-wire o for each spindle. Each drop-wire hangs on a light wire lever p , shown broken in length in the figure, and carrying a weight or counterpoise q and which is suitably pivoted at p' on a small stand r in such

85 a position that one end of it holds up the drop-wire out of the path of a rotating wiper shaft r' so long as the other end bears against the unbroken thread. If any one of the four threads should break the end of the

90 lever p bearing against it will swing downward so far that its drop-wire drops into the path of the wiper shaft's rotation which then tilts the drop-wire box n .

The light wire lever p may be arranged

95 in front of the rollers i i as shown in Fig. 11. The lever p is pivoted at p^2 and on the rear end of it is hooked the drop wire o , the yarn passing through an eye formed in the front part of the lever. In case of breakage of the

100 yarn the rear end of the lever p falls and with it the drop wire which then comes into contact with the wiper shaft. I provide means shown in Figs. 9 and 10 whereby the

105 drop wires may be temporarily held up out of the path of the wiper shaft while the restarting of the spindles is taking place. As shown in Fig. 10 the drop wires are formed double at the lower end and bent out at an

110 angle. Beneath the bent out part of the drop wire is placed a wire s resting on a finger s' the fingers being all secured to a bar s^2 which in turn is connected to a pivoted lever s^3 . By operating the pivoted lever

115 the drop wires can all be lifted. The tilting of the drop wire box as above described actuates a pivoted lever t' (Figs. 2 and 6) by means of a rod t attached to the drop wire

120 box n to remove a projection t^2 away from a tooth or ledge t^3 on the boss of a lever u extending to the front of the machine. The

125 lever u is loosely mounted on a shaft t^4 and on this same shaft are loosely mounted four levers t^5 to each of which is secured a fork u' embracing the driving cord w^3 of the

130 spindle. A bar u^2 secured to the lever u passes beneath the four levers t^5 and normally raises them to direct the driving cord w^3 on to the fast pulley f of the spindle, but when the lever t' is removed

as described, the lever u and the four levers t^5 drop by gravity and the forks u' shift the driving cord w^3 from the fast to the loose pulley v of the spindle. Brakes v' secured by a spring to each of the levers t^5 are applied to the tubes d to effect a prompt stoppage of the spindles. When the lever u is lifted by the hand, all four levers, t^5 are also lifted by the bar u^2 and the driving cords are shifted on to the fast pulleys f and the lever t returns by gravity to again secure the lever u . Each of the fork levers t^5 may have a light rod t^6 (see Fig. 5) attached to it whereby any one fork lever may be lifted independently for the purpose of putting some twist into a newly pieced thread before starting all four spindles.

The tilting of the drop wire box is also arranged to stop the four top delivery rollers i so that no delivery of yarn takes place while the spindles are stopped, in the manner shown in Figs. 6 and 7. The top rollers rest upon the driven long lower roller rotating as usual in a water bath Z . In connection with each top roller i I provide a frame w loosely pivoted at its rear end on a rod w' . The side members of the frame at the front ends are slotted as more clearly shown in Fig. 6. Each frame w is connected to the drop wire box by a rod w^2 and when the drop wire box is tilted the front part of the frame is lifted and the noses w^3 come into contact with the axles i' of the rollers i and thrust the rollers backward in the gaps x formed in the fixed brackets y and so remove the top rollers from driving contact with the lower roller and stop the delivery of yarn.

I declare that what I claim is.

1. As means for performing twisting and cabling operations simultaneously in one twisting frame a plurality of delivery spindles carrying yarn in cop form, tubes surrounding the cops on the spindles, a tension device on the tubes through which the yarn passes from the cops, drawing rollers through which the yarn is conducted from

the tension device whereby an unvarying amount of twist is imparted to the yarn, means to combine the twisted yarns, a cabling spindle and delivery rollers to conduct the combined twisted yarns to the cabling spindle substantially as described.

2. In combination in a twisting frame, a plurality of delivery spindles carrying yarn in cop form, tubes surrounding the cops on the spindles, a tension device on the tubes through which the yarn passes from the cops, drawing rollers through which the yarn is conducted from the tension device, means to combine the twisted yarns from the delivery spindles, a cabling spindle, delivery rollers to conduct the combined twisted yarns to the cabling spindle and means for driving the spindles and for stopping the spindles and drawing and delivery rollers on the breakage of a thread, substantially as described.

3. In combination in a twisting frame a plurality of delivery spindles carrying yarn in cop form, tubes surrounding the cops on the spindles, a tension device on the tubes through which the yarn passes from the cops, drawing rollers through which the yarn is conducted from the tension device, means to combine the twisted yarns from the delivery spindles, a cabling spindle, delivery rollers to conduct the combined twisted yarns to the cabling spindle, means for separately guiding and putting equal tension on each twisted yarn and conducting the several twisted yarns to the delivery rollers and the cabling spindle, and means for driving the spindles and for stopping the spindles and rollers on the breakage of a thread substantially as described.

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

JOHN DEMPSTER WHYTE.

Witnesses:

JOSHUA ENTWISLE,
NORMAN KIERNAN.