

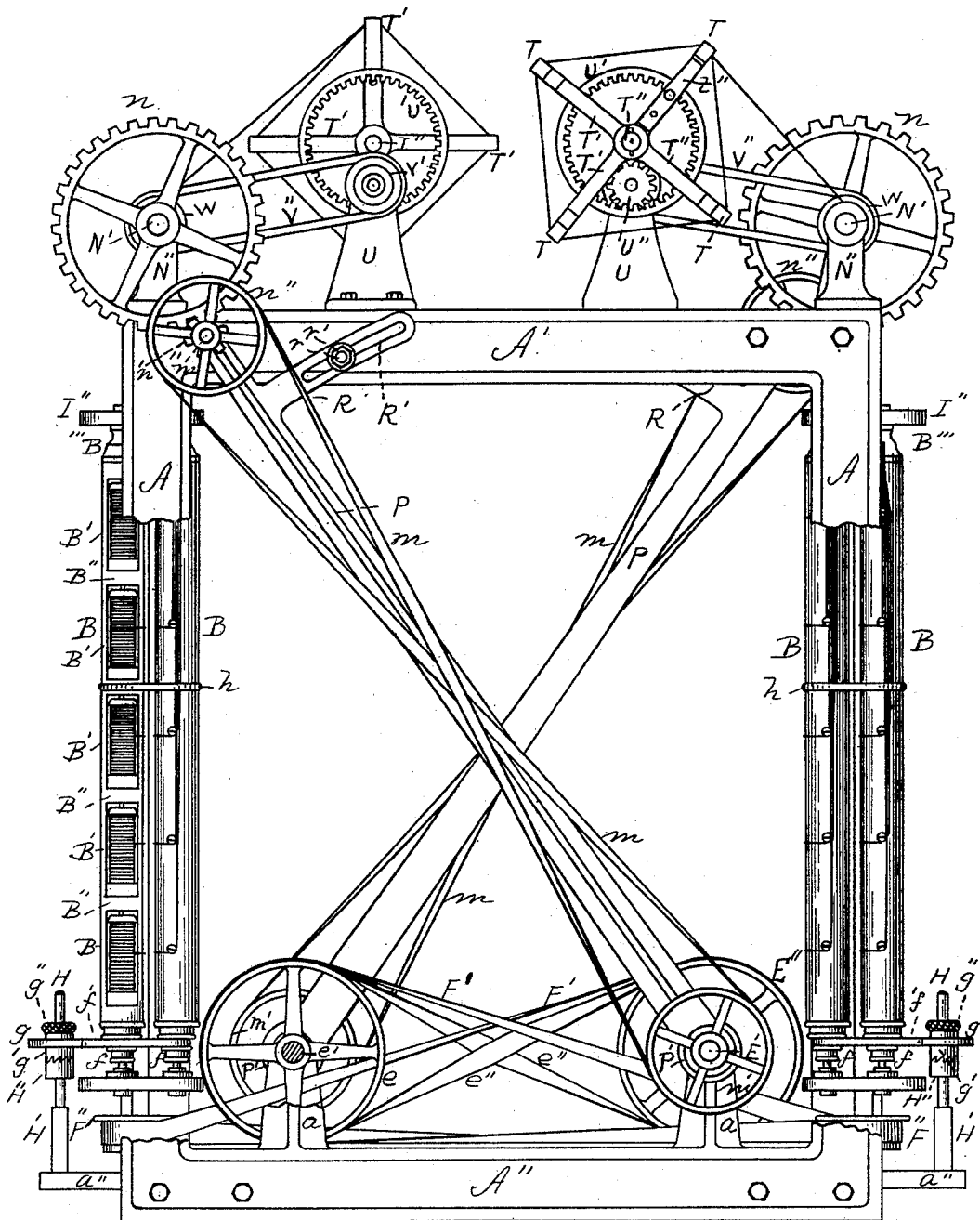
(No Model.)

3 Sheets—Sheet 2.

A. B. BULLOCK.
TWISTING MACHINE.

No. 497,762.

Patented May 23, 1893.



WITNESSES

J. M. Hartnett.
B. N. Williams

FIG 2

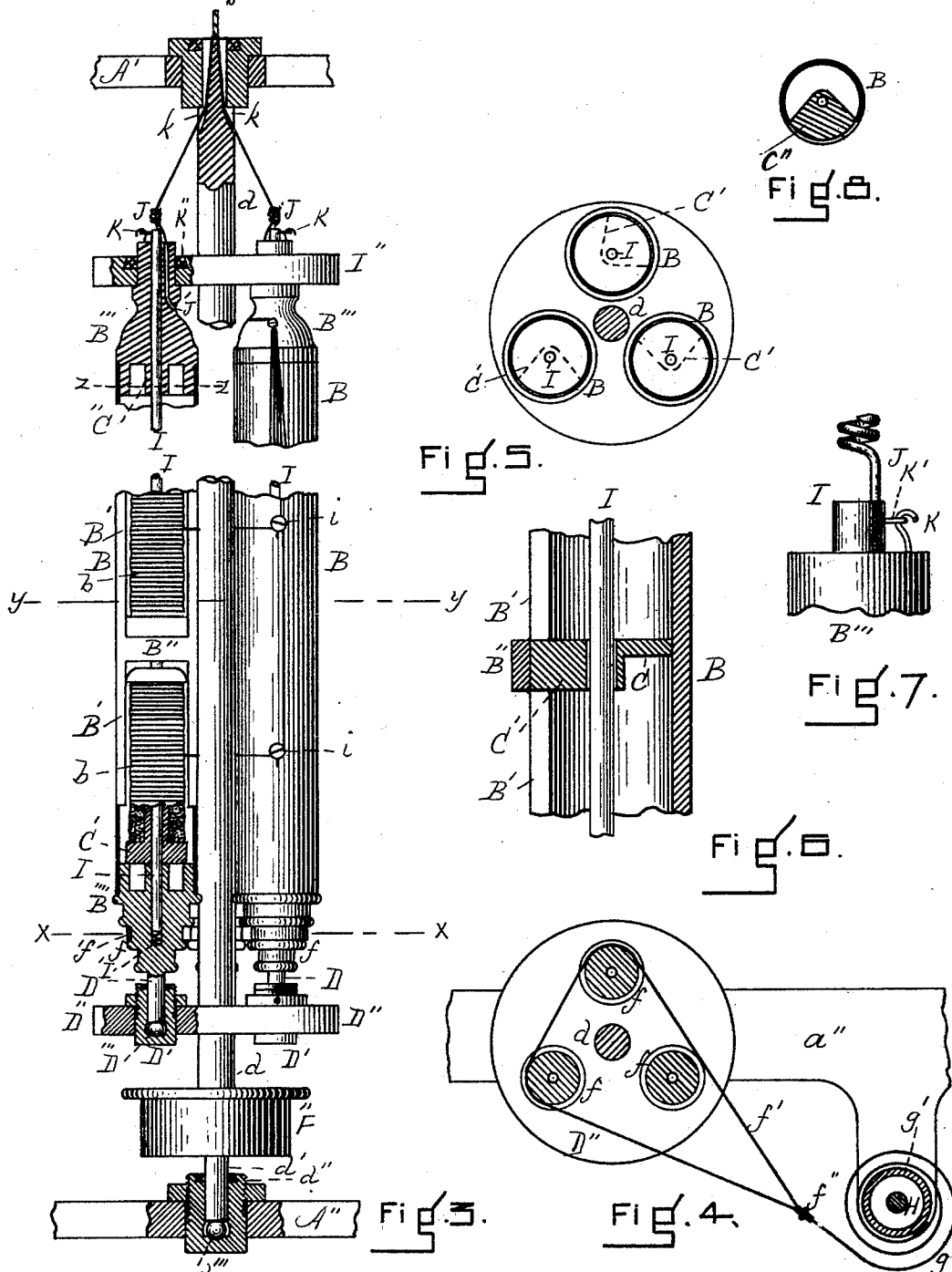
INVENTOR

Alanson B. Bullock,
By his Atty.
Sherry Williams

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UNITED STATES PATENT OFFICE.

ALANSON B. BULLOCK, OF CANTON, MASSACHUSETTS.

TWISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 497,762, dated May 23, 1893.

Application filed July 28, 1892. Serial No. 441,479. (No model.)

To all whom it may concern:

Be it known that I, ALANSON B. BULLOCK, a citizen of the United States, residing in Canton, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Twisting-Machines, of which the following is a specification.

This invention relates to twisting-machines for twisting and laying cordage, yarn, &c., and the invention relates to certain novel constructions and combinations of parts fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a twisting-machine embodying my invention, portions of the frame and machine being represented as broken out. Fig. 2 is an end elevation with portions of the frame represented as broken out, the better to illustrate the invention. Fig. 3 is a part front elevation and part vertical section enlarged showing portions of my invention in detail. Fig. 4 is a horizontal section on line *x*, Fig. 3. Fig. 5 is a horizontal section on line *y*, Fig. 3. Fig. 6 is an enlarged detail in vertical section showing the shape of the weighted disks which support the spools. Fig. 7 is an enlarged detail in elevation showing the arrangement of the guide-wires and adjacent parts. Fig. 8 is a horizontal section on line *z*, Fig. 3.

Similar letters of reference indicate like parts.

A A represent upright portions of the frame, and A' A'' represent respectively upper and lower horizontal portions thereof.

B B are hollow fliers (often termed spindles) arranged preferably in groups of three, as shown in the drawings. Each of these fliers is provided with a series of openings B' (Figs. 1, 2, and 3), arranged one above another, and all on the same side of the flier. Within each flier, behind each opening, is a spool *b* which rests on a disk or horizontal partition C, (see Fig. 6) said disk or partition being very much thickened or weighted at its front portion C', (see Figs. 3 and 6) that is, the portion directly to the rear of or within the portions B'' of the flier. The weighted portions C' therefore, of the disks C are all on the side of the flier which is provided with the openings B', and serve to balance the flier by providing sufficient extra weight

on that side to counterbalance the weight of the other or closed side. The shape of these portions C' is shown by broken lines in Fig. 5. Similar weights or masses of metal are provided at the closed upper and lower ends B''' B'''' of the fliers, the shape of said weights being shown at C'' in Figs. 3 and 8. The lower portion of each flier is provided with a projecting shaft or spindle D which is supported in a step D' screwed or otherwise secured into and sustained by the lower plate D''. Between the lower end of the spindle D and that of the opening in the step D' into which said spindle extends is a ball D''', say a thirty-second of an inch smaller in diameter than the opening in which it is placed. The flier, in rotating, turns on this ball which turns within its chamber, thus constituting two centers and providing an excellent oil-chamber. See Fig. 3. The plate D'', in which are bearings for all three of the fliers, is rigidly secured to or integral with the driving spindle *d* whose lower end, *d'*, rests in a step *d''* upon a ball *d'''*, said step being supported by the portion A'' of the frame. (Figs. 1 and 3.) The arrangement of this ball is exactly similar to that above described of the ball D'''. 55 60 65 70 75

E is a driving pulley to which power is applied, said driving-pulley being fast on the shaft E'. There being two sets of fliers, one set being exactly behind the other, as shown in Fig. 2, it is necessary that there should be two driving shafts, one of which is connected with the other. The driving shaft E' has fast upon it the pulley E'' connected by cross-belts *e''* with the driving pulley *e* fast on the shaft *e'*. (Figs. 1 and 2.) The shafts E' and *e'* have their bearings in uprights *a* extending from the portion A'' of the frame. Each of these shafts E' and *e'* has fast upon it a pulley F, and each pulley F is connected by a belt F' with the horizontal pulley F'' fast on the driving spindle *d* of the set of fliers opposite said pulley F. Thus rotary motion is applied to the spindle *d*, around which the fliers revolve by means of the plate D'' and an upper plate described below. 80 85 90 95

The lower or solid ends B'''' of the fliers are provided each with cones or pulleys *f*, and a cord or belt *f'* is passed around said cones or pulleys in the manner shown in Fig. 4. The ends of this cord *f'* are secured at *f''* to

the outer end of a coiled spring *g* similar to the main-spring of a watch, the inner end of said spring being secured to the drum *g'*. (Figs. 1, 2, and 4.) This drum, which is provided with an annular serrated thumb-piece *g''*, surrounds an upright stud *H* supported by an upright *H'* extending from a bracket *a''* secured to the portion *A''* of the frame. The lower edge of the drum *g'* is cut into ratchet-teeth, as shown in Figs. 1 and 2, which engage similar ratchet-teeth in a drum or head *H''* secured rigidly upon the stud *H*. By means of the cord *f'*, spring *g*, and ratchet-drums above named, the fliers are individually rotated as they revolve around the spindle *d*, while the tension of the cord *f* not only accommodates itself to the exigencies of the case but can be regulated by rotating the ratchet drum *g'* upon the under drum or head *H''*.

In order to prevent the fliers from spreading by centrifugal force, bands *h* (not new in this invention) may be centrally applied thereto.

Each flier is provided with the usual solid or dead spindle *L*. This spindle extends from the upper end of the flier through the bobbins *b* and disks *C* into the lower end *B''''*. Between the lower end of this dead spindle and its seat is a spiral spring *I'*. (Fig. 3.) The upper ends *B'''* of the fliers have their bearings in the plates *I''* rigid upon the spindle *d*. These upper ends are provided with the usual passages *J'*. (Fig. 3.) The upper end of each dead spindle *I* has rigidly secured to it a guide-wire *J* bent into the coiled shape shown in Fig. 7, said guide-wire being secured to one side of the center of the spindle *I* so as to bring its coiled portion over such center. The strands pass from the bobbins through suitable openings in the fliers in the usual manner around the screws or pins *i* and through the passages *J'* up into and through the guide-wires *J*; thence they pass through the usual passages *k* in the "laying-up" spindle *d* and up through the portion *A'* of the frame. By means of this guide-wire in which the thread winds, in case it is desired to remove and replace a bobbin, the yarn is unwound, the dead spindle *I* withdrawn, the bobbin removed and another put in its place, the spindle *I* dropped into its former position and the yarn wound in again.

A hook *K* (Fig. 7) extends up from the upper end of each flier, and a projection *K'* extends horizontally from the side of the spindle *I* into engagement with said hook. In practice, the spring *I'* holds the spindle *I* up and prevents jar, and the projection *K'*, engaging with the hook *K*, prevents it from moving up or sidewise.

I prefer to introduce felt, *K''*, (Fig. 3) between the upper end of the flier and the plate *I''*, said felt acting as an oil-absorbent and obviating the necessity of frequent oiling.

The yarn *S*, after passing up through the guide-wire *J* passes over the whirl or pulley

L (Fig. 1) which is loose and free to slide endwise on the tight shaft *L'* supported at *L''* on suitable brackets secured to the frame. The usual adjustable tension-spring *l* bears against the yarn *S* between the laying-up spindle *d* and the whirl *L*. From the whirl *L*, the yarn passes over the cone or series of pulleys *N* adjustably secured to the shaft *N'* having its bearings in brackets *N''* supported by the frame. Of course the parts *L L' L''*, *N N' N''*, connected with the fliers on the front of the machine, are exactly duplicated at the rear of the machine for connection with the rear fliers.

Motion is imparted to the shafts *N'* by means of gear-wheels *n* fast on said shafts, said gear-wheels being engaged by the pinions *n'* fast on the hubs of the pulleys *n''* which are connected by the cross-belts *m* with the pulleys *m'* fast on the driving-shafts *E' e'*. (See Figs. 1 and 2.) The pinions *n'* which are fast upon the hubs of the pulleys *n''* are loose upon shafts or pins *m''* which are supported by arms *P*, (Fig. 2) whose lower ends are loosely supported by hubs or boxes *P'* on the driving shafts *E' e'*. These arms *P* are provided with the integral extensions *R*, each of which has a curved slot *R'* forming an arc of a circle of which one of the driving shafts *E' e'* is the center. These slotted arms are adjustably secured to the frame by means of suitable bolts and nuts *r r'*. Hence, if different sized pinions *n'* are desired to be employed, the pinion in use can be removed and replaced by, say a larger one, by swinging the arm *P* by means of the slotted extension *R* until the new pinion is in engagement with the gear-wheel *n*. The yarn *S* passes from the cone or pulley *N* to the reel, which is not new in this invention, and which consists essentially of the four arms *T* extending from the outer ends of the four radial arms or spokes *T'*, one of said arms *T* being pivoted at *t* to its radial arm, which has pivoted to it at *t'* the arm *t''*. These reels are loose on studs *T''* supported by uprights *U* secured to the frame. The reels moreover are rigidly secured to the internal or ring gear-wheels *U'*, which are engaged by the pinions *U''* fast on the hubs *V* of the loose pulleys *V'*, which are connected by belts *V''* with the pulleys *W* fast on the shafts *N'*. Thus motion is imparted to the reel indirectly from the driving shafts.

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

1. The hollow fliers *B* provided with openings *B'* for the admission of the bobbins, and disks *C* for supporting said bobbins, said disks being weighted at *C'* on the side next said openings for the purpose of balancing the fliers, substantially as set forth.

2. In a twisting machine, the combination of the fliers *B* provided with the cones or pulleys *f*, the band *D''* around said fliers, the coiled spring *g* one end of which is secured to

said band, the adjustable drum g' to which the other end of the spring g is secured, said drum g' having ratchet teeth, and the drum H'' also having ratchet teeth which engage the ratchet teeth of the drum g' , said drum H'' being secured to the frame, substantially as described.

3. In a twisting machine, the combination of the flier B provided with the solid lower end B'''' bored out to receive the end of the dead spindle, the dead spindle I, the spring I' interposed between the lower end of the dead spindle and the end of the hole in which its end lies, the hook K secured to the upper end of the flier, and the projection K' extend-

ing from the upper end of the dead spindle and engaging with said hook, substantially as described.

4. In a twisting machine, the combination of the dead spindle I provided near its upper end with the horizontal projection K' , and the flier B provided on its upper end with the vertical hook K, said hook and projection being in engagement with each other, substantially as set forth.

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Witnesses:

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