(No Model.)

T. DOWNWARD.

SPINNING MACHINE.

No. 306,815. Patented Oct. 21, 1884.

Fig. 1.

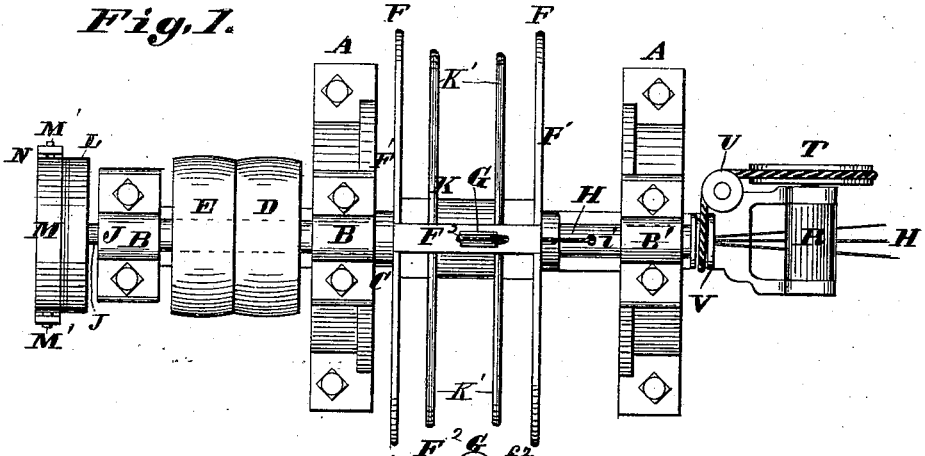


Fig. 2.

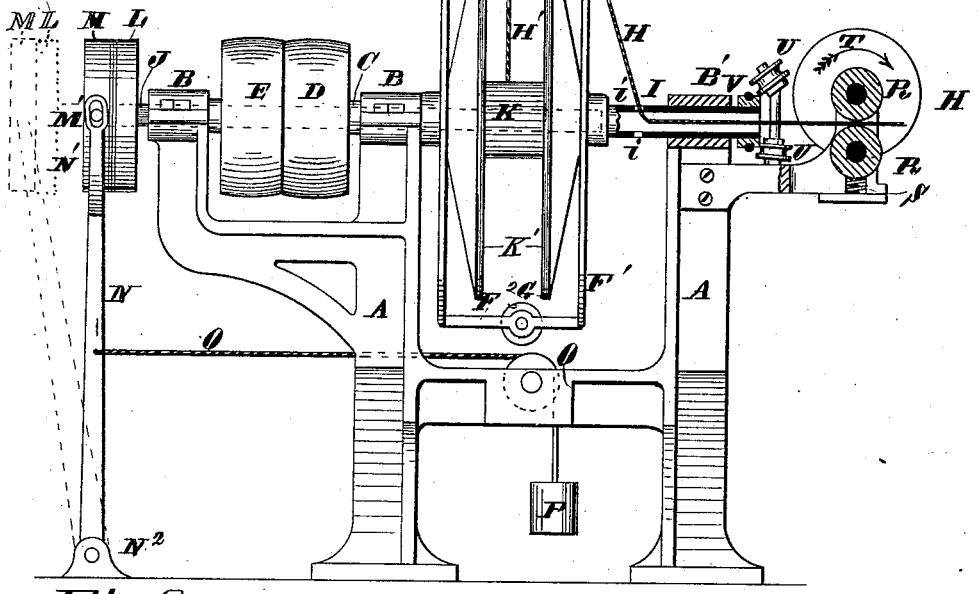
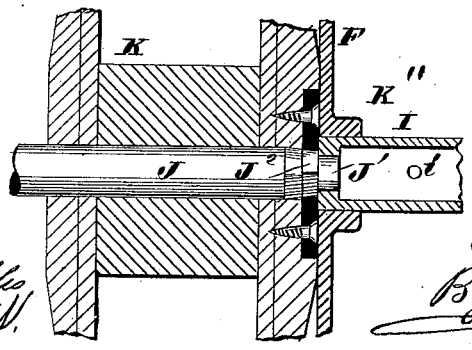


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS DOWNWARD, OF RINKELVILLE, MISSOURI.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,815, dated October 21, 1884.

Application filed May 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS DOWNWARD, of Rinkelville, in the county of St. Louis and State of Missouri, have invented a certain new and useful Improvement in Spinning-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The scope of the invention is set forth in the claims.

Figure 1 is a top view of the machine. Fig. 2 is a side elevation, part in section. Fig. 3 is an enlarged detail axial section.

A is the frame of the machine.

B B are boxes giving bearing to the tubular flier-shaft C, said shaft carrying a fast pulley, D, and a loose pulley, E.

F is the flier attached to the tubular shaft C. The flier, in its preferred form, consists of two flat circular plates or disks, F′, having thread-eyes *f′* and parallel with each other, and set at right angles with the shaft. These disks are connected at the periphery by two longitudinal bars, F^2, each having a thread-slot, f^2, and set at opposite sides of the flier, and having a grooved pulley, G, (occupying the slot,) over which the thread H passes, between the tubular spindle I and the reel. The tubular spindle I is attached to the flier, and forms its bearing-shaft upon one side, turning in a box, B′.

J is a shaft or spindle occupying the bore of the shaft C, and movable therein both in a longitudinal and rotary direction. The shaft J passes axially through both the flier and the reel K, and forms the bearing or support of the latter within the flier. The end of the shaft J has a cylindrical tip, J′, having journal-bearing in the inner end of the tubular spindle I; and J^2 is an angular part fitting an aperture in the plate K″, that is fitted in the end of the reel. The construction is such that the reel always turns with the shaft J, whereas the shaft J may rotate at a slower speed than the tubular shaft C and the flier F with the hollow spindle I. This retardation of rotary movement in the reel is for the purpose of winding the thread upon the reel, and takes place when the strain upon the thread is diminished by the operator. The shaft J carries at the rear end a friction-wheel, L, whose face has contact with a friction-block, M, supported upon the fork N′ at the upper end of a lever, N, by means of trunnion-pins M′, occupying slots in the fork. The lever is fulcrumed at N^2, and the block M is pressed against the friction-wheel L by means of a cord and weight, O P, the cord O being attached to the lever N, and passing over a pulley, Q, as shown in Fig. 2. It will be seen that the friction device tends to check the motion of the shaft J and the reel K. The friction between the parts J K and the shaft C and flier is less than that between the wheel L and block M, so that when the strain upon the thread is decreased below a certain amount the reel rotates at a slower speed than the flier and the thread is wound upon the reel. At other times the strain upon the thread by the hands of the operator is sufficient to cause the reel to turn at equal speed to the flier, and the thread is twisted but not wound on the reel.

As ordinarily constructed, the reel is made of small diameter in proportion to its length, as compared with the reel in my machine, and the flier-bar in which the thread has bearing in comparatively near proximity to the body of the reel. It has consequently been found necessary to give the flier or the reel a longitudinal or endwise motion to cause the even winding of the thread upon the reel. With my device the diameter of the flanges K′ of the reel exceeds the length of the barrel, say, about five to one, and thus the extreme shortness of the barrel and great distance from it of the part of the flier carrying the thread render it unnecessary that the reel or flier should have any longitudinal movement relative to the other, as the direction of the thread between them, at H′, never varies much from a line parallel to the flanges K′ of the reel, and consequently the coil of thread last laid forms a sufficient guide to the thread being wound upon the reel, as the direction of the thread at H′ renders it easy to guide endwise of the reel. The thread from the hands of the operator may pass (as usual) through the open end of the spindle I, and out through a side eye, *i*, to the eye *f′*, through slot f^2, and around pulley G of the flier, and from thence to the barrel of the reel K. The thread (or threads where two or more are being twisted together) may pass between feed-rollers R, pressed to-

gether by springs S, acting on the journals of one of the rollers. One of the rollers carries a pulley, T, that carries a belt passing over idle-pulleys U, and around a pulley, V, upon the tubular spindle I. The speed of the rollers R may of course be regulated by taking pulleys T and V of the required relative size.

It will be understood that the feeding-rolls are not intended to be used except when doubling.

To remove the reel from the shaft J and the flier, the shaft is drawn out of the reel into the position shown in dotted lines in Fig. 2.

I claim—

1. The combination of a tubular shaft, tubular spindle, flier mounted on the inner ends of the tubular shaft and tubular spindle, reel-shaft having an angular end, and cylindrical tip supported in the end of the tubular spindle, reel having recess to receive the angular end of the shaft, fast and loose pulleys on the tubular shaft, and means for retarding the rotation of the reel-shaft, the reel-shaft adapted to have a longitudinal movement in the tubular shaft, substantially as set forth.

2. The combination of tubular shaft, tubular spindle, flier supported on the inner ends of the tubular shaft and tubular spindle, to turn with the shaft, the reel, the reel-shaft adapted to move longitudinally in the tubular shaft, friction-wheel secured to the reel-shaft, fulcrumed lever, friction-block supported on the lever to bear on the friction-wheel, and a weight connected to the lever to hold the block in contact with the friction-wheel, substantially as described.

3. The combination of the tubular shaft, tubular spindle having a driving grooved pulley, a flier supported on the tubular shaft and tubular spindle, a reel, a reel-shaft extending through the tubular shaft and supported in the inner end of the spindle, feed-rollers, a pulley secured to one of the feed-rollers, idle-pulleys, and a belt connecting the pulleys, substantially as set forth.

THOMAS DOWNWARD.

Witnesses:
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