

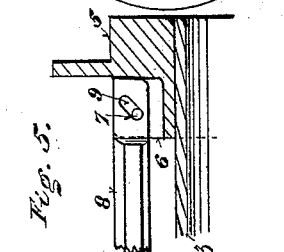
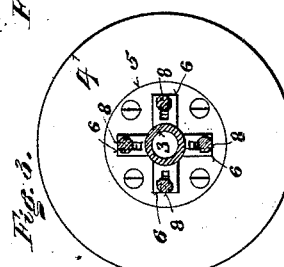
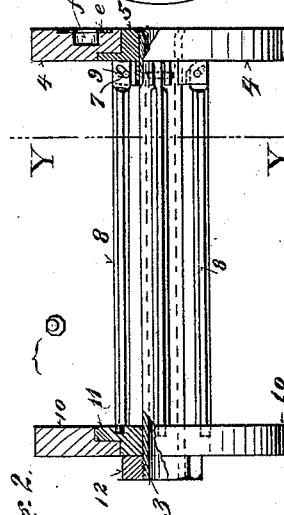
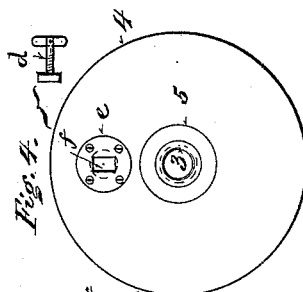
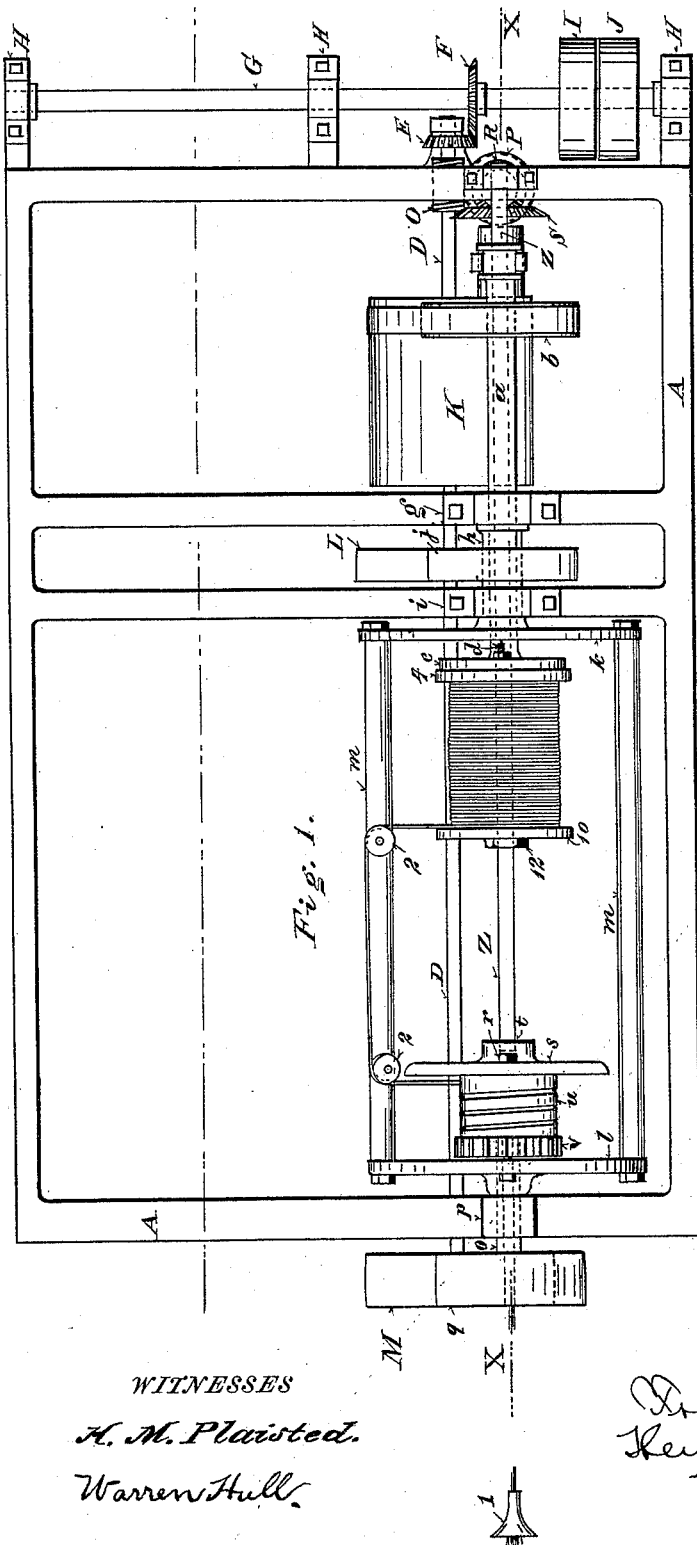
(No Model.)

2 Sheets—Sheet 1.

F. B. DREES & H. R. SWAN.  
SPINNING MACHINE.

No. 419,649.

Patented Jan. 21, 1890.



WITNESSES  
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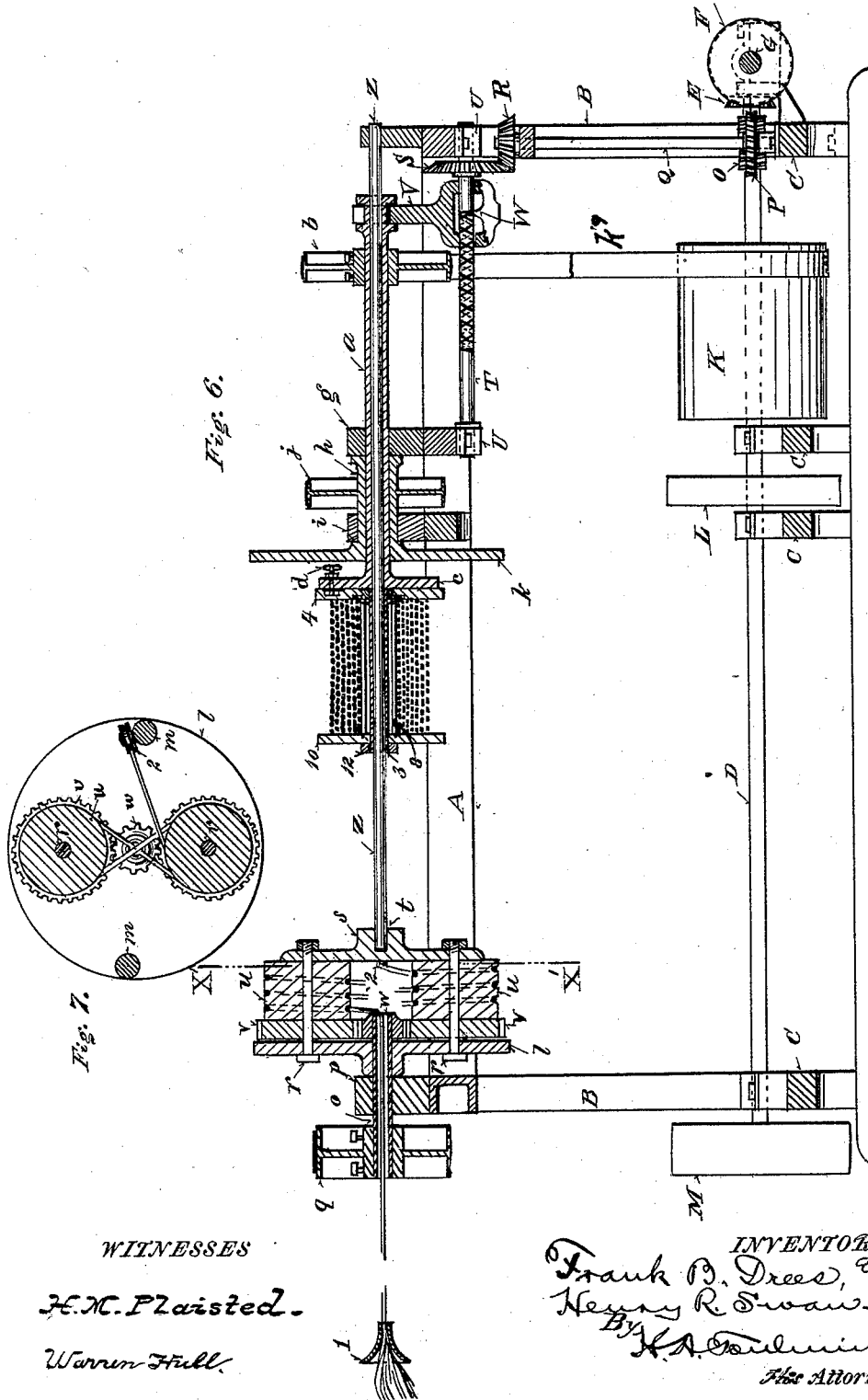
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# UNITED STATES PATENT OFFICE.

FRANK B. DREES AND HENRY R. SWAN, OF XENIA, OHIO.

## SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 419,649, dated January 21, 1890.

Application filed August 27, 1889. Serial No. 322,091. (No model.)

*To all whom it may concern:*

Be it known that we, FRANK B. DREES and HENRY R. SWAN, citizens of the United States, residing at Xenia, in the county of Greene and State of Ohio, have invented certain new and useful Improvements in Spinning-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to spinning-machines used in the manufacture of binder-twine, rope, and cordage, particularly the former, and the improvements have reference to  
15 adapting the bobbin to the accomplishment of a twofold object—namely, the ready removal of the same from the flier and the contracting of the diameter of the core or body upon which the cord is wound as it is converted from sliver into this product. By  
20 this means we are enabled to remove the roll of twine from the bobbin without breaking it down and without unwinding it from the bobbin and rewinding the cord in a ball, as is now the universal practice. The result of  
25 this is that the roll of twine is sent into the market in the form and in the condition in which it is made up by the spinning-machine, without having to go through this subsequent  
30 operation of unwinding and rewinding, which, outside of the enormous attendant expense, to be presently referred to, also affects the quality of the product, in that such unwinding and rewinding more or less loosens the  
35 fibers of which the cord is composed and causes a frequent breakage of the cord, resulting in the presence of knots here and there throughout the balls. These knots are  
40 objectionable in the use of binder-twine on grain-binders, as the cord is obstructed by the knots catching against the needle. Then, referring to the matter of expense, we would  
45 observe that by our invention the purchase of the rewinding-machines, the cost of keeping them in repair, (which is considerable,) the power required to operate them, the expense in wages for an operator for each of  
50 such machines, and the loss of fiber from breakage, stripping, and other causes which result in the accumulation of waste about each rewinding-machine, (and which in a plant of twelve rewinding-machines averages ten dollars per day,) are each and all saved and

avoided, as will hereinafter be more fully described.

In the accompanying drawings, forming a part of this specification, and in which like reference-letters and figures indicate corresponding parts, Figure 1 represents a plan view of a twine or cordage spinning machine of any improved type with one flier and its adjuncts and a bobbin mounted on the flier; Fig. 2, a partial section and partial side view of one exemplification of our improved bobbin; Fig. 3, a sectional view on the line Y Y of Fig. 2; Fig. 4, an outside elevation of the removable disk of the bobbin and side elevation of the locking device, hereinafter referred to; Fig. 5, a detail sectional view of a part of the bobbin; Fig. 6, a vertical sectional view on the line X X of Fig. 1 of the spinning-machine and bobbin, &c.; and Fig. 7, a sectional view on line X' X' of Fig. 6.

The spinning-machine is not wholly illustrated, and will only be described in so far as necessary to enable an understanding of our invention.

The letter A designates a rectangular frame supported by suitable posts B, upon the transverse pieces C of which are mounted suitable boxes for a longitudinal shaft D, carrying a beveled pinion E, meshing with a beveled gear-wheel F, mounted upon a transverse driving-shaft G, having bearings in the extensions H of the frame. The shaft G is supplied with the usual loose and fixed pulleys I J, which are operated by a belt from the line-shaft of a factory. The shaft D carries a drum K, which, through a belt *k*<sup>2</sup>, rotates the pulley *b*, employed in driving the bobbin. It also carries a pulley L, which, through a similar belt, (not shown,) rotates the pulley *j*, which is employed in driving the flier. It further carries a pulley M, which, also through a suitable belt, (not shown,) rotates the pulley *g*, by which the yarn-drawing rolls *u u* are actuated. The shaft D further carries a worm O, meshing with a worm-gear P, carried by a shaft Q, geared through a beveled pinion R and a beveled gear S with a right and left hand threaded shaft T, mounted in suitable bearings U and adapted to reciprocate an arm V, whose lower end engages with the threads of said shaft by means of a projection W, so that as the shaft T is rotated the arm will

travel back and forth the length of the screw-threaded portion. Each flier has a central spindle Z, mounted in suitable bearings on the upper part of the machine, and upon which  
 5 is fitted the hollow reciprocating shaft *a*, carrying the pulley *b*, by which and the belt *k*<sup>9</sup> and drum K, already mentioned, it is rapidly rotated, while it is reciprocated by the arm V, already referred to. This shaft terminates in a disk *c*, to which is locked one  
 10 head or disk of the bobbin in any convenient manner—say by means of a bolt *d*, carried by the disk *c* and adapted to pass through a slotted plate *e* on the bobbin-disk and into  
 15 the recess *f* of the bobbin-disk. (See Figs. 2 and 4.) The bolt has a cross-piece on the end which catches behind the plate *e* when turned crosswise in the slot in said plate. By these means the bobbin is rotated at a high rate of  
 20 speed and reciprocated sufficiently fast to wind the cord thereon in layers from end to end of the bobbin. The hollow shaft *a* passes through a bearing *g*, as also through a short hollow shaft *h* of the flier, where it has a sup-  
 25 port in a bearing *i*. The pulley *j*, rotated by the pulley L and a suitable belt, is carried by the shaft *h*, as also one of the flier-heads *k*. The other flier-head *l* is connected to the flier-head *k* by the rods *m*, and is mounted  
 30 upon a hollow shaft *o*, having a bearing at *p* and carrying a driving-pulley *q*, and receiving rotary motion through a belt from the pulley M, already referred to. The head *l* carries bolts *r*, which connect with a disk *s*,  
 35 having a socket which receives the end of the spindle Z, as seen at *t*. The bolts *r* form shafts for the yarn-rolls *u* and their operating-gears *v*, while the pinion *v* is carried by the hollow shaft *o* and meshes with said gear-  
 40 wheels *v*.

The sliver is conveyed to the reducer 1 by the usual gill chain or feed common to this class of spinning-machines, and the yarn passes from the reducer through the hollow  
 45 shaft *o*, thence to one of the grooved rolls *u*, and then to the opposite side of the other roll, and so on from one to the other, as seen in Figs. 6 and 7, finally passing from one of said  
 50 rolls over suitable sheaves 2 to the bobbin, during which operation it has been formed into twine by the proper twisting of the fibers of the yarn.

The above description of the machine and its operation will enable an understanding of  
 55 our invention, and we will now proceed to the description of the preferred form of bobbin for carrying it into effect.

A tubular shaft 3, adapted to fit upon the spindle Z and rotate and reciprocate thereon,  
 60 is provided at one end with a bobbin-head 4, with an intermediate metallic bushing 5, fitted rigidly upon the shaft 3 and screwed to the head. (See Figs. 2 and 3.) This bushing has a number of radial sockets 6, (four in the  
 65 present instance.) To these sockets are fitted transverse pins 7, and upon the latter are mounted bars 8, composing a skeleton barrel

or body. These bars have oblique slots 9, which fit the pins 7 in such a manner that when the bars are pressed in the direction of  
 70 the head 4 they will ride upon the pins and move in a radial direction, so as to increase the diameter of the body or barrel. When this pressure is relieved, the bars 8 are free  
 75 to move inward to collapse the body or barrel, for a purpose presently to appear. Other forms of detail construction may be employed to cause the bars to expand and contract or collapse the barrel which they compose, but the present construction is preferred. The  
 80 other end of the shaft 3 is provided with a similar bobbin-head 10, having a bushing 11, provided with a recess for a tenon formed on the adjacent end of each of the bars 8. A nut 12 or other suitable means is employed to  
 85 force the head 10 and the bars 8 toward the head 4. It will now be understood that after the twine has been wound upon the bobbin, as suggested by the heavy dots in Fig. 6, and it is desired to remove the roll or package and  
 90 tie the ends preparatory to shipment, it is simply necessary to slide the spindle Z toward the right-hand end, as viewed in Figs. 1 and 6, and disengage the bolt *d* from the head 4, when the bobbin may be taken off. This  
 95 done, the roll or package of twine is removed from the bobbin without breaking it down or getting it out of shape by removing the nut 12 and head 10, when the natural contraction of the roll will quickly collapse the barrel,  
 100 and thus loosen the bars from the interior of the roll. This done, the roll may be lifted off or the bobbin withdrawn from the roll. Thus it will be understood that by means of our improvements the subsequent operations of  
 105 unwinding from the spinning-bobbin and re-winding in the form of balls their attendant expense, loss of material, consumption of time, &c., are avoided and the product improved in appearance, value, and utility.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a hollow shaft adapted to reciprocate and rotate upon a  
 115 spindle, of a head fixed to one end of said hollow shaft and another head removably attached to the other end thereof, and a series of bars composing a skeleton barrel pivoted to the fixed head and connected to the other  
 120 head with an oblique surface in the connection, so as to move the bars outwardly by the pressure of one of the heads and to allow them to collapse by the removal of such pressure.

2. The combination, with a hollow shaft adapted to rotate and reciprocate upon a  
 125 spindle, a head fixed to one end thereof and having a series of radial sockets provided with transverse pins, and a removable head  
 130 having a like series of recesses, and a binding-nut at the other end of said shaft, of a series of bars fitted to the said recesses and sockets and having oblique slots occupied by

said pins, whereby the barrel is collapsible and one of the members removable.

3. The combination, with a bobbin having a hollow shaft adapted to be mounted upon a spindle, a head fixed to one end of the hollow shaft, a head removably attached to the heads and radially movable, said bars being adapted to move outward when the removable head is forced against them and move inwardly when it is removed from them, of means to rotate and reciprocate the bobbin.

4. The combination, with a bobbin having a hollow shaft, of a head fixed to one end of

the hollow shaft, a head removably attached to the hollow shaft, and a series of bars between the heads and radially movable, the bars being adapted to move outward when the removable head is forced against them and moved inward when it is removed from them.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK B. DREES.  
HENRY R. SWAN.

Witnesses:

J. C. HULL,  
ARTHUR HARTWELL.