

(No Model.)

2 Sheets—Sheet 1.

G. FLORENCE.
TWINE MACHINE.

No. 530,891.

Patented Dec. 11, 1894.

FIG. 2.

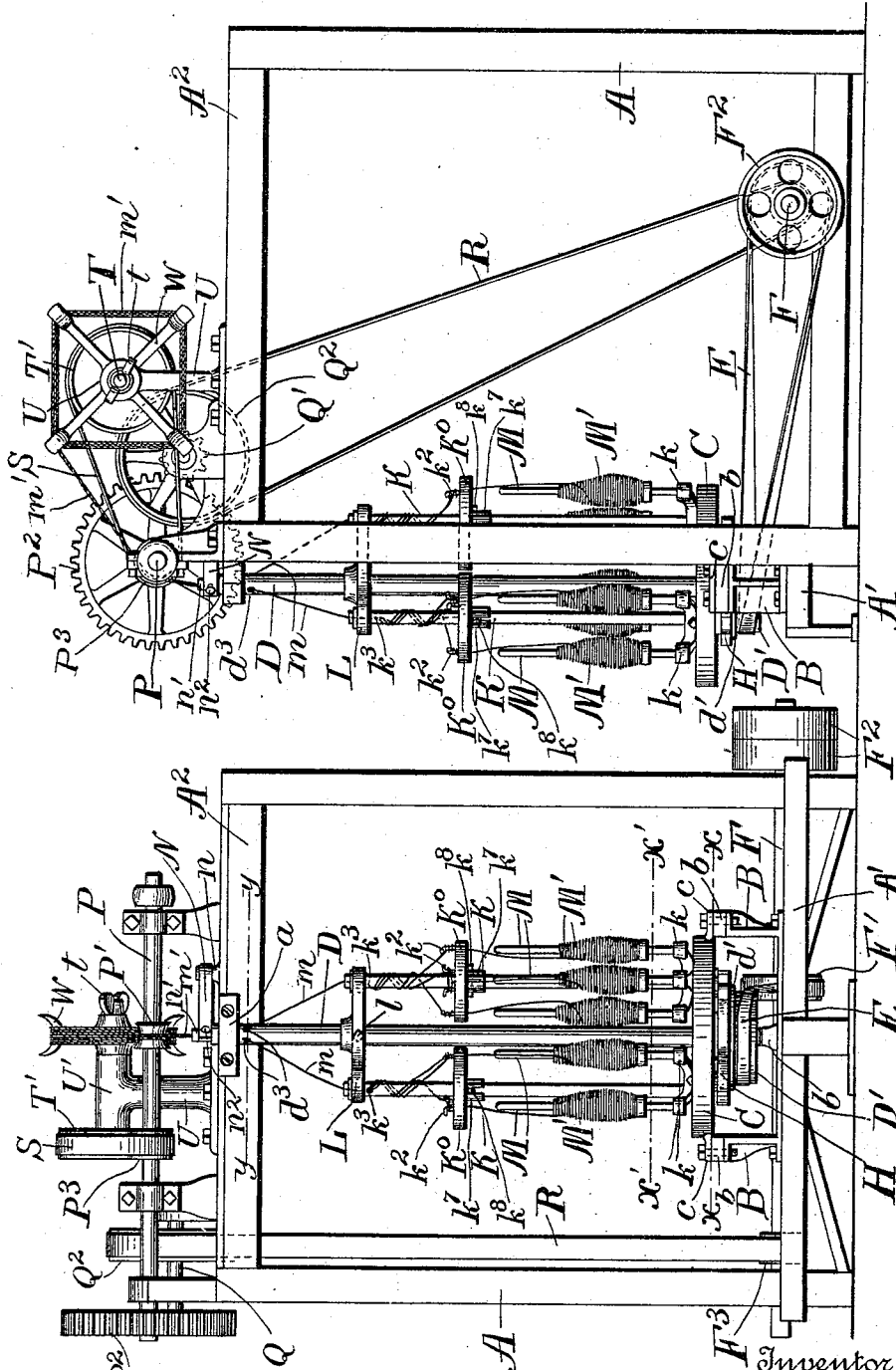
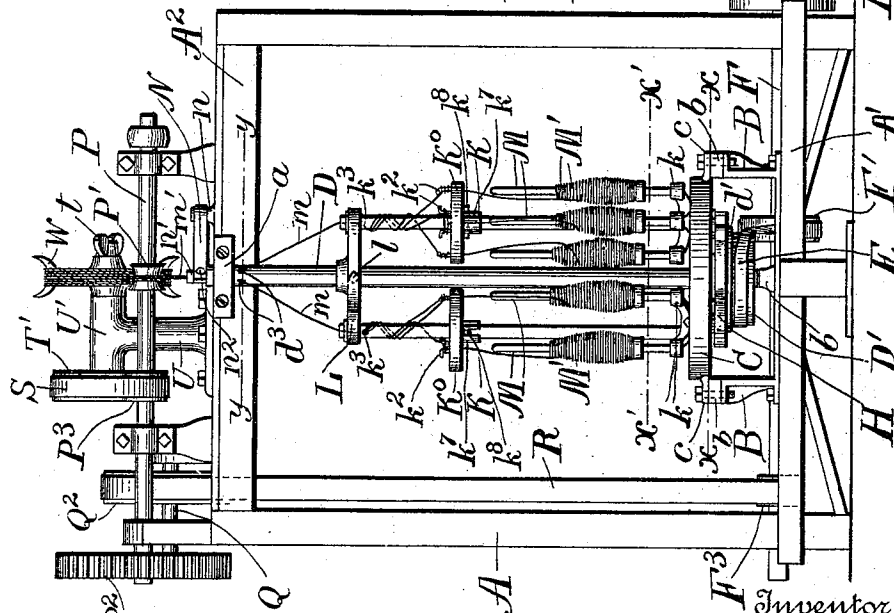


FIG. 1.



Witnesses
Rey C. Bowen.
Maurice Lionessa.

Inventor
George Florence,
By *Whitman & Wilkinson,*
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

G. FLORENCE.
TWINE MACHINE.

No. 530,891.

Patented Dec. 11, 1894.

FIG. 3.

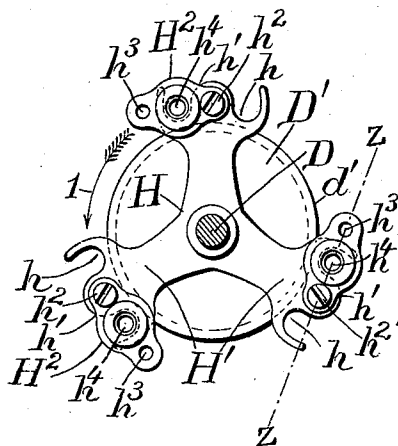


FIG. 4.

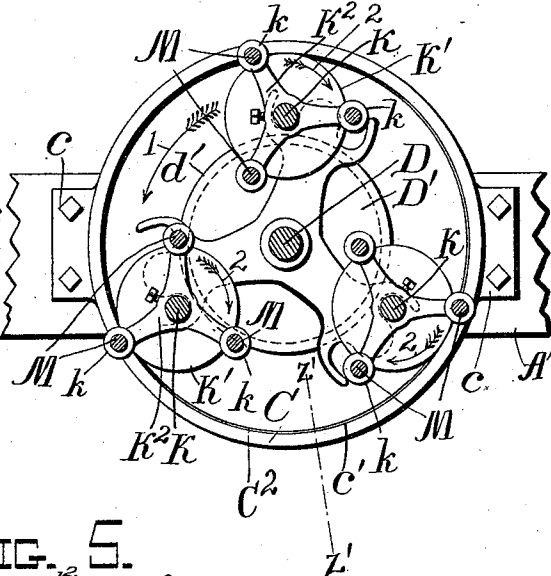


FIG. 5.

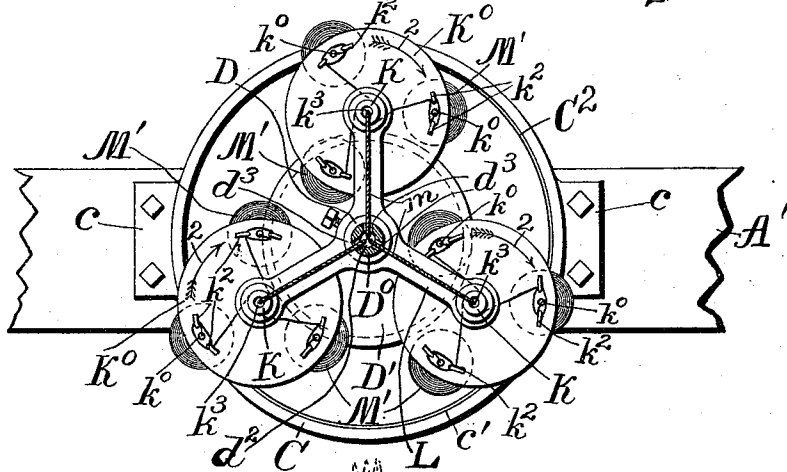
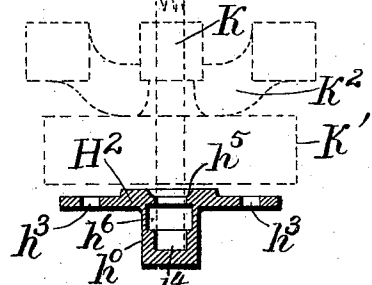
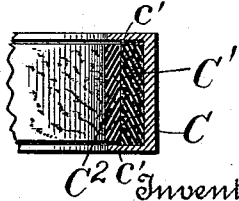


FIG. 7.



Witnesses
Percy C. Bowen.
Malvina S. Sassa.

Inventor
George Florence,
By *Hutman & Wilkinson,*
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE FLORENCE, OF NEWNAN, GEORGIA, ASSIGNOR OF ONE-HALF TO
R. D. COLE, SR., OF SAME PLACE.

TWINE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 530,891, dated December 11, 1894.

Application filed July 9, 1894. Serial No. 516,994. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FLORENCE, a citizen of the United States, residing at Newnan, in the county of Coweta and State of Georgia, have invented certain new and useful Improvements in Twine-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for the manufacture of twine, cord, and the like, and it consists of certain novel features hereinafter described and claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a front view of the machine, as seen from the left in Fig. 2. Fig. 2 represents a side elevation of the machine as seen from the right of Fig. 1. Fig. 3 represents a section along the line $x-x$ of Fig. 1, and looking down. Fig. 4 represents a section along the line $x'-x'$ of Fig. 1 and looking down. Fig. 5 represents a section along the line $y-y$ of Fig. 1, and looking down. Figs. 3 to 5 are on an enlarged scale. Fig. 6 represents a section along the line $z-z$ of Fig. 3, and shows the pivoted spindle step for the former spindles, and Fig. 7 represents a vertical section through one side of the friction ring.

A represents a frame of suitable construction provided with the projecting sill A' , and upper beams A^2 .

B represents a bracket casting secured to the said frame and carrying on its upper side two strips b , of rubber or felt, or like material for lessening the vibrations, and deadening sound. The friction ring C is secured above these strips b by means of the ears c , and suitable bolts. This ring is provided with annular flanges c' between which are held the annular cushion piece C' made of rubber, felt, leather or similar material, inside of which is an annular leather friction piece C^2 . Passing through the axis of this ring C is the layer spindle D which revolves

in journals a and b . This layer spindle carries the fast pulley D' , which is flanged as at d' , and carries the belt E leading to the pulley F' on the driving shaft F. The said shaft F carries the fast and loose pulleys F^2 which are driven by belting, not shown, from the source of power. The layer spindle D also carries a spindle step spider H, which is provided with a plurality of arms H' , each of which arms spreads out exteriorly, forming the perforated lug h' and the double grooves h one on either side of said lug. In this lug h' a screw seat is provided to receive the screw h^2 which forms the pivot of the plate H^2 provided with the spindle step h^4 . The two ends of this plate H^2 are provided with holes h^3 as shown in detail in Fig. 6, and thus the said plate is made reversible relative to its pivot. It will also be seen by reference to Fig. 3, and to Fig. 6, that the lower portion h^0 of the plate H^2 may be swung into either of the grooves h of the spider H. This renders the machine capable of laying up either right handed or left handed cord or rope, according to the direction in which the layer spindle D is revolved. The spindle step h^4 is enlarged as at h^6 , see Fig. 6, to form an oil-chamber for lessening friction, and a funnel-shaped groove h^5 is provided in the said plate, for the better oiling of the spindle step.

The top spider L is held fast on the layer spindle D as by means of the set screw l .

The former spindles K are journaled in the spindle steps h^4 , and also in the top spider L. These former spindles carry the whirl K' , and the spiders K^2 in the set bearings k in which the bobbin spindles M are mounted, carrying the bobbins M' . These bobbin spindles are made tapering and the bobbins are pressed tightly down on said spindles and are held fast thereon by friction. These bobbin spindles are more strictly bobbin supports or holders, as the bobbins do not revolve thereon, and they are merely made in the form of tapering spindles, as bobbins are ordinarily made hollow. Above the top of these bobbin spindles the tension plate K^0 is held on the former spindles K by means of the slotted hub k^7 engaging the pin k^8 fast on the former spindle. By this means the tension plate K^0

may be readily moved upward well clear of the bobbin spindles when it is desired to remove the bobbins. The tension plate is provided with holes k^0 , through which the yarn passes, and on either side of said holes tension wires or cleats k^2 about which the yarn from the bobbins is wound one or more times. The bobbins being fast on the spindles M, the yarn is drawn off from the top of the bobbins as needed and thus the accidents that frequently happen from the bobbins unwinding too fast are obviated. This drawing of the yarn upward from the bobbins obviates the necessity of imposing any tension on the bobbins, and prevents the yarn from hanging in loops or bights. Further tension is given by winding the yarns one or more times around the former spindles K and then passing the yarns on each former spindle through the side hole k^3 , and up through the hollow center of the said spindle to the side holes d^3 of the layer spindle, where the three strands m meet and pass up through a plug D^0 in the hollow center of the upper end of the layer spindle, where the three strands are twisted into the twine or cord by the revolution of the layer spindle.

The top spider L is so secured by the set screw l on the layer spindle D, that the hole in the top of the former spindles will be in line with the side holes d^3 in the layer spindle.

The twine or cord m' passes one or more times around the stretcher-whirl P' on the shaft P, which shaft is driven by means of the gear wheel P^2 , which meshes in the pinion Q' on the shaft Q, which shaft carries the pulley Q^2 driven by the belt R, which belt is driven by the pulley F^3 on the driving shaft F.

In order to give the twine or cord the proper tension before it reaches the stretcher-whirl, it should preferably pass through a clamp tube n' operated by the thumb screw n^2 both of which are mounted in the frame N pivoted at n as shown in Fig. 1. After leaving the stretcher-whirl, the twine or cord is wound in skeins on the swift W, which is detachably connected to the shaft T by means of the thumb screw t . This shaft T is mounted in bearings U' on the frame U, and the said shaft carries a pulley T' which is driven by means of the belt S from the pulley P^3 on the shaft P.

It will be seen that as the spindle step spider H revolves with the layer spindle D, the whirls K' will be thrown outward with sufficient force through centrifugal motion, to bear firmly on the interior friction piece C^2 , of the ring C. This friction piece and the cushion C' behind the same will deaden the vibrations and lessen the sound. If the spindle D revolves in the direction of the arrow 1 in Fig. 4, then the whirls K' will be caused to revolve in the direction of the arrows 2 of the said figure, or opposite to the motion of the arrow 1. Since the plate H^2 is pivoted at one end, and these whirls fly outward through centrifugal force, until they bear on the inner face

of the friction piece C^2 of the ring C, it will be evident that no nice adjustments are necessary.

In view of the duplicate holes h^3 in the plate H^2 , and the duplicate grooves h in the spider H, it will be evident that the spindle step plates may be reversed if desired, and thus the relative positions of the various strands may be varied with regard to the laying spindle D.

In the drawings the machine is shown constructed to make three strands from three yarns, and to twist the three strands up into a single cord, but it will be evident that by varying the number of bobbin spindles, the numbers of yarns to the strand may be varied, and by varying the number of former spindles, the number of strands in the cord may be varied at will.

In the herein described machine spiders are preferably used on account of their greater cheapness and lightness, but solid bearing plates or disks may be substituted for any or all of the various spiders herein referred to, if desired. It will also be evident that the bobbin spindles M may be mounted directly on the whirls K' .

Various other modifications of the herein described machine, might also be made by any one skilled in the art, which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine of the character described, the combination with a layer spindle and means for rotating the same, of a bearing disk or spider fast to said layer spindle, a friction ring exterior to and inclosing said layer spindle, a reversible plate pivotally attached near one end to said disk or spider and provided with a spindle journal bearing therein in the center thereof, a former spindle journaled in said bearing, and a whirl carried by said former spindle and adapted to bear against the inner face of said ring when the free end of said pivoted plate is swung outward by centrifugal force, substantially as described.

2. In a machine of the character described, the combination with a layer spindle and means for rotating the same of a bearing disk or spider fast to said layer spindle, a friction ring exterior to and inclosing said layer spindle, a reversible plate pivotally attached near one end to said disk or spider and provided with a spindle journal bearing in the center thereof, a former spindle journaled in said bearing, and a whirl carried by said former spindle and adapted to bear against the inner face of said ring when said pivoted plate is swung outward by centrifugal force, bobbin supports carried by the layer spindle and adapted to move in circles about the axis of said whirl and to hold said bobbins fast thereon, and means for drawing

the yarn from the top of the bobbins without causing the same to revolve about their axes, substantially as described.

3. In a machine of the character described, 5 the combination with a layer spindle and means for rotating the same of a bearing disk or spider fast to said layer spindle, a friction ring exterior to and inclosing said layer spindle, a plurality of reversible plates 10 H^3 pivotally attached near one end to said disk or spider and each provided with a spindle journal bearing h^4 and an oil cup h^5 in the center thereof, former spindles journaled in said bearings, and whirls carried by said 15 former spindles and adapted to bear against the inner face of said ring when the free ends of said pivoted plates are swung outward by centrifugal force, substantially as described.

4. In a machine for making twine or cord, 20 the combination with a hollow layer spindle and means for driving the same, of a top spider and a spindle step spider fast to said layer spindle; reversible plates each having a spindle step in the center thereof pivoted near one

end on said spindle step spider and adapted 25 to have their free end swing outward, due to centrifugal force, a former spindle journaled in each of said pivoted plates, and in said top spider, a whirl fast to said former spindle, tension plates fast to said former spindles, 30 tension wires on said plates, and an adjustable clamp tube at the top of said layer spindle; a friction ring exterior to said whirl and adapted to be borne against by said whirl when the said pivoted plates swing outward, 35 a bobbin support holder rotating with said whirl, bobbin supports mounted in said holder, and adapted to hold the bobbins against revolving thereon, and a stretcher swift for taking the cord from the layer spin- 40 dle, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE FLORENCE.

Witnesses:

BENJ. GAUSE,
ROY R. COLE.