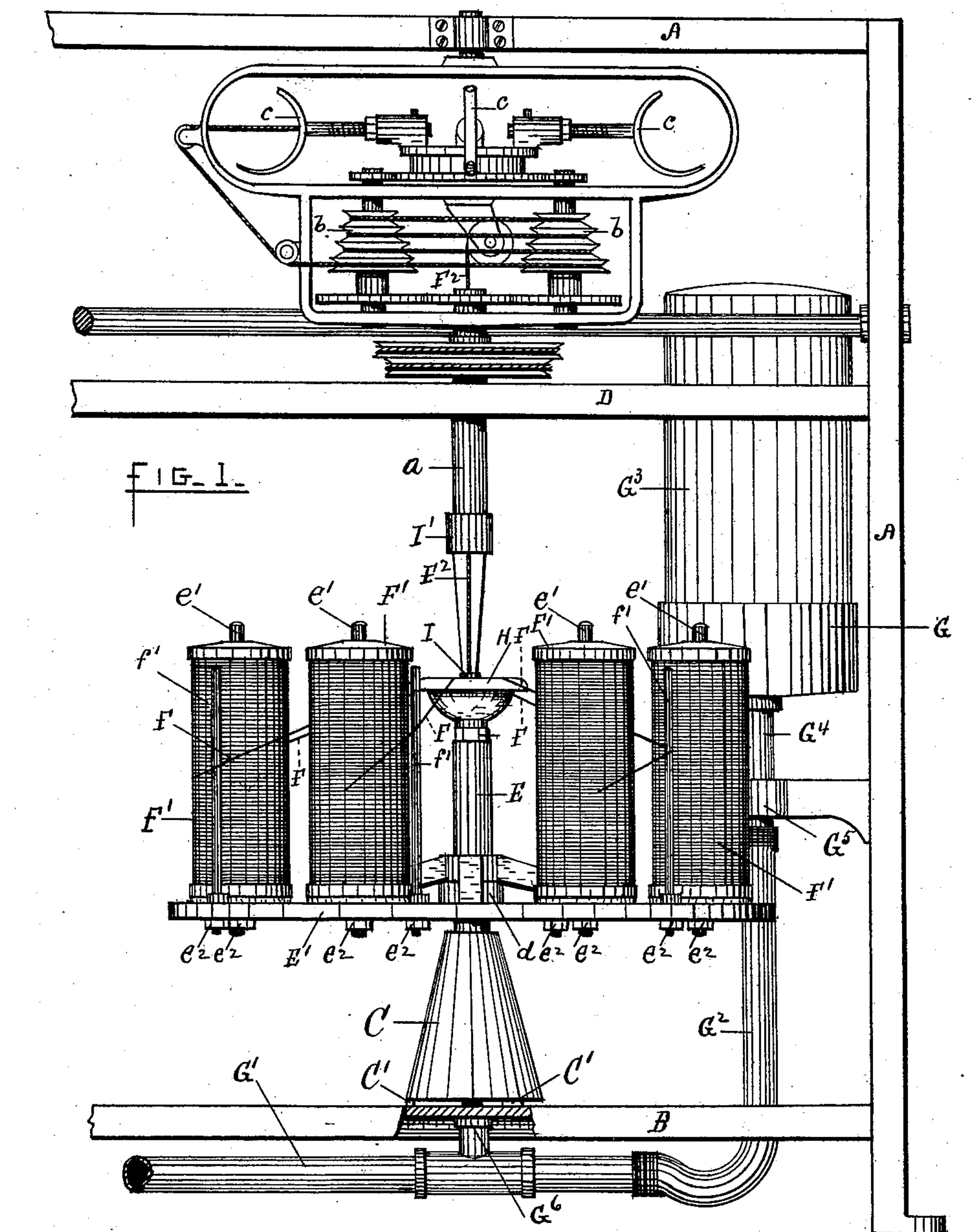


2 Sheets—Sheet 1.

MACHINE FOR MAKING CORD OR TWINE.

Patented Nov. 15, 1887.



Witnesses.

Refus Stollen
C. Mc Donnell

Inventor _____

J. L. Brownell

2 Sheets—Sheet 2.

MACHINE FOR MAKING CORD OR TWINE.

Patented Nov. 15, 1887.



Witnesses.
Refus B. Fowler
S. Mc Connell

f' inventor
 J. L. Brownell

UNITED STATES PATENT OFFICE.

GEORGE L. BROWNELL, OF WORCESTER, MASSACHUSETTS.

MACHINE FOR MAKING CORD OR TWINE.

SPECIFICATION forming part of Letters Patent No. 373,385, dated November 15, 1887.

Application filed August 11, 1886. Serial No. 210,655. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. BROWNELL, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Cord or Twine, of which the following is a specification, accompanied by drawings illustrating a twisting-machine embodying my invention.

My invention has for its object to produce a cord or twine in which all the component strands shall be of equal length and evenly laid upon the outside of the cord, and I attain these results by means of mechanism constructed and arranged as hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is a front view of a portion of a twisting frame or machine embodying my invention. Fig. 2 represents a vertical sectional view of the spool-stand with one of the spools in position on the stand, and also an elevation of the water-reservoir and die. Fig. 3 is a top view of the spool-stand and die with a part of the spools in position. Fig. 4 is a sectional view of the water-reservoir. Fig. 5 is a detached view of the die; and Fig. 6 represents, on an enlarged scale, a portion of the spool-supporting stand.

Similar letters refer to similar parts in the several views.

It is usual to place several sets of twisting mechanisms in a single frame; but as each is a duplicate of the others in construction and operation I have shown in the accompanying drawings but one twisting mechanism and a portion of the supporting-frame.

Referring to Fig. 1, A denotes the frame, B, the lower rail, and D the upper rail, between which and the upper horizontal portion of the frame I pivot the revolving "head" or twisting mechanism proper. The cord to be twisted is taken through the tube *a*, held rigidly in the upper rail, D, and forming the lower pivot, about which the head revolves. The cord is carried around the two stretching-drums *b b*, and is wound upon the reel *c*. I have not described in detail the operation of this part of the machine, as it forms no part of my present invention, and is fully set forth in my application for Letters Patent, Serial

No. 139,350, and also in the patent, No. 286,258, granted to me on the 9th day of October, A. D. 1883. To the lower rail, B, I attach a spool-supporting stand consisting of the cone-shaped base C, with a vertical spindle, E, upon which is placed the circular creel E', resting upon a collar, *d*, attached by the set-screw *d'*, permitting the position of the creel E' to be varied vertically upon the spindle E. In the creel E' are two rows of concentric slots, *e* and *f*. In the inner row, *e*, I place the spool-spindles *e'*, and in the outer row, *f*, the guide spindles or pins *f'*, each spindle of both series of spindles being held in place by a collar resting on the upper surface of the creel and the nut *e''*, screwed against the under surface of the creel. The enlarged base C of the stand rests upon the three equidistant feet or legs C', which enable the stand to be made plumb and all the stands in the frame to be brought at the same level by filing one or more of the feet C'. F denotes the strands to be twisted, and F' the spools.

G is a water-basin, from which water is supplied to the pipe G' through a section of flexible tubing, G².

G³ is a water-reservoir, consisting of a tubular chamber placed in an inverted position in the basin G.

The reservoir G³ has a transverse partition, *g*, above the lower or open end and a short distance below the top of the basin G, forming an upper inclosed chamber, *g'*, containing water, and a lower compartment, *g''*. A tube, *g'''*, extends from the partition *g* to within a short distance of the bottom of the basin G, with its lower end closed by the step-valve *g⁴*. When the reservoir is placed in the position shown in the drawings, the valve *g⁴* is raised by being brought in contact with the bottom of the basin G, allowing water to flow from the upper chamber, *g'*, into the basin G and the lower compartment, *g''*, and through the pipe G' into the water-cups, as hereinafter described. The flow of water will continue until the water in the basin rises high enough to close the lower end of the tube *g'''* to the admission of air to the water-chamber *g'*. An opening, *g⁵*, is made through the wall of the reservoir G³, to admit air above the water in the lower compartment, *g''*.

To the basin G, I attach a pipe, G⁴, which is held in the clamp G⁵, tightened by the thumb-screw g⁵. From the pipe G⁴, which runs along beneath the lower rail, B, a pipe, G⁷, is carried up through each hollow stand C and spindle E. The pipe G⁷ is screw-threaded at the top to receive the nut G⁸, whose under side is chamfered and enters the end of the hollow spindle E, thereby centering the pipe G⁷ with the spindle E, and drawing the flange G⁹ of the pipe against the under side of the lower rail, B, and binding the stand C firmly against the rail B. Upon the projecting end of the screw-threaded pipe G⁷, I screw the circular water-cup H, screwing it down on the nut G⁸, and forming a water-tight joint.

The die I is a small circular plate, having a central hole, i, the size of the twisted cord. It is supported from the sleeve I', attached to the tube a by a set-screw, i', which allows the die to be adjusted with reference to the water-cup H, and also the depth of its immersion in the water to be varied. Water is maintained in the cup H by adjusting the height of the basin G, by means of the clamp G⁵, so the water-line required to seal the end of the tube g² shall correspond with the desired water-line of the cups H. When it is desired to withdraw the water from the water-cups, the basin G is lowered so the water will run back into the lower compartment, g².

Each of the strands F is carried around its corresponding guide-pin and over the edge of the circular water-cup H, beneath the die-plate I, and through its central opening, i, and the tube a to the twisting mechanism, by whose rotation the strands are twisted into the cord F², and wound upon the reel c.

The strands F are carried over the edge of the water-cup H, and are presented to the die at nearly right angles to the axis of the die, the tension upon each strand tending to hold it against the inner edge of the die and preventing any of the strands from being drawn into the center of the cord, and thereby forming a "core," around which the remaining strands will be twisted. By holding the strands against the inner surface of the die they are maintained at all times at an equal distance from the axis of rotation, and as the cord is twisted they become laid upon the outside, thereby securing a uniform length of all the strands in any given section of cord. This is an advantage in any twisted cord, and particularly in some kinds, such as that employed in wax-thread boot and shoe sewing machines, where the process of waxing the thread draws the slacker strands, forming loops which interfere with the process of sewing.

The under surface of the die I is brought into contact with the surface of the water in the cup H, which secures the wetting of the strands as they pass beneath the die. If the die is barely in contact with the water, the strands will be moistened but slightly; but the amount of water absorbed by the strands may be increased by loosening the set-screw

i' and lowering the die into the water and increasing the time the strand is held beneath the water as it passes under the die. The die may be raised entirely free from the water-cup by sliding the sleeve I' upwardly on the tube a, allowing the die to be cleared of lint or knots which may obstruct its passage.

The spools F' are arranged at equal distances upon the creel E', and within as small space as will afford room enough for changing the spools. I secure sufficient length of strand between the water-cup and the spool, and thereby prevent the strand from being drawn off the spool at too acute an angle, by placing a row of equidistant pins, f', outside the row of spools, around which the strands are carried, bringing each strand in convenient position outside the spools to be reached by the attendant. The creel E' is capable of being rotated around the spindle E so it can be freely turned to bring any of the strands upon the outer side. The occasional turning of the creel for the purpose of mending broken ends and replacing the spools will so change the position of the strands as they move across the edge of the water-cup as to prevent its becoming worn into grooves by the continued friction of the strand in one path.

I am aware that strands to be twisted have been carried through water. Such I do not claim, broadly; neither do I claim the use of a die in a twisting-machine, as they have long been in use.

What I do claim, and desire to secure by Letters Patent, is—

1. The combination, in a machine for twisting, with the mechanism for producing a rotary motion of the cord to be twisted, and a water-receptacle holding water through which the component strands of the cord are passed, of a die through which the cord is passed, said die having its under surface in contact with the water in said water-receptacle, and a guide for said strands above the water in said receptacle, substantially as described.

2. In a twisting-machine, the combination of a die through which the cord is passed, a circular guide for the component strands of which the cord is composed, said guide being arranged concentrically to said die, and a water-receptacle holding water through which said strands are passed on their way to said die, substantially as described.

3. In a twisting-machine, the combination, with the mechanism for producing a rotary motion of the cord to be twisted, and a receptacle holding water through which the component strands of the cord are passed, of a die through which the cord is passed, said die being adjustable with reference to said water-receptacle, substantially as described.

4. In a twisting-machine, the combination, with mechanism for imparting a rotary motion to the cord to be twisted, and a receptacle holding water through which the component strands of the cord are passed, of a water-reservoir connected with said water-receptacle and

vertically adjustable with reference to said water holding receptacle so the water can be withdrawn therefrom by lowering said water-reservoir, as described.

5 5. In a twisting-machine, the combination, with mechanism for imparting a rotary motion to the cord to be twisted, of mechanism for supporting the spools carrying the strands forming the cord, and consisting of a vertical
10 spindle and a circular creel held on said spindle and capable of being turned about said spindle, as described.

15 6. In a twisting-machine, the combination, with mechanism for imparting a rotary motion to the cord to be twisted, and a die through which the cord is passed, of a circular water-holding receptacle with its edge forming a guide for the strands as they enter said die, as described.

20 7. In a twisting-machine, the combination, with mechanism for imparting a rotary motion to the cord to be twisted, and a vertical spindle carrying the spool-supporting creel, of a circular spool-supporting creel, said creel being
25 vertically adjustable on said spindle, substantially as described.

8. The combination of the hollow spindle E, pipe G⁷, chamfered nut G⁸, water-cup H, base C, and bar B, as described.

9. The combination, with a water-cup, of a die placed above and concentrically with said
30 water-cup, a spool-supporting creel placed below said water-cup, spool-supporting pins held in said creel and concentrically with said water-cup, and guide-pins held in said creel
35 outside of and concentric with said spool-supporting pins, substantially as described.

10. In a twisting-machine, the combination, with mechanism for imparting a rotary motion to the cord to be twisted, of a circular
40 water-holding receptacle, a die with its axis concentric with said water-holding receptacle, and a series of spool-supports for carrying the strand-spools, said supports being arranged concentrically around said water-holding re-
45 ceptacle, substantially as described.

G. L. BROWNELL.

Witnesses:

RUFUS B. FOWLER,
S. McDONNELL.