2 Sheets—Sheet 1

G. L. BROWNELL.

Machine for Making Cordage.

No. 202,406. **Patented April 16, 1878.**

Fig. 1.

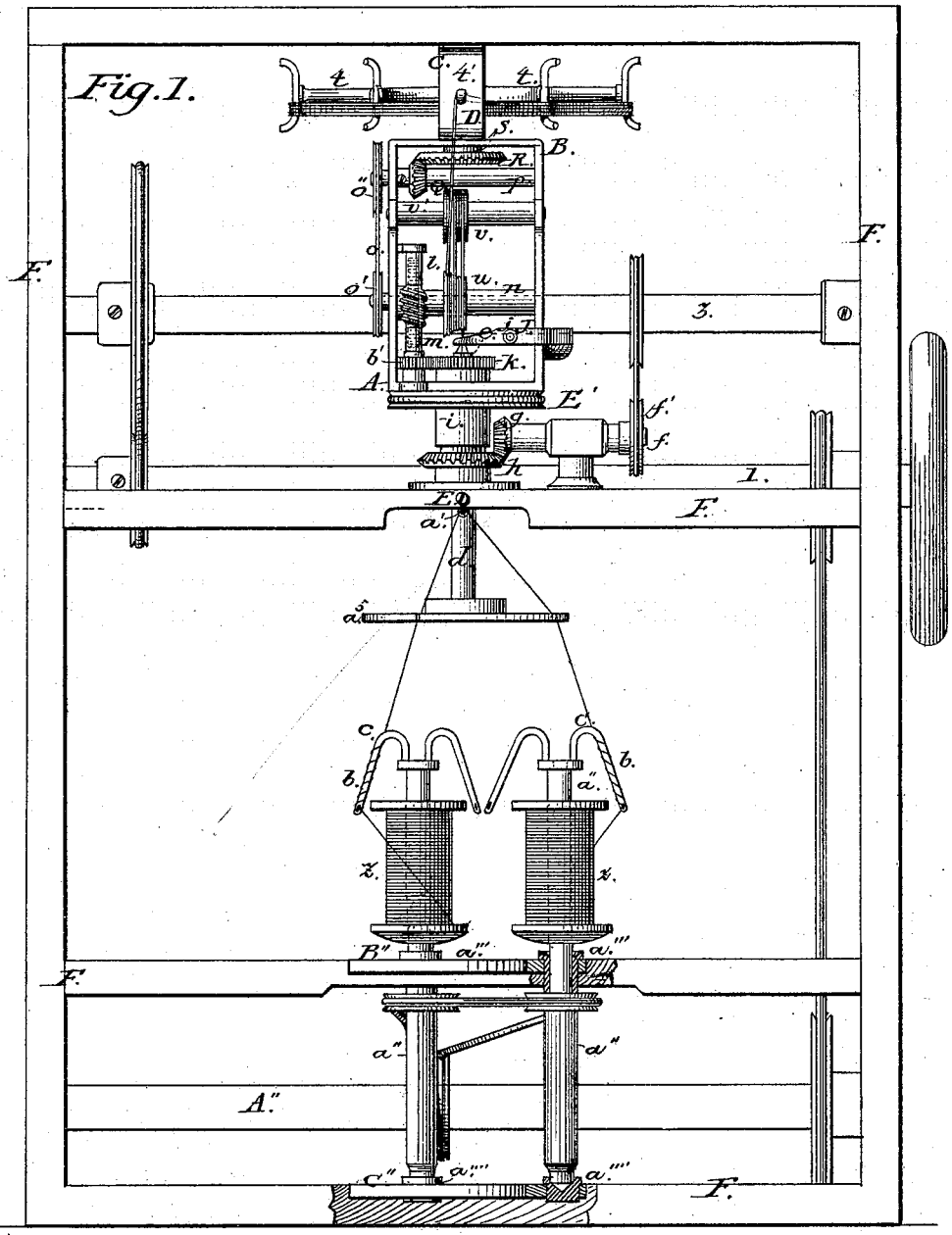
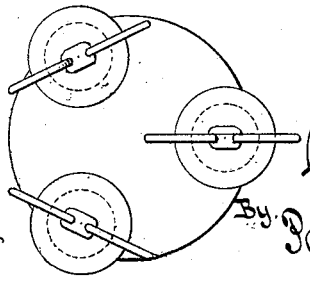


Fig. 2.



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2 Sheets—Sheet 2

G. L. BROWNELL.

Machine for Making Cordage.

No. 202,406. Patented April 16, 1878.

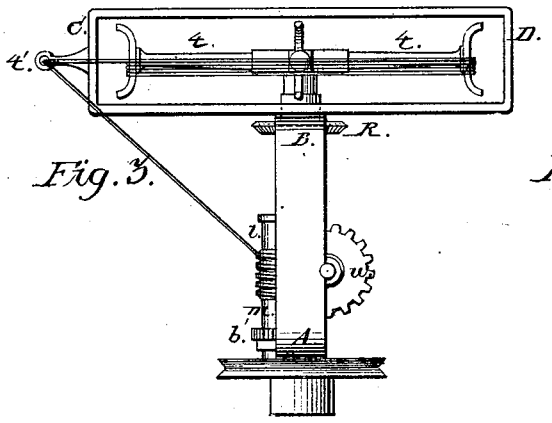


Fig. 3.

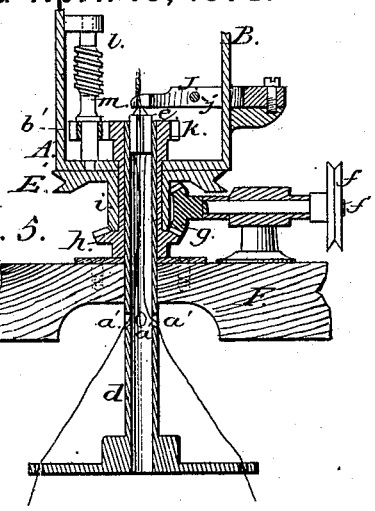


Fig. 5.

Fig. 6.

Fig. 4.

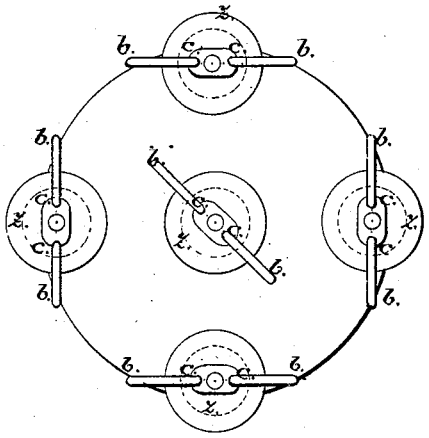
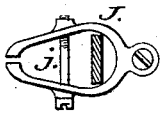


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE L. BROWNELL, OF EAST HADDAM, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR MAKING CORDAGE.

Specification forming part of Letters Patent No. **202,406**, dated April 16, 1878; application filed September 21, 1877.

To all whom it may concern:

Be it known that I, GEO. LOOMIS BROWNELL, of the town of East Haddam, in the county of Middlesex, in the State of Connecticut, have invented a new and useful form of Twister for Making Twine or Cordage of any Number of Strands, of which the following is a specification:

My invention is an improvement in machinery for making twine or cord.

It consists, mainly, in a hollow spindle fixed in a frame, in connection with certain gear-wheels, by which motion is imparted to a revolving frame to give the final twist to the cord as the several strands which compose it are twisted separately by fliers, which are caused to move by suitable mechanism about axes in common with the axes of the bobbins which supply the several strands which compose the cord or twine.

Referring to drawings, Figure 1 is a front view of the machine complete, with several broken sections to more fully illustrate certain important details. Fig. 2 is a plan view, showing chiefly the bobbins and their fliers. Fig. 3 is a side elevation of the upper part of the machine. Fig. 4 is a plan view, showing the arrangement of the bobbins and fliers when four strands are used. Fig. 5 is a sectional detail, showing the hollow spindle and its associate parts. Fig. 6 is a plan, showing laying-block, which fits into the spindle. Fig. 7 is a top view of the compressor.

Similar reference-letters denote like parts in all of the figures.

The spindle *d*, which is hollow, has holes *a'*, of a number corresponding to the number of strands to compose the cord, and is provided with a circular disk, a^5, at its lower end, with holes opening outward, corresponding in number and location, relatively to the strands, to the holes in the spindle. Below the hollow spindle *d* are the spools or bobbins *z*, which supply the thread. These spools are fixed on vertical spindles *a''*. To the upper ends of these spindles *a''* are fixed fliers *b*, which are coupled, and, rising a short distance from their heads, are bent downward and outward, and terminate with blunt points, in which are eyes, through which the threads are intended to pass previous to being wound on the arms of said fliers.

The spindles *a''* have pulleys, over which passes the band which comes from a pulley on the driving-shaft A''. The spindles *a''* have bearings in the disks B'' C''. The steps *a''''* of spindles *a''* are reamed out to receive the lower ends of said spindles, which are conical in form, to give the best known form of bearing to provide against frictional wear. In the upper disk B'', bolsters *a'''* are provided for the journals of spindles *a''*.

The spindle *d* has a block, *e*, provided with grooves running parallel with its axis, through which pass the several threads as they are twisted, before being united to form the twine or cord. Above the block *e* is a compressor, J, secured to the revolving frame A B, the form of which may be seen in Fig. 7 of the drawings. The purpose of this device is to gripe the cord at the point of union of the strands, while it steadies the cord, keeping it in the center of the spindle *d*, and thus correcting any tendency in the strands to ride. The compressor is adjustable by the screw *j* to suit the size of the twine, and is elastic or yielding, so as to accommodate itself to any irregularities that might accidentally occur in the twist.

Above the compressor J is a scored drum, *u*, conical in form, fixed on the shaft *n*, and above this a correspondingly-scored drum, *v*, secured to shaft *v'*. The twine which comes through the compressor J passes over the drum *v*; thence downward over conical drum *u*; thence up over *v*; thence down about *u* again, and so on. These drums serve to stretch the cord to prevent kinking. The conical one is rotated to draw the cord over the upper one and stretch it as it is drawn. The twine is fed from the conical drum *u* to the reel *t* as it passes through the eye *t'* attached to the upper section of frame A B C D. The frame A B C D, which supports the gear-wheels, drums, &c., is composed of two parts, both of which are rectangular in form, have a common axis of motion, and revolve together about the axial line of spindle *d*. The plane of the upper section C D is at right angles to that of A B.

By placing the frame containing the reel directly over the mechanism for twisting and stretching the cord, I produce a combined construction, which is compact and economical, requiring a very simple system of gearing to give the movement necessary in winding the cord which comes directly from the stretching device.

Motion is transmitted to the several parts already described as follows: A pulley on the main shaft 1 of the machine carries a band, which runs over a pulley on shaft A″. Another belt from shaft A″ passes over the pulleys on the spindles *a″*. Movement is thus gained for the fliers on their respective spindles. A second pulley on main shaft 1 carries a belt which passes over a large pulley on shaft 3. A second small pulley on shaft 3 carries a belt which communicates motion to pulley *f′* on shaft *f*, and thence, through bevel-gearing *g h* and shaft *i*, to spur-wheel *k*, pinion *b′*, worm *m* on shaft *l*, and wheel *w*, gearing with said worm, to move the scored drum *u* on the shaft *n*. On the end of the shaft *n* is a pulley, *o′*, which takes motion from said shaft, and with a band carries it to a corresponding pulley, *o″*, on shaft *p*. On this shaft *p* is a bevel-pinion, Q, which engages a bevel-wheel, R, which communicates motion to the reel *t*, driving it in a direction reverse or opposite to that of the frame A B C D. Motion is imparted to the frame A B C D by a belt, which unites large pulley E′ with a pulley on main shaft 1. The frame A B C D in its movement, which is in a direction corresponding with that of the independent fliers, serves to twist the several threads together as they are twisted independently.

By means of suitable change-pulleys on the shafts driving the frame A B C D and spindles *a″*, the relative velocities of frame to spindles are effected to give to the strands and cord the proper twist to prevent kinking.

Tension of the threads passing to the fliers is effected by winding said threads around the arms of said fliers before carrying them up to the spindle *d*. The spindle *d* is adjustable vertically by means of screw E in frame F.

In my drawings I show a cord formed of three threads, although more may be used without varying materially the mechanism by which the twist is formed.

I do not claim as my invention anything not specifically pointed out in my claims.

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

1. The cylindrical laying-block *e*, provided with vertical grooves of a number to suit the number of threads to be twisted, in combination with hollow spindle *d*, fixed in the frame of the machine by screw E, as and for the purpose set forth.

2. The frame A B C D, provided with pulley E′, in combination with bevel-gear wheels *g h*, spur-gear wheels *k b′*, worm-shaft *l*, spur-wheel *w*, and scored pulleys *u v*, pulleys *o′ o″*, bevel-gear Q R, and reel *t*, all combined and arranged to twist, stretch, and reel the twine, as described.

3. The compressor J, having elastic arms, and provided with adjusting-screw *j*, in combination with frame A B C D, and mechanism for twisting, stretching, and reeling the twine, as and for the purpose set forth.

GEORGE LOOMIS BROWNELL.

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GEORGE O. SOULE.