

2 Sheets—Sheet 1.

A. T. SHERWOOD.
Machines for Twisting and Untwisting Fibre, &c.
No. 214,591.
Patented April 22, 1879.

Fig. 2.

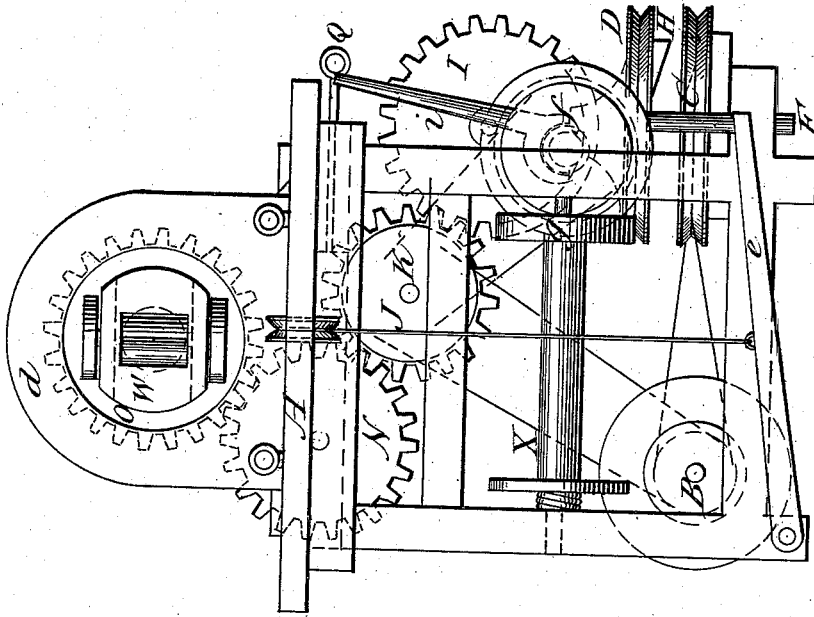
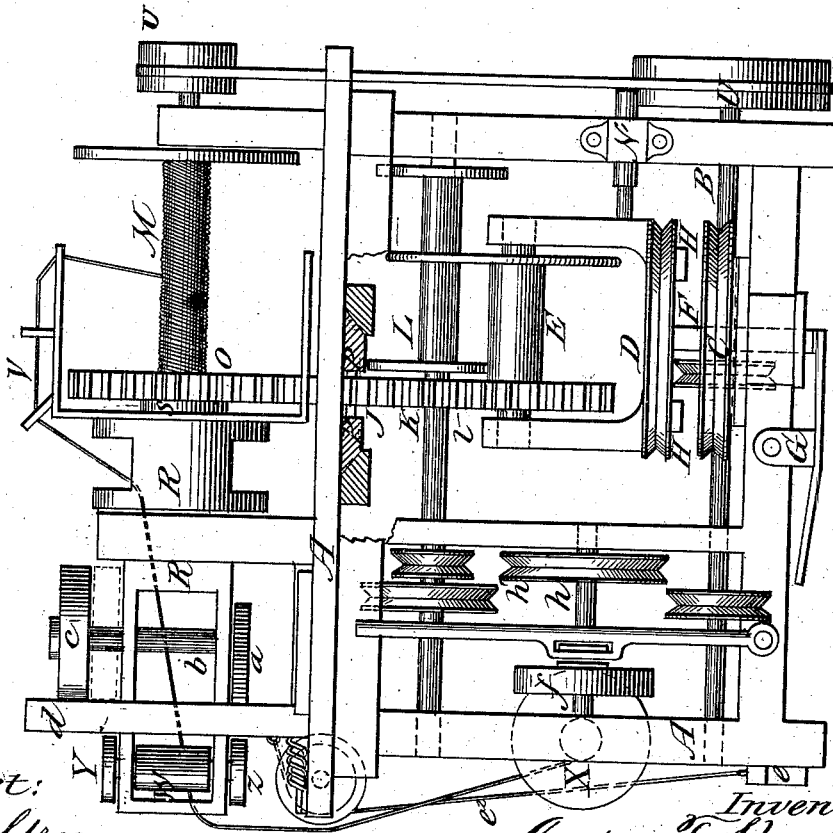


Fig. 1.



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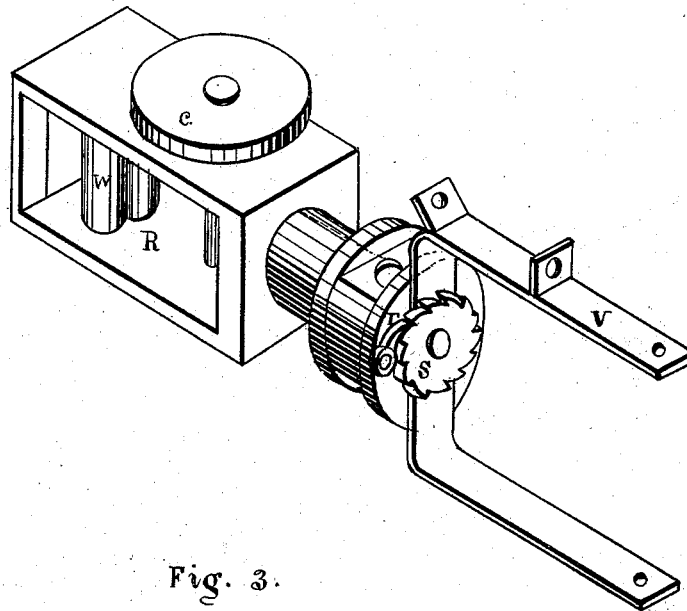


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW T. SHERWOOD, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF
ONE-HALF HIS RIGHT TO J. HERZOG & CO.

IMPROVEMENT IN MACHINES FOR TWISTING AND UNTWISTING FIBER, &c.

Specification forming part of Letters Patent No. **214,591**, dated April 22, 1879; application filed
April 1, 1878.

To all whom it may concern:

Be it known that I, ANDREW T. SHERWOOD, of the city and county of San Francisco and State of California, have invented certain Improvements in Machines for Twisting, Kinking, and Untwisting Fiber for Upholstering and other purposes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

The object of my invention is to provide a novel mechanism for untwisting rope, or it may be reversed, so as to twist the fiber into rope and kink it.

This invention is principally useful for the purpose of twisting and kinking hair and other substances into rope, so as to make it a commercial article and convenient to handle, and also for untwisting hair which has been twisted into rope, in order to fit it for use in upholstering. It may also be employed to make oakum, and for various other purposes which will readily suggest themselves.

This invention consists of a series of reels, which are formed to receive the single or double rope, and are so rotated as to untwist and separate it into a single rope, which is then wound upon a reel, from which it is taken and passed through a peculiar feed apparatus, so as to be entirely untwisted, and from this point it may be delivered upon a receiving-reel, or it may pass through pickers, which will separate it into a final condition for use.

In the accompanying drawings, Figure 1 is a side view of my machine. Fig. 2 is an end view. Fig. 3 is a view of the adjustable feeding device.

A is a table or frame, which serves to support the mechanism, and B is the main driving-shaft. Upon one side of the lower part of the machine a horizontal wheel or drum, C, is mounted, being driven by a belt from a pulley upon the main shaft. Another wheel, D, is mounted upon the upper surface of the wheel C, and upon this are mounted standards to support the reel E. A stem or spindle, F, extends down through the center of the lower drum, and a lever, G, upon the frame serves to elevate and depress the stem and the upper wheel. Lugs H are formed upon one of these

wheels, and corresponding depressions upon the other, so that when the upper wheel is lowered it and the reel will be revolved by the action of the lower one. When elevated the lugs are thrown out of contact, and a spur-gear wheel, I, is caused to mesh with another gear, J, above, so that the reel will be rotated for the purpose of winding or unwinding upon it. While in this position the reel is prevented from horizontal movement by a locking-pin, N', or other suitable locking device. The gear J is mounted upon a shaft, K, and this shaft is also provided with a winding-reel, L, and is driven by a belt from the main shaft.

The hair which comes in the form of a kinked rope, and which is also twisted double for convenience, is first wound upon the reel E until the reel is full. When the reel is full it is lowered until the lugs H on the wheel D take into the depressions upon the lower wheel, C. This causes the reel to be rotated upon the vertical spindle or stem F, and thus the double rope is separated into a single one. One end of this rope is then wound upon the reel L, while the other end is wound upon the upper reel, M, which may also be driven in unison with the other two reels by means of an intermediate gear, N, which is made to mesh with the gear J and the gear O of the upper reel by means of a slide, P, upon which it is mounted. This slide is moved back and forward by means of a rod, Q.

When the double rope has all been untwisted and is wound upon the two reels L and M up to the bight or point where it was doubled, the reel L is thrown out of contact with its driving-gear by a clutch-lever or otherwise, and, the motion of the reel M being kept up, the whole of the single rope will be wound upon it.

In order to finally untwist this single rope and reduce the hair to the form of fiber ready for use, I employ a device, as follows: In a line with the axis of the reel M, I mount my feed apparatus. This consists of a suitable head, R, one end being connected loosely with the shaft of the reel. A ratchet, S, is rigidly mounted upon this shaft, and a pawl, T, upon the end of the head R serves to unite the head and reel, so that they will rotate together when desired. While the reel is receiving its load

of rope it moves independent of the head, being actuated by the gears, as before described; but when the head and reel are to move together the pawl and ratchet-wheel unite them, and they are driven by an independent belt and pulley, U, from the main shaft. The rope is passed from the reel M through a flier or guide, V, and thence to the interior of the head R. At the outer end of this head is placed a feed device of any suitable form.

In the present case I have shown a pair of elastic rollers, W, between which the rope passes, and thence out at the end and to a separator or reel, X, the rotary motion of the head serving to untwist the rope and straighten it into fiber, which may be separated or reeled. The feed for these rollers is regulated to suit the progress of the work, so that the rope may be fed forward rapidly or slowly, as the untwisting is more or less thorough.

The rollers W are geared to move together at one end, while at the opposite end, where the spindle of one of the rollers projects through the side of the frame or head R, it has fixed to it a gear-wheel, Z, to which X, an intermediate gear, transmits motion from the pinion *a*, which is mounted upon the shaft or spindle *b*, passing through the head R, as shown.

A roller or pulley, *c*, is fixed to the opposite end of the shaft *b*, so as to roll in frictional contact with the stationary face-plate *d*, through which the head R projects.

It will thus be seen that by means of a frictional contact between the pulley *c* and the plate *d* the rotation of the head R will cause the pulley to revolve, and thus, through the medium of the gear-wheel, will drive the feed device before mentioned.

In the present case I have shown the plate *d* mounted upon a slide, which is operated by means of springs *e* and a treadle, *e'*, and a cord, *e''*, so that the plate may be moved to or from the pulley *c*, and thus vary the speed of the feeding device. This enables me to slow down the feed or stop it altogether, if the rope is not entirely untwisted; and it may thus be held at any point until the work is accomplished thoroughly. If found more convenient, the pulley may be moved to or from the plate; but the essential feature of the mechanism is to allow the feed device W to be adjusted in its movement to accommodate the rate at which the rope untwists.

The pulley *c* is also made adjustable by means of a nut and screw upon its shaft *b*, so as to revolve in a larger or smaller circle upon the face-plate, and thus increase or decrease the speed of the feed device W. The reel X is driven at a rate of speed to accommodate it to the material which is being wound upon it. This is done by means of a pulley, *f*, which drives the reel by frictional contact against the sides of one of its end disks, *g*, as shown. This pulley is mounted upon a shaft, *h*, by means of a feather or other device, so that it

can be moved backward or forward by means of a lever, *i*. This allows it to drive the reel by contact with the disk *g*, either near the center or near its periphery, and thus the reel will be driven fast or slow, as may be desired. This accommodates it not only to the speed at which the material is arriving, but also to the varying size of the reel as it gradually becomes filled. The shaft *h* is driven by a belt from the main shaft or the shaft K, running on pulley *h'*.

While the material is running from the reel M into the head R and through the untwisting device it will be necessary for the reel and head to have a slight independent movement or a difference in their rates of speed, so as to accommodate the delivery of the rope from the spool as it untwists; and this is effected by the backward movement of the pawl T over the ratchet-wheel S during the rotation.

By means of this mechanism I am enabled to perform the operation of untwisting the rope in the small space occupied by the machine, instead of being obliged to have a long room, as formerly.

It will readily be seen that by reversing the movement of the apparatus I can twist loose material into ropes with the same facility and with the same economy of space.

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

1. The horizontal wheel C, in combination with the vertically-movable horizontal wheel D, with their connecting-lugs, the wheel D, supporting the reel E, so that it may be rotated upon a vertical axis or held stationary, substantially as shown, and for the purpose herein described.

2. The horizontal wheels C and D, provided with connecting and disconnecting devices, in combination with the gears I and J, for giving the reel a vertical rotation, and the stop N, to prevent horizontal motion, substantially as shown, and for the purpose herein described.

3. In combination with the reel E, for receiving the double rope, and mounted so as to be rotated in a vertical plane, the reels L and M, for receiving the two separated parts of this rope, substantially as shown, and for the purpose herein described.

4. In combination with the untwisting-reel E and the receiving-reels L and M, the gear-wheels I, J, and O and the intermediate gear, N, with its slide P and operating-rod, substantially as shown, and for the purpose herein described.

5. The feeding device W, operating within the rotating head R, in combination with the reel M and a device, substantially as described, for causing a difference in the speed of revolution of said head and reel, substantially as shown, and for the purpose herein described.

6. The device consisting of the pulley *c*, turning with the head R and geared to drive the feeding device W, in combination with the face-plate *d*, against which the pulley rotates

upon its axis, said plate being adjustable to or from the pulley, substantially as shown, and for the purpose herein described.

7. The combination, with the plate D and the head R, of the pulley C, made adjustable upon its shaft to or from the center of rotation of the head R, so as to describe a smaller or larger circle upon the plate *d*, and thus decrease or increase the speed of the feed device, substantially as shown, and for the purpose herein described.

8. The reel X, receiving the untwisting material, in combination with the adjustable pulley *f* and operating-lever, to regulate the speed of the reel, substantially as shown, and for the purpose herein described.

In witness whereof I hereunto set my hand and seal.

A. T. SHERWOOD. [L. S.]

Witnesses:

GEO. H. STRONG,
F. A. BROOKS.