

W. H. DEFREES.
Machines for Making Cord, &c.

No. 153,320.

Patented July 21, 1874.

Fig. 1.

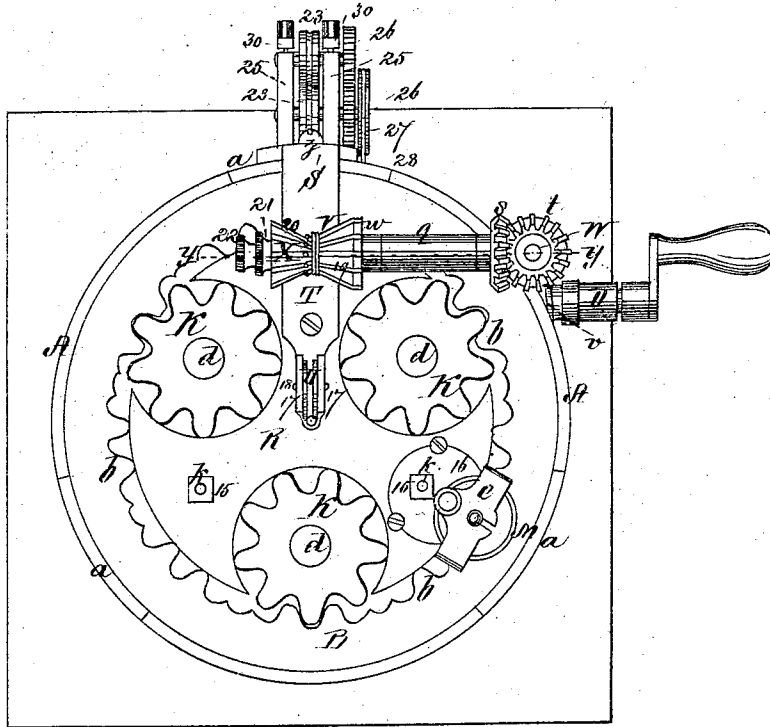
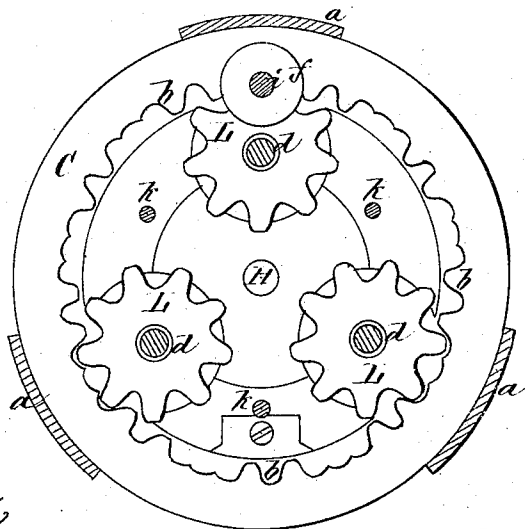


Fig. 3.



Witnesses,
W. J. Cambridge
J. C. Cambridge

Inventor,
William H. Defrees,
Pr. Teschemacher & Stearns,
Attorneys

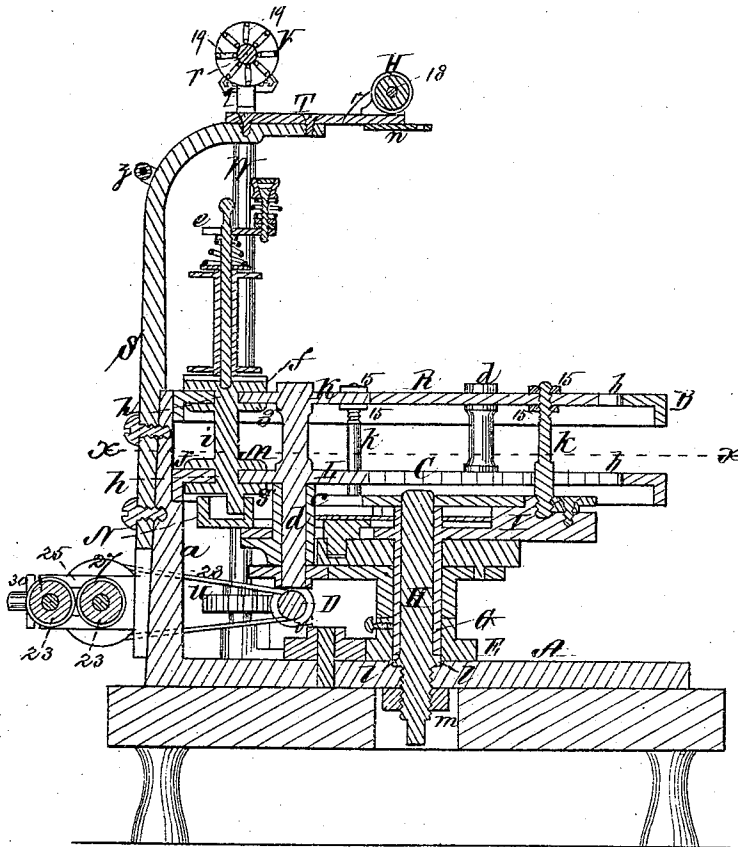
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Fig. 2.



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Attorneys.

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Fig. 4.

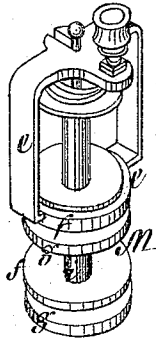


Fig. 5.

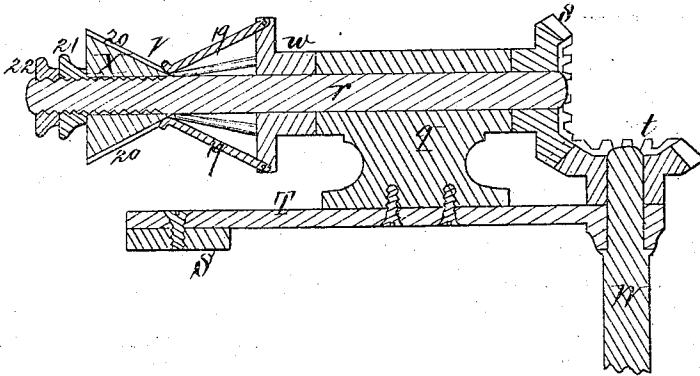
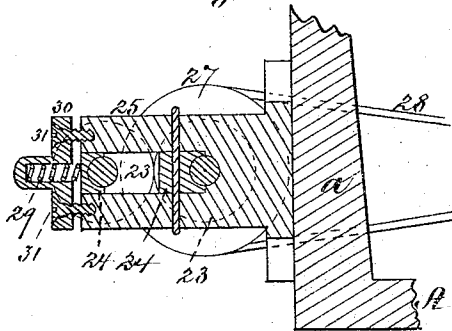


Fig. 6.



Witnesses,
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J. C. Cambridge

Inventor,
William H. Defrees,
Per. Teschemacher & Stearns,
Attorneys.

UNITED STATES PATENT OFFICE

WILLIAM H. DEFREES, OF NEWTONVILLE, MASSACHUSETTS, ASSIGNOR TO
SILVER LAKE COMPANY, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING CORD, &c.

Specification forming part of Letters Patent No. **153,320**, dated July 21, 1874; application filed
May 9, 1874.

To all whom it may concern:

Be it known that I, WILLIAM HENRY DEFREES, of Newtonville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Machines for Making Cordage, Webbing, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a plan of my improved machine. Fig. 2 is a vertical section through the center of the same. Fig. 3 is a horizontal section on the line *xx* of Fig. 2. Fig. 4 is a perspective view of my improved spool-frame carrier. Fig. 5 is a section on the line *yy* of Fig. 1; Fig. 6, sectional detail to be referred to.

The ordinary carriers for the spool-frames of machines for making cordage, &c., as heretofore constructed, are each formed of two disks, connected by a short neck, one of the disks resting upon the guide ring or plate on which it travels, the other disk fitting up against its under side. This construction is objectionable, for the reason that the tension of the strands from the spools produces a great amount of friction between the surfaces of the disks and parts in contact therewith, causing them to be rapidly worn away, the looseness or play thus produced allowing the spool-frames to be inclined toward the center by the strain of the strands to such a degree that the tops of the frames are brought into contact with each other as they revolve, and the machine is thus liable to be injured or broken.

To overcome this difficulty is the object of my invention, which consists in a double-headed spool-frame carrier, the two heads being connected by a shank, and traveling on separate and independent guide rings or plates, placed one over the other, by which construction additional support is afforded, and the wear of the parts in a great measure avoided. My invention also consists in two series of toothed wheels, connected in pairs, for actuating the carriers, in combination with the two guide rings or plates, whereby greater

precision in the movement of the carriers is insured.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the bed-plate, from which rise the standards *a*, secured to which, at a short distance from each other, are two circular plates or guide-rings, B C, provided on the inside with teeth *b*. D is the driving-shaft, which communicates its motion through intermediate gears to a gear, E, on the lower end of a sleeve, G, which revolves upon a vertical shaft, H, projecting up from the center of the bed-plate A, and carries at its upper end a circular table or platform, I, provided with bearings *c*, in which revolve the shafts *d* of the toothed wheels K L, connected in pairs, as seen in Fig. 2, and engaging with the teeth *b* of the guide-rings B C as the platform I is revolved. *e* is one of the spool-frames, (the others being removed,) the lower end of which is attached to a carrier, M, having two heads, each consisting of two disks, *f g*, united by a short neck, *h*, the two heads being connected by a shank, *i*, the upper guide-ring, B, fitting between the disks of the upper head, and the ring C between the disks of the lower head of the carrier when at rest. The carriers are successively carried around in a small circle by each pair of toothed wheels, so as to produce the required interlocking of the strands of which the cord is composed. The movements of the carriers are controlled by a series of sliding plates, N, placed within the platform I, and operated by mechanism which forms no part of my present invention, and is described in Letters Patent of the United States No. 56,485, granted to James A. Bazin on the 17th of July, 1866. By employing a carrier provided with two heads, each head traveling on a separate and independent guide-ring, instead of one head only, as heretofore, additional support is afforded, and a much greater resistance offered to the drawing over of the spool-frame by the tension of the strand, while the amount of

wear is greatly reduced, and the liability of the tops of the spool-frames being broken or injured by coming into contact with each other is entirely avoided. Within the upper ring, B, and between the toothed wheels K, is placed a plate, R, of the form seen in Fig. 1. This plate is supported upon three vertical posts, *k*, rising from the platform I, and is secured and adjusted vertically in position by nuts 15, turning on the upper ends of the posts, which are provided with screw-threads. This plate R is designed to fit between the upper disks of the carriers as the latter are traversed, and while they are at rest, and assists in supporting the carriers and maintaining the spool-frames constantly in a vertical position against the tendency of their tops being drawn over toward the center by the strain upon the strands, the wear of the surfaces being taken up by raising the plate R by means of the nuts 15, a portion, 16, of the plate R being made removable to allow of the insertion or removal of the carriers. The central shaft is provided with a collar, *l*, which fits into a recess in the bed-plate A, and the lower end of the shaft has a screw-thread cut thereon, which fits a corresponding thread in an opening made centrally through the bed-plate. This shaft is turned, so as to raise or lower it, by means of a wrench applied to its bottom, which is square or polygonal, and is held in place by a check-nut, *m*, and as the sleeve G rests on the collar *l* the platform I is thus adjusted vertically, so as to bring the lower disk of each carrier-head up against the under side of its respective guide-ring. Furthermore, this capability of adjusting the platform I enables me to very readily set the parts up in their proper positions and to compensate for the wear of the bearing-surfaces. To the outside of one of the standards *a* is secured the bottom of a bent arm, S, the upper end of which extends over the machine in a horizontal direction toward its center, and forms a support for a bent plate, T, from the inner end of which rises a pair of bearings, 17, in which revolves the journal 18 of a small grooved wheel, U, which serves to guide the finished cord in its passage to the expansion-pulley V, around which it is wound, the cord being conducted through an opening in a small plate, *n*, secured to the under side of the plate T, and projecting out over the center of the machine. From the portion of the bent plate T extending out from the machine rises a long bearing, *q*, within which a horizontal shaft, *r*, is revolved by a bevel-gear, *s*, engaging with a corresponding gear, *t*, on the top of a vertical shaft, W, provided at its lower end with a gear, *u*, which engages with a worm, *v*, on the driving-shaft D. To the shaft *r*, close to the bearing, is secured a disk, *w*, within recesses in the periphery of which are pivoted the inner ends of a series of rods or wires, 19, which constitute the exterior sur-

face of the pulley, the outer ends being bent as shown, and resting in grooves 20 cut within the slant surface of a conical block, X, which is supported on the shaft *r*, and is connected therewith by a spline and feather, which enables it to slide freely without revolving thereon. On this end of the shaft is cut a screw-thread, over which turns a thumb-nut, 21, by which the conical block may be advanced toward the disk *w* and held in place when it is desired to increase the diameter of the pulley, the outer ends of the wires being forced apart or away from the shaft *r* by the advance of the conical block. When it is desired to reduce the diameter of the pulley it is simply necessary to unscrew the nut 21, when the pressure of the outer ends of the wires against the block X, caused by the cord around them, will be sufficient to force it back against the nut as it is unscrewed, the outer ends of the wires being thus drawn closer together. When the block is adjusted in the desired position the nut 21 is securely held by a check-nut, 22.

The diameter of the above-described pulley may thus be varied with a great degree of nicety by means of the screw-nut 21, so that the cord when wound around it will be drawn off at the exact speed required, thus keeping the point where the cord is being formed at the desired height, and preventing it from running up or down, as is the case when the pulley draws it too fast or too slow, different sizes of cord being manufactured with more or less speed.

The cord passes from the expansion-pulley over a guide-wheel, *z*, to a pair of grooved drawing-rolls, 23, and thence to a box or receptacle placed to receive it, the rolls drawing it down with the required degree of tension to prevent its slipping on the pulley V. The shafts of the rolls 23 revolve in bearings or boxes 24, the outer one of which slides in a slotted frame, 25, secured to one of the standards *a*, and these shafts are connected together so as to revolve with the same speed and with a positive motion by means of gears 26, secured thereto outside their bearings. To the shaft of the inner roll 23 is secured a grooved pulley, 27, driven by a belt, 28, passing over it and the driving-shaft D. The outer roll 23 is pressed toward the inner roll by spiral springs 29, Fig. 6, which bear against its boxes, these springs extending into recesses formed in plates 30, which close the open ends of the slotted frame 25, and to which they are secured by screws 31, by turning which the size of the opening between the rolls is varied to accommodate cords of different diameters, and by means of this adjustment the required draft or tension upon the cord is produced.

The diameter of the drawing-rolls and their surface motion is such that they will produce the required amount of tension on the cord made with the greatest rapidity of which the machine is capable, so as to draw it down as

fast as it is made, and keep it stretched as desired, while, when a cord is being made which is not delivered so fast, the belt 28 slips around the pulley 27 and shaft D, as is necessary, in consequence of the difference between the surface motion of the rolls and the speed with which the cord is produced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A double-headed spool-frame carrier, consisting of two flanged heads, *f g f g*, connected by a shank, *i*, substantially as and for the purpose set forth.

2. The two guide-rings B C and supporting-

plate R, in combination with double-flanged headed carriers M, substantially as and for the purpose described.

3. Two series of toothed wheels, K L, connected in pairs, in combination with two guide-rings, B C, substantially as described, for the purpose set forth.

Witness my hand this 23d day of April, A. D. 1874.

WILLIAM H. DEFREES.

In presence of—

P. E. TESCHEMACHER,
N. W. STEARNS.