O. BRYANT.

Whip-Rolling Machine.

No. 212,891 Patented Mar. 4, 1879.

Fig 1

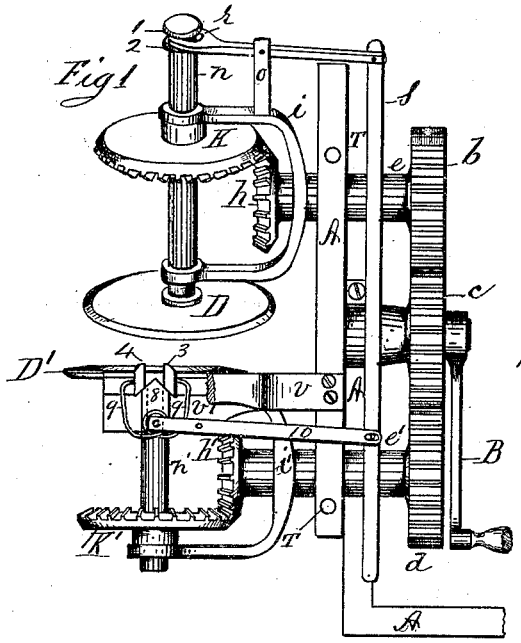


Fig 2

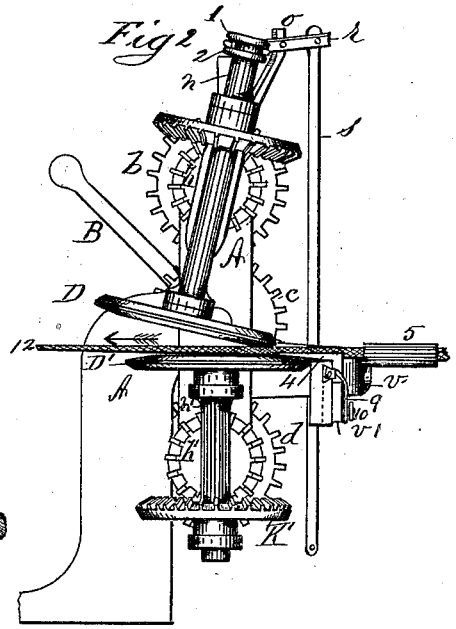


Fig 3

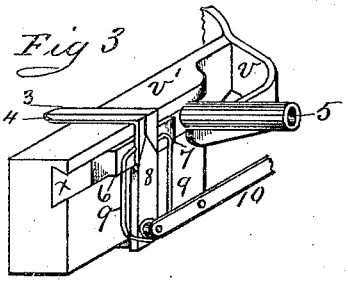


Fig 4

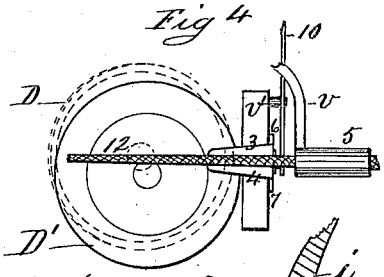


Fig 5

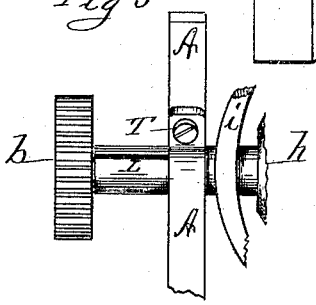


Fig 6

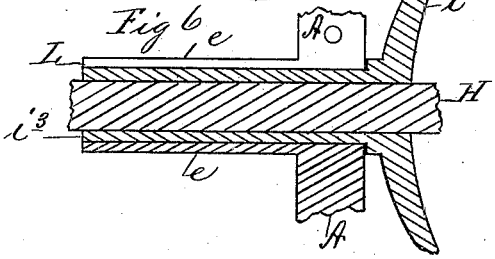
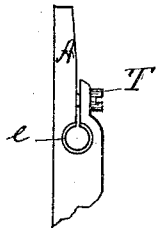


Fig 7



Witnesses
Wm. H. Chapin.
H. A. Chapin

Inventor
Orrin Bryant
By Chapin & Co
Atty's

UNITED STATES PATENT OFFICE.

ORRIN BRYANT, OF WESTFIELD, ASSIGNOR TO HENRY A. CHAPIN, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN WHIP-ROLLING MACHINES.

Specification forming part of Letters Patent No. **212,891**, dated March 4, 1879; application filed November 22, 1878.

To all whom it may concern:

Be it known that I, ORRIN BRYANT, of Westfield, county of Hampden, and State of Massachusetts, have invented new and useful Improvements in Machines for Rolling Whips and Whip-Lashes, which improvements are fully set forth in the annexed specification and in the accompanying drawings.

My invention relates to such machines as are used for rolling the surfaces of whip-stocks in a "plaited" or partially-finished state, for the purpose of producing thereon a smooth hard surface, and for rolling braided whip-lashes, for the purpose of solidifying and smoothing the same.

The object of my invention is to adapt a system of rolling and straightening metallic cylindrical objects, already known to whip-rolling and such analogous uses, by the addition thereto of such devices and by such modifications of construction as are demanded for said work on whips, and thus to provide a machine for the above-named purposes which will entirely supersede hand-work, and more effectually accomplish the object of its construction, by the employment of only two rollers operating together upon the object being rolled, than have machines heretofore constructed for this purpose, in which four or more rollers are employed.

Referring to the drawings, which consist of seven figures, Figure 1 is a side elevation of my machine, with one guide removed. Fig. 2 is a front elevation, and Fig. 3 is a perspective view, of the guide-support and guides detached from the machine. Fig. 4 is a plan view of the two rollers, the guides, and a whip-stock, all in their relative working positions. Fig. 5 is a side elevation of the upper end of frame A. Fig. 6 is an enlarged sectional view of the principal parts embraced in Fig. 5. Fig. 7 is a face view of that portion of frame A shown in Fig. 5.

A is the frame. *b c d* are driving-gears. B is a crank. *e e'* are hollow split hubs on frame A. *h h'* are bevel-gears. *i i*^{1} are shaft-yokes. K K' are bevel-gears. *n n'* are roller-shafts. D D' are cone-faced disk-rollers. 1 2 are collars on shaft *n*. *o* is a lever-support. *r* is a lever. *s* is a foot-treadle connecting-rod. *v* *v'* are guide-supports. 3 4 5 are guides; 6 7, sliding guide-blocks. 8 is a wedge-block. 9 is a guide-spring. 10 is a guide-lever. 12 is a whip-stock. H is a shaft between gears *h'*, *d*, and *h* and *b*. *i*^{3} is a long hub on yokes *i* and *i*^{1}. L is a longitudinal slit in hubs *e* and *e'*. T represents clamp-screws in frame A.

Like letters and figures refer to like parts in all the drawings.

The essential operative parts of this machine—viz., the cone-faced disk-rollers D and D'—and the principle upon which they operate, are shown and described in the patent to Jacob Reese of June 18, 1867, "machine for straightening cylindrical bars of metal;" and my improvements consist of a combination of Reese's conical-faced revolving disks with other devices herein described and shown, for adapting said revolving disks to whip-stock and whip-lash rolling, which devices consist of certain self-adjustable guides acting in combination with said disk-rollers to guide and support flexible tapering whip-stocks in a proper direction and position between said rollers of certain devices whereby the amount of pressure which may be brought to bear upon the work between the rollers is constantly under the control of the operator, and may be varied from tip to butt while the whip-stock is passing through the machine and of the adjustable yoke-supports for the shafts to said disk-rollers, whereby the inclination of their axes may be easily varied.

Frame A is constructed with hollow split hubs *e e'* thereon, extending from the frame to the hubs on gears *b* and *d*, and with the end of an offset portion thereof, through which screws T are inserted, separated from the main part of the frame, so that by turning said screws said hollow hubs may be contracted or enlarged slightly.

Frame A is provided with a proper stud, on which gear *c*, which meshes into gears *b* and *d*, may turn, actuated by any convenient belt or gear connection with the motive power in place of crank B.

The construction of gears *b* and *h*, *d* and *h'*, and their shafts H is substantially the same.

Yokes *i* and *i*^{1} are constructed with the long hollow hubs *i*^{3}, Fig. 6, reaching through hol-

low hubs *e e'* to gears *b* and *d*, and their two extremities are fitted to be proper bearings for shafts *n* and *n'* to run in. So constructed, said yokes are placed in position in frame A, and shafts H are inserted through their hollow hubs *i*³, and gears *h* and *b* and *h'* and *d* are secured to the ends thereof, as shown.

Shaft *n'*, carrying the lower disk-roller, D', has a gear, K', which gear *h'* drives, keyed to it, and is not movable vertically in its bearings.

Shaft *n*, carrying the upper disk-roller, D, is splined, and a key secured in the hub of gear K fits said spline, and said shaft has a reciprocating vertical movement, like an upright drill-spindle, through its bearings in yoke *i* and gear K, the latter being driven by gear *h*, and two collars, 1 and 2, secured on shaft *n* at its upper end, provide a groove between them for the reception of the forked end of lever *r*.

That portion of the faces of disk-rollers D D' which bears upon and rolls the work between them is turned off so that said faces are slightly conical, as shown in Figs. 1 and 2, in order that when they are inclined, as there shown, the bite of the rolls may be nearly or quite on a line with the surface of the whip-stock passing between them.

On the upper arm of yoke *i* is set a vertical lever-support, *o*, on which is pivoted the above-named lever *r*, and the extreme end of the latter is pivoted to a vertical foot-treadle connecting-rod *s*. The requisite downward movement of said rod *s* to counterbalance the weight of shaft *n* and disk-roller D may be obtained by any suitable weight or spring, and I employ an ordinary foot-treadle for lifting-rod *s*.

Secured to the side of frame A, about opposite disk-roller D', is a guide-support, *v*, supporting-guide 5, and a second guide-support, *v'*. Guide 5 is of tubular form, and is simply for the purpose of supporting and keeping the whip-stock in a horizontal position as it enters and passes on between the disk-rollers D and D'. The said guide-support *v'* consists of a rectangular-shaped block, in which is a horizontal dovetail-shaped groove, *x*, Fig. 3, and about midway between the ends of said block is a second dovetail-shaped groove running vertically from the bottom front edge of said block into groove *x*. Fitted to groove *x* so that they have a free lateral movement therein are two guide-blocks, 6 and 7, which project a little beyond the front face of block *v'*. The inner ends of said guide-blocks 6 and 7 are cut so that when they slide one against the other they form an inverted-V-shaped opening over the top end of the above-named vertical groove in block *v'*. Fitted to said vertical groove, and having a vertically-reciprocating movement therein, is a wedge-block, 8, whose upper end fits the inverted-V shaped formation above named between guide-blocks 6 and 7, and one end of a lever, 10, is pivoted to said block 8 and to the front face of guide-block *v'*, and its opposite end is pivoted to connecting-lever *s*. To said blocks 6 and 7 are secured two guides, 3 and 4, which extend from thence up the side of block *v'*, and across and beyond its upper side, as shown in Figs. 2, 3, and 4. A spring, 9, as shown in Figs. 1, 2, and 3, is arranged to draw guide-blocks 6 and 7 toward each other.

In this machine, as in the above-named Reese machine, the revolving disks are arranged to run in opposite directions, and with their axes of revolution inclined, and in slightly different planes, for the purpose set forth in the Reese patent.

As the work to be done with my machine is all on tapering cylindrical objects, requiring sometimes a variation of the incline of the axes of revolution of the disk-rollers D D', I support yokes *i i'* on their long hubs *i*³, fitted inside of the split hubs *e e'*. Thus, to adjust shaft *n*, which carries disk-roller D, to any desired incline, screw T in frame A is loosened, allowing the separated end of frame A, through which said screw passes, to spring off and release the long split hub *e* from its clamping effect upon hub *i*³ on yoke *i*. When properly so adjusted, screw T is turned in, reclamping the parts to retain yoke *i*, shaft *n*, and disk-roller D at the proper degree of inclination. Any desired variation of inclination of the face of disk-roller D' is obtained in the same manner.

The guides 3 4, as shown in Figs. 2 and 4, extend between disk-rollers D D' for a certain distance. The thickness of the ends of said guides which are between the disk-rollers is less than the diameter of the whip-stock at its point, so that the rollers will gripe the point of the stock as soon as it enters between them.

The operation of my machine is as follows, viz: The disk-rollers D D' are, by the counter-weight or spring, attached to the rod *s*, held apart slightly, and are set in motion through driving-gear *c*. The whip-stock 12 is entered through guide 5, point first, (which may as well be of a trough shape as tubular,) and between guides 3 and 4, and the rod *s* is operated by a foot-treadle, as stated, to lift the end of lever *r*, and thus press down shaft *n* and disk-roller D upon the whip-stock. Simultaneously with the said movement of the disk-roller, guides 3 and 4 adjust themselves to the proper degree of separation demanded by the diameter of that part of the whip-stock immediately contiguous to them. This self-adjustment of said guides is produced by the interoperation with them of lever 10, wedge-block 8, and spring 9, with connecting-rod *s*, which actuates the downward movements of disk-roller D. And it will be seen that when roller D moves down to bite on the point of the stock the end of lever 10 is lifted by rod *s*, wedge-block 8 is depressed, and spring 9 draws guides 3 and 4 toward each other; and as the whip-stock passes on between the rollers the latter separate more and more as the butt approaches them, and the movement of

one roller from the other, so caused by the taper form of the stock, is imparted to guides 3 and 4 through the above-described connections, so that their lateral movements are governed by and follow said upward and downward movements of the disk-roller D. During the passage of the whip-stock between the rollers, the operator, by said foot-treadle, exerts such an amount of pressure upon it as the nature of the work may demand.

The function of guides 3 and 4 is to hold the whip-stock against an inclination to roll off sidewise when the rollers operate upon it, and to support each side of the very flexible top of the stock when first caught by the rollers.

Thus it will be seen that the entire work of the operator in rolling whips consists in feeding them between the rollers and holding his foot on the treadle, and giving it the requisite pressure during the passage of the whips through the rolls.

The general position of the disk-rollers D D′ as to the inclination and difference in plane of their axes is shown in Figs. 2 and 4, the dotted lines in the latter figure representing the center and the periphery of the upper disk or roller, D.

What I claim as my invention is—

1. The combination, with the cone-faced disk-roller D and shaft *n*, of yoke *i*, with its long hollow hub i^3, the hollow split hub *e* on frame A, and screw T, substantially as and for the purpose set forth.

2. The combination of the cone-faced disk-rollers D and D′, arranged to revolve in opposite directions, having their axes of revolution inclined, and their axes in slightly-different planes, shaft *n*, with its collars 1 2, lever *r*, and connection-lever *s*, substantially as and for the purpose set forth.

3. The combination, with disk-rollers D and D′, arranged to operate as shown, shaft *n*, with its collars 1 2, lever *r*, and connection-lever *s*, of lever 10, wedge-block 8, guide-blocks 6 and 7, and guide-support *v′*, substantially as and for the purpose set forth.

4. In a whip-rolling machine, the combination, with guides 3 and 4, of guide 5, substantially as and for the purpose set forth.

5. The combination, with the cone-faced disk-rollers D D′, arranged to revolve in opposite directions, and having their axes of revolution inclined, and their axes in slightly-different planes, of guides 3 and 4, arranged to move laterally to and from each other simultaneously with and actuated by the reciprocating vertical movements of one of said cone-faced disk-rollers, substantially as set forth.

ORRIN BRYANT.

In presence of—
JOEL H. FOX,
D. W. C. SMITH.