(No Model.)

L. WILLIAMS.

APPARATUS FOR DRAWING WIRE.

No. 256,779. Patented Apr. 18, 1882.

FIG. 4.

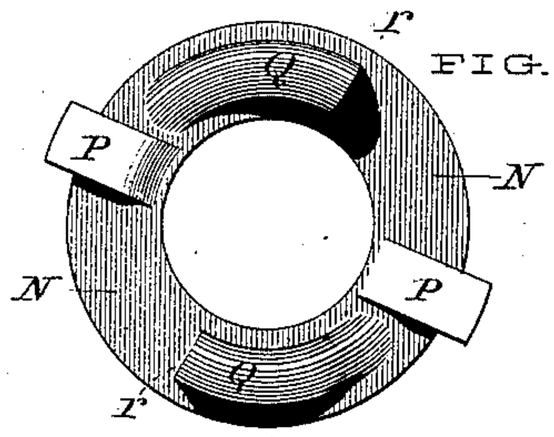


FIG. 5.

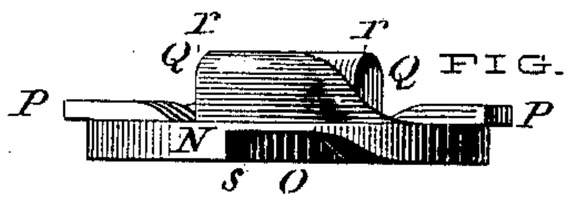


FIG. 6.

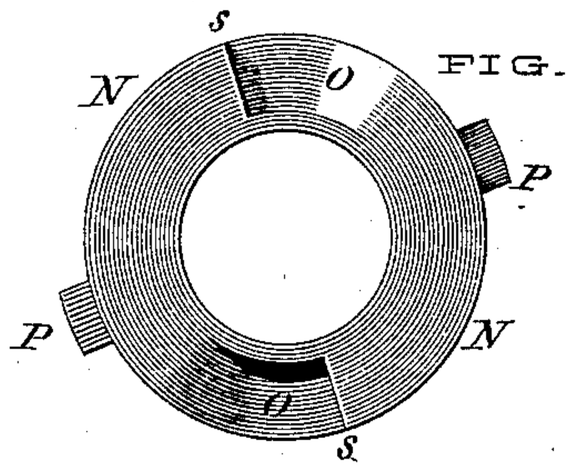


FIG. 7.

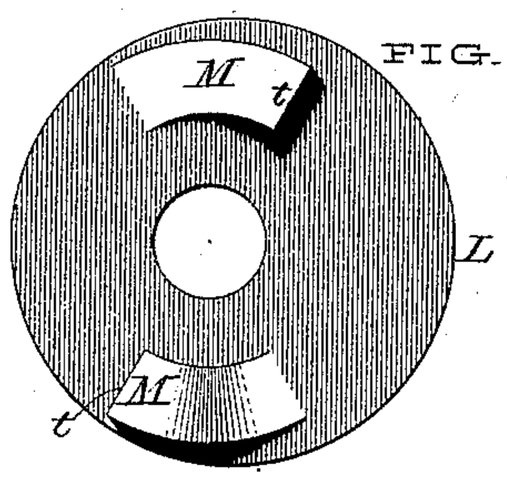


FIG. 8.

FIG. 1.

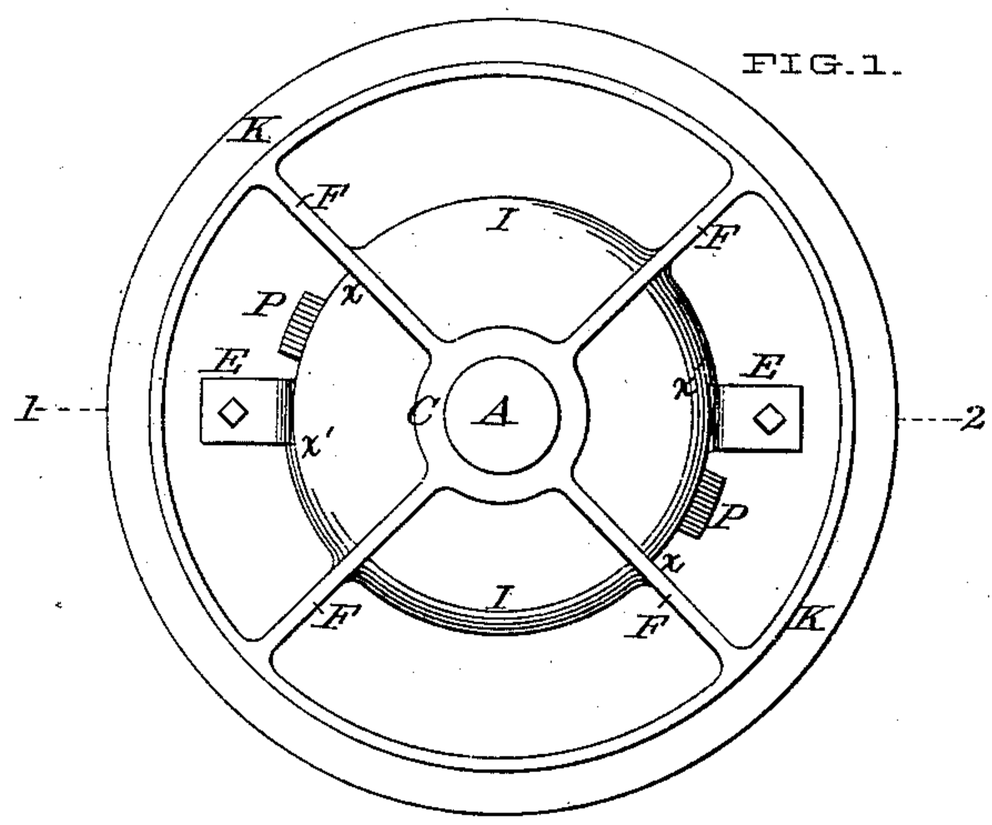
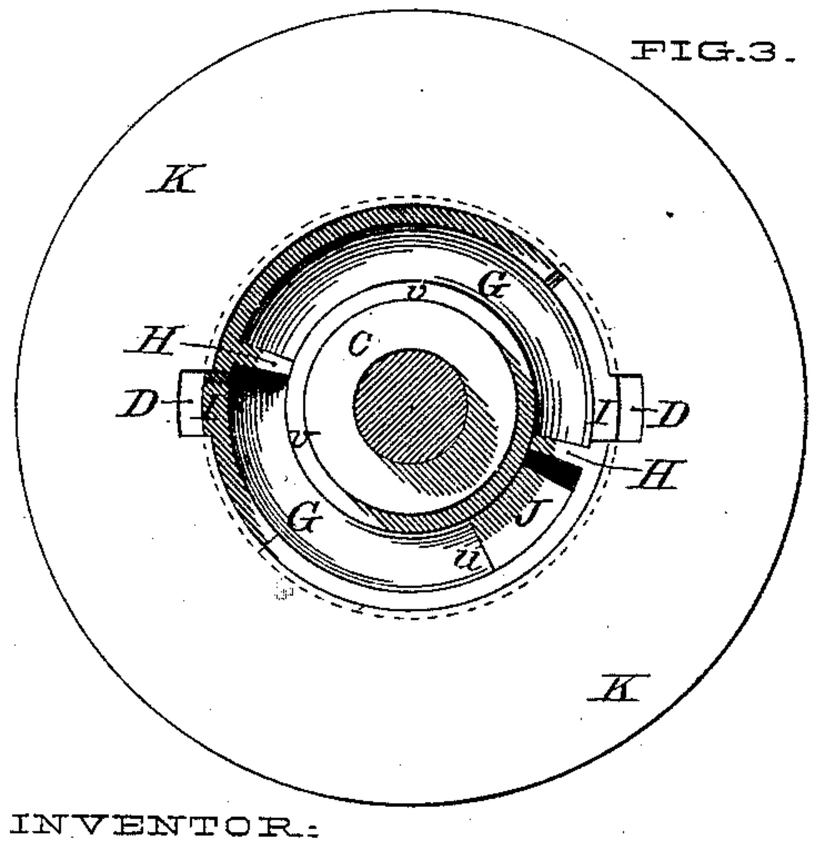


FIG. 2.

FIG. 3.



WITNESSES:

George W. Bigart.

Mary Bigart.

INVENTOR:

LEWIS WILLIAMS,

By Franklin Scott, Atty

UNITED STATES PATENT OFFICE.

LEWIS WILLIAMS, OF BENNINGTON, VERMONT.

APPARATUS FOR DRAWING WIRE.

SPECIFICATION forming part of Letters Patent No. 256,779, dated April 18, 1882.

Application filed October 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, LEWIS WILLIAMS, of the town of Bennington, in the county of Bennington and State of Vermont, have invented certain Improvements in Apparatus for Drawing Wire, of which the following description, in connection with the accompanying single sheet of drawings, constitutes a specification.

The subject-matter of this invention is embodied in a driving-clutch of special construction as adapted and applied to the block used in the process of wire-drawing for grasping one end of the wire and coiling the same after it passes through the draw-plate. As these blocks have heretofore been constructed, they have consisted of a vertical winding drum or spool having a single disk-head at the bottom end, the edge of which projects beyond the peripheral surface of the drum and constitutes a raised beveled flange, against or athwart which the wire is strained as the drum is revolved in the process of drawing the wire. Upon the under face of this disk or head are cast or attached lugs or ledges, which thus constitute one member of the clutch combination whereby the devices are actuated. This flanged drum or spool so provided with concentric lugs or clutch teeth, together with the devices thereto attached for grasping the end of the wire as it left the draw-plate, were and are collectively called the "block." Upon the same shaft upon which the block is mounted, and upon which it is so fitted that when thrown out of action it freely revolves, and below the block, is rigidly attached to the shaft the counterpart or driving member of the clutch, being simply a hub keyed or otherwise fastened to the shaft, its upper end constituting an enlarged flange or disk, upon the upper face of which are constructed lugs or clutch-teeth which are adapted to enter the interdental spaces of the driven member of the clutch on the block, and thus engage the lugs or teeth thereof to drive the same. All these parts were and are usually made of iron, and experience has demonstrated that after long use the continued throwing in and out of engagement of the clutch, which is usually done by dropping the block down upon or into engagement with the driver or bottom member of the clutch, results in gradually upsetting, crumbling off, and in ultimately destroying the clutch-teeth, so that after such damage the whole block, with its appendages, is rendered unfit for use long before its other parts are worn out, and is consequently lost. Such damage is the natural consequence of the shock resulting from the sudden impact between the clutch-teeth when the driving-shaft is running more or less rapidly, and the dormant or inert member of the clutch is suddenly thrown into engagement with the driver.

To remedy these defects is the object of this invention. For this purpose I have interposed between the driving and the driven clutch disks a concentric annulus equipped on its opposite sides with lugs or clutch-teeth for engagement with the lugs of the driving and the driven members of the clutch, respectively, and so constructed as to be constantly held in engagement with one of the members of the clutch, (which in this case is the member connected with the block,) and in such a way that an elastic pad or cushion is retained in position between each lug or clutch-tooth of the member with which the annulus is connected and the lug or clutch-tooth on the annulus following immediately in its rear. By means of this arrangement of devices the shock or concussion attendant upon throwing the clutch into gear suddenly when the driver is running is received primarily by the annulus, and through it is transferred to the elastic cushions interposed between the lugs or teeth of the annulus and of the driven member of the clutch, upon or through which such shock is nearly or entirely diffused or dissipated, as a result whereof the several teeth of the respective parts are greatly relieved from the effect of the hammering incidental to throwing the parts into engagement where no such protection is provided.

My invention will be fully understood by reference to the drawings, wherein Figure 1 is a top plan of such a block as is used in the process of drawing wire, with my improvements applied thereto. Fig. 2 is a vertical longitudinal section of the block, taken on the line 1 2 of Fig. 1. Fig. 3 is an inverted plan view of the underside of the drum detached from all other parts, and shows the construction of the driven member of the clutch system. Fig. 4 is a top view of the intermediate member of the sys-

tem, termed the "annular" member. Fig. 5 is an edge view of the annular member. Fig. 6 is a view of the bottom thereof. Fig. 7 is a top view of the driver. Fig. 8 is a perspective of one of the cushions employed to mitigate and diffuse the shock.

My apparatus consists essentially of four parts mounted on a common shaft, A, consisting of the driver L, which is permanently fastened to the shaft, the annular clutch N, located between the driver and the drum B, the driven clutch C, which is integral with the flanged drum B, and the cushion or cushions J. The hub C of the drum B is constructed with two concentric semicircular chambers or recesses, G G, of the form shown in cross section in Fig. 2 and in inverted plan in Fig. 3 These are separated by the transverse webs or stops H H, which constitute the clutch-teeth, lugs, or abutments for receiving the thrust or impact from the driver through the ring and interposed cushions. The disk K K of the drum B is centrally perforated, as shown in Fig. 3, so that the annular clutch N N may fall into its proper seat or position. The interior edge of this perforation is recessed back, as at D D, Figs. 2 and 3, for the passage through of the wings P P of the annular clutch N N. The concave semi-annular concentric recesses G G are for the reception of the clutch-teeth or lugs Q Q of the annular clutch and of the cushions J J. One of these cushions is shown in position in Fig. 3.

The annular clutch N N (shown in top, edge, and bottom views in Figs. 4, 5, and 6, respectively) is cast from metal in one piece. It is centrally bored or turned to fit the bottom end of the hub C of drum B, and when in position rests against the shoulder *v v* of such hub, as seen in Fig. 2. It is equipped with the wings P P, which are provided to hold the annular clutch in position in engagement with the clutch of drum B, the mode of accomplishing which is more fully explained further on. Upon its upper surface are the elevated concentric clutch-teeth Q Q, which are of the shape shown or of any other suitable configuration, provided they are adapted to properly fill and rotate in the concentric recesses G G, Fig. 3. The lugs Q Q and wings P P are sufficiently separated to permit one of the cushions J to find room between stop H and the driving-face *r* of lug Q, and then allow partial rotation of the annular clutch when it is in working position. Beneath the lugs Q Q of the annular clutch N N, and upon the under side thereof, are the rebatements O O, which are in form the counterpart of the lugs or clutch-teeth M M of the driving-clutch L, the driving-faces *t t* of the teeth M M engaging with the ledges *s s* of the annular clutch N N when the parts are assembled and are ready for action.

The periphery of clutch-disk L is eccentric with its axis of rotation, and is so constructed to facilitate the action of a brake. (Not shown in the drawings.)

One of the cushions is shown in perspective in Fig. 8. There are two of these employed, and they may be made of any elastic material, preferably of rubber; but steel springs could be adapted to the purpose, if desired. They are of such form in cross-section as to fit the annular chambers or grooves G G, and are confined in position by means of the annular ring N N.

The mode of assembling and operating the mechanism is as follows: Clutch L is first firmly secured to the driving-shaft A in position as shown in Fig. 2. Then the annular clutch N N is dropped over it, so that the bottom side, or that seen in Fig. 6, shall lie next to the teeth M M of the driving-clutch L. Next the spring-cushions J J are placed in position lying on top of the ring-clutch and next to the front ends, *r r*, of the lugs Q Q, Fig. 4. After this the drum B, disk side down, is slipped on over the top of shaft A, and in its descent the wings P P enter and pass through the recesses D D of the drum disk or head K K. The annular disk is then rotated slightly to one side, thus carrying wings P P around, so that they rest upon the upper surface of the interior edge of drum-head K K, as seen in Fig. 1. Slots or recesses D D are then closed by the stops E E, each of which has a downwardly-projecting lip, which enters such recess and closes the same. These stops are held by a bolt, pin, or screw, and thin edges furnish an abutment against which the wings P P impinge whenever there is any backlash or recoil from the action of the spring-cushions J J. The edges of the driven clutch are slightly cut back, as from *x'* to *x*, Fig. 1, thus constituting open intervals or spaces in or through which the wings P P have free play or movement. The several parts being thus assembled, the reduced end of the wire to be drawn is passed through the draw-plate and brought somewhat diagonally over the upturned flange of the drum or block B and across the face of such drum to its upper edge, where it is grasped by a gripping or clamping device (not shown in the drawings) such as is now in use for that purpose. By suitable appliances the block is then depressed until it engages with the driving-clutch L. From the moment of such engagement until the annular clutch has advanced to the point where its lugs Q Q strike the cushions J J there is little or no shock; but from the last point forward there is a rapidly augmenting tension until its maximum is reached, when the wire is drawn taut and the drawing proper commences. This rapidly increasing tension or impact is resisted by the cushions J J, which by the aforesaid action of the parts become densely compacted, but yet elastic while the drawing proceeds, by means and as a consequence whereof the several metallic parts are not in any appreciable degree injured by the force of such impact, and any destructive force or influence is expended upon the cushions which can be easily replaced. It is obvious that a

set of such cushions may also be applied between the driving and the annular clutch with slight mechanical adaptation.

The foregoing-described system of devices for reducing shock and conserving the wearing-surfaces or points of contact in clutches of the character described—viz., by interposing between the driving and the driven clutch an intermediate member having lugs or teeth on its opposite faces for engagement with the lugs or teeth of such driving and driven members, respectively, and so constructed as to carry interposed between the engaging teeth on one or both sides of said intermediate member elastic cushions for the dissipation of the shock or jar resultant from instantaneous starting or throwing into gear—is susceptible of a wide range of application in all kinds of machinery where such results are desirable. Hence I do not confine myself to any single application of my invention; but

I claim as new and hereby declare the following enumerated features and characteristics of my hereinbefore-described invention to be the subject-matter intended to be secured and protected by these Letters Patent, to wit:

As an improvement in wire-drawing apparatus, the combination of the flanged winding-drum B, constructed with the concentric semicircular grooves or channels G G and abutments H H, the annular clutch N N, provided on its opposite sides with lugs for engagement with the corresponding lugs of the driving and driven clutches, respectively, and having elastic cushions or springs interposed between the lugs of the annular and the driven members of the system, with a driving member, L, rigidly connected with the driving-shaft, substantially in the manner described, and for the purposes set forth.

In testimony whereof I have hereto subscribed my name, at Johnstown, in the county of Cambria and State of Pennsylvania, this 7th day of October, A. D. 1881.

LEWIS WILLIAMS.

In presence of—
A. MONTGOMERY,
JAMES D. KELVIE.