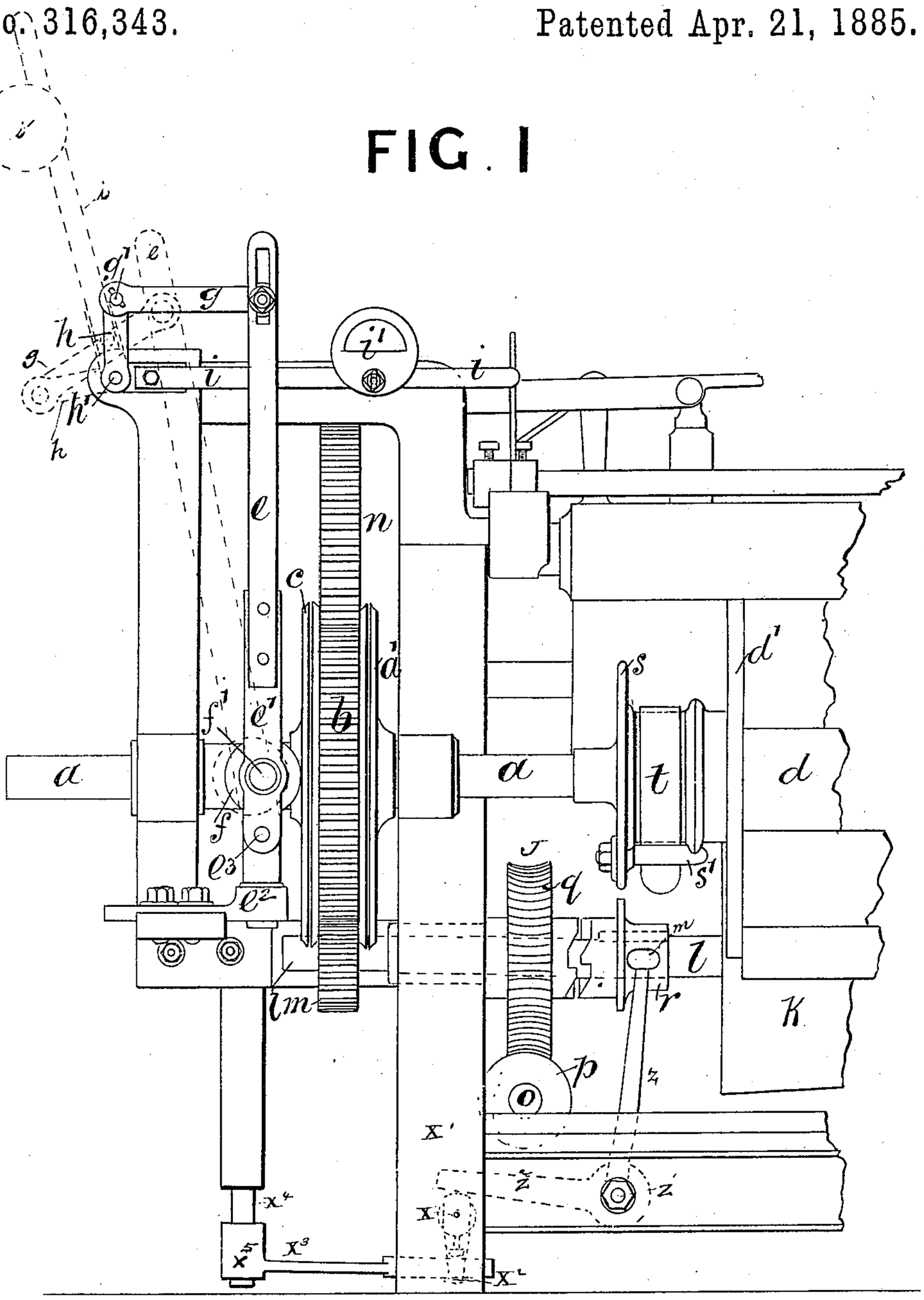
(No Model.) 3 Sheets—Sheet 1.

Y. DUXBURY, Jr.

WINDING ON MOTION FOR MACHINES FOR TAPING, SLASHING PAPER, &c.

No. 316,343. Patented Apr. 21, 1885.

FIG. 1



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(No Model.) 3 Sheets—Sheet 2.

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FIG. 2.

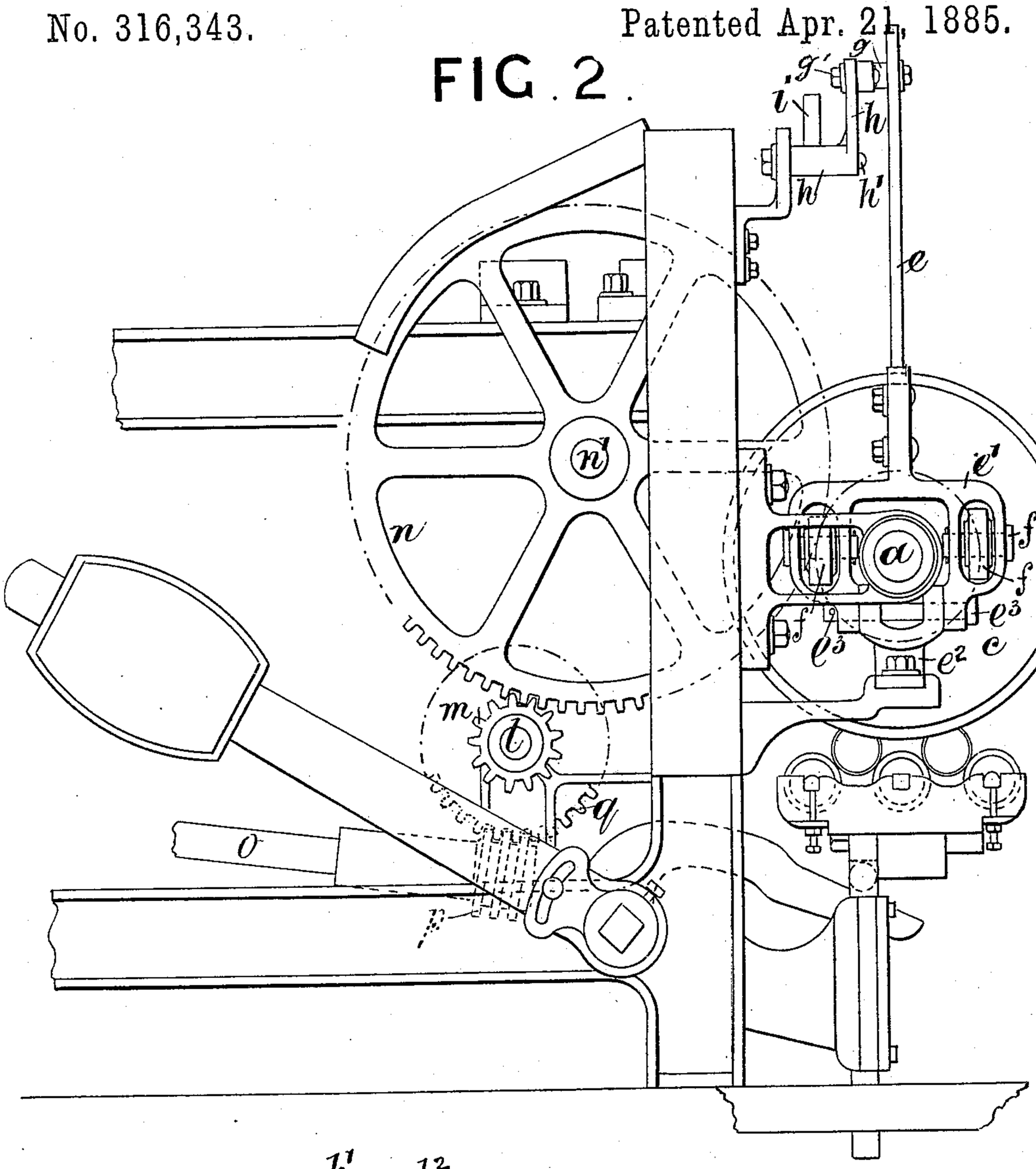
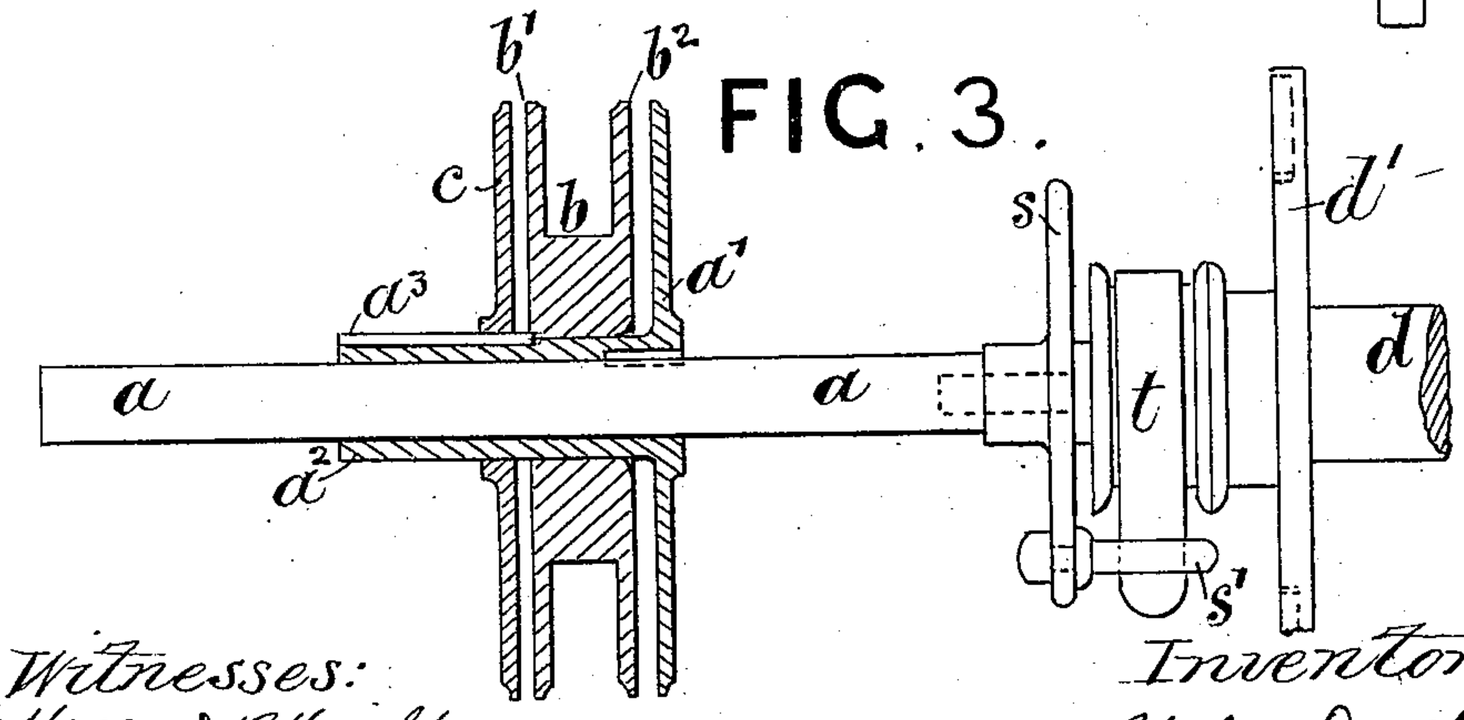


FIG. 3.



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(No Model.) 3 Sheets—Sheet 3.

Y. DUXBURY, Jr.

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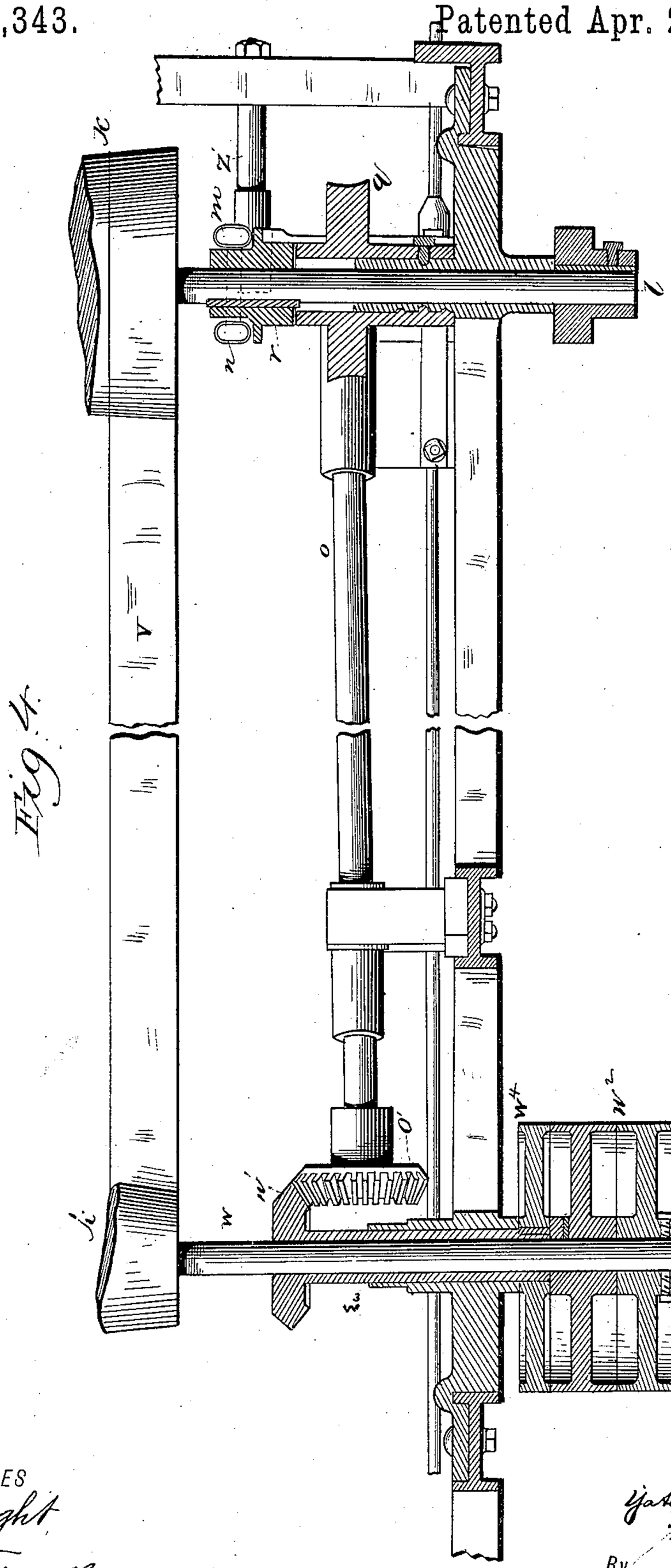

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UNITED STATES PATENT OFFICE.

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WINDING-ON MOTION FOR MACHINES FOR TAPING, SLASHING PAPER, &c.

SPECIFICATION forming part of Letters Patent No. 316,343, dated April 21, 1885.

Application filed February 27, 1884. (No model.) Patented in England August 2, 1882, No. 3,692.

To all whom it may concern:

Be it known that I, YATES DUXBURY, Jr., a subject of the Queen of Great Britain, residing at Over Darwen, in the county of Lancaster, England, have invented a new and useful Improvement in Winding-on Motions for Machines for Taping, Slashing Paper, &c., (for which I have obtained a patent in Great Britain, No. 3,692, bearing date August 2, 1882,) of which the following is a specification.

My invention relates to what are known as "frictional winding-on motions" for taping, slashing paper, and other analogous machinery. In such winding-on motions as hitherto for the most part employed the beam or roller on which it is intended to wind the yarn, paper, or other analogous material is suitably connected to an apparatus carrying a friction plate or plates or disks free to revolve. The driving-wheel is also attached to apparatus carrying another such friction plate or plates revolving parallel to the friction plate or plates previously described. These friction plates or disks have their opposing faces suitably prepared with flannel or other suitable substance, so that when brought together by means of a screw-boss and intermediate spring they form the frictional winding-on apparatus, as is well understood.

The object of my invention is to dispense with the screw-boss and intermediate spring, and to substitute a system of levers actuated by a movable weight for the purpose of bringing the friction plates or disks of winding-on motions together under a pressure regulated by the said movable weight. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view, and Fig. 2 is a side view, of my improved winding-on motion as applied to a slashing or sizing machine. Fig. 3 is a detached view, partly in section, of the shaft with the friction-plates and one end of the beam. Fig. 4 represents a view, partly in horizontal section, of the devices for giving fast or slow motions, as desired.

Similar letters refer to similar parts throughout the several views.

In said drawings, *a* designates the yarn-beam shaft, on which is keyed a friction-disk, a', having a long boss, a^2. A second friction-disk is feathered on said boss by means of a feather or spline, a^3, so that it may move toward or from the said fast disk a'. In the space between these disks a gear-wheel, *b*, is mounted loosely on said hub, and provided at its sides with circular flanges b' b^2, which are in planes parallel to said disks and coincident with the sides of the wheel *b*, so that said sides and the flanges may be engaged by said disks, respectively. One end of the yarn-beam *d* (the proximate flange d' of which is shown) is supported by said shaft *a* by means of connections hereinafter to be described. The other end of said yarn-beam is carried by a movable bearing. (Not shown.) When the shaft *a* turns, the yarn-beam *d* turns with it and winds the yarn thereon. This rotation is caused by the engagement of the flanges b' and b^2 and the sides of wheel *b* with the disks a' and *c*, the said gear-wheel *b* meshing with a gear-wheel, *n*, which is carried by a shaft, n'. The said gear-wheel *n* meshes with a pinion, *m*, which is carried by a shaft, *l*, having a cone-drum, *k*, fast thereon. This cone-drum is connected, when the machine is in operation, to a similar cone-drum on a driving-shaft, *w*. (Shown in Fig. 4.) On this shaft *l* a worm-wheel, *q*, is loosely sleeved, one end of its sleeve being adapted to engage with a sliding clutch member, *r*, which is feathered (see Fig. 4) on said shaft *l*, so as to rotate with said shaft, while being movable at will into or out of engagement with said sleeve. This clutching or unclutching is effected by means of a shifting-arm, z', that has another arm, z^2, acted on by a friction-roll, x', supported by an upright bracket, *x*, which is mounted on a slide, x^2, that is reciprocated by an arm, x^3, operated by a vertical rock-shaft, x^4. The connection between this arm x^3 and shaft x^4 is made by a sleeve, ring, or yoke, x^5, on one end of said arm, which fits on a cam (not shown) on said shaft x^4, so that the rotation of said shaft and cam will cause the reciprocation of said arm x^3 and slide x^2. These shifting devices may of course be varied at will, as they do not form part of my

invention. The operative end of shifting-arm *z* is bifurcated and provided with elastic pads *m*, which clasp the clutch member *r*, and thereby cause it to move with said shifting-arm *z*. The aforesaid rock-shafts are journaled in the frame of the machine. The worm-wheel *q* meshes with a worm, *p*, on a shaft, *o*, Figs. 1 and 4, which is provided with a bevel gear-wheel, *o'*, meshing with a similar gear-wheel, *w'*, on a sleeve, w^3, which is loosely mounted on shaft *w*, said sleeve being provided with an independent belt-wheel, w^4. This latter shaft *w* also carries a belt-cone, K', arranged to be connected by belt *v*, when desired, to the cone *k* on shaft *l* aforesaid. It is driven by any suitable motor through the medium of belt pulley or pulleys w^2.

The parts are so arranged that the rate of motion communicated by shaft *w* to shaft *l* through the gears *w' o p q* differs from the rate of speed communicated through belt *v*. Therefore by slipping belt *v* off from cone *k'* and throwing clutch member *r* into engagement, as aforesaid, or by reversing this procedure, the operation of the winding-on mechanism may be made more rapid or less rapid, as desired. As shown, the rate of speed will be less when the gear-wheels are in use for rotating shaft *l* and the belt *v* is out of use, since the shaft *o* must make as many rotations as there are teeth in worm-wheel *q*, in order to cause one rotation of the latter and its shaft.

The clutch-shifting devices before described are operated by hand.

To hold the disks *a'* and *c* in or out of frictional contact with the outer faces of the flanges *b' b²*, as desired, I employ a weight, *i'*, which is attached to an arm, *i*, that is mounted at its lower end on a rock-shaft, *h'*, with which it moves. To this rock-shaft is similarly attached the lower end of an arm, *h*, which is pivotally connected at the other end by a stud, *g'*, to another arm or rod, *g*. This latter is again pivoted at its other end to the slotted upper end of a lever, *e*, the bifurcated lower part of which, *e'*, is expanded to form an open frame, and pivoted at e^3 to a fixed support, e^2. This bifurcated lower part or frame, *e'*, of lever *e* also carries two anti-friction rollers, which are mounted in the open sides thereof. When the weight *i*, the lever *e*, and the intermediate parts are moved into the position shown by full lines in Fig. 1, these anti-friction rollers *f f* are forced against the movable friction-disk *c*, and press the same against the flange *b'* and the proximate side of gear-wheel *b*. This wheel is thereby moved into contact with friction-disk *a'* on the opposite side thereof, the wheel *b* and its flanges *b'* and b^2 being thus bound between the disks *a'* and *c*, thus producing considerable friction. By moving the weight *i* and lever *e*, with the intermediate parts, into the position shown in dotted lines, Fig. 1, the friction will be withdrawn altogether. In the former case the motion transmitted by pinion *m* on shaft *l* to idle-wheel *n*, (see Fig. 2,) and thence to wheel *b*, (see Fig. 1,) is communicated by the latter wheel to shaft *a* by reason of the friction between the disks *a'* and *c* and the respective sides and flanges of the gear-wheel *b;* but in the latter case the motion will not be communicated to said shaft and the yarn-beam will not turn.

The frictional engagement above described between the faces of the disks and the wheel and its flanges will allow slipping in case of accidental obstruction to the turning of the beam.

The slot at the upper end of the lever *e* allows the adjustment of the inclination of arm *g* with respect to lever *e*, and consequently of the leverage exerted by weight *i* through said arm *g* on lever *e*. The weight *i'* holds the parts in or out of frictional contact (according to its position) until it is shifted by hand from one position to the other.

The connection between the shaft *a* and the yarn-beam *d* is made by means of a pin, *s'*, which projects in a line parallel to the axis of said shaft from the inner face of a disk, *s*, carried by the latter, said pin engaging with a shoulder formed on the ruffle *t* of beam *d*. The beam *d*, though spoken of herein as a yarn-beam, may of course be used for winding any kind of flexible material, and my winding-on motion hereinbefore described is applicable to any machine employed for such purposes.

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

In combination with a yarn-beam and its shaft, a gear-wheel mounted loosely on said shaft, actuating devices whereby said gear-wheel is caused to rotate, a friction disk or plate which is movable into and out of contact with the side of said gear-wheel, a lever whereby said friction-disk is thus shifted, and a weight and intermediate devices which hold said lever in position to maintain such frictional contact or free the gear-wheel therefrom, substantially as set forth.

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