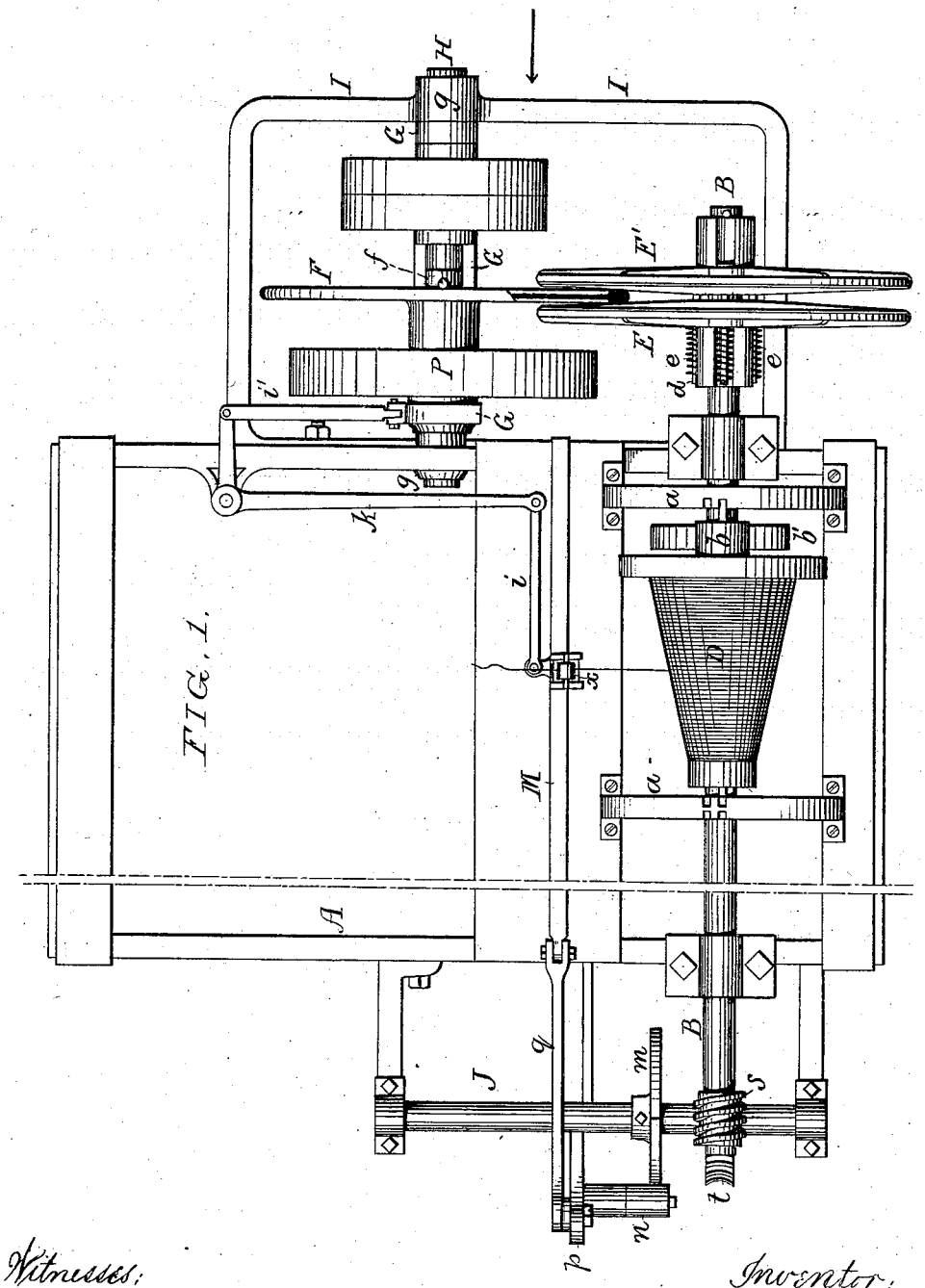
(No Model.) 4 Sheets—Sheet 1.

J. H. GOMERSALL.

MACHINE FOR WINDING COPS OR BOBBINS.

No. 260,190. Patented June 27, 1882.



Witnesses:
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James J. Tobin

Inventor,
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by his attorneys,
Howson and Sons

(No Model.) 4 Sheets—Sheet 2.

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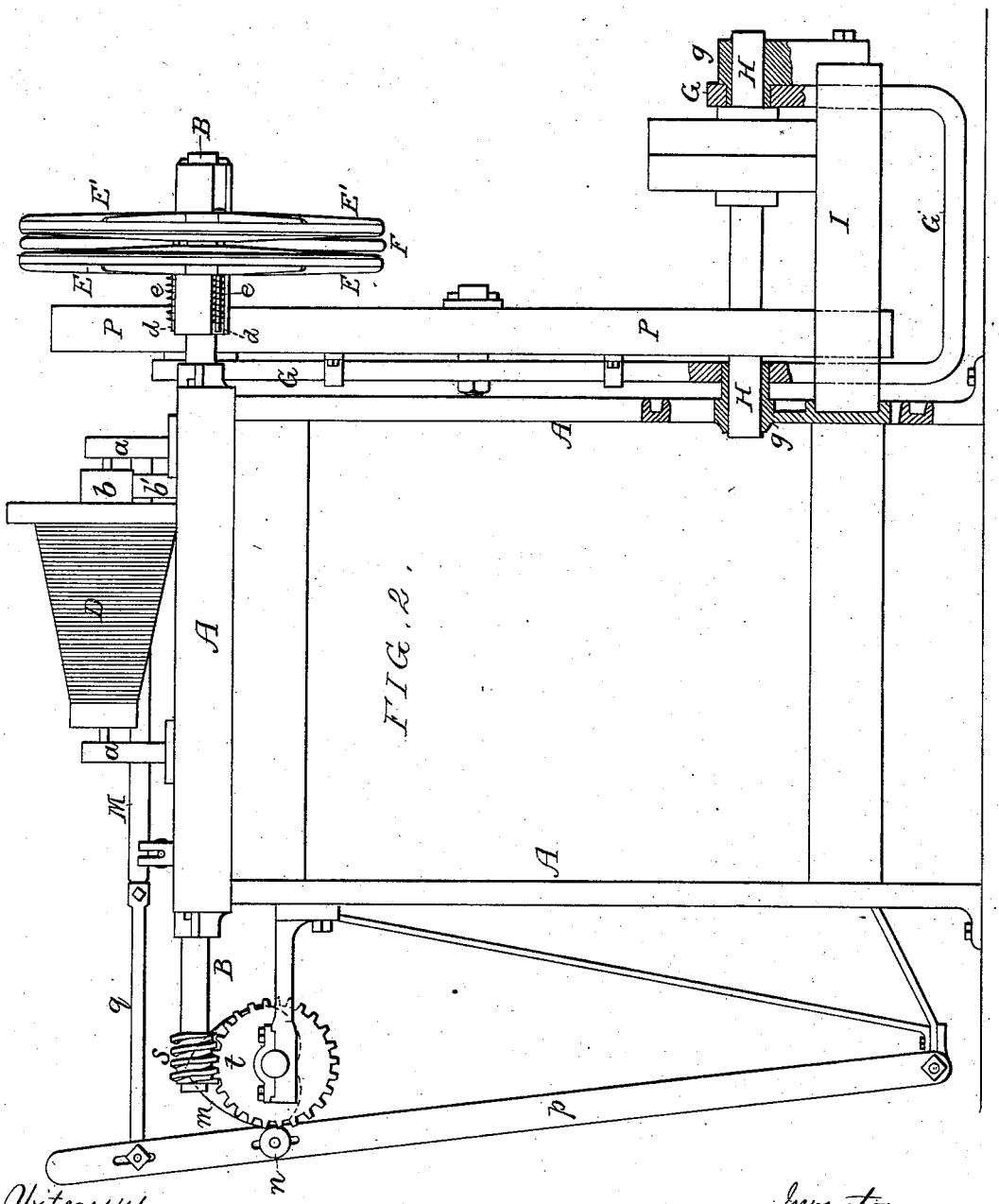

FIG. 2.

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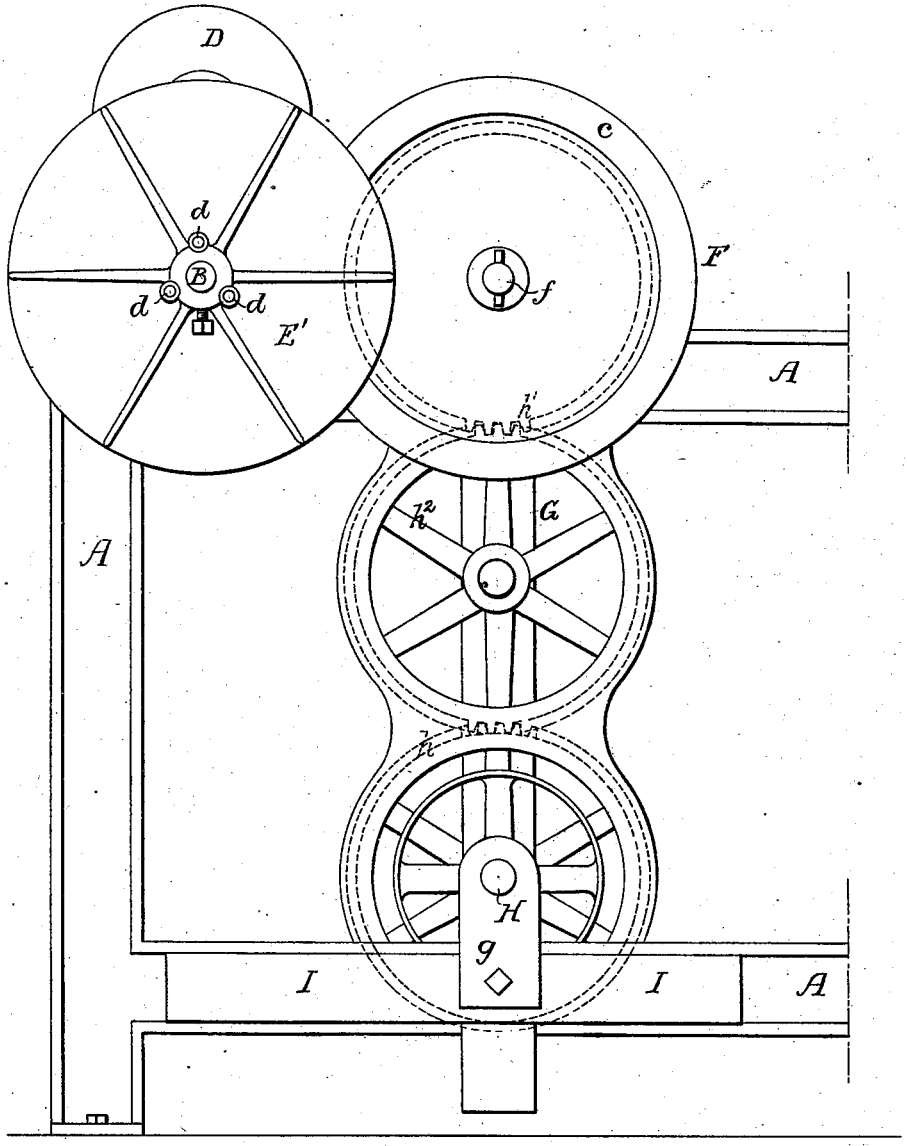
FIG. 3.



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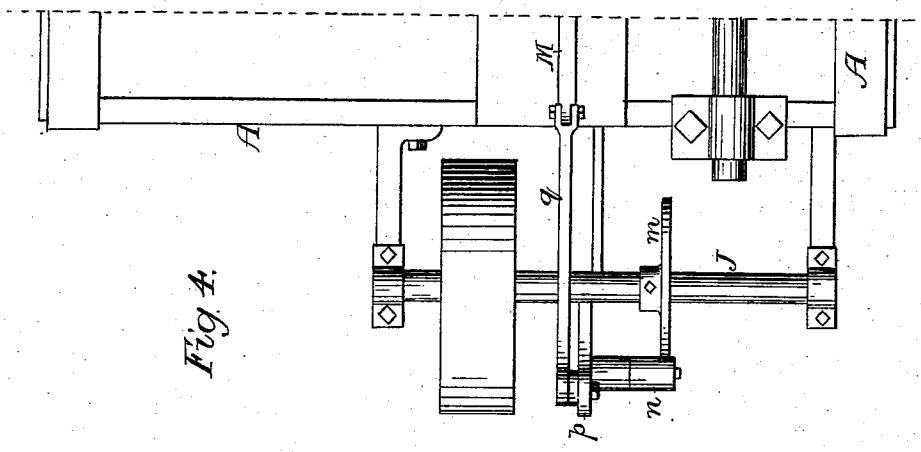

Fig. 4.

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UNITED STATES PATENT OFFICE.

JAMES H. GOMERSALL, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR WINDING COPS OR BOBBINS.

SPECIFICATION forming part of Letters Patent No. 260,190, dated June 27, 1882.

Application filed November 28, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. GOMERSALL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Winding Cops or Bobbins, of which the following is a specification.

The object of my invention is to so construct a machine for winding cops or bobbins that the speed of the spindles or of both the spindles and traverse-bar will be rendered differential, more perfect winding being thus insured, and the yarn relieved from the strains due to unevenness in the draft upon the same.

In the accompanying drawings, Figure 1 is a plan view, partly in section, of a bobbin-winding frame with my improvements; Fig. 2, a front view of the same, partly in section; Fig. 3, an end view of the machine, looking in the direction of the arrow, Fig. 1; and Fig. 4, a plan view of part of the machine, illustrating a modification.

A is the frame of the machine, to bearings on the opposite ends of which is adapted the shaft B, which drives the bobbin D, the spindle of the latter being adapted to vertical slots in bridge-pieces *a* on the frame, and being furnished with a collar, *b*, which bears upon a drum, *b'*, on the shaft B and is caused to rotate by contact therewith. This is a common arrangement in ordinary winding-frames.

In the drawings I have shown a short frame, A, and shaft B, the latter being adapted to actuate but a single bobbin; but it will be understood that in practice the frame and shaft are made of such a length that said shaft carries a number of drums and actuates a number of bobbins.

On one of the projecting ends of the shaft B is a pair of disks, E E', the disk E' being secured to the shaft, and the disk E being free to slide longitudinally thereon, but having no movement of rotation independently of the disk E', rods *d* extending from the latter through openings in the disk E, and the projecting ends of these rods being furnished with springs *e*, which bear upon said disk E and tend to force it toward the disk E'. A third disk, F, occupies such a position in respect to the disks E E' that an annular flange, *c*, of said disk F is clamped between the said disks E E', so that any rotary motion imparted to the disk F will be imparted to the disks E E', owing to the friction between the flange *c* and the inner faces of the said disks E E', the speed of the latter depending upon the distance of the flange from the shaft B. Thus the nearer the flange is moved toward the said shaft the greater will be the speed of the disks E E' in respect to the speed of the driving-disk F, and vice versa. The inner faces of the disks E E' are clothed with leather or other frictional surface, and are made slightly conical, so as to effect the proper gripping of the flange of the disk F, the disk E yielding, owing to the springs *e*, as the flange approaches the shaft B.

A frictional speed-changing device of this character is not new in itself, and I do not desire to claim the same, broadly, my invention relating to the method of hanging and operating the different parts, as described hereinafter.

The disk F has a hub which turns on a stud, *f*, projecting from a lever, G, the latter being hung concentrically with a shaft, H, which turns in bearings *g*, one on the frame A and the other on a yoke, I, bolted to said frame, the shaft H being furnished with a suitable fast pulley and loose pulley adapted to receive a belt from a pulley on any adjacent power-driven shaft. Motion is communicated to the disk F from the shaft H through the medium of a train of gearing comprising a spur-wheel, *h*, on the shaft, a spur-wheel, *h'*, on the hub of the disk, and an intermediate pinion, h^2, hung to a stud on the lever G. The gearing is covered and protected by a casing, P, bolted to the lever. The lever G is hung to hubs or projections formed on the bearings *g*, as shown in Fig. 2, the lower end of the lever being bent for adaptation to the outer bearing. An extended bearing for the lever is thus provided, and steadiness of movement of said lever insured, the shaft H being relieved from all of the wear and strain which might be caused if the lever were hung directly to said shaft. As the shaft H is concentric with the pivots of the lever, the latter may be vibrated so as to vary the position of the disk F in respect to the disks E E' without throwing any of the parts out of gear.

If desired, the lever G may be made shorter and the intermediate pinion h^2 dispensed with,

or belts and pulleys may be substituted for the spur and pinion gearing shown; but the latter is preferred.

The vibration of the lever G to shift the disk F and vary the speed of the spindle B is effected from the reciprocating traverse-bar M, through the medium of links *i i'* and a bell-crank lever, *k*, hung to the frame A, and the reciprocation of the traverse-bar is caused by the action of a cam, *m*, upon a roller, *n*, carried by a pivoted arm, *p*, the upper end of which is connected by a link, *q*, to the traverse-bar. The cam *m* is carried by a shaft, J, which is driven from the shaft B by means of a worm, *s*, on said shaft, said worm gearing into a worm-wheel, *t*, on the shaft J.

The traverse-bar has the usual thread-guide *x*, and the operation of winding is as follows: When the parts are in the positions shown in the drawings the thread is being wound upon the bobbin at a point midway of its length, and the lever G and disk F occupy positions midway of their extremes of movement. As the thread-guide traverses toward the base of the bobbin the diameter of the body of the yarn gradually increases, and in order to prevent a corresponding increase in draft on the thread it becomes necessary to gradually reduce the speed of the bobbin, which is effected by the gradual withdrawal of the disk F farther and farther from the centers of the disks E E'. As the thread-guide traverses from the base to the top of the bobbin, however, the diameter of the body of the yarn gradually decreases, and this necessitates a gradual increase in the speed of the bobbin, a result which is effected by the approach of the disk F toward the centers of the disks E E'. The reciprocating movement of the traverse-bar is also differential, owing to the fact that it is derived from the shaft B. Hence a very small portion of the yarn only is wound at and near the nose or top of the bobbin, owing to the fact that the speed of the traverse-bar is quickest at this portion of its movement. By this means the shape of the finished bobbin is better than if the traverse-bar has a uniform reciprocating movement.

Although I have shown my invention as applied to a machine for winding bobbins, it will be evident that the same could be used in connection with the operating spindle or drum of a cop-winding frame with equal advantage, the speed-changing devices in this case being operated by the traverse-bar, but the latter having a uniform instead of a differential movement. To effect this the worm *s* and worm-wheel *t* may be discarded and the shaft J provided with a pulley driven by a belt from a pulley on any adjacent shaft. (See Fig. 4.)

I claim as my invention—

1. The combination of the operating-shaft B of a winding-frame, a frictional speed-changing device, as described, a traverse-bar, and mechanism, substantially as described, connecting said traverse-bar and the movable disk of the speed-changing device, whereby a to-and-fro movement is imparted to the latter on each to-and-fro movement of the traverse-bar, as set forth.

2. The combination of the operating-shaft B of a winding-frame, a frictional speed-changing device, whereby a differential movement is imparted to said shaft, a traverse-bar, M, driven from the shaft B, and mechanism, substantially as described, connecting the traverse bar and the movable disk of the speed-changing device, whereby a to-and-fro movement is imparted to the latter on each to-and-fro movement of the traverse-bar, as set forth.

3. The combination of the shaft B, having disks E E', the disk F, the driving-shaft H, and a lever, G, pivoted concentrically with the driving-shaft and carrying the journal of the disk F, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES H. GOMERSALL.

Witnesses:

HARRY DRURY,

HARRY SMITH.