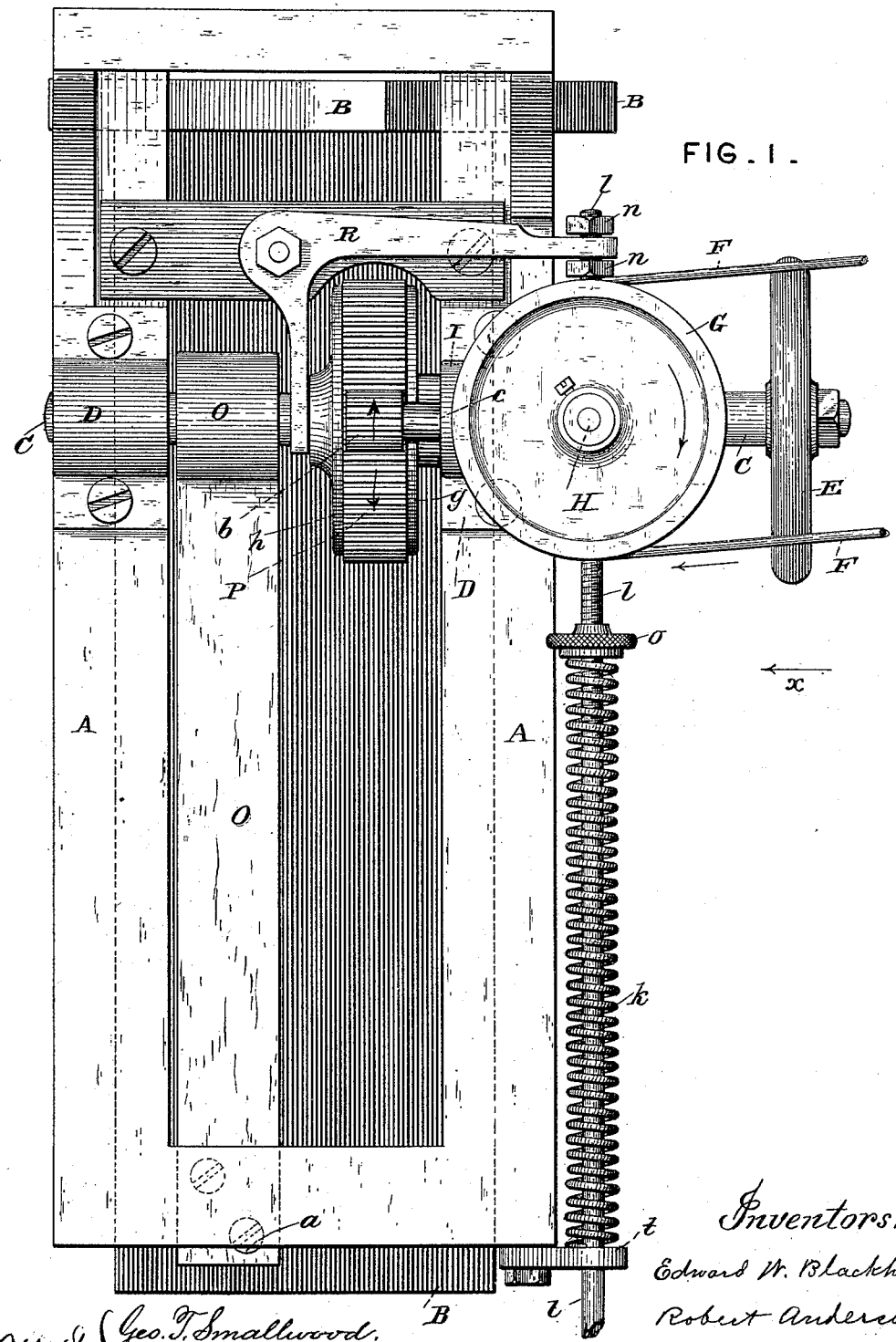
(No Model.) 3 Sheets—Sheet 1.

E. W. BLACKHALL & R. ANDERSON.

ELEVATOR FOR ENVELOPE MACHINES.

No. 417,973. Patented Dec. 24, 1889.

FIG. 1.



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By E. B. Whitmore, Atty.

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FIG. 2.

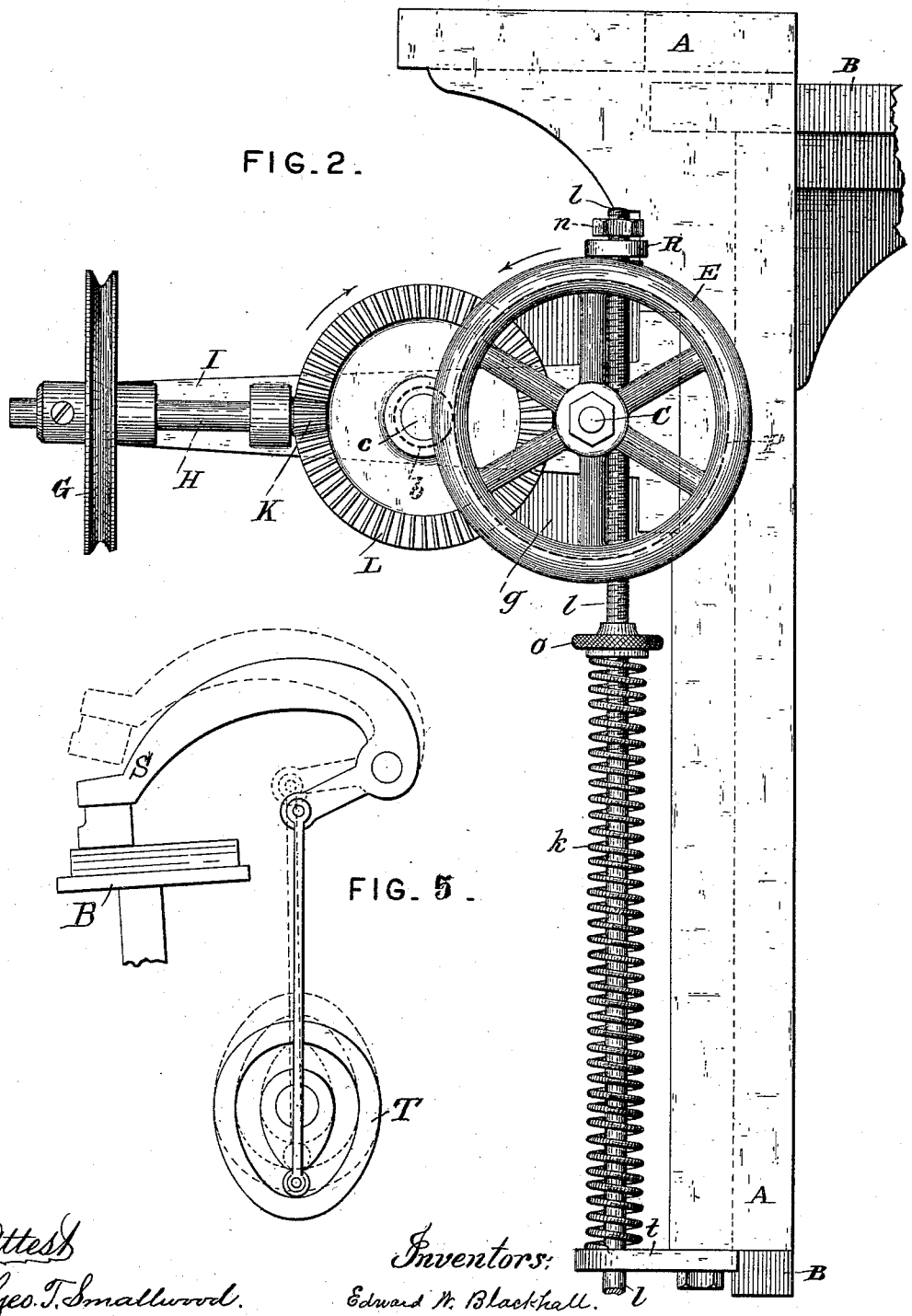

FIG. 5.

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FIG. 3.

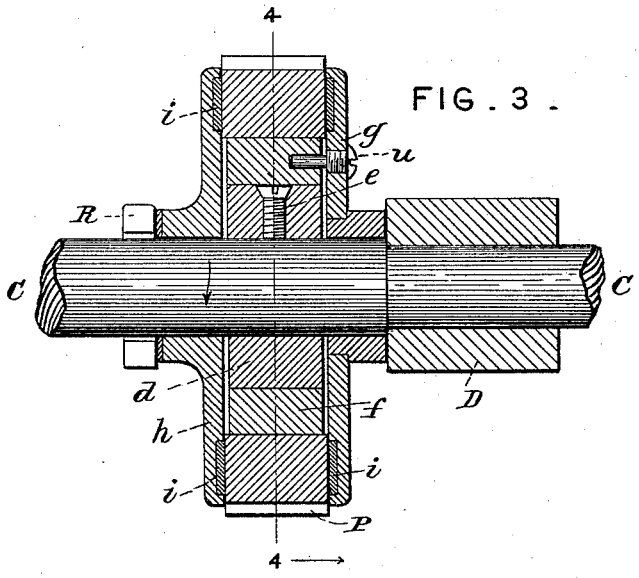
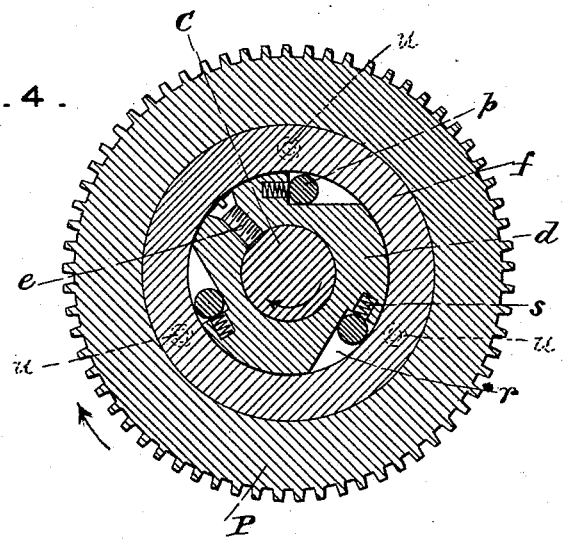


FIG. 4.



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UNITED STATES PATENT OFFICE.

EDWARD W. BLACKHALL AND ROBERT ANDERSON, OF YORK, ONTARIO, CANADA.

ELEVATOR FOR ENVELOPE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 417,973, dated December 24, 1889.

Application filed October 26, 1888. Serial No. 289,192. (No model.)

To all whom it may concern:

Be it known that we, EDWARD W. BLACKHALL and ROBERT ANDERSON, of Toronto, in the county of York, Ontario, Canada, have invented a new and useful Improvement in Elevators for Envelope-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention relates to the elevators of machines for gumming paper blanks to be folded to form paper bags, for instance, or similar articles of manufacture, the device being herein shown and described more particularly as adapted to the manufacture of letter-envelopes.

The invention more especially relates to the means of carrying or feeding the elevator-platform gradually upward for the purpose of presenting the blanks to the gummer and pick-up and of regulating or correcting this upward feed at each action of the pick-up.

As is usual in this class of envelope-machines, a pile of blanks is placed upon the elevator-platform, the blanks being taken from the top of the pile to be folded, the platform being by some means moved upward as the upper blanks are conveyed away.

In envelope-machines some difficulty has been experienced in the matter of feeding the platform upward, so that the top of the pile of blanks shall be kept at the same elevation. In our invention we aim to overcome this difficulty by providing a uniform continuous overfeed and correcting it—the overfeed—by the action of the pick-up head at each descent of the latter, the blows of this head upon the top of the pile of blanks serving to set the latter back to the amount of the slight overfeed. Thus operating, this feeding mechanism regulates itself.

Referring to the drawings, Figure 1 is an elevation of our improved feeding device for the blanks; Fig. 2, a view of the same taken as indicated by arrow *x* in Fig. 1; Fig. 3, (drawn to a larger scale,) a radial section of the friction-wheel and adjoining parts; Fig. 4, a section of the friction-wheel taken at right angles to its axis, as on the dotted line 4 4 in Fig. 3; and Fig. 5 (drawn to a reduced scale) shows a manner of operating the pick-up.

Referring to the parts of the device, A is a part of the general frame of the envelope-machine formed to support the elevator, and B the elevator-platform upon which the blanks are placed.

C is a horizontal shaft for carrying the platform upward, resting in bearings D D in the frame and provided with a hand-wheel E, by means of which the shaft may be turned when required. This shaft may be connected with the platform by any simple means not involving invention—as, for instance, by a rack and pinion or a chain and wheel; but we prefer a strap or band O, secured to the lower part of the platform at *a*, and wound upon the shaft.

P is a friction-wheel, it being a toothed ring (see Sheet 3) held concentric with the shaft C, and arranged to turn independent of the shaft, but at times to drive the latter.

g and *h* are opposing friction-disks held to turn loosely on the shaft, one on each side of the wheel P, these disks being preferably faced with friction-rings *i i*, of leather or similar substance. When the wheel is pinched between the disks, the shaft C turns with it, by means hereinafter fully described. A bent lever R is held to crowd the disk *h* against the wheel and pinch the latter between the disks, the opposite one *g* being prevented from moving back by the bearing D. The lever is actuated by a spiral spring *k* pushing upward on an axial rod *l*, joined to the lever, the rod being provided with collars *n n*, one above and one below the arm of the lever. The rod and spring are held by an arm *t*, rigid with the frame A, and the tension of the spring is regulated by an adjusting thumb-nut *o* on the threaded part of the rod, to vary the degree of pressure of the lever against the friction-disk. The rod *l* extends to the floor, and a simple foot piece or pedal (not shown) attached to the lower end of the rod enables the attendant to depress the latter and release the friction-wheel, and allow the platform to descend by its own weight for the purpose of receiving a new supply of blanks. The platform falls as far as allowed by the unwinding-belt, the shaft turning backward within the friction-wheel

during the descent of the platform. The friction-wheel P is turned uniformly by driving a pinion *b* upon a rotatory shaft *c*, resting in a bearing in a projecting arm I of the frame A. The shaft *c* may be turned by any convenient means—as, for instance, by a shaft H, provided with a grooved pulley G and a bevel-pinion K—there being a bevel-gear L on the shaft *c* and a driving-cord F on the pulley G. Motion being given the driving-cord F, the wheel P is slowly turned and the platform, with its load of blanks, gradually carried upward as the blanks are taken from the top of the pile. Now, it is hardly possible to run a slowly-feeding device for the platform so exactly that it will keep the top of the pile of blanks at the same level or point of elevation during all the time the blanks are being worked up—that is to say, the feed will either gain or lose on the work, causing the blanks to be crowded upward too rapidly in the first case or lag back in the second case. This undesirable action of the feed mechanism is particularly noticeable when, in running through different lots or kinds of work, blanks of different weights or thickness are put upon the platform. To remedy this difficulty, we arrange the feed mechanism so that it will slightly overfeed and have the tension of the spring *k* such that the blow or impact of the gumming or pick-up head S will drive the pile of blanks and the platform slightly back at each downward stroke. The backset of the platform at each stroke of the head is exceedingly small, it being usually only a fraction of the thickness of a blank; but these backsets just keep pace with the overfeed and neutralize the latter, keeping the top of the pile of blanks always at the same elevation. These small backward movements of the platform occur from a slight slipping each time of the friction-wheel between the disks, the whole thus constituting a self-regulating overfeed. The amount of the overfeed depends upon the relative speed of the driving-pinion *b*, and the ease with which the pick-up head drives the platform back depends upon the degree of friction between the disks and wheel regulated by the tension-spring *k*. As the blanks are taken from the top of the pile only one at a time, the upward feed of the platform must necessarily be quite slow. When a pile of blanks is first placed upon the depressed platform, the top of the pile may be to the amount of several inches below the gummer and pick-up, and to have the pile brought up by this slow feed would involve a serious waste of time. We have therefore constructed this device so as to have the platform brought up quickly by hand without disturbing the regular feed mechanism.

To enable the platform to be raised by hand, we employ a notched hub or cylindrical piece *d*, Fig. 4, fastened to the shaft C, within the wheel P, by some simple fastener *e*. Outside of this hub is placed an idling-ring *f*, turning freely thereon, the wheel P, in turn, being fitted to turn freely upon the perimeter of the idling-ring. The hub *d* and ring *f*, as shown in Fig. 3, are shorter than the friction-wheel, so as not to be pinched by the opposing disks *g* and *h*. Studs or pins *u*, threaded in the disk *g*, and caused to enter the ring, lock said disk and ring together, so that both must turn together.

The notches *r* in the hub are preferably made three in number, reaching longitudinally from end to end of the hub, and, as shown, are segmental in cross-section. A cylindrical piece or roller of steel or other durable material *p* is placed longitudinally in each notch, these rollers having a length equal to that of the hub. The diameters of the rollers are such that they just clear the inner surface of the ring *f* when they are at the deepest or widest parts of the respective notches or depressions, as shown; and they are slightly pushed toward the narrow parts of the respective notches by slender springs *s* embedded in the hub. Now, it will be understood that if the ring be turned by the disk *g* and friction-wheel in the direction indicated by the arrows in Fig. 4, it will at first slip slightly upon the hub until the rollers move toward the narrow parts of the notches and bite or squeeze between the hub and ring, when all the parts, including the shaft C, must turn together; but it will also be seen that the shaft may be turned in the same direction by the hand-wheel E at any time independently of the ring, for this motion tends to keep the rollers back in the deeper parts of the notches where they do not pinch. From this it will be seen that the shaft may be turned at any time by the hand-wheel to raise the platform without interfering with the regular upward feed, which is carried on by means of the friction-wheel P and the disks *h* and *g*; but a backward motion of the hand-wheel would cause the rollers to move toward the narrower parts of the notches and lock with the ring *f*. After the platform is thus raised to bring the top of the pile of blanks to the proper elevation the regular feed carries it upward gradually, as stated. This feed device being self-regulating, there is not required a very great nicety in the upward feed.

The pick-up head or gummer S is substantially like that shown and described in our pending application filed October 11, 1888, Serial No. 287,786, and it may be operated by a crank or a cam T of common construction. The motion of the head is positive, it being caused to descend to the same point at each downward stroke. Its action thus causes the top of the pile of blanks to be kept at the same elevation until all the blanks are gummed and conveyed away, the friction-disks slipping back from the blows of the head to the amount of the overfeed, as already stated.

What we claim as our invention is—

1. In combination with the platform of an elevating mechanism for envelope-machines, a shaft, a wheel on the shaft, friction-disks for the wheel, a lever for operating the disk, and connections, substantially as described, between one of the disks and the shaft.

2. In an elevating mechanism for envelope-machines, a platform for holding the blanks, in combination with a shaft, a wheel on the shaft, friction-disks for the wheel, a head to strike the blanks, and connections, substantially as described, between one of said disks and the shaft.

3. In a machine for gumming blanks, a platform, in combination with a shaft connected with the platform, a wheel upon the shaft, friction-disks to turn the wheel, a lever to operate the disks, a spring to operate the lever, and connections, substantially as described, between one of the disks and the shaft.

4. In a machine for gumming sheets or blanks, a platform for the blanks, a shaft connected with the platform, a wheel on the shaft, friction-disks for the wheel, a lever to move the disks, a rod to move the lever, a spring on the rod, an adjusting-nut for the spring, and connections, substantially as described, between one of the disks and the shaft.

5. In a machine for gumming blanks, a platform, in combination with a shaft connected with the platform, a friction-wheel and disks on the shaft, a hand-wheel to turn the shaft, and connections, substantially as described, between one of the disks and the shaft.

6. In a machine for gumming paper blanks, a platform, in combination with a shaft connected therewith, a hand-wheel on the shaft, a notched or grooved hub on the shaft, cylinders in the grooves of the hub, springs for the cylinders, a ring to cover the grooves, and a wheel for the ring, substantially as shown.

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ROBERT ANDERSON.

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GEO. T. SMALLWOOD.

Witnesses to the signature of Robert Anderson:

JNO. DAVIDSON,
E. W. BLACKHALL.