

No. 661,019.

Patented Oct. 30, 1900.

C. S. McCONNAN.
TRAVERSING OR BUILDING DEVICE FOR FLIERS.

(Application filed July 17, 1900.)

(No Model.)

4 Sheets—Sheet 1.

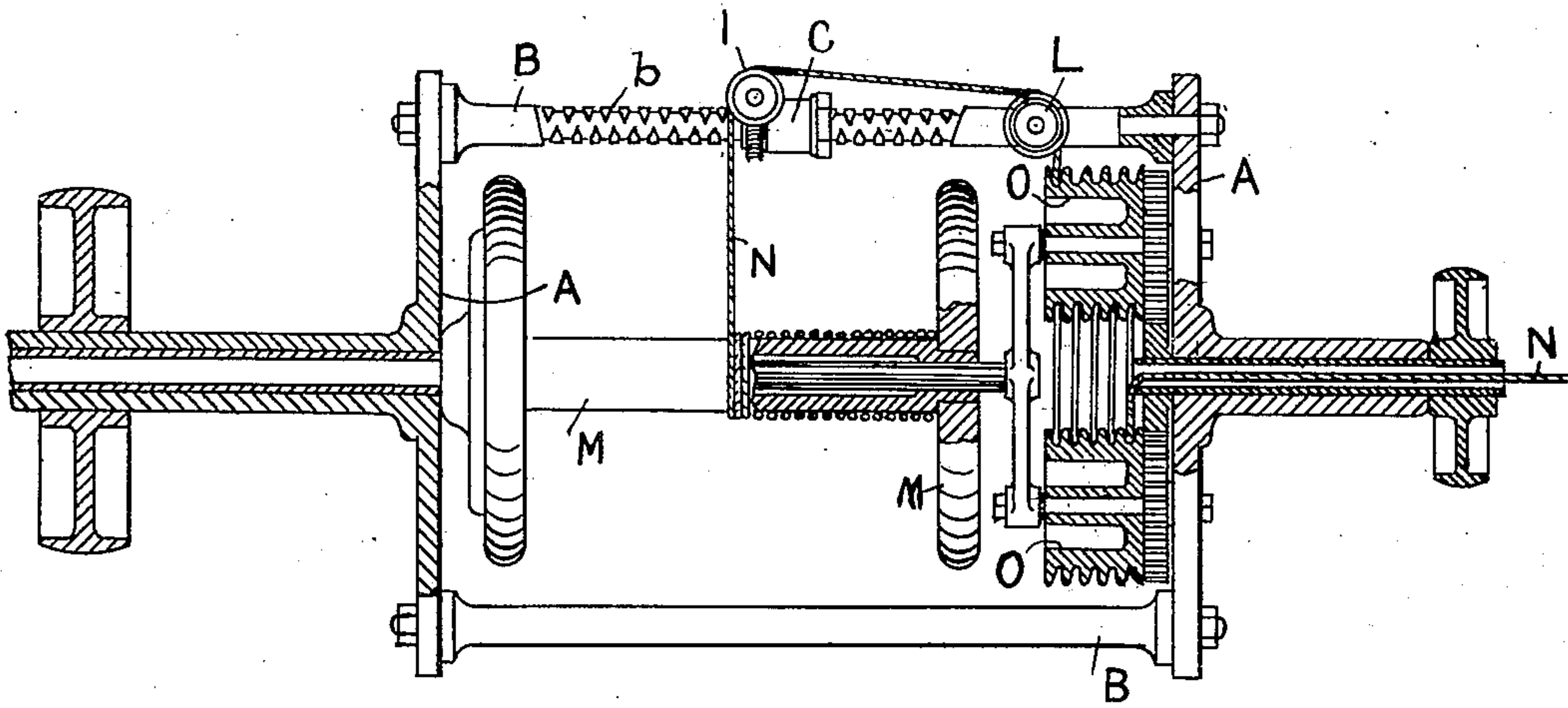


FIG. 1.

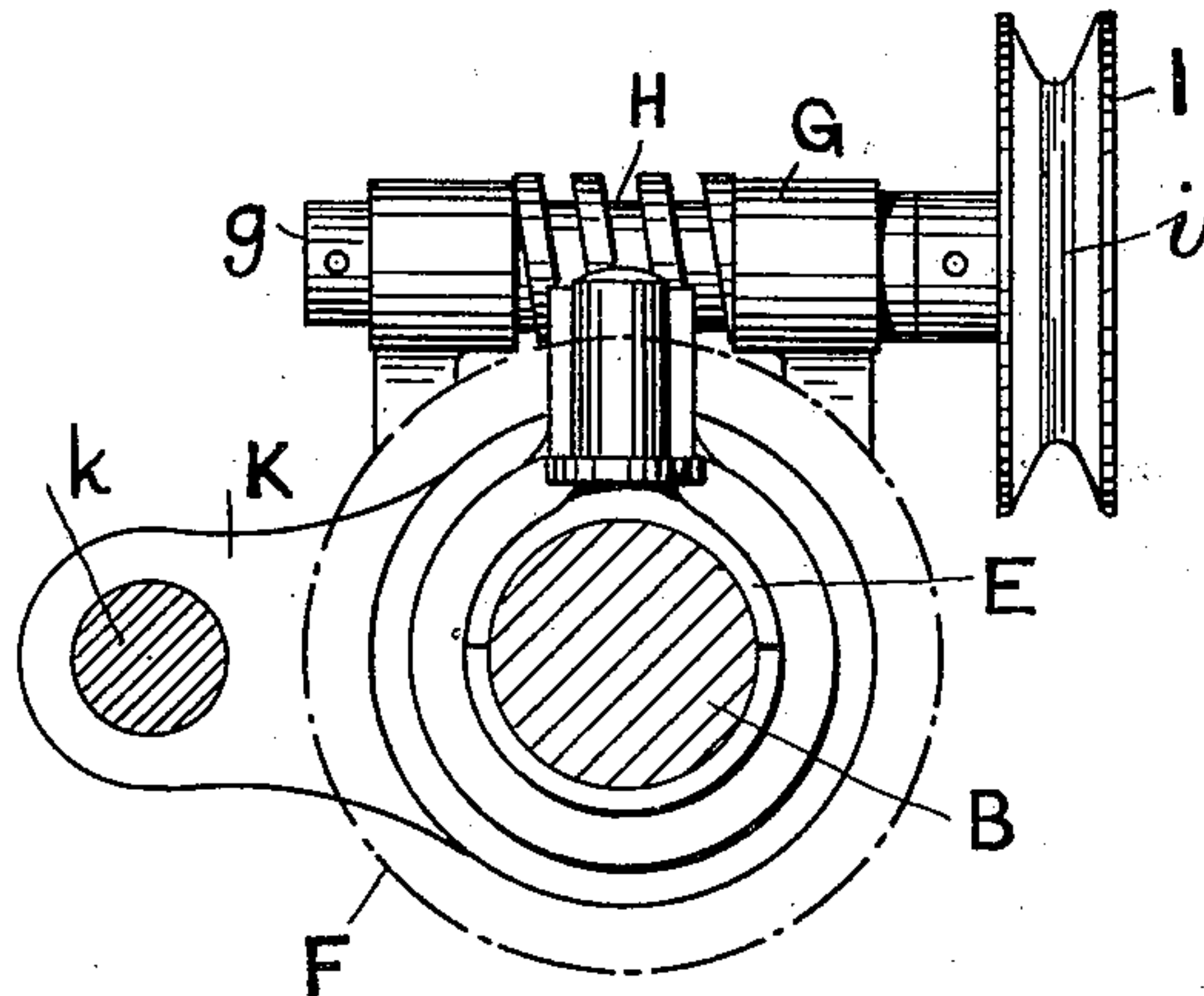


FIG. 2.

Witnesses
Geo. P. Kingsbury.

Cassell Deverance.

Inventor

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by Mason, Fenwick & Lawrence
his Attorneys.

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FIG. 3.

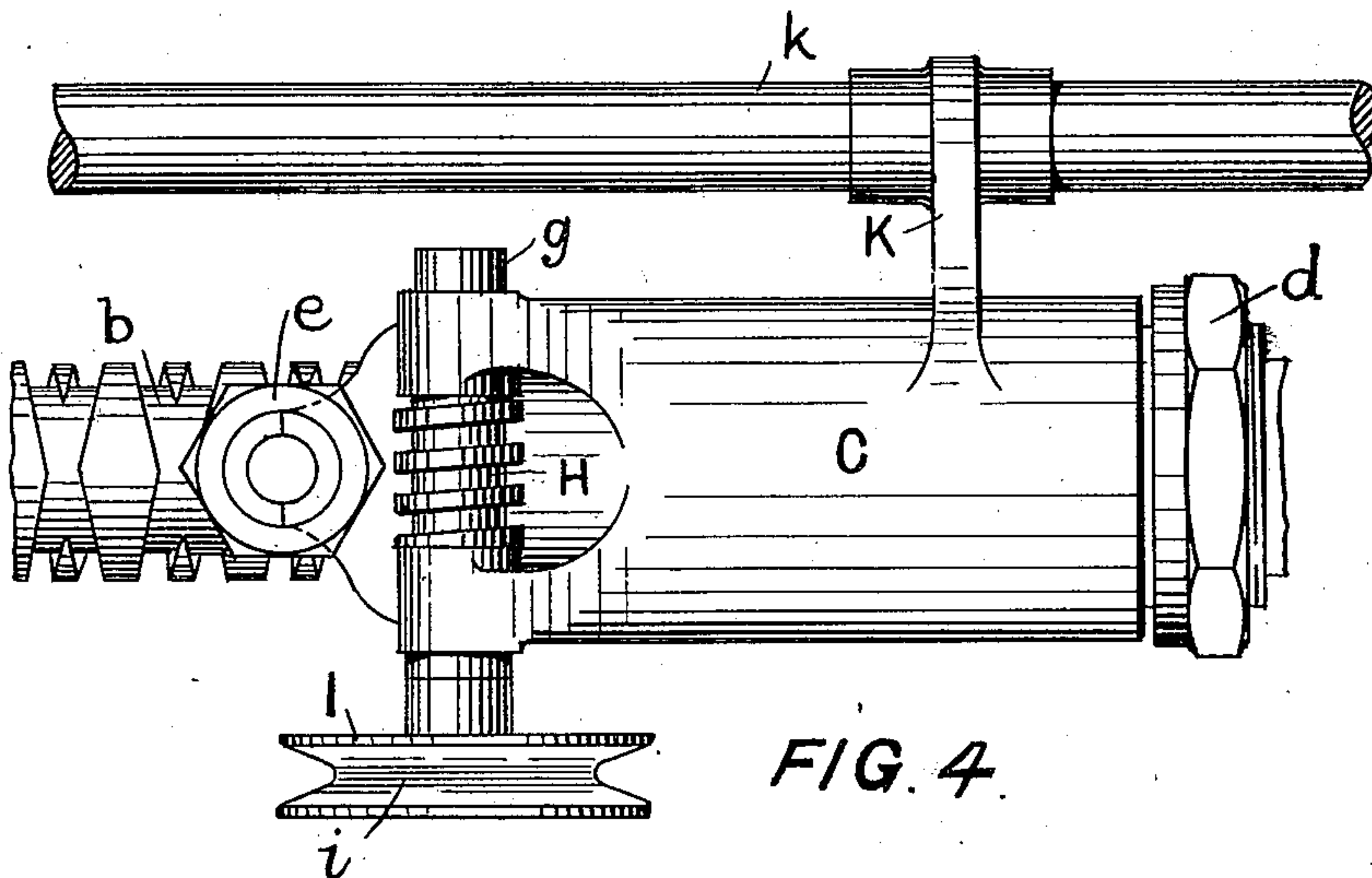
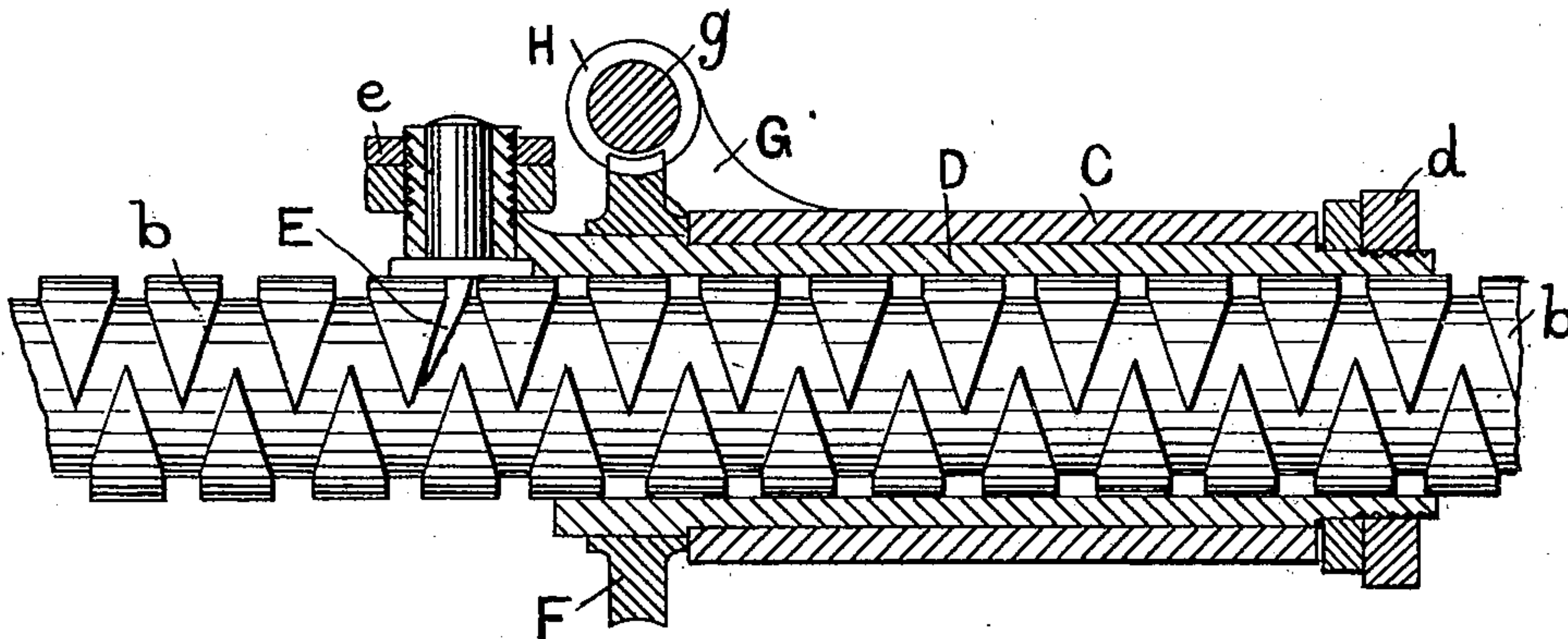


FIG. 4.

Witnesses

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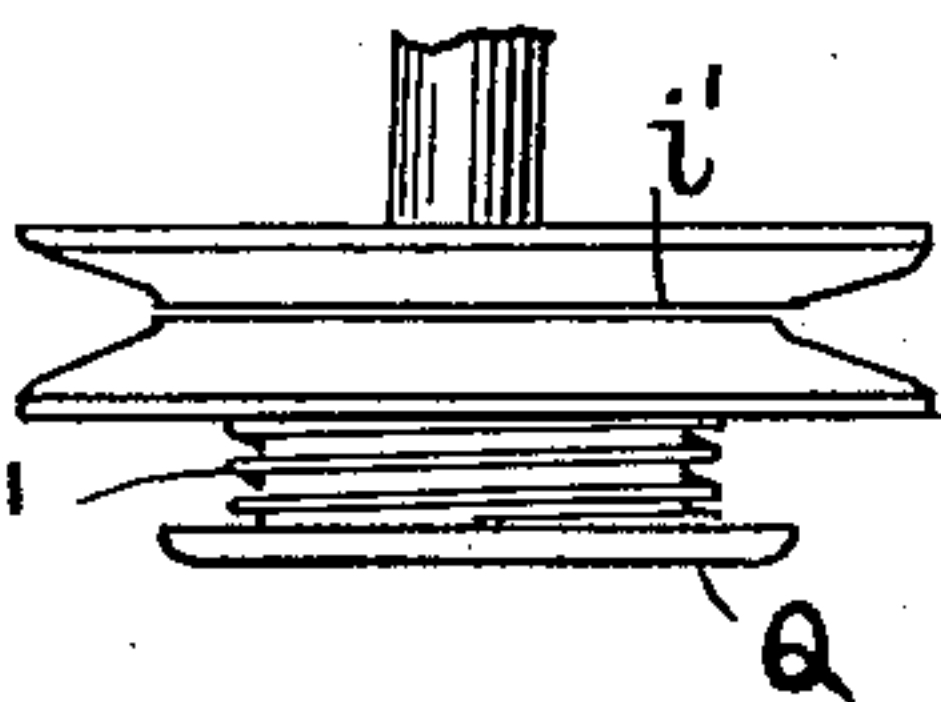


FIG. 5.

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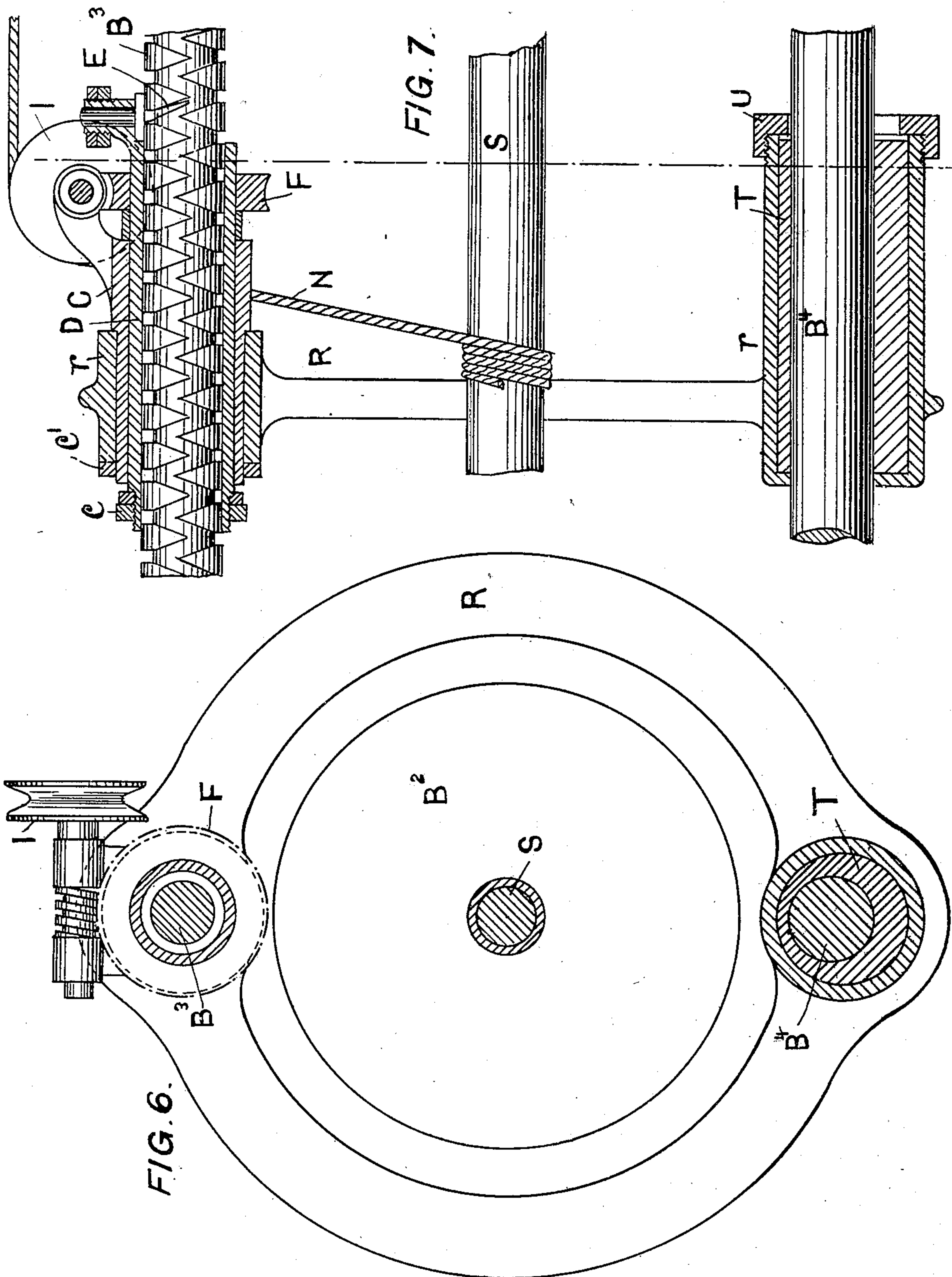
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4 Sheets—Sheet 3.



Witness

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FIG. 9.

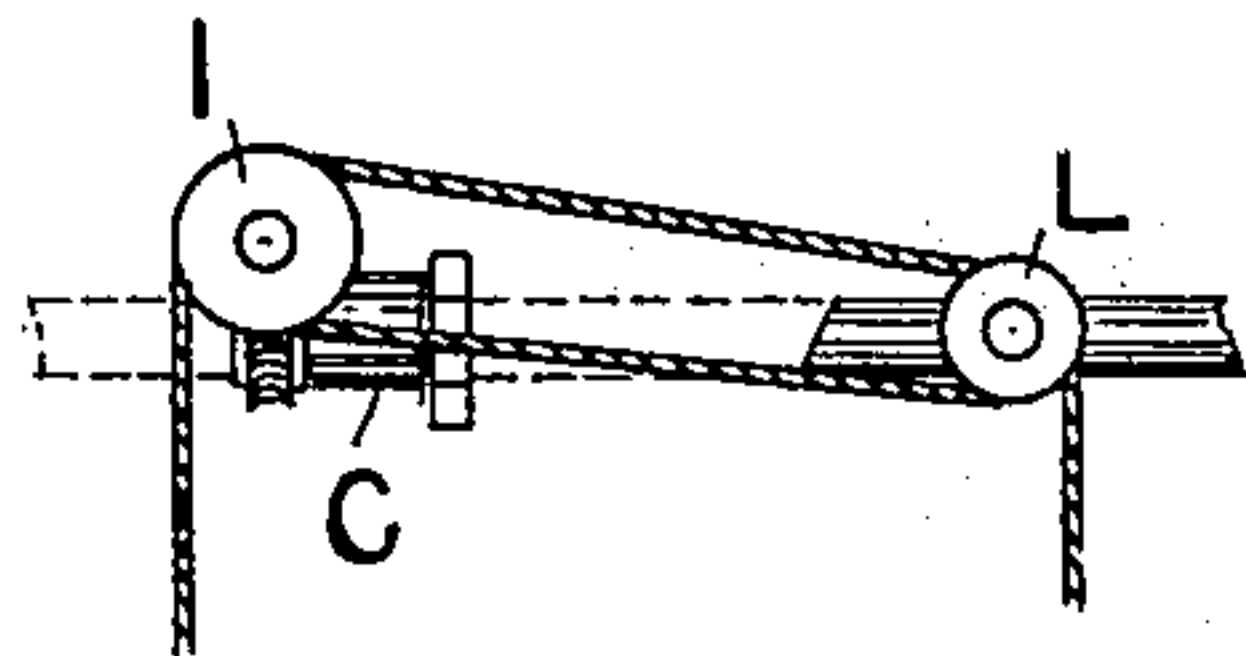


FIG. 8.

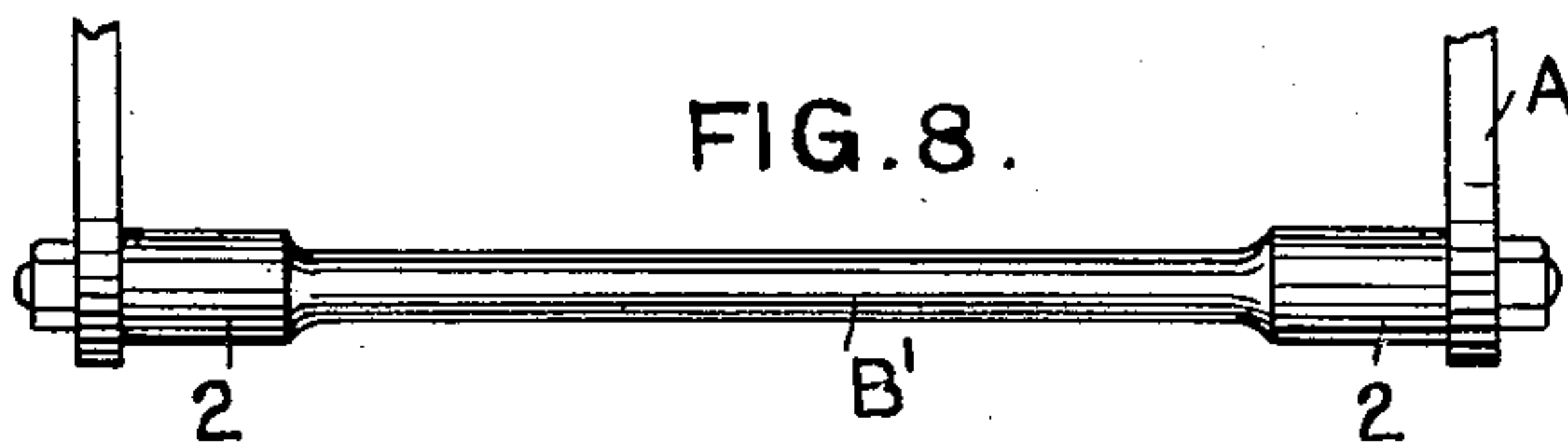


FIG. 10.

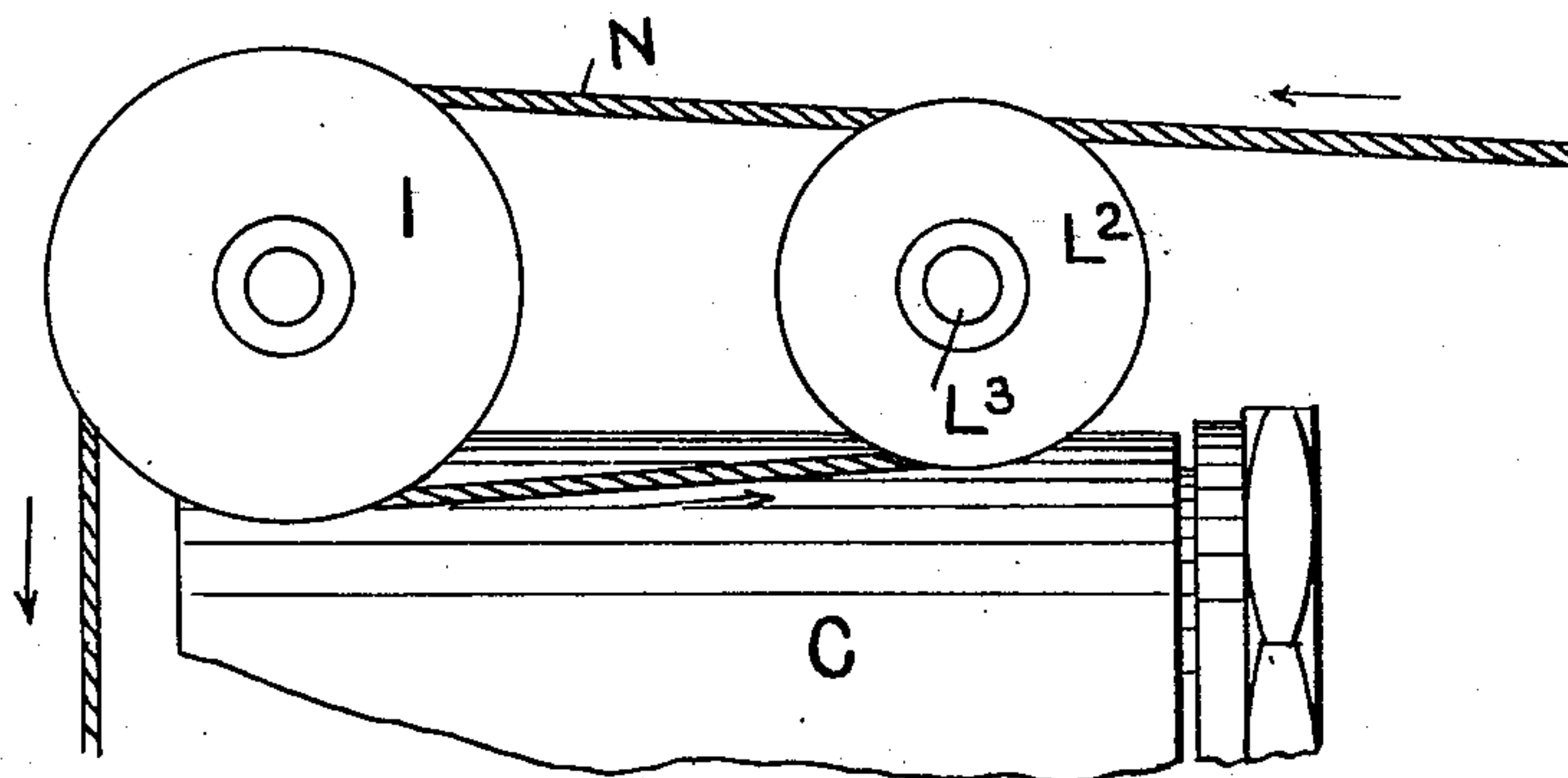
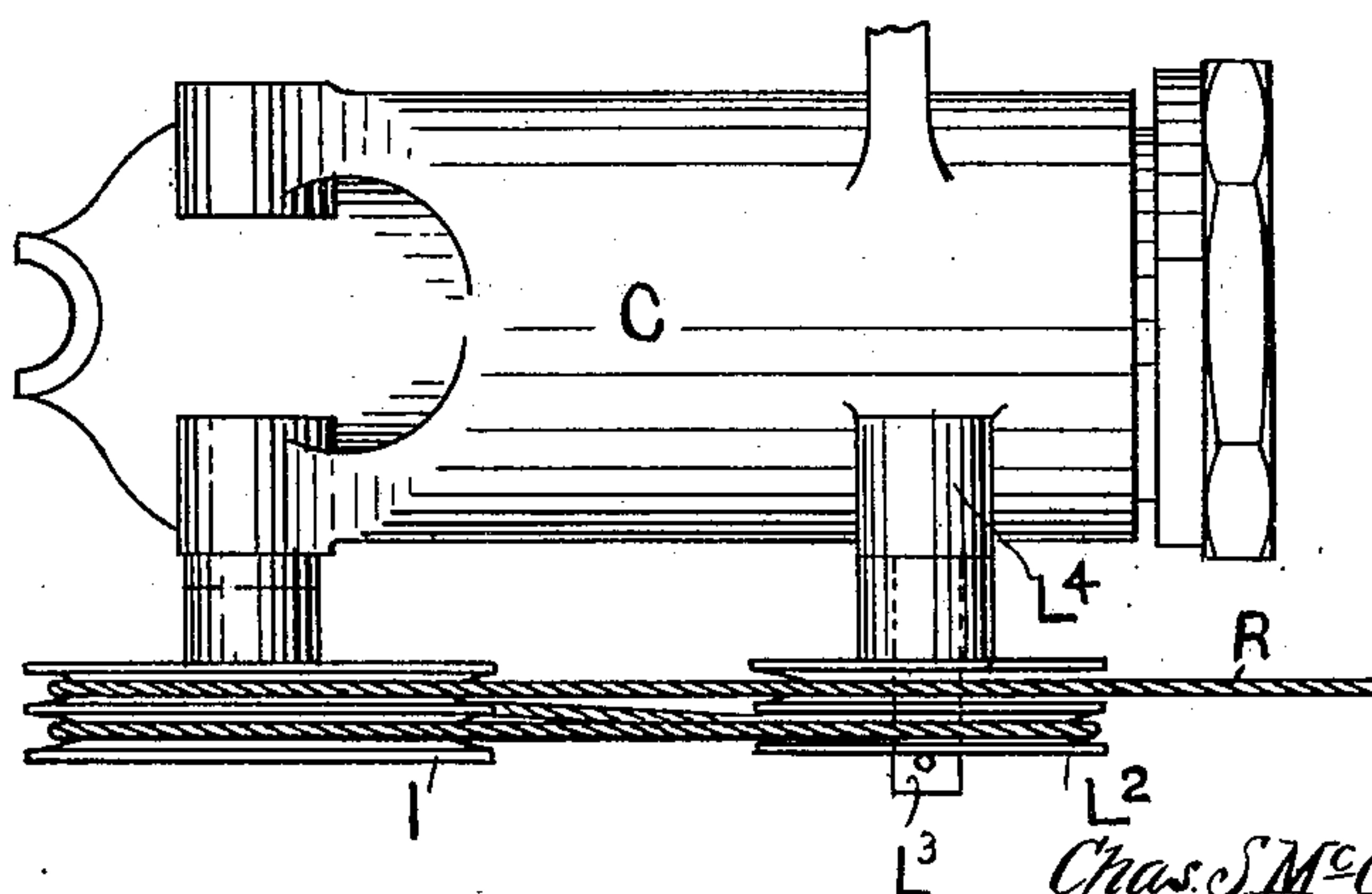


FIG. 11.



Witnesses

Geo. Kingsbury

Cassell Beverance

Chas S McConnan

Inventor

by Mason Fennick Lawrence atty

UNITED STATES PATENT OFFICE

CHARLES STODART McCONNAN, OF LIVERPOOL, ENGLAND.

TRAVERSING OR BUILDING DEVICE FOR FLIERS.

SPECIFICATION forming part of Letters Patent No. 661,019, dated October 30, 1900.

Application filed July 17, 1900. Serial No. 23,945. (No model.)

To all whom it may concern:

Be it known that I, CHARLES STODART McCONNAN, a subject of the Queen of Great Britain, residing in Liverpool, in the county of Lancaster, England, (whose postal address is 305 Edge Lane, Liverpool, England,) have invented certain new and useful Improvements in Traversing or Building Devices for Fliers, of which the following is a specification, and for which application has been made in Great Britain, (provisional application only,) dated November 11, 1899, No. 22,529.

This invention may be used for fliers employed in spinning and twisting and in cordage manufacture and for the spinning, twisting, or the like operation of any material in which the fibers of that material are strong enough for the purpose to be described. I consider my invention most applicable to cordage manufacture, principally to the forming of rope-strands and rope-making, and very suitable for making heavy cords and the like.

The invention will be described for a flier used in the spinning of rope-yarn, which will serve to illustrate my invention.

In the accompanying drawings, Figure 1 is a sectional elevation of a horizontal flier, showing the application of my invention; Fig. 2, a cross-section, on an enlarged scale, of the device for traversing the guide-pulley; Fig. 3, a longitudinal section thereof, and Fig. 4 a plan; Fig. 5, a detail view of a modification of the yarn-guide pulley; Figs. 6 and 7, my invention applied to a traverse-ring. Fig. 8 is a detail view showing a counterbalance-weight for the unthreaded rod of the flier. Fig. 9 is a detail view showing an arrangement for securing the requisite friction or grip between the yarn and the pulleys, so as to insure the driving of the traversing-motion by the running of the yarn. Figs. 10 and 11 are respectively a side elevation and a plan view of the carrier, showing a modification of the arrangement for insuring the driving of the traversing-motion by the running of the yarn.

My improvement is applied to apparatus of that kind in which the bobbin is not traversed, but the pulley or other device which conducts the yarn to the bobbin is made to move backward and forward longitudinally

with the bobbin-axis, and thus wind the yarn thereon. The manner in which the pulley is traversed so as to wind the yarn equally upon the bobbin constitutes, essentially, my invention.

The flier consists of the usual end disks A, with journals held together by two arms B, secured by nuts at ends in the usual way. Either or both of these flier-arms B, which are fixtures in the end disks, have a right and left hand traverse-screw *b*, with continuous threads cut on their outside diameters for the requisite amount of their length.

C is a sleeve or carrier, preferably solid, having a rotary bush D fitting and capable of sliding easily on the traverse-screw *b*. This bush D is secured in place by a shoulder at one end and by a nut *d* and washer at the other, so that it cannot separate from the sleeve.

E is a traverse web or tongue mounted in and secured by means of nuts *e* in a split boss on the bush D, said web or tongue engaging in the threads of the traverse-screw *b*, so that the bush on being rotated will travel to and fro along the screw and set up a traversing movement of the carrier.

F is a worm-wheel firmly secured to and concentric with the bush D.

G is a bracket on carrier C, on which there is mounted a traverse-spindle *g*, and on this traverse-spindle there is mounted a worm H, which engages in the worm-wheel F. At one end of the spindle G is a yarn-guide pulley or sheave I, made solid with correctly-shaped groove to enable the material to properly grip it, which conducts the yarn to the bobbin.

On the carrier or sleeve C there is cast or otherwise formed a lug K, so shaped as to slide on the rod *k* as the sleeve slides to and fro on the traverse-screw *b*. This rod *k* is fixed in close proximity to and parallel with the flier-arm B and held to each end disk of the flier, preferably in the same manner as the flier-arms are fixed—namely, by screwing the ends of same and holding with nuts. The purpose of this rod or guide is to resist the pull of the yarn and to hold and retain the carrier with its yarn-guide in the required position. It forms, however, no obstacle to the carrier moving backward and forward longitudinally the length of the bobbin or its

rotating with the flier-arms concentrically around the bobbin.

O indicates the usual hauling-pulleys for drawing the yarn into the flier.

5 I propose to make the carrier and inner loose bush and perhaps other parts of aluminium or the alloy of aluminium and magnesium, so as to have the weight of my traverse-motion at a minimum lightness, being
10 essential on account of the high speed I may run this flier.

N is the yarn or other material being twisted.

If both the flier-arms be threaded and fitted with carriers, the flier is counterbalanced, one side being no heavier than the other. If, however, only one flier-arm be threaded, then in that case the unthreaded one B' is counterweighted at 2, as seen in
20 Fig. 8, so as to balance the other arm and its traversing device.

The mode of action is as follows: The yarn N passing from the capstans runs over guide-pulley L, mounted on a pin at one end of the
25 flier-arm B in the usual way, and then passes over the aforesaid guide-pulley I to the bobbin M. Now this pulley has its groove *i* so formed that the yarn while running over its periphery will also drive it and impart to the
30 aforesaid spindle *g* a rotary motion. This spindle will in turn by means of its worm H drive at a slower speed the aforesaid worm-wheel F, which being fixed to the bush will rotate it. The bush holds the traverse web
35 or tongue E, that works in the continuous threads of the right and left hand traverse-screw on the flier-arm, and thus as the bush is rotated by the guide-pulley it moves to and
40 fro along the screw on the flier-arm traversing the carrier C with its yarn-guide pulley longitudinally with it, and thereby traversing the yarn on the bobbin, so that it will be wound equally along the latter. The carrier itself, with its yarn-guide, is prevented
45 from being dragged over by the pull of the yarn by means of the guide-bar *k* and lug K or ring *r*, as herein described, or other convenient means, while the bush D is free to rotate inside the carrier, thus insuring that the
50 guide-pulley shall move up and down longitudinally of the traverse-screw in a straight line. It will be seen, therefore, from the above description that the motion of the pulley I to and fro longitudinally of the flier distributes the twisted material equally along
55 the bobbin, and thus motion is produced not by any revolution of the right and left hand screw, which in my invention is held perfectly stationary, but by the running of the
60 yarn or other material itself. Gearing is detrimental to high speeds, and by this invention, there being no gearing required to drive the traverse-screw, I am able to secure a
65 higher speed, and, furthermore, the machine is considerably simplified and is much shorter in length than in cases where the bobbin is made to travel in the direction of its axis.

In Fig. 5 a modification of the yarn-guide pulley is shown. This is used in case the material being twisted is so fine that it will not
70 drive my traversing mechanism on solid pulley I of itself. This consists of the pulley I, split at *i'* and provided with a spring I', which can be adjusted by means of a thumb-nut Q, thus enabling the requisite grip between the
75 yarn and the pulley to be obtained.

If desired, there may be more than one groove in the pulleys I and L and the yarn or other material taken several times backward
80 and forward over these pulleys, as shown in Fig. 9, thus insuring the driving of the traversing-motion by the running of the yarn. In such case the pulley I has by preference two V-shaped grooves and the pulley L, the same. The yarn is taken from the capstans
85 to one groove on pulley L, passed partly around it, and carried to a groove on pulley I, then returned to the other groove in L, and forward again to the groove in I, and from thence to the bobbin. Instead of the pulley
90 L having two or more grooves it may have a single groove and a loose pulley L² with grooves provided on the carrier C', adjacent to the pulley I, as shown in Figs. 10 and 11. The pulley L² is loose on the pin L³, which is
95 screwed into a small post L⁴, cast or attached to the carrier. The yarn N is run from pulley L around one groove of pulley I and then back to a groove in pulley L², and so forward again to the other groove in pulley I, and from
100 thence to the bobbin.

Instead of using the guide-rod *k* for holding the carrier in position I may employ a traverse-ring R, arranged with my traverse motion as shown in Figs. 6 and 7 of the accom-
105 panying drawings, wherein the same letters of reference apply to the same or like parts throughout. B² is the bobbin end, S the spindle, and B³ and B⁴ the flier-arms, one of which, B⁴, is plain and the other, B³, formed with a
110 right and left hand screw with continuous threads. The carrier C is fitted in a sleeve at one side of ring R and secured in place by a nut *c'*, while inside the carrier is the bush D on the flier-arm B, and on this bush is se-
115 cured the worm-wheel F. I is the yarn-guide pulley, and N the yarn or other material being wound. The opposite side of ring R has mounted within its sleeve an eccentric bush T on the plain flier-arm B⁴. This eccentric
120 bush allows for adjustment, as if the arms B³ or B⁴ expand owing to centrifugal force and the ring is traveling on the middle portion of the flier, the bush T being loose, said bush turns automatically partly around and ad-
125 justs itself, preventing the ring R from jamming on the flier-arms and permitting the easy sliding of the ring R—that is to say, the point at mid-length of each flier-arm will of course expand the most and all points along
130 each half-length of the flier-arm will gradually expand less until the ends of the flier-arm are reached, where there will practically be no expansion due to centrifugal force—

and it will be clearly understood the object of this eccentric bush is to provide a self-adjusting means whereby this above-described varying expansion along the flier-arm may be automatically compensated for in order to avoid the ring *r* being wedged on the flier-arms, and this bush is kept in position by means of a nut-cover *U*. If necessary, a spring may be fixed between the eccentric bush *T* and the sleeve in which it is fitted in such manner that when the ring is in that position where the flier-arms do not expand—namely, the ends—the ring will be automatically returned to its normal position and adjust itself continually according to the position of ring *R* on the flier. The eccentric bush *T* and its containing-sleeve are of such a length and weight as to counterbalance my traverse-movement on the opposite side of the flier.

It will be readily understood that my traverse-motion, as hereinbefore described, may be applied with advantage to existing machines.

I declare that what I claim is—

1. An apparatus for spinning or twisting yarns or other material, comprising fliers, a bobbin arranged between them, a guiding-pulley adapted to be moved backward and forward along one of the fliers for conducting the material to the bobbin, mechanism operated by the said pulley for feeding the same longitudinally with respect to the bobbin, whereby the material will be fed evenly from one end of the bobbin to the other, substantially as described.

2. An apparatus for winding or twisting yarn or other material, comprising a bobbin, fliers arranged on either side thereof, a guiding-pulley for directing the material to the bobbin, and mechanism interposed between the said pulley and one of the fliers, whereby the passage of the material over the pulley will operate to feed the said pulley back and forth upon the flier, substantially as described.

3. A mechanism for twisting or winding yarns, comprising a bobbin, one or more fliers, a sleeve adapted to engage screw-threads upon a flier, gearing carried by the said sleeve, a guide-pulley for guiding the material to the bobbin, the said pulley being connected to the gearing so that the material in rotating the pulley will operate the gearing and feed the sleeve back and forth upon the flier opposite the bobbin for delivering the material evenly thereto, substantially as described.

4. An apparatus for winding yarn or the like, comprising a bobbin, fliers arranged outside the same, a rotating sleeve, screw-threads formed upon one of the fliers, the sleeve engaging the same, means for preventing the sleeve from turning on the flier, a guide-pulley carried by the sleeve for directing the yarn to the bobbin, gearing connecting the pulley

with the screw-threads upon the flier, the structure being such that as the material passes over the pulley it will operate the gearing to feed the sleeve back and forth on the flier, substantially as described.

5. An apparatus for winding or twisting yarn, comprising a bobbin, fliers arranged outside the same, a traverse-ring mounted on a flier, a sleeve carried by the said ring, back-and-forth screw-threads formed on one of the fliers, a guide-pulley carried by the sleeve and adapted to engage the threads on the flier, whereby the sleeve will be fed back and forth on the same, the said traverse-ring operating to prevent the sleeve from turning around the flier, substantially as described.

6. An apparatus for twisting or winding yarn and the like, comprising a bobbin, fliers arranged outside the same one of said fliers being provided with back-and-forth screw-threads, a traverse-ring mounted on a flier, a sleeve carried by the ring and surrounding the screw-threaded flier, a counterbalancing-eccentric mounted upon the smooth flier and adapted to automatically accommodate said traverse-ring to the swinging of the flier under centrifugal force, substantially as described.

7. An apparatus for winding or twisting yarn, comprising a bobbin, fliers mounted outside the same, one of said fliers being provided with back-and-forth screw-threads, a sleeve surrounding the screw-threaded flier, means for preventing the same from turning around the sleeve, a bushing mounted in the sleeve and having a web engaging the threads of the flier, a gear-wheel for turning the bushing, a worm engaging the said gear-wheel, and a pulley for turning the worm, the said pulley being arranged to guide the yarn to the bobbin, the structure being such that the yarn, through the agency of the said pulley, will cause the sleeve to be fed back and forth on the threaded flier, substantially as described.

8. An apparatus for twisting or winding yarn, comprising a bobbin, fliers arranged outside the same, a guide-pulley mounted on one of the fliers, gearing connecting the said pulley with screw-threads formed on a flier, two or more grooves arranged in the periphery of the pulley around which the yarn may be passed two or more times for obtaining a positive grip upon the same, the structure being such that the yarn passing over the pulley will cause the said pulley to be moved back and forth on the said flier, substantially as described.

In witness whereof I have hereunto signed my name, this 5th day of July, 1900, in the presence of two subscribing witnesses.

CHARLES STODART McCONNAN.

Witnesses:

JOSEPH J. ROYDEN,
W. H. BEESTON.