

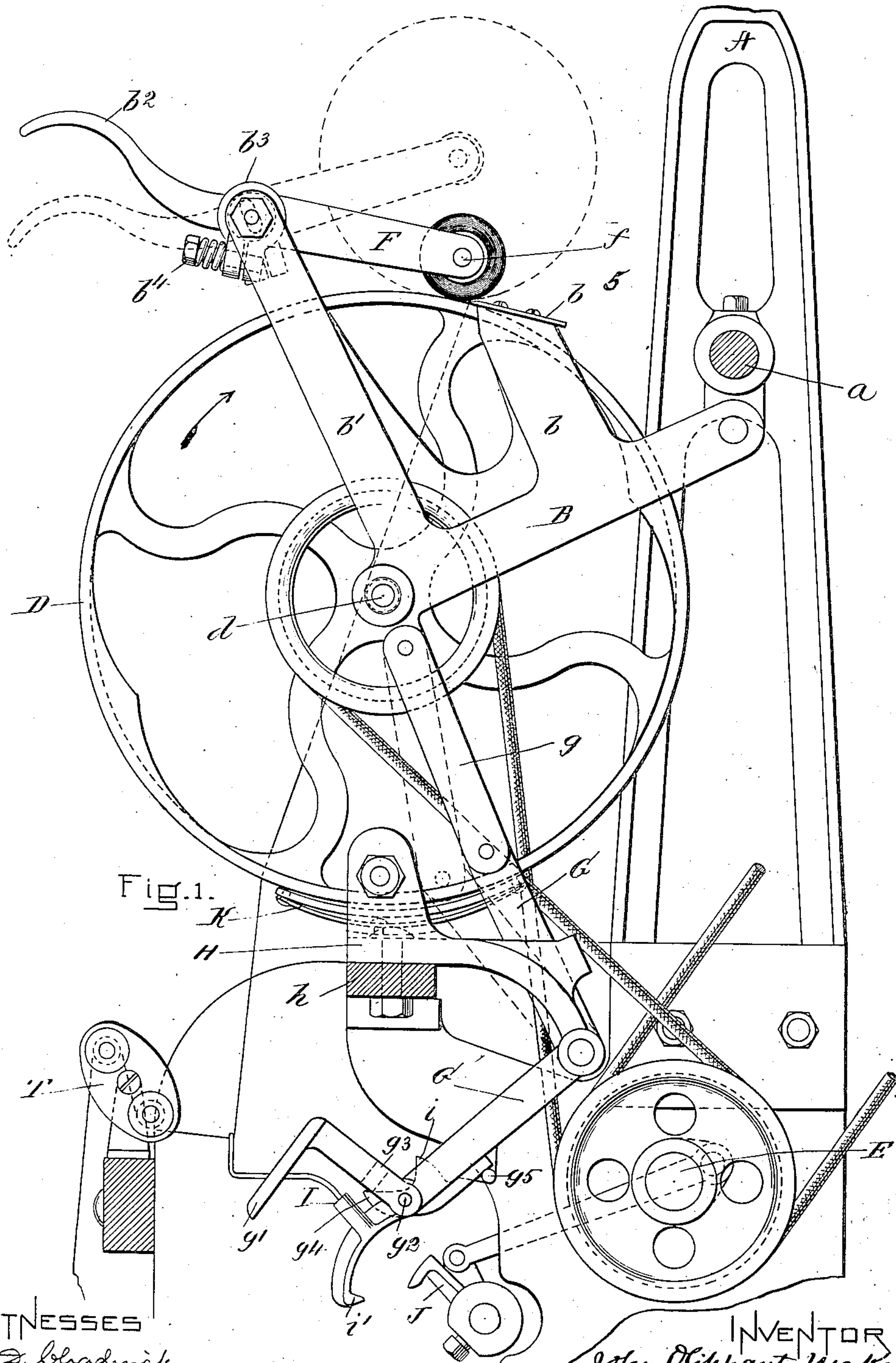
No. 829,886.

PATENTED AUG. 28, 1906.

J. O. McKEAN.  
WINDING MACHINE.

APPLICATION FILED JUNE 30, 1905. RENEWED JULY 26, 1906.

3 SHEETS—SHEET 1.



WITNESSES  
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Margaret A. Daniker.

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John Oliphant Maclean  
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his attorneys.

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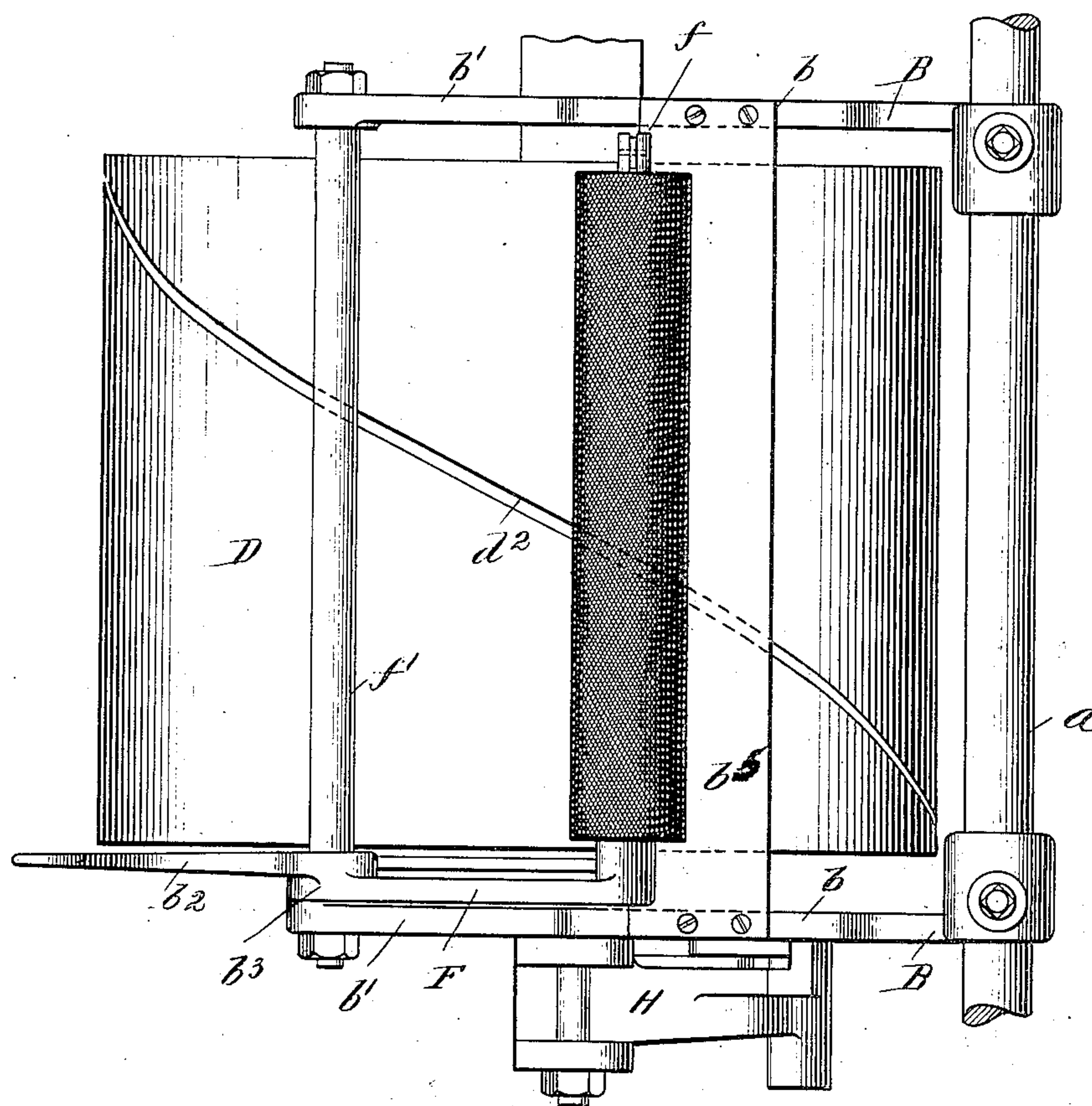


Fig. 2.

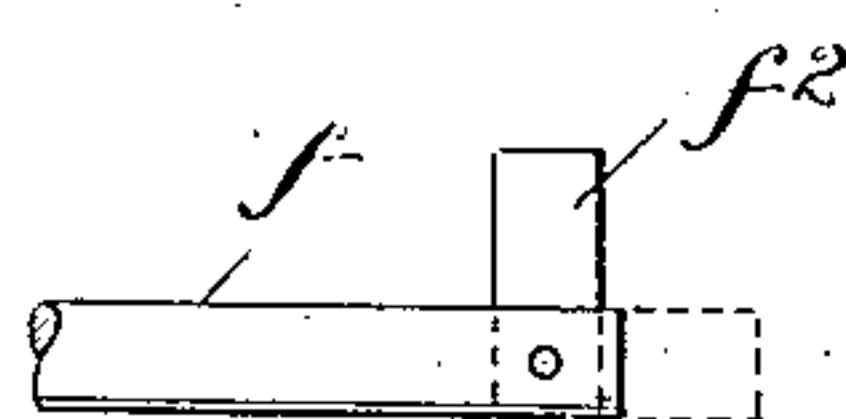


Fig. 5.

WITNESSES

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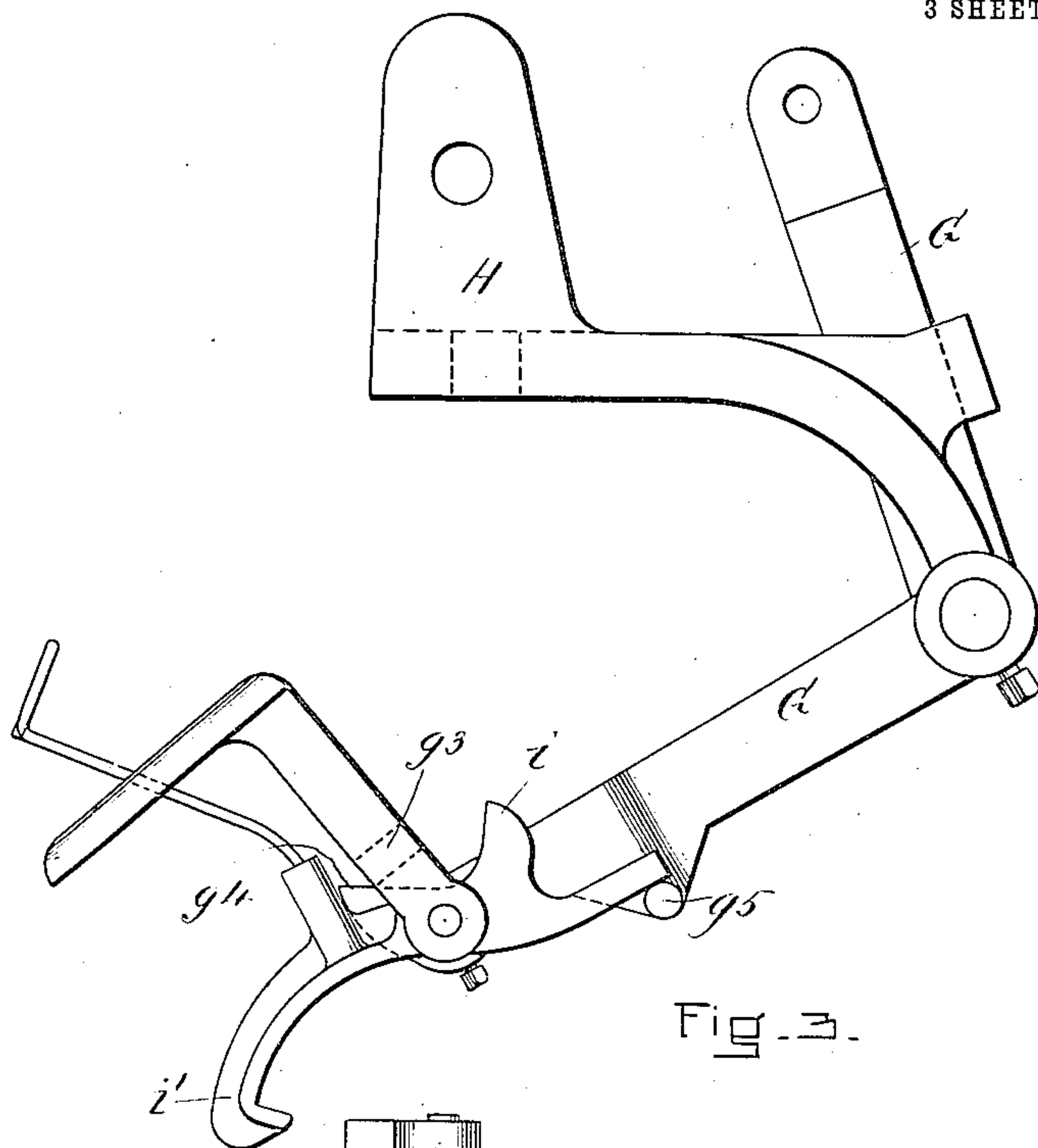


Fig. 3.

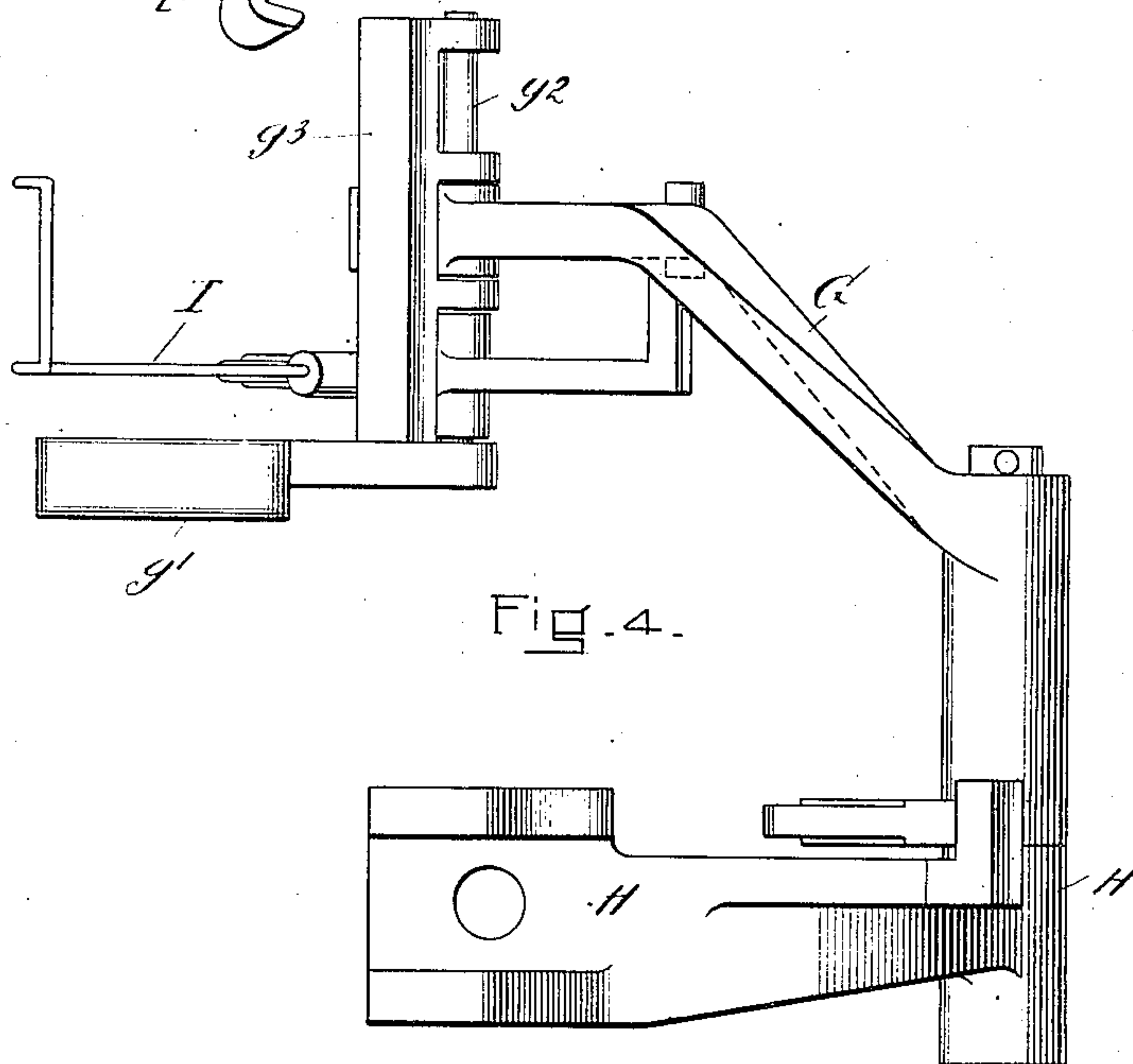


Fig. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN OLIPHANT McKEAN, OF WESTFIELD, MASSACHUSETTS.

## WINDING-MACHINE.

No. 829,886.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed June 30, 1905. Renewed July 26, 1906. Serial No. 327,963.

*To all whom it may concern:*

Be it known that I, JOHN OLIPHANT McKEAN, a citizen of the United States, and a resident of Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Winding-Machines, of which the following is a specification.

My invention relates to mechanism more especially designed for winding yarn or thread in a cylindrical or conical form onto "quills" of cardboard or the like which have no heads and in which the thread mass is retained in shape upon the quill by laying the thread in long open spirals from one end to the other and back again, each thread laid in one direction crossing and binding down the threads previously laid in the opposite direction—that is to say, the mechanism I describe is what is known as a "quick-traverse" machine for laying self-binding cops as distinguished from those mechanisms which lay successive spirals close together and which required a head upon the core on which the thread mass is built in order to retain the ends of the mass in position.

The object of my invention is to organize the parts of the machinery in such fashion that the length of thread between the surface of the cop and the thread-guide shall be very short and shall remain substantially uniform throughout the building of the cop at all sizes of the cop, and to provide, further, means which upon the breaking of the thread shall cause the cop to cease to rotate.

To this end the invention consists, essentially, in a driving-drum by means of which the thread mass and the spindle upon which it is mounted is rotated by the surface contact of the thread mass and the driving-drum, the drum having an oblique or helical slot formed in its periphery through which the yarn or thread passes and by which the thread is moved longitudinally of the thread mass on which the thread is being wound. This slot may be formed of any desired shape to lay thread, as desired. If the slot is generated by rotating a cylindrical drum once and moving a point at a uniform speed in contact with the drum one complete reciprocation while the drum is rotated once, the resulting slot will lay the thread in a uniform spiral on the cop. By increasing the pitch of the slot at the ends or either end or in the middle the movement of the thread will be correspondingly increased, so that by varying

the shape of the slot the resulting lay of the thread may be effected as desired. In laying conical cops a conical driving-drum is employed and a correspondingly-shaped quill or tube, as is fully set forth in patent to Hill and Brown, No. 32,245, dated July 21, 1885, and in building conical cops it is desirable to increase the pitch of the thread-actuating slot toward the small end of the drum, as is set forth in that patent.

In the drawings a machine is illustrated in which only one cylindrical drum is employed to wind a single cop; but it will of course be understood that in practice the machines consist of a multiplicity of drums either cylindrical or conical, as desired, driven from a common power-shaft. As, however, each drum and its associated parts is a duplication of every other drum, I have shown only one drum and its associated parts in the drawings.

In the drawings, Figure 1 is a side elevation, partly in section, of a winding-machine embodying my invention. Fig. 2 is a plan view of the drum and its associated parts. Fig. 3 is a detail, on a larger scale, of the angular lever G and its associated parts. Fig. 4 is a plan view of Fig. 3. Fig. 5 is a detail of the spindle, showing the quill-retaining means.

In the drawings, A is the main frame of the machine upon which are mounted and sustained the moving parts. Adjustably secured to a longitudinal member *a* is a swinging frame B, having upwardly-projecting members *b* and *b'*. The free end of the swinging frame B carries the shaft *d*, upon which the drum D freely rotates, the drum D being actuated by a belt from the power-shaft E, as will be plain. To the upper end of the projections *b* is secured a plate *b<sup>5</sup>*, which is held almost in contact with the surface of the drum D. (See Fig. 1.) The drum D is formed in two parts, the opposed ends of which nearly touch, but leave a suitable space forming a slot *d<sup>2</sup>*. (See Fig. 2.) At the upper end of the member *b'* is mounted a swinging arm F, the inner end of which carries a spindle *f*, upon which is carried free to rotate the cop tube or quill. The quill is retained upon the spindle by a hinged retainer *f<sup>2</sup>*, which is controlled by a knife-blade spring, so that it may be thrown out straight to receive the quill upon the spindle and then thrown up at a right angle to the spindle, as shown in Fig. 5, to retain the quill upon the spindle. The arm F is mounted on a rod *f'*, adjustable in a slot in the upper end



of  $b'$ , the portion of the rod within the slot being squared, and a handle  $b^2$  is provided by which the cop may be swung from the surface of the drum D. The hub  $b^3$  of the arm  
 5 F is split and clasps the rod  $f'$ , and a screw-threaded bolt  $b^4$  passes through the two halves of the split hub and serves to give a frictional action to the hub  $b^3$  upon the rod  $f'$ , which may be graduated at will, so that the move-  
 10 ment of the quill away from the drum D as the cop grows may be had against any desired frictional resistance.

It is desirable that when the thread breaks or runs out in the winding process the machine should be stopped, and to this end I  
 15 have provided a stop-motion. It will be seen, Fig. 1, that the arm B is supported by a toggle member consisting of an angular lever G and a link  $g$ . The lever G is carried by a  
 20 bracket H, fast to a longitudinal member  $h$  of the frame. At the free end of the lever G is a swinging handle  $g'$ , pivoted upon a transverse pin  $g^2$ , carried at the free end of the lever G, and this handle has a projecting bar  $g^3$   
 25 extending to one side. On this pin  $g^2$  is also pivoted a drop-bar I. Upon the extreme outer end of the lever G is a stop  $g^4$ , which limits the downward fall of the pivoted handle. The movements of the drop-bar are  
 30 limited in one direction by a stop  $i$ , which engages the bar  $g^3$ , and in the other direction by a stop  $g^5$  on the lever G. The drop-bar carries at its outer end a hook  $i'$ . In opera-  
 35 tive relationship with the hook  $i'$  is an oscillating hook J, actuated by a connecting-rod and crank motion from the power-shaft of the machine. (See Fig. 1.) Supported on  
 the member  $h$  beneath one end of the drum D is a brake K.

40 The mode of operation is as follows: As shown in Fig. 1, the machine is supposed to be in operation. The toggle members G  $g$  having been thrown into line, the drum D on the swinging frame B is raised from the brake  
 45 K and the belt between the power-shaft and the drum D is tightened, causing the drum D to rotate in the direction of the arrow. The quill carried at the inner end of the frame F is pressed against the surface of the revolving  
 50 drum. The thread is passed through the tension member T into the slot on one side of the drum, through the drum, and out of the slot in the other side of the drum, one side of the thread against the edge of plate  $b^5$ , the thread  
 55 then passing to the quill. In passing from the tension member T to the drum the thread is hooked under the drop-bar I, holding the swinging hook  $i'$  out of the path of the oscillating hook J. The rotation of the drum D  
 60 coacting with the edge of the plate  $b^5$  causes the thread to be guided longitudinally of the quill from one end of the quill and back again, so that the slot in the drum and the plate  $b^2$  form together a thread-guiding means for lay-  
 65 ing the thread. This thread-guiding opera-

tion is, as shown in the patent to Hill and Brown, No. 332,951, dated July 21, 1885, upon which my present invention is an improvement. As the cop grows it is obvious that the quill upon which it is formed must  
 70 be pressed away from the surface of the drum by the increment of thread, and this action is resisted to any desired extent by the braking action of the split hub  $f^3$ . The cop may be  
 75 removed from the surface of the drum at any time, if desired, by depressing the handle  $b^2$  of the frame F, which will swing the cop upward. It will be observed that the move-  
 80 ment of the cop swinging upon the frame F is to the front of the machine—that is, away from the frame. In the Hill and Brown patent above mentioned and in all other machines of the same type the cop has been piv-  
 85 oted to swing toward the frame—that is, toward the direction in which the drum rotates and toward the plate, which served as one member of the thread-guiding means. The effect of this was that as the cop grew in  
 90 size and the quill swung upward the center of the cop moved over the thread-guide plate and caused the distance between the operative edge of the thread-guide plate and the point upon the surface of the cop where the  
 95 thread seated itself to lengthen somewhat, so that at the end of the reciprocation of the thread thereon when the thread was reversed a loose loop of slack thread was formed which  
 100 tended to throw out over the ends of the cop and become broken or abraded, and the ends of the cop in consequence were imperfectly formed. It is obviously desirable in a self-  
 105 binding cop that the thread should be delivered upon the surface of the thread mass as closely as possible and placed and held in place where it is laid and that any play of  
 110 the thread between the thread-guide and the surface of the cop is an undesirable feature where the thread is reversed in direction with great rapidity. The organization of parts which I have shown in the drawings is such  
 115 that the swing of the cop as it grows is in a direction away from the operative edge of the thread-guide plate  $b^5$ , so that any increasing in length of the thread between the thread-  
 120 guide plate and the surface of the cop is counteracted by the movement of the center or quill of the cop in a direction opposite to what has commonly been practiced. The result of this organization of parts is that the  
 125 length of the thread between the edge of the thread-guide plate and the surface of the cop is maintained practically uniform and as short as is practicable. When the thread breaks or when the thread runs out, owing to the exhaustion of the source of supply, the  
 130 drop-bar I will be released and the hook  $i'$  will by gravity be moved into the path of the oscillating hook J. The drop-bar I being pivoted to the end of the lever G, the lever G will be immediately pulled down at the next



reciprocation of the hook J, and the toggle-joint formed by the members G and *g* will be broken and the drum D will fall upon the brake K, the driving-belt being by the same action slackened, so that the drum D will have no tendency to rotate farther. To restart the machine, the operator lifts the handle *g'*, pulling up the lever G until the members G and *g* are in line or a little beyond the dead-center. In this action the bar *g*<sup>3</sup> engages the stop *i* on the drop-bar I and lifts the hook *i'* out of the path of the hook J, and the thread thereafter supports the weight of the drop-bar I so long as the thread continues to pass under the drop-bar.

In the practical operation of a winding-machine such as I have described it is highly desirable that when the machine is first put in operation the drop-bar be held up until any slack thread has been wound and the thread is in condition to support the drop-bar, to the end that the drop-bar may not remain down with its hook in the path of the reciprocating member. To effect this, the swinging handle *g'* on the toggle member is provided with the laterally-extending bar *g*<sup>3</sup>, which engages with the stop *i* on the drop-bar and lifts the drop-bar and its hook when the toggle member is raised and set by means of the swinging handle. The handle is held momentarily after the toggle member is set, thus supporting the drop-bar until the thread is taut, and when released the handle falls and is stopped by the stop *g*<sup>4</sup> on the end of the angular lever G, leaving the drop-bar supported by the thread or yarn. It is obvious that by adjustment of the point of support of the swinging frame F the arc of movement of the quill may be governed as desired.

I claim—

1. In a winding-machine, a rotating driving-drum, having a thread-actuating slot; a plate coöperating with the slot to control the laying of the thread; a swinging support for the cop pivoted to swing the center of the cop, as the cop grows, away from the operative edge of the thread-plate, all organized and operating substantially as described.

2. In a winding-machine, a driving-drum adapted to actuate a cop; a toggle member to

support the drum in operative position; a moving member in operative relation with the toggle member; a member, carried by the toggle member and normally held during the operation of the machine, by the thread, and passing into engagement with the moving member when the thread ceases to support it, to break the toggle-joint and cause the drum to cease to rotate, all organized and operating substantially as described.

3. In a winding-machine, a driving-drum adapted to actuate a cop; a toggle member to support the drum in operative position; a brake, arranged beneath the drum; a moving member in operative relation with the toggle member; a member carried by the toggle member and normally held during the operation of the machine by the thread and passing into engagement with the moving member when the thread ceases to hold it, to break the toggle-joint and cause the drum to drop upon the brake; all organized and operating substantially as described.

4. In a winding-machine, a driving-drum adapted to actuate a cop; a toggle member to support the drum in operative position; a reciprocating member in operative relation with the toggle member; a brake arranged beneath the drum; a member carried by the toggle member and normally held during the operation of the machine by the thread and passing into engagement with the reciprocating member when the thread ceases to hold it to break the toggle-joint and cause the drum to drop upon the brake, all organized and operating substantially as described.

5. In a winding-machine, the swinging handle *g'*; a drop-bar I carrying a stop in the path of the swinging handle and engaging the latter when the swinging handle is moved to start the machine and a stop in the path of the swinging handle to limit its fall when the swinging handle is released.

Signed by me at Boston, Massachusetts, this 23d day of June, 1905.

JOHN OLIPHANT McKEAN.

Witnesses:

ROBERT CUSHMAN,  
JOSEPHINE H. RYAN.