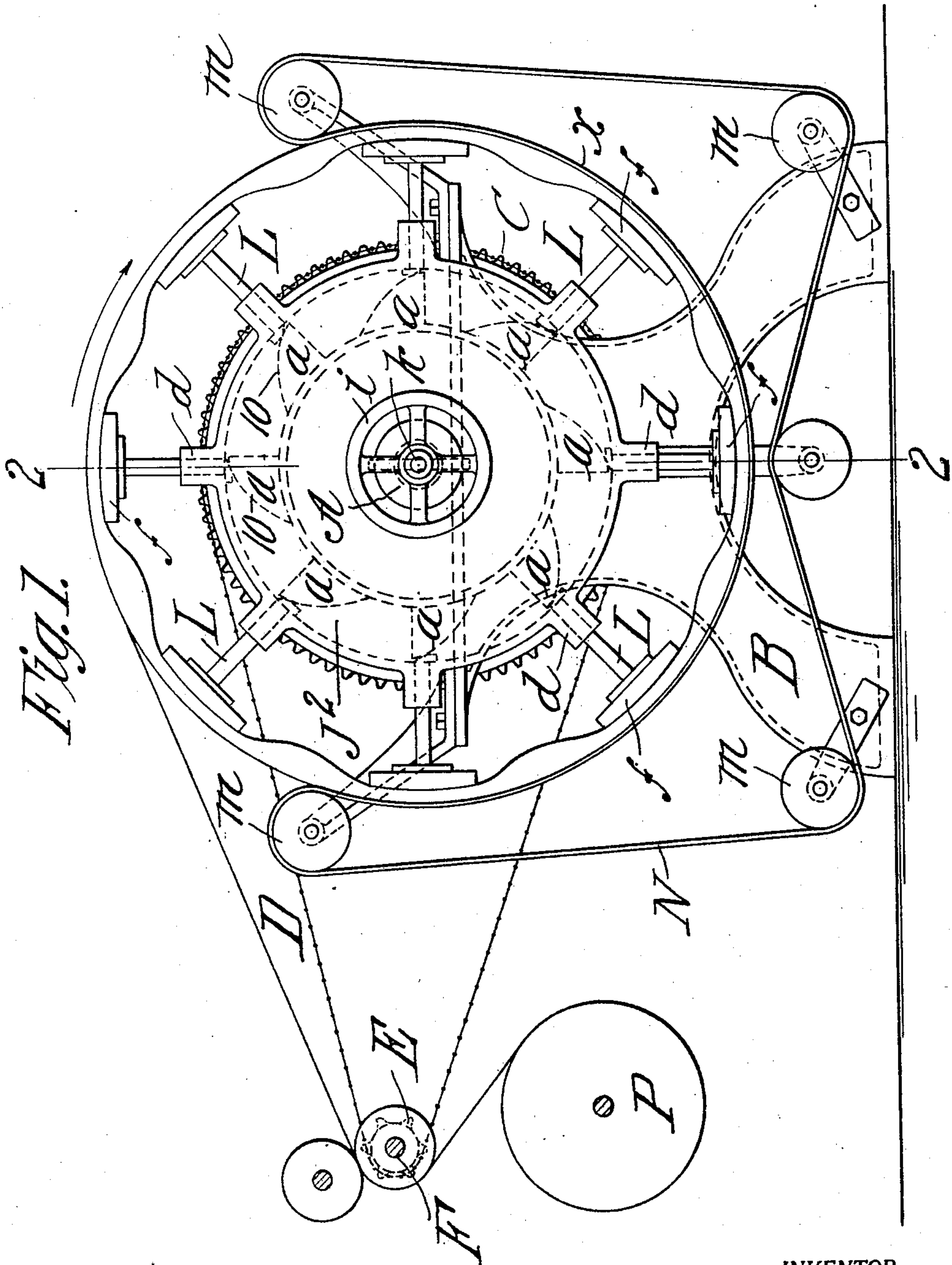


C. E. POPE.
 REEL FOR PAPER.
 APPLICATION FILED JULY 9, 1908.

912,262.

Patented Feb. 9, 1909.
 3 SHEETS—SHEET 1.

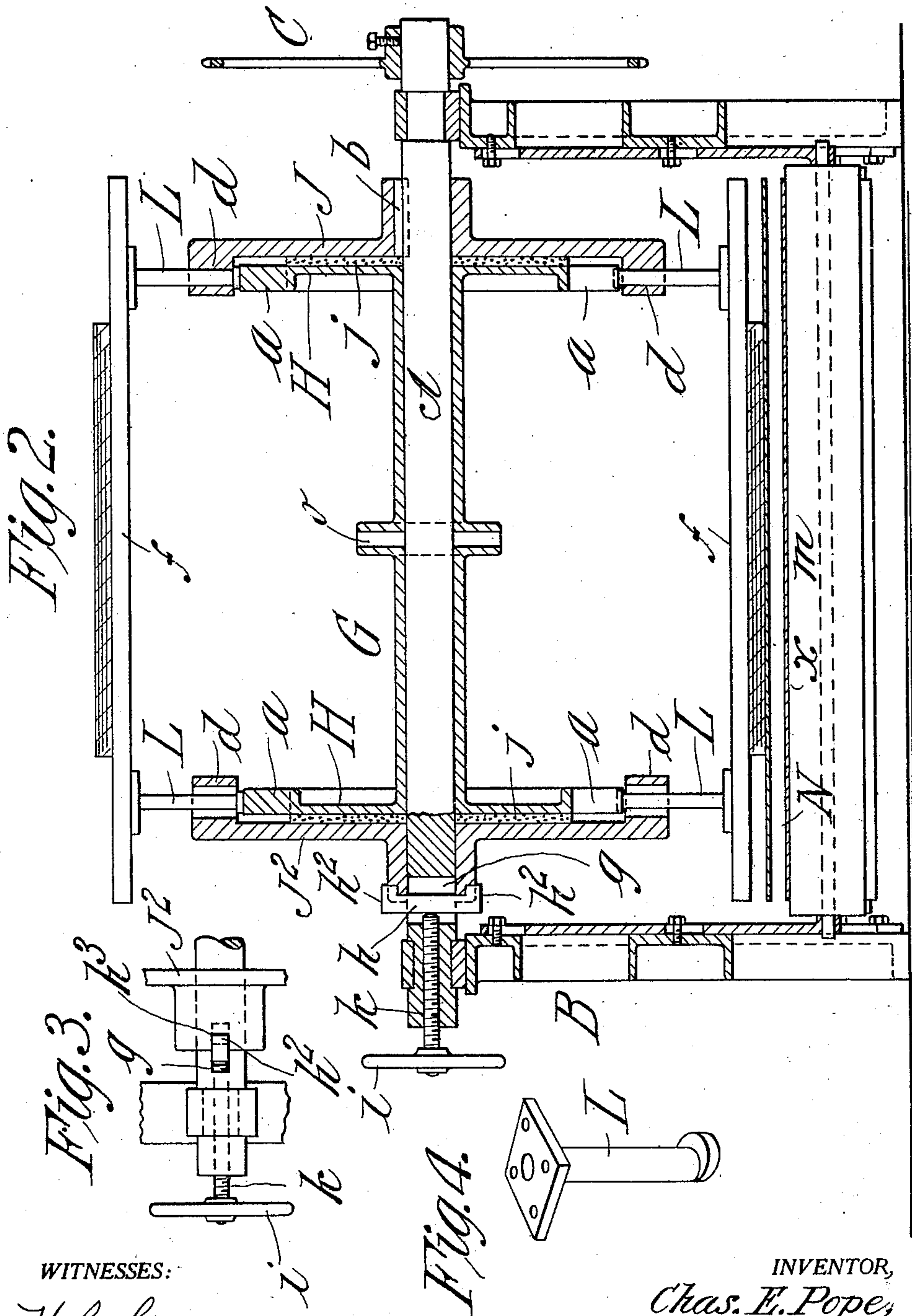


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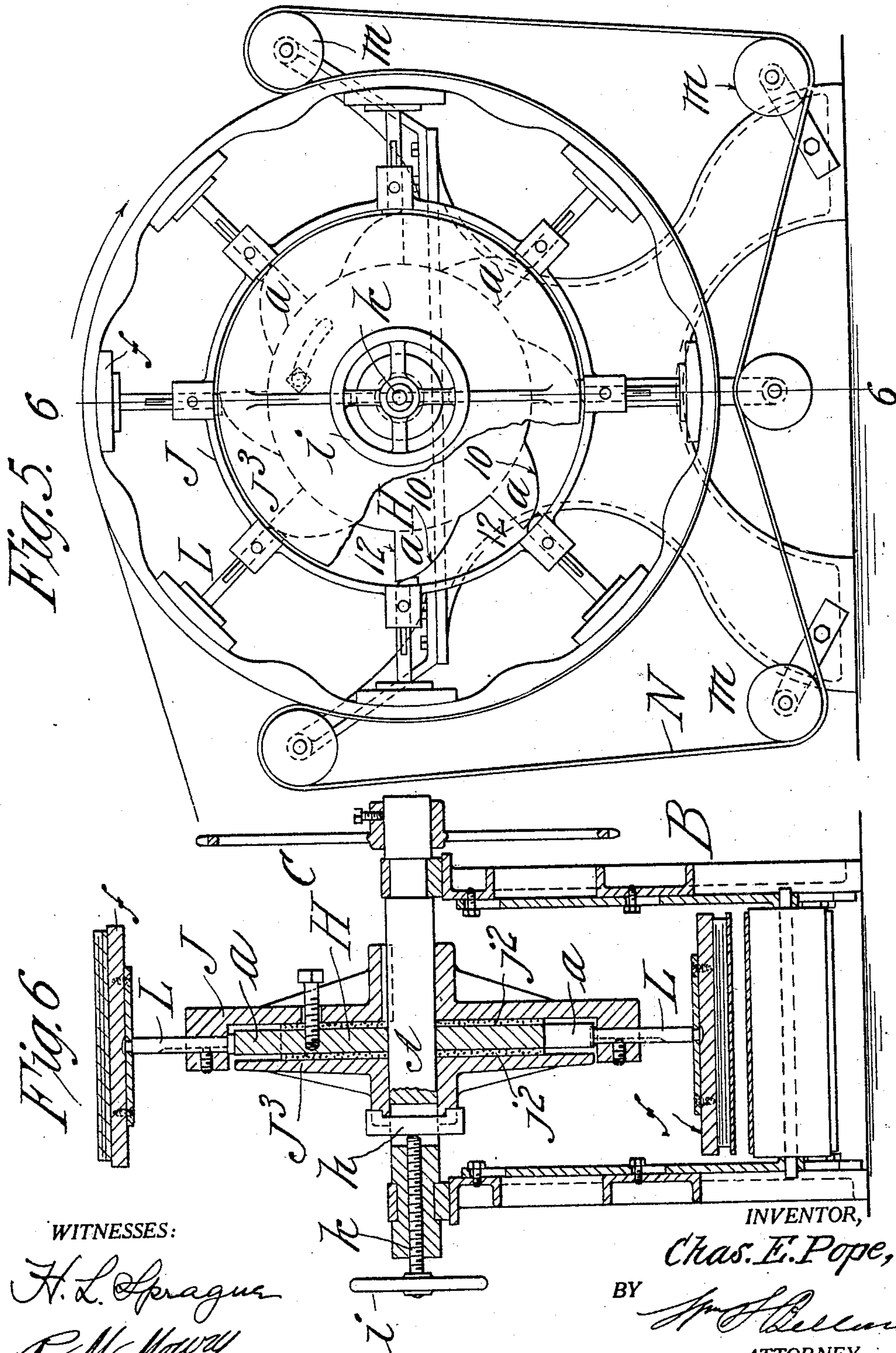
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UNITED STATES PATENT OFFICE.

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REEL FOR PAPER.

No. 912,262.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed July 9, 1908. Serial No. 442,663.

To all whom it may concern:

Be it known that I, CHARLES E. POPE, a citizen of the United States of America, and resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Reels for Paper, of which the following is a full, clear, and exact description.

This invention relates to improvements in what may be termed automatically contracting reels on which are to be wound tissue or crepe paper or other sheet material, in such manner that the members of the reel on which the convolutions of the paper are successively wound recede inwardly at each revolution proportionate to the thickness of the paper whereby the convolutions are all the same and so that when the paper on the filled reel is cut or sub-divided to make several piles of sheets suitable for napkins or other articles, they will all be of the same size.

The invention essentially comprises in combination a rotative shaft, a frame mounted on and rotatable with said shaft, having radial guideways, a plurality of members having cam inclined edges, and a disk or other suitably shaped part, on which said members are carried, which is loosely mounted on said shaft for a degree of revoluble movement relatively to the latter, means for imparting a variable resistance to movement of said disk, and rods movably guided in the radial ways of said frame having their inner ends engaged with the respective cam inclined members and having transverse bars, to constitute the reel, at their outer ends.

The invention furthermore comprises certain particular combinations and arrangements of parts and the constructions of parts all substantially as hereinafter fully described and set forth in the claims.

The improved reel is illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation; Fig. 2 is a central vertical longitudinal section as taken on line 2—2, Fig. 1; Fig. 3 is a plan view of the left hand end portion of Fig. 1; Fig. 4 is a perspective view illustrating a detail of construction hereinafter referred to; Figs. 5 and 6 are respectively a side elevation and a central vertical section on line 6—6, showing a construction of the reel when made up with single, instead of double, reel bar supporting radial rods.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the supporting shaft of the reel horizontally mounted in suitable journals therefor in the frame B and having at its one end a sprocket wheel C by means of which rotary movement may be imparted to the shaft through the sprocket chain D which runs around a sprocket wheel E on a shaft F to which power may be applied from a suitable source.

A sleeve G is loosely but closely fitted on the intermediate portion of the shaft A and provided at its opposite ends with circular flange-like extensions or disks H H which are provided, circumferentially, with outwardly projecting members *a a* having cam inclined edges 10 and radial or perpendicular backs 12, these members being in suitable number and regularly spaced.

J, J² represent frames provided on end portions of the shaft in facewise proximity to said disks, one J having means for preventing endwise movement thereof which practicably may consist of a key *b*, while the other frame J² is by its hub loosely fitted about the other end portion of the shaft and movable slightly, axially relatively to the latter. Both said frames have radial guides *d d* for a series of rods L L which by their inner ends have contact bearings or supporting engagements respectively with the cam inclined members *a a* of the said disks, and bars *f* are extended transversely between the ends of corresponding rods of both sets, in lines parallel with the axis of the shaft A to constitute the winding or sheet receiving members of the reel.

The left hand end portion of the shaft A is shown as constructed with a longitudinal slot *g* therethrough, through which is engaged a loose bar or key *h* having angularly turned ends *h*² which engage in recesses *h*³ in the ends of the hub of the circular frame J² so that while not preventing the axial movement of the part J², the latter is constrained to rotate in unison with the shaft.

A screw *k*,—having the hand wheel *i*,—is threaded in an axial hole therefor, in the end portion of the shaft A, which extends into the aforementioned slot *g* so that the screw may have a forcing engagement against the bar or key *h* to crowd, through the latter, the frame J² to a required tension relatively to the adjacent disk H and

through the medium of the sleeve G to correspondingly tension the right hand disk H and frame member J.

In practice, layers or disks j of leather, felt, fiber, or other suitable, more or less compressible and frictioning material are interposed between the disks H H and the adjacent circular shaft carried members J and J².

M represents an endless apron guided around sheaves or rollers m , an inner course x thereof having a half-circular engagement around the reel bars or slats and serving as a means for limiting or determining the maximum dimension of the winding convolutions,—no completely encircling portion of the paper wound on the reel ever being permitted to be greater than, or exceed the limitation imposed by the endless apron.

As the paper from the supply roll P runs to and is wound onto the reel, the tensioning or force of the paper in a direction inwardly or towards the axis of the reel causes gradual inward receding movements of the reel slats or bars f and their carrying rods, the inner ends of which latter are yieldingly resisted by the members a of the disks H, which members have revoluble movements slightly as the same is imparted thereto by the crowding action of the rods edgewise thereagainst.

The machine is, preparatory to being used, adjusted as to the tension or variability of yielding resistance, which the inclined member carrying disks have relatively to the adjacent shaft carried parts; and the capability of yielding resistance may be nicely predetermined or regulated to be proportionate to the winding tension of the paper on the reel so that the wound paper will never become circumferentially enlarged greater than the initial convolution, even if the restricting apron or belt N is not employed; but the provision of the belt is simple, inexpensive and conducive to the general satisfactory composition of the machine.

After a sufficient quantity of the paper has been wound on the reel and the machine is stopped, the wound paper is usually removed by cutting it at regular intervals and along the lengths of the slats or reel bars f for the making of paper napkins or other articles all of uniform widths.

In placing the machine in condition to be again employed for receiving a new quantity of paper wound thereon, the sleeve G is turned for a fraction of a rotation relatively to the shaft A through means of a bar or lever inserted in one of the radial sockets o at the middle of the sleeve whereby the cam inclined edges of the members a force the rods L and slats f to their outermost distension.

The reel illustrated in Figs. 5 and 6 is to

all intents and purposes like that shown in the other illustrations, excepting that it is modified in respect of minor details and matter of design for the production of a reel for winding narrower paper and where double sets of reel slat supporting rods and guides and actuators therefor are not required. In this case the disk H which carries the members a having the cam inclined edges is frictionally bound and yields rotatively relatively to the shaft A between the face of the frame J which is keyed or affixed on the shaft and a follower disk J³ which is loose on the shaft and with the hub of which the screw forced bar H is operative in a manner described in conjunction with the structure shown in Figs. 2 and 3; and in the arrangement shown in Fig. 6, disks or layers j^2 , j^2 , of leather or like frictioning material are interposed between the opposite faces of the disk H and the parts J and J³ at either side thereof.

I claim:—

1. In a reel, in combination, a rotative shaft; a frame mounted on, and rotatable with, said shaft having radial guideways, a plurality of members having cam inclined edges and a part, on which said members are carried yieldingly mounted on said shaft for revoluble movement relatively to the latter, means for varying the resistance to movement of said part, and rods movably guided in the radial ways of said frame having their inner ends engaged with the respective cam inclined members and having transverse bars at their outer ends.

2. In a reel, in combination, a rotative shaft, a frame mounted on, and rotatable with, said shaft having radial guideways, a plurality of members having cam inclined edges and a part, on which said members are carried yieldingly mounted on said shaft for revoluble movement relatively to the latter, means for varying the resistance to movement of said part, rods movably guided in the radial ways of said frame having their inner ends engaged with the respective cam inclined members and having transverse bars at their outer ends, and means for limiting the extent of rotative movement of said cam inclined member carrying part relatively to the shaft.

3. In a reel, in combination, a rotative shaft, a frame mounted on and rotatable with said shaft having radial guideways, a disk loosely fitted about said shaft circumferentially provided with a series of members having cam inclined edges, means for binding the said disk yieldingly and with predetermined variable resistance relatively to said shaft and frame, rods movably guided in the radial ways of said frame having their inner ends engaged with the respective cam inclined members and having transverse bars at their outer ends.

4. In a reel, in combination, a rotative shaft, having a longitudinal slot near an end thereof, a frame mounted on and rotatable with said shaft having radial guideways, and
 5 a disk loosely fitted about said shaft and circumferentially provided with a series of members having cam inclined edges, said frame and disk being slightly movable, axially, the one relatively to the other, a bar trans-
 10 versely extending through the slot in the shaft and movable endwise therein, and a screw threading through an end portion of the shaft and engaging said bar and operative for effecting a crowding and tensioning
 15 between the faces of said disk and frame, and rods movably and radially guided in said frame having their inner ends engaged respectively with said cam inclined members of the disk and having transverse bars at
 20 their outer ends.

5. In a reel, in combination, a rotative shaft, having a longitudinal slot near an end thereof, a frame mounted on and rotatable with said shaft having radial guideways, and
 25 a disk loosely fitted about said shaft and circumferentially provided with a series of members having cam inclined edges, said frame and disk being slightly movable, axially, the one relatively to the other, a bar
 30 transversely extending through the slot in the shaft and movable endwise therein, and a screw threading through an end portion of the shaft and engaging said bar and operative for effecting a crowding and tensioning
 35 between the faces of said disk and frame, rods movably and radially guided in said

frame having their inner ends engaged respectively with said cam inclined members of the disk and having transverse bars at their outer ends, and means for manually
 40 imparting a rotative movement to said disk.

6. In a reel, in combination, a rotative shaft and supports therefor, a sleeve loosely fitted about an intermediate portion of said shaft and provided with disks having circum-
 45 ferentially cam inclined edges, a frame provided on one end portion of the shaft in facewise proximity to one of said disks and having means for preventing endwise movement thereof, another frame loosely fitted
 50 about the other end portion of the shaft in facewise proximity to the other of said disks and movable axially relatively to the shaft, both said frames having radial guides, a bar transversely engaged through said slot in the
 55 shaft and having its extremities engaging said frame, a screw provided with a hand wheel and having its shank threading in the end portion of the shaft and endwise engaging said bar, a series of rods movable and ra-
 60 dially guided in said frames having their inner ends engaged respectively with the cam inclined members of the disk and bars transversely extending between the ends of both series of the rods.

Signed by me at Springfield, Mass., in
 65 presence of two subscribing witnesses.

CHARLES E. POPE.

Witnesses:

WM. S. BELLOWS,
 G. R. DRISCOLL.