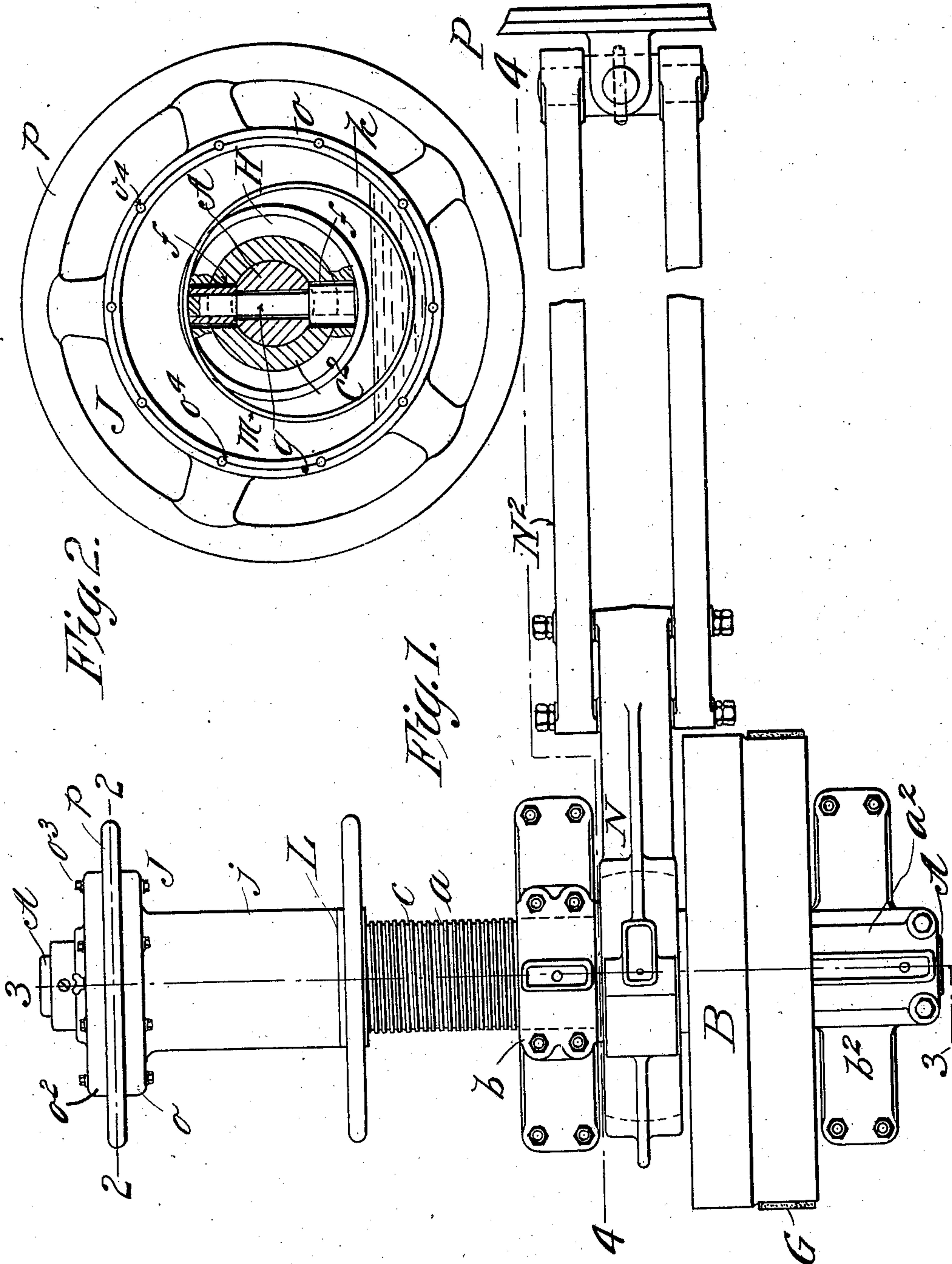


No. 859,866.

PATENTED JULY 9, 1907.

C. H. ATKINS.  
VIBRATING DEVICE.  
APPLICATION FILED DEC. 5, 1906.

6 SHEETS—SHEET 1.



Witnesses:  
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W. C. Ross.

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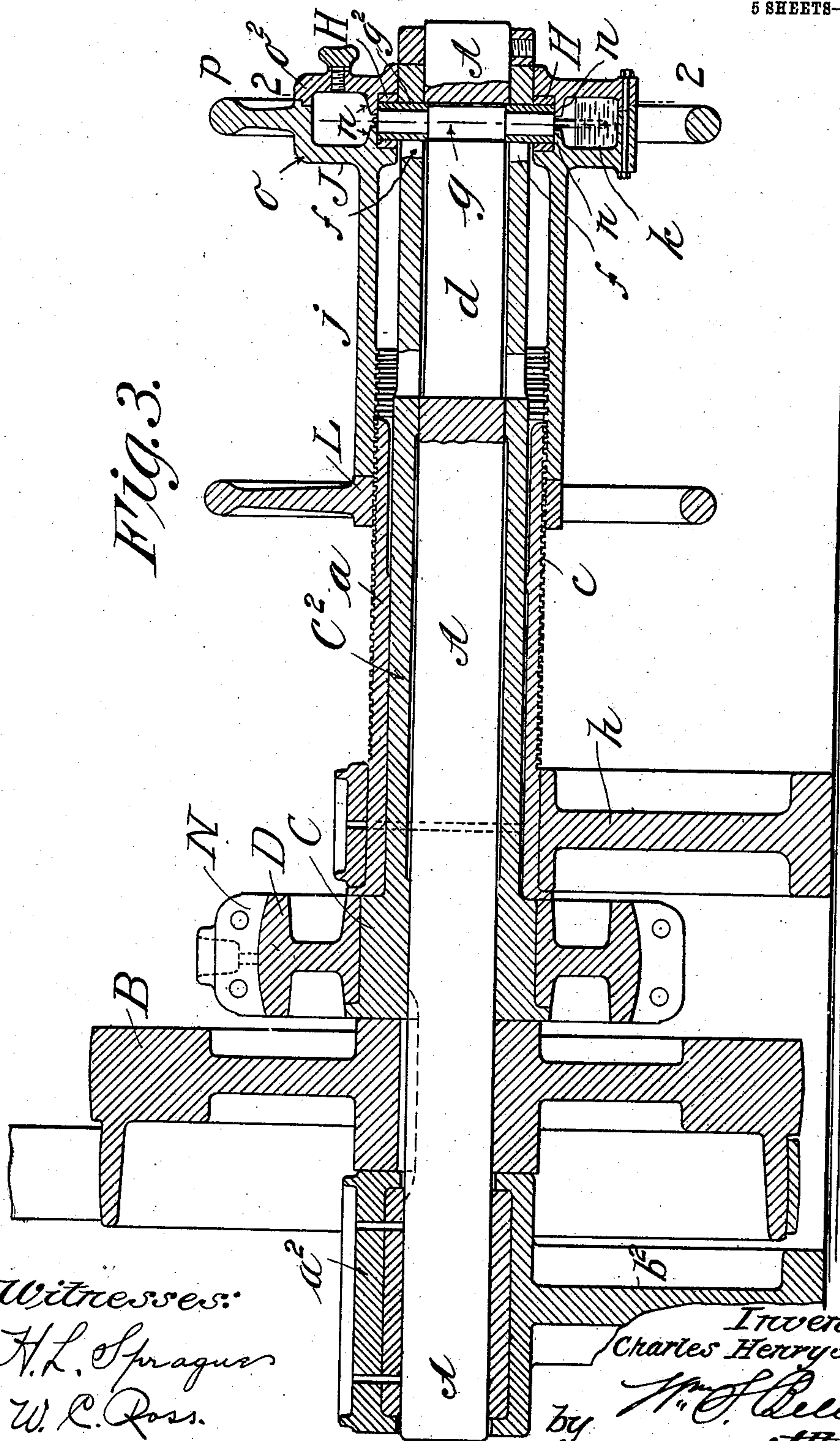
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5 SHEETS--SHEET 2.



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Attorney.



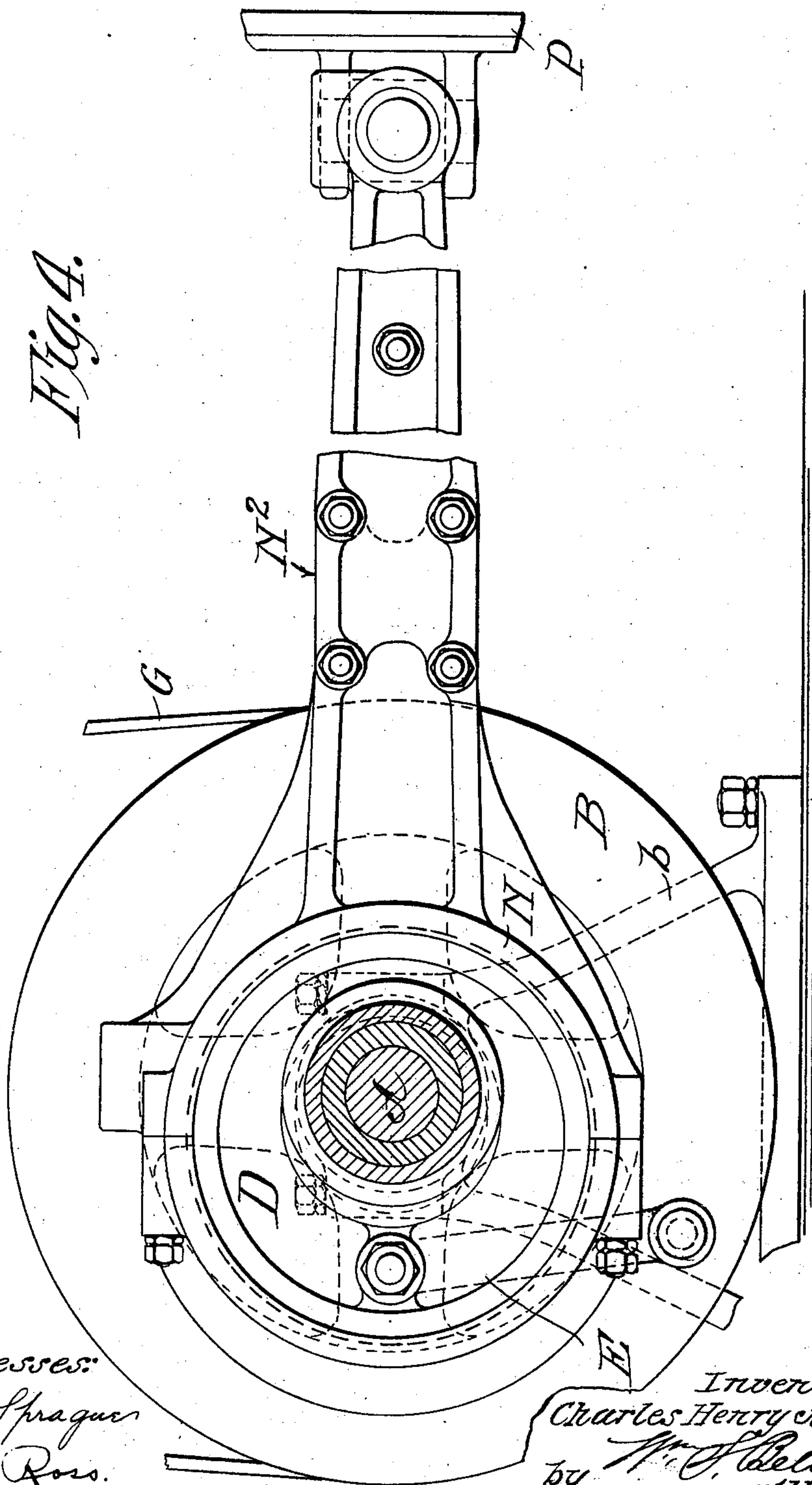
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5 SHEETS—SHEET 3.

*Fig. 4.*



*Witnesses:*  
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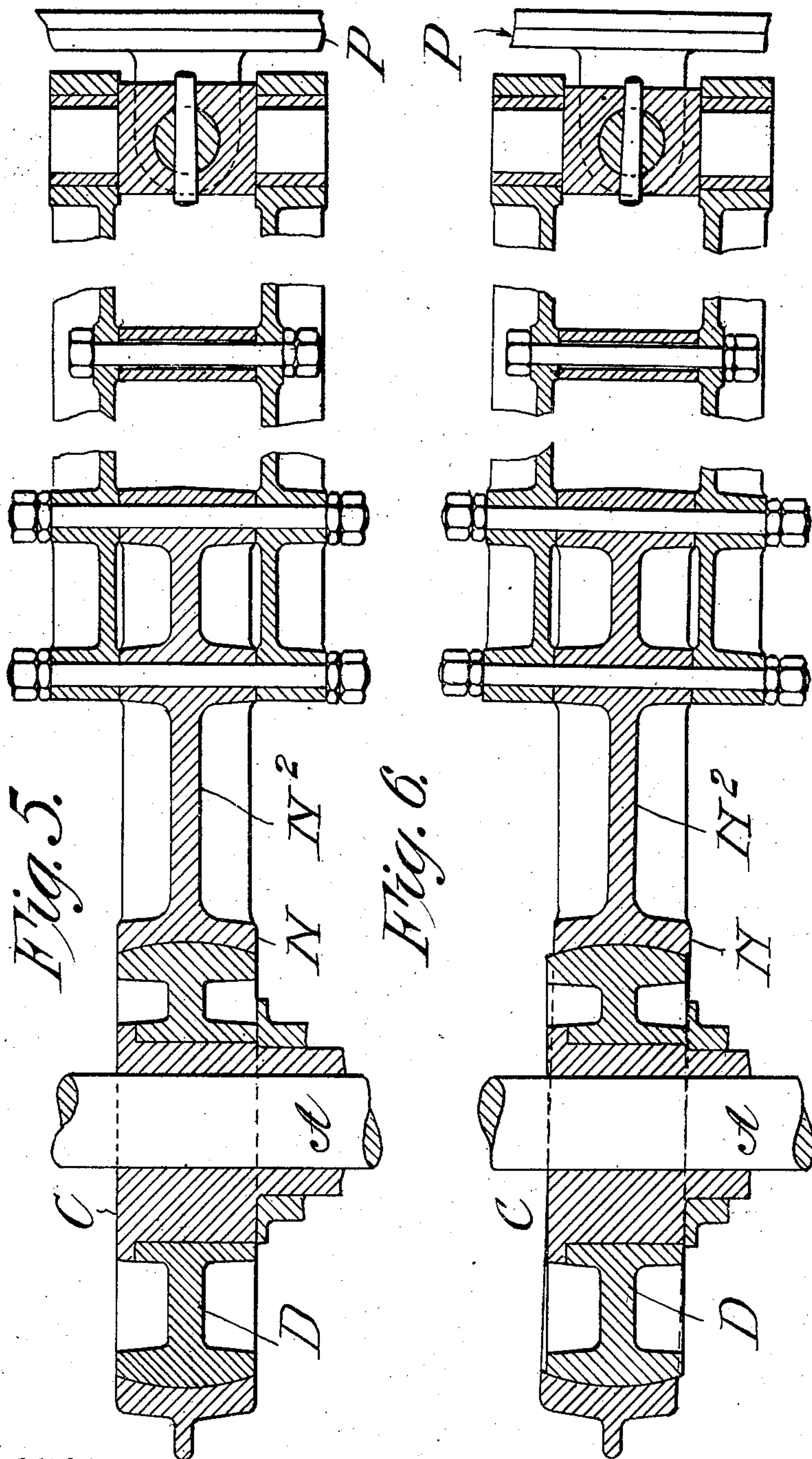
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5 SHEETS—SHEET 4.



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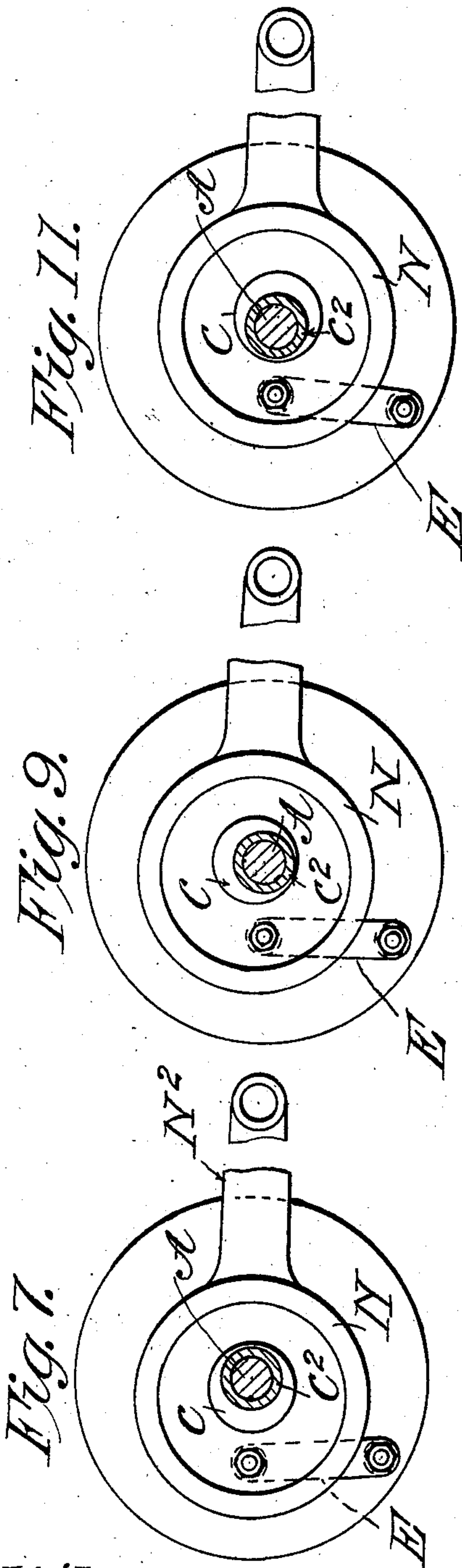


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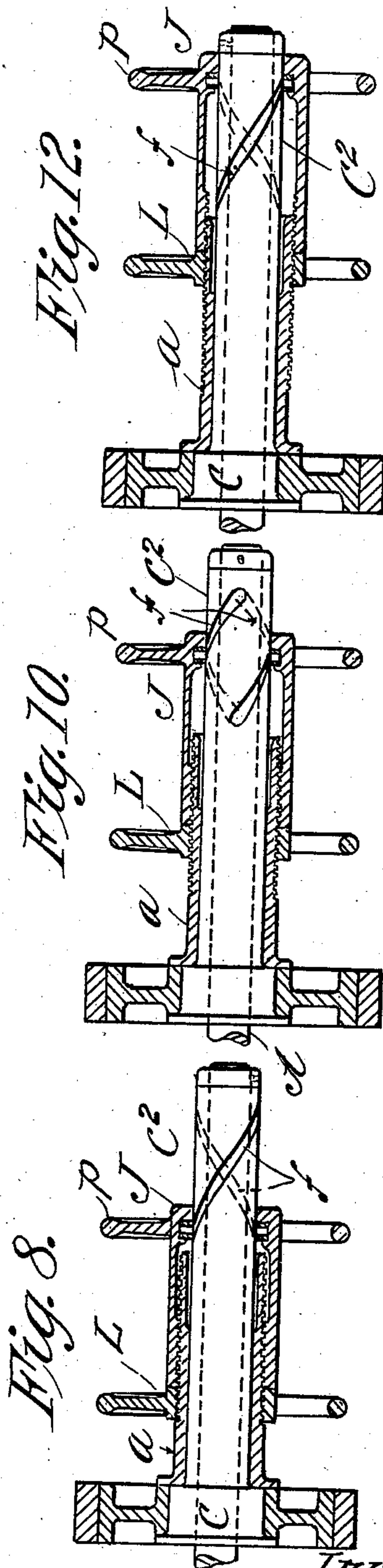
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APPLICATION FILED DEC. 5, 1906.

5 SHEETS—SHEET 5.



Witnesses:  
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W. R. Ross.



Inventor,  
Charles Henry Atkins,  
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Attorney.



# UNITED STATES PATENT OFFICE.

CHARLES HENRY ATKINS, OF SPRINGFIELD, MASSACHUSETTS.

## VIBRATING DEVICE.

No. 859,866.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed December 5, 1906. Serial No. 346,398.

To all whom it may concern:

Be it known that I, CHARLES HENRY ATKINS, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Vibrating Devices, of which the following is a full, clear, and exact description.

This invention relates to a vibrating mechanism primarily designed for operating the vibrator or shaker of a Fourdrinier paper machine, with capability, by effecting changes or relations of parts included within the mechanism, of varying the lengths of the vibrations or strokes; but the present improved mechanism is applicable for employment in situations other than in connection with a paper machine.

An important object of the invention is to provide a variable vibration imparting mechanism including a revoluble eccentric, in which parts for regulating the lengths of the vibratory strokes may be operated while the eccentric continues to revolve, without any stoppage of the mechanism or machine with which it is connected. And other objects are to construct the vibrating mechanism in a simple and practical manner and so that it will be reliable during protracted periods of operation for imparting exactly the character of vibrations for which it may be adjusted.

The invention is hereinafter described in a preferred design thereof, in conjunction with the accompanying drawings.

In the drawings,—Figure 1 is a plan view of the vibrating device shown in its relation to a small portion of the vibrator of a paper machine. Fig. 2 is a sectional elevation, on a larger scale, as taken on line 2—2, Figs. 1 and 3. Fig. 3 is a central vertical section as taken on line 3—3, Fig. 1. Fig. 4 is a sectional elevation as seen on and beyond the plane indicated by line 4—4, Fig. 1. Figs. 5 and 6 are horizontal sectional views through the mechanism at the portion thereof in which the eccentric and the eccentric strap and rod are comprised,—these views being identical with the exception that Fig. 6 shows the eccentric rod and strap slightly oscillated, on a horizontal plane, from the position in which the same element is represented in Fig. 5. Figs. 7 and 8, 9 and 10, and 11 and 12 are pairs of views showing varied positions of the parts of the compound eccentric and the means for varying their relations, the upper views of this said set showing the eccentrics facewise while the lower views are sections taken similarly to Fig. 3.

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

This mechanism comprises a horizontal shaft A and a pulley B fast thereon, for rotating it by belt G.

C represents an eccentric having integrally formed therewith an extended hub-like sleeve C<sup>2</sup>, which latter with the eccentric proper loosely surrounds the shaft,

the eccentric having its position closely alongside the face of the pulley.

D represents an "eccentric ring," as herein termed, the same being in the form of a disk or wheel having eccentrically therein an opening to closely fit the eccentric C. This eccentric ring is caused to rotate in unison with the pulley through means of the link E, one end of which is pivoted to the face of the pulley and the other to the face of the eccentric ring.

An intermediate portion of the shaft, and the eccentric sleeve loosely surrounding it are loosely passed through and beyond a stationary tubular journal bearing *a* supported by the standard *b*, while another portion of the shaft is supported in a journal bearing *a*<sup>2</sup> at the opposite side of the pulley from that at which the eccentric and eccentric ring are located, said latter journal bearing being supported by the standard *b*<sup>2</sup>. The stationary tubular journal bearing *a* has external screw threads *c*. Adjacent portions of the shaft and sleeve are constructed respectively with a straight longitudinal way *d* in the shaft, and a helical slot,—or duplicated opposite helical slots *f*,—in the sleeve. In practice, and preferably, although not necessarily, the way *d* in the shaft is made in the form of a slot extended through the shaft.

An element H capable of revolving in unison with the eccentric sleeve and shaft and also capable of an independent movement along the line of the axis of these parts and having associated therewith a stud *g* which passes through the helical eccentric sleeve slot, and engages within the straight longitudinal way in the shaft, constitutes a means for causing the sleeve and eccentric to partake of the revoluble movement of the shaft, and yet to enable said element, on being axially moved, through impingement of its stud against the boundaries of the helical slot, to impart a rotative movement to the sleeve and eccentric relatively to the shaft, and independently of and additional to the rotary movement of the shaft. This rotative movement of the sleeve which may be imparted while the sleeve and shaft are rapidly turning, changes the position of the eccentric within and relatively to the eccentric ring so that the latter may have the eccentricity thereof in relation to the axis of the shaft, much or little as may be desired, for the accomplishment of long or short vibratory strokes to the part with which the rod is connected or engaged.

In the present instance, the aforementioned element H is provided in the form of a collar fitting and slidable endwise along the eccentric sleeve, and diametrically oppositely engaged, within apertures therein, by roller surrounded ends of the stud *g*, the rollers *g*<sup>2</sup> having anti-friction bearings in the opposite sleeve slots, while the intermediate oppositely slatted portion of the stud engages transversely through and within the straight longitudinal shaft slot.



J represents an annular yoke having an embracing engagement about said collar and constructed with a tubular internally screw threaded hub *j* which loosely surrounds the eccentric sleeve and shaft there within and screw engages the threads *c*, externally provided on the tubular journal bearing *c*<sup>2</sup>. The said yoke J is made in the form of a circular chambered body having an inclosed oil chamber *k* therein; and the oil distributing ring *m* of larger diameter than the collar rests on and depends from the top of the collar at the plane of revolution of said stud, and is in contact with opposite ends of the stud and its roller (which are flush with the periphery of the collar) at every half revolution of the stud.

The lips *n* inwardly extended from opposite sides of the chambered yoke casing overlap and fit the periphery of the collar, and also are approached to overlap portions of the ends of the studs and surrounding collars, serving to keep the collars from being centrifugally thrown from the ends of the stud and to keep the oil ring at the proper median plane so that the oil carried by the ring upwardly will be conveyed to the proper point for lubrication of the stud and its roller, and result in a lubrication of the boundaries of the helical and straight slots in the eccentric sleeve and shaft.

As shown in Fig. 3, the chambered casing which constitutes the body of the yoke is made in matched sections *o* and *o*<sup>2</sup>, united by the screws *o*<sup>3</sup>,—the screw holes *o*<sup>4</sup> for which are indicated in Fig. 2 in which view the outer end yoke section *o* is understood as removed.

The annular chambered yoke body has formed as a part thereof a hand wheel *p* to facilitate the turning of the yoke for acquiring a screw feed along its axial line of the normally immovable yoke, for correspondingly moving the collar H and sleeve rotating stud for varying the position of the eccentric C relatively to the eccentric ring D.

L represents a nut made in the form of a hand wheel and in engagement with the screw threads *c* of the tubular journal support *a* for being set up against the end of the hub *j* of the yoke and to lock the same against being unduly rotatively moved whereby the proper adjustment of the eccentric would become deranged.

In Figs. 7 and 8 the yoke is moved to place the stud *g* at the oppositely located extreme left hand ends of the helical slot *f* in the sleeve, resulting in bringing the portion of the eccentric having the greatest eccentricity aligned with the portion of the eccentric ring also having the greatest eccentricity, whereby the composite eccentric having a maximum eccentricity to the shaft is acquired to result in imparting, through the eccentric strap, the longest vibratory strokes within the scope of the present mechanism.

In Figs. 9 and 10 the stud is in an intermediate position relatively to the sleeve slots *f* so that the eccentric line of the eccentric is at right angles to the eccentric line of the eccentric ring; and thus the resultant character of the composite eccentric is modified to impart vibratory strokes of a medium length; and in Figs. 11 and 12 the parts are shown in the extreme opposite position from that represented in Figs. 7 and 8 so that the periphery of the eccentric ring is nearly or quite concentric with the shaft and so that there may be imparted no, or almost imperceptible vibratory strokes to the part to which the eccentric strap is connected or

engaged. And, of course, there are endless relative positions between those represented in Figs. 9—10, and Figs. 7—8, or Figs. 11—12, for the acquirement of medium long or medium short vibratory strokes.

In Figs. 1, 5 and 6 the periphery of the eccentric ring is represented as convex on the curvature of a true sphere, and the inner circular wall of the eccentric strap N, made as one with the eccentric rod N<sup>2</sup>, is correspondingly concaved, so that under oscillatory motions which the vibrator P may have the eccentric and its strap may oscillate on the periphery of the eccentric ring in the manner of a ball joint; and in Fig. 6 the eccentric strap is shown as having been oscillated from the position shown in Fig. 5 to accord with a slightly swung position of the vibrator P.

It is to be appreciated that in this improved mechanism it is possible, and entirely convenient, to change the relation of the eccentric within the eccentric ring while the shaft and eccentric sleeve are rapidly rotated; and, therefore, as is especially advantageous in a paper machine, the extents of the vibratory movements of the shaker or vibrator may be varied at any time to accord with paper making requirements or desirability, without necessitating any stopping of the paper machine,—the shaft A being understood as the driving shaft of the machine, or a shaft driven continuously in unison with such shaft.

I claim:—

1. In a device of the character described, in combination, a shaft and means for rotating it, an eccentric having an extended sleeve loosely surrounding the shaft, adjacent portions of the shaft and sleeve being constructed respectively with a straight longitudinal way in the shaft and a helical slot through the sleeve, an eccentric ring encircling the eccentric, and means for revolving it with the shaft, an element revoluble with, and endwise movable relatively to the sleeve and shaft, a stud extended through the sleeve slot and engaging within the shaft way, and means for adjusting said element and its stud longitudinally of the sleeve and shaft.
2. In a device of the character described, in combination, a shaft and means for rotating it, an eccentric having an extended sleeve loosely surrounding the shaft, adjacent portions of the shaft and sleeve being constructed respectively with a straight longitudinal way in the shaft and a helical slot through the sleeve, an eccentric ring encircling the eccentric, and means for revolving it with the shaft, a collar surrounding, revoluble with, and endwise movable relatively to the sleeve and shaft, a stud extended through the sleeve slot and engaging within the shaft way, a part adjustable lengthwise of the shaft and sleeve, comprising an annular yoke which engages said collar.
3. In a device of the character described, in combination, a shaft and means for rotating it, an eccentric having an extended sleeve loosely surrounding the shaft, adjacent portions of the shaft and sleeve being constructed respectively with a straight longitudinal way in the shaft and a helical slot through the sleeve, a tubular screw threaded journal bearing through and beyond which the shaft and sleeve are extended, an eccentric ring encircling the eccentric, and means for revolving it with the shaft, a collar surrounding, revoluble with, and endwise movable relatively to the sleeve and shaft, a stud extended through the sleeve slot and engaging within the shaft way, and an annular yoke embracing and engaging said collar, and having a tubular hub loosely encircling the sleeve and screw-engaging said tubular journal bearing.
4. In a vibrating device, in combination, a shaft and means for rotating it, an eccentric having an extended sleeve loosely surrounding the shaft, adjacent portions of the shaft and sleeve being constructed respectively with a straight longitudinal way in the shaft and a helical



slot through the sleeve, a tubular externally screw  
threaded journal bearing through and beyond which the  
shaft and sleeve are extended, an eccentric ring encircling  
the eccentric, and means for revolving it in unison with  
5 the shaft, a collar, surrounding, revoluble with, and end-  
wise movable relatively to, the sleeve and shaft, a stud  
extended through the sleeve slot and engaging within the  
shaft way, an annular yoke having an embracing engage-  
ment about said collar, and having a tubular internally  
10 screw threaded hub, a screw-engaging said threaded tubu-

lar journal bearing, and a locking nut having a screw  
thread engagement on said tubular journal bearing and  
adapted to be set against the end of the tubular yoke-hub.  
Signed by me at Springfield, Mass., in presence of two  
subscribing witnesses.

CHARLES HENRY ATKINS.

Witnesses:

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