

(No Model.)

2 Sheets—Sheet 1.

N. P. TOWNE.  
TURRET DRIVING MECHANISM.

No. 606,039.

Patented June 21, 1898.

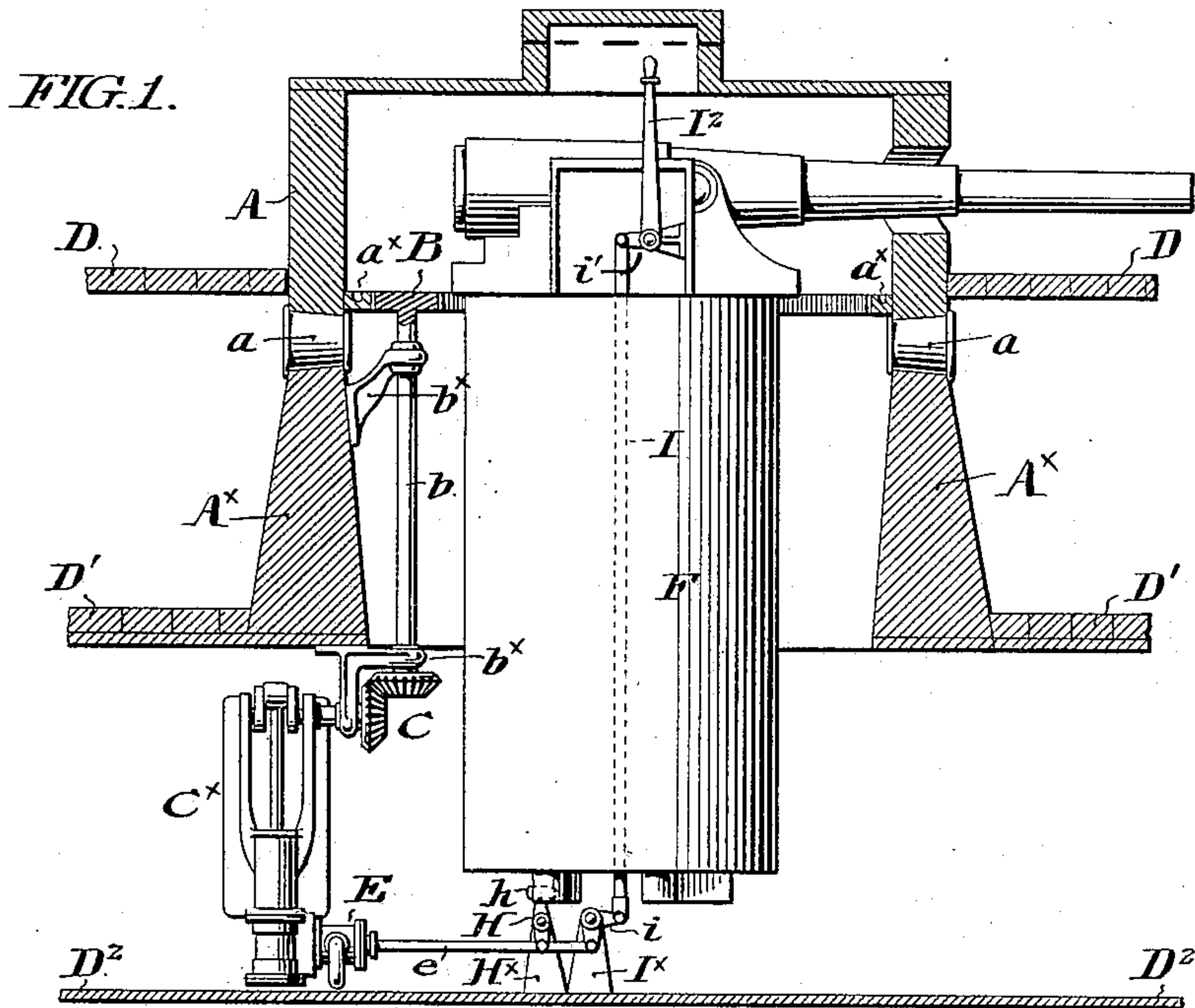
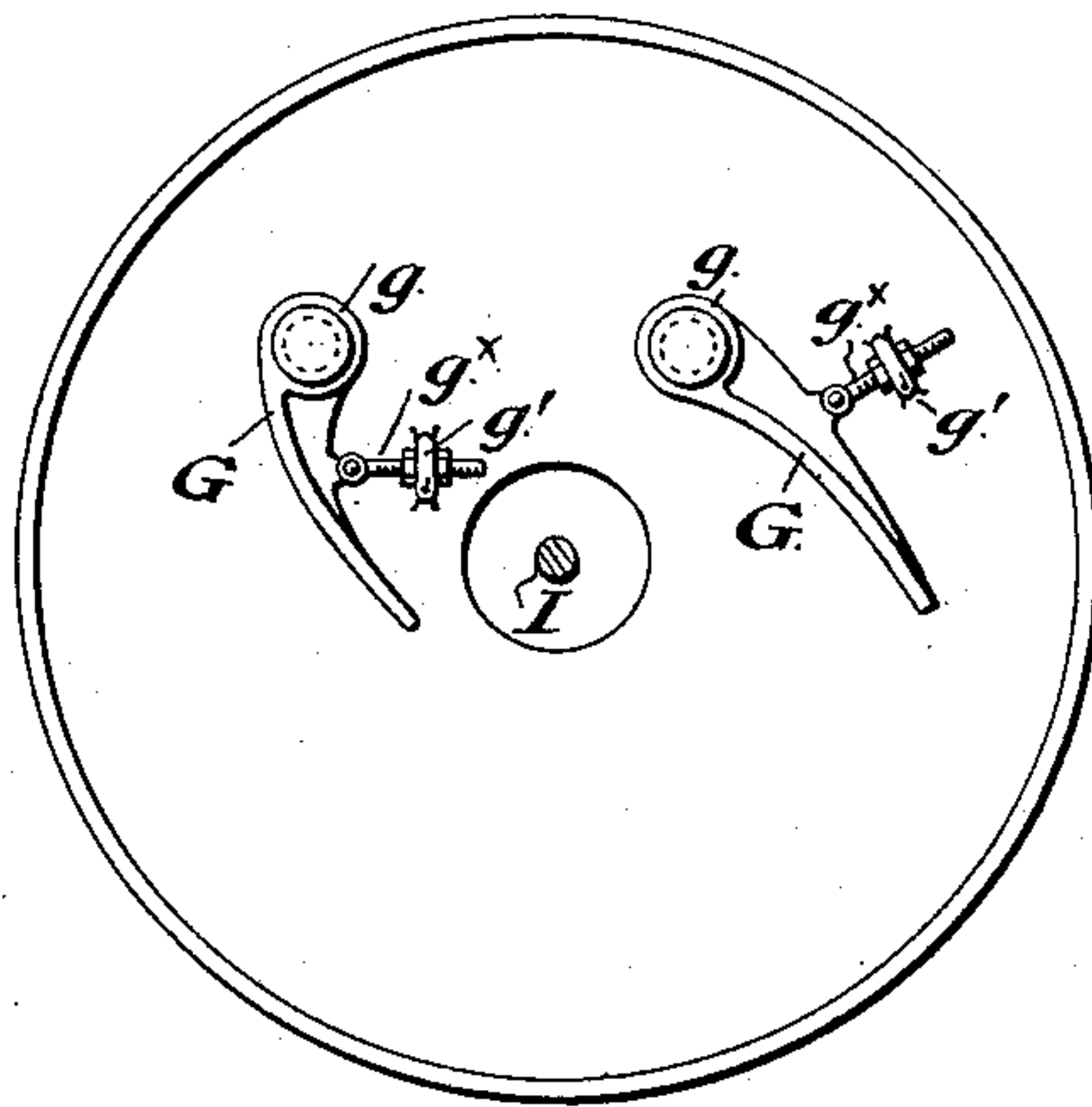


FIG. 2.



WITNESSES:  
*A. E. Paige*  
*F. Norman Dixon,*

*Nathan P. Towne*  
INVENTOR:  
*By his Attorneys,*  
*Wm. E. Strawbridge*  
*Bonsall Taylor*

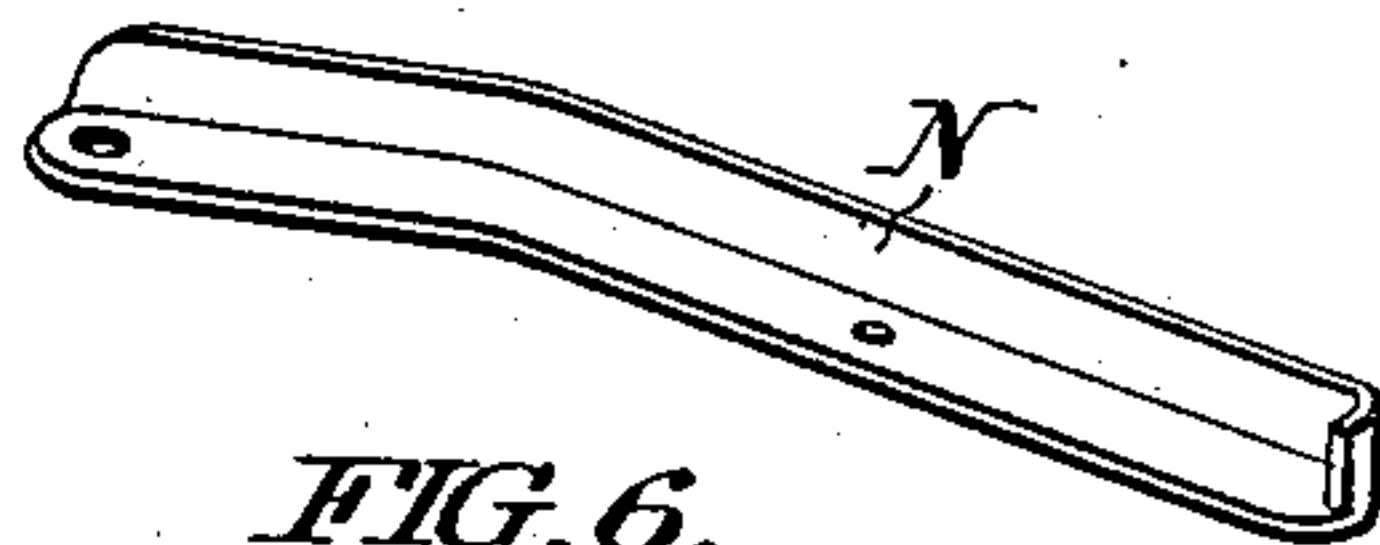
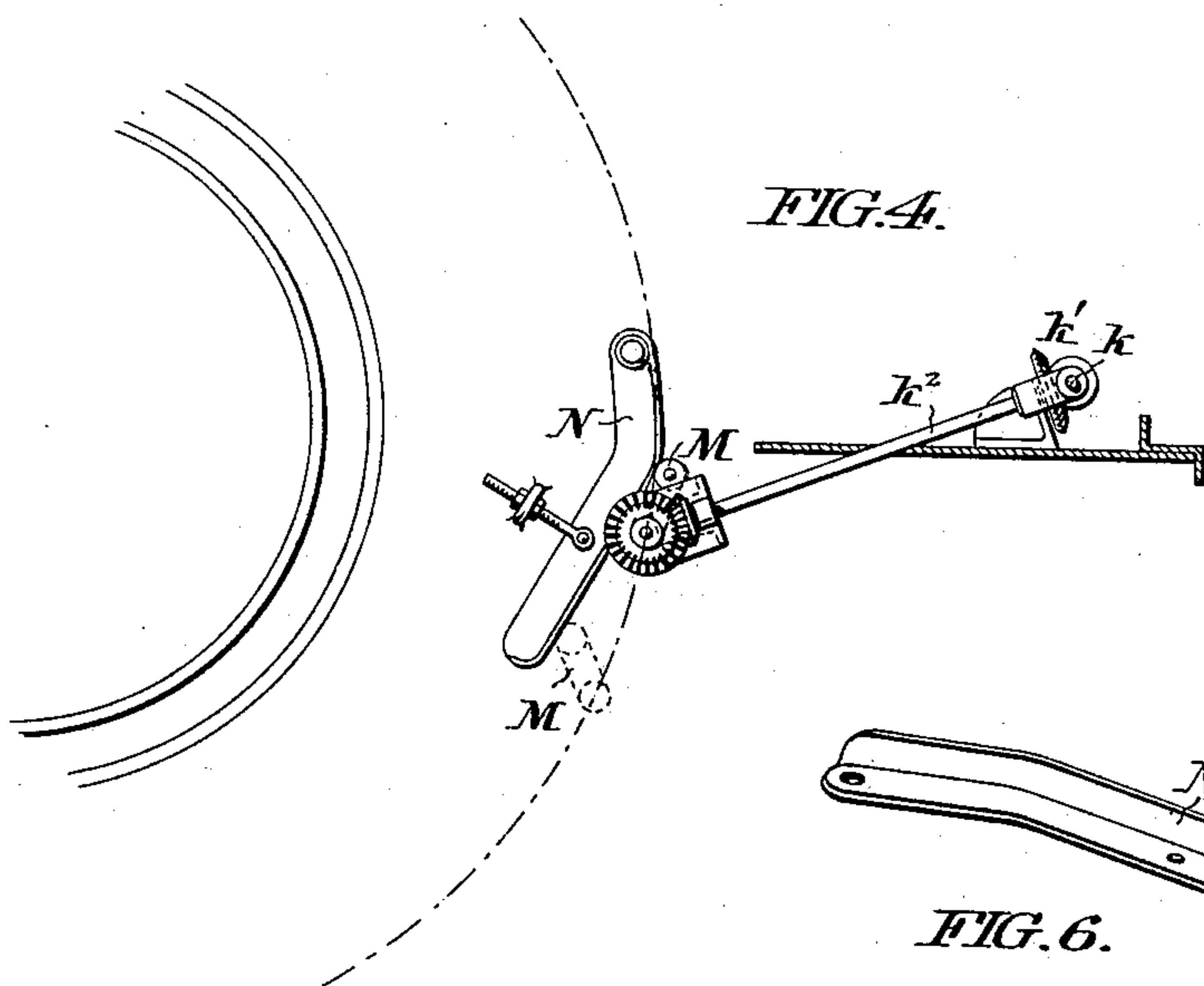
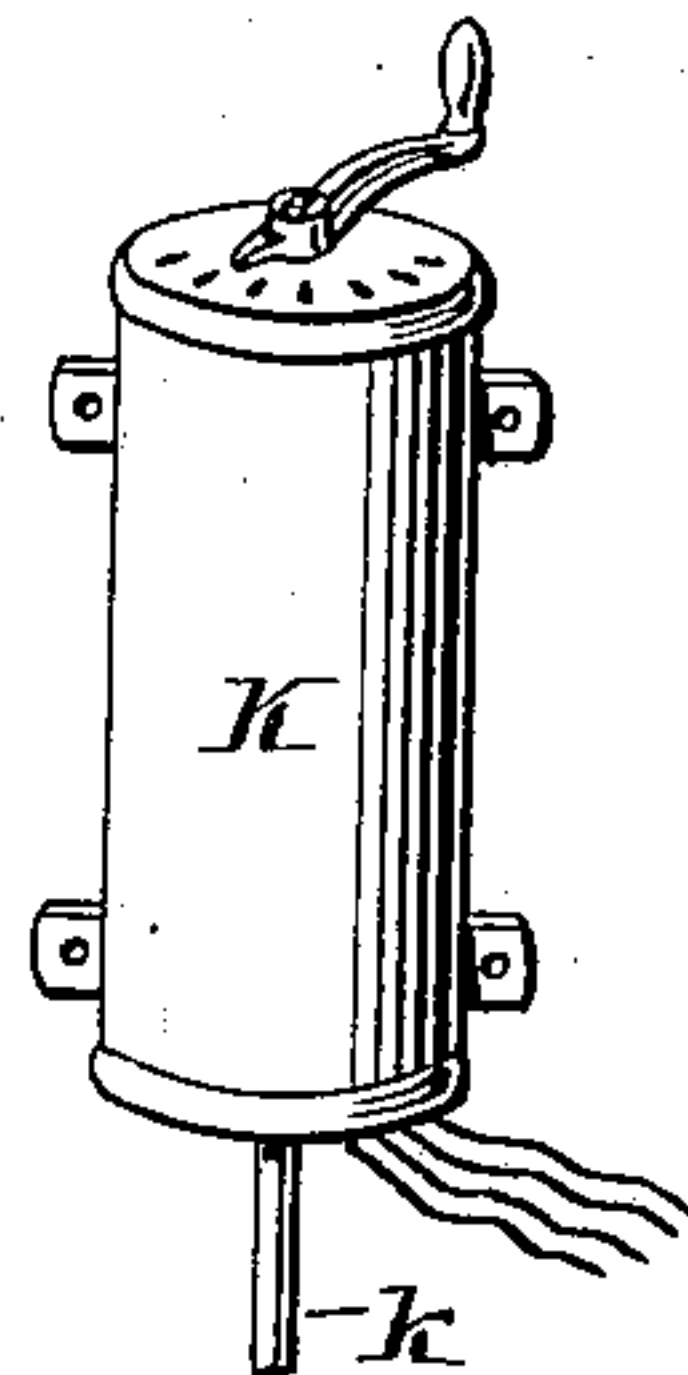
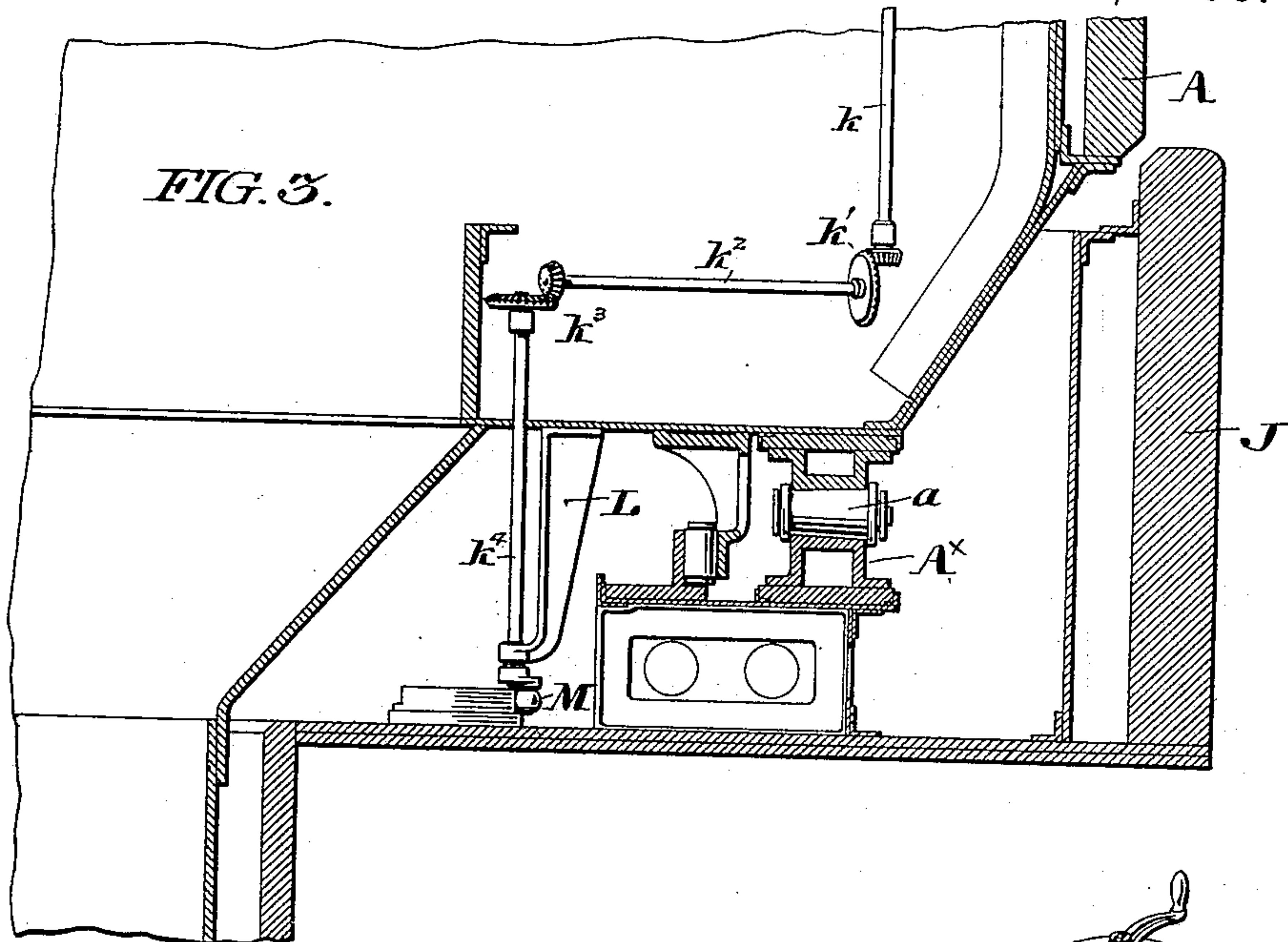
(No Model.)

2 Sheets—Sheet 2.

N. P. TOWNE.  
TURRET DRIVING MECHANISM.

No. 606,039.

Patented June 21, 1898.



*FIG. 6.*

WITNESSES:

N. E. Paige  
J. Norman Dixon,

Nathan P. Towne

INVENTOR:

By his Attorneys,  
Wm. E. Strawbridge  
J. Bonnell Taylor.



# UNITED STATES PATENT OFFICE.

NATHAN P. TOWNE, OF PHILADELPHIA, PENNSYLVANIA.

## TURRET-DRIVING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 606,039, dated June 21, 1898.

Application filed July 30, 1897. Serial No. 646,470. (No model.)

*To all whom it may concern:*

Be it known that I, NATHAN PRATT TOWNE, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Turret-Driving Mechanisms, of which the following is a specification.

My invention relates to the mechanism employed for occasioning the rotation of the turrets of ships, and especially to the means for controlling such turret-driving mechanism.

While it is necessary, as is well known, that turrets should be capable of being rotated in either direction, it is desirable, for instance to avoid the encounter or collision of a projecting gun with deck fixtures, that they should be prevented from being rotated past given points in either direction; and, whereas the manually-controlled mechanism ordinarily employed is adequate under usual conditions to prevent rotation beyond prescribed limits, yet such undue rotation is liable to occur should the operator be inattentive or become incapacitated for duty.

It is the object of my invention to provide, in connection with the mechanism employed to drive the turret, means of a special character or arrangement, and automatically controlled by the movement of the turret itself, to so manipulate the turret motor that the turret, notwithstanding inattention of the operator, will be prevented from moving beyond the points which mark the desired limits of its contemplated normal movements.

In the accompanying drawings I show, and herein I describe, two forms of mechanism alike embodying my invention, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the accompanying drawings,

Figure 1 is a central sectional elevation of a turret provided with devices embodying my invention.

Figure 2 is an under plan view of the depending turret tube.

Figure 3 is a view in central sectional elevation of a portion of a turret, and of a bar-bette within which the turret is mounted.

Figure 4 is a top plan view of the cam and trip devices shown in Figure 3.

Figure 5 is a view in perspective of a well known type of controller.

Figure 6 is a view in perspective of the cam shown in Figure 4.

Similar letters of reference indicate corresponding parts.

Referring, first, to the embodiment of my invention represented in Figures 1 and 2 of the drawings:—

A is a turret of a well known type, the vertical cylindric wall of which rests and runs upon rollers *a*, disposed upon a track or way, formed by or on the upper edge of a permanent cylindrical turret base or support *A*<sup>x</sup>.

The inner face of the wall of the turret is provided with an annular rack *a*<sup>x</sup> affixed to its basal portion, with which rack is engaged a driving pinion B, to occasion the rotation of the turret.

The driving pinion B is shown as mounted upon the upper end of a vertically disposed shaft *b*, supported in a suitable bearing *b*<sup>x</sup> mounted upon the base or support *A*<sup>x</sup> and the lower end of which is, through bevel gears C, engaged with the driving crank of any suitable stationary motor such, for instance, as that typically illustrated in Figure 1, and designated C<sup>x</sup>.

In Figure 1 of the drawings, the upper floor or deck D is slightly above the level of the lower edge of the turret, while the turret base *A*<sup>x</sup> is erected upon a second floor or deck D',—the motor C<sup>x</sup> resting and being supported upon a third floor or deck D<sup>2</sup>.

It is, of course, to be understood that the several elements or devices forming the above described apparatus may be arranged in such relationship as the constructor may desire, or as may be rendered appropriate or necessary by the character of the structure as an entirety.

E is any common type of reversing valve, constituting a controlling device, conveniently mounted upon, and operating in connection with, the motor C<sup>x</sup>, and the stem *e* of which is shown as extending to a point beneath the center of the turret tube F.

This turret tube F, depends axially from the turret, rotates therewith, and is provided as to its lower end or bottom plate with two cams G G,—while the stem *e* of the valve E



is provided with a projecting tripping lever so connected and disposed with reference to said stem, as to be adapted to be encountered and tripped or deflected by said cams, in the  
5 rotation of the turret and turret tube.

The tripping lever H, which is conveniently provided as to its upper end with an anti-friction roller *h*, is pivotally supported upon any suitable support such as the vertical  
10 plate H<sup>x</sup>.

The cams G G, are shown as each consisting of a curved plate or wing pivoted at the point *g* to the bottom plate of the turret tube, and each provided, intermediate of its length  
15 with a threaded stem *g*<sup>x</sup> pivoted or swiveled to it, and extending through a retaining keeper *g*' on the bottom plate, on opposite sides of which are disposed adjusting nuts engaged with said stem.

Ordinarily the valve E is manipulated, through an operating handle I<sup>2</sup>, by an operator within the turret, conveniently by a train of devices such as that shown, in which the  
20 outer end of the stem *e* is connected to one arm of a bell-crank lever *i* pivotally supported upon a suitable support I<sup>x</sup>, to the other arm of which lever is swiveled a link I, extending up to a point within the turret, and within the turret connected to one arm of a bell-  
25 crank *i*', the other arm of which forms the operating handle I<sup>2</sup> referred to.

Manifestly, the throw of the handle I<sup>2</sup> by the operator stationed within the turret, will, through the bell-crank *i*', link I, bell-crank *i*,  
35 and valve stem *e*, control the change valve and therefore control the operation of the motor and direction of rotation of the turret.

When, however, at certain points in the rotation of the turret, the latter approaches the  
40 limit which it is desired that it shall not pass, one or the other of the cams G G,—(intentionally located at predetermined points to bring about this result),—will encounter the tripping lever H and throw the valve stem *e*  
45 to reverse the valve E and bring the motor to a standstill,—an operation of course independent of any control of the operator.

By the manipulation of the nuts on the stems *g*<sup>x</sup> the cams G may obviously be set at  
50 any desired inclination, to graduate and determine their action upon the tripping lever H.

In the organization above described, the cams which trip the motor rotate with the turret, while the motor is stationary.

My invention may, of course, be and preferably is embodied in an organization arranged in a manner the reverse of the foregoing.

Thus in Figures 3, 4, 5, and 6, is represented an arrangement of devices in which a station-  
60 ary cam is shown as employed in connection with a turret operated by a motor mounted upon and rotating with it.

In said Figures 3, 4, 5, and 6, the turret A is shown as mounted upon rollers *a*, which run upon a support A<sup>x</sup>, all as shown in Figure 1, the  
65 turret, however, being inclosed by a barbette J of an ordinary character.

A cam, which is designated N, and which is of substantially the character of those represented in Figures 1 and 2 as mounted upon the  
70 lower end of the depending turret tube F, and rendered adjustable by similar devices,—is secured to one of the decks or floors, or to any convenient stationary part of the structure in which the turret is located. 75

A turret-driving motor of any desired character, and carried by the turret, and which may be assumed to be an electric motor, controlled by any well known form of controller K, is supposed present, but not shown, such  
80 devices being well known to those familiar with the art,—for which reason also the exterior only of the controller K is exhibited.

Any form of motor, controlled by any type of controller or valve, may obviously be carried by the turret. 85

A train of gearing consisting of an operating shaft *k*, connected to the controller, and in gear, through the bevels *k*' with a shaft *k*<sup>2</sup>, in turn in gear through the bevels *k*<sup>3</sup> with a  
90 shaft *k*<sup>4</sup> mounted for rotation in a hanger L and equipped as to its lower end with a rock arm M keyed upon it and adapted to encounter the cam N, constitutes a convenient chain of devices by which the cams, of which two are  
95 supposed employed, operate to throw the switch or controller K and reverse the electric or other motor which propels the turret.

As will be understood, in the travel of the turret and motor, the contact of the rock arm  
100 M, with the cam, N, will cause the deflection of said arm, the consequent rotation of the shaft *k*<sup>4</sup>, and the correspondent movement of the train of gearing leading to the controller, and of the controller. 105

The cams referred to are, of course, to be placed in the proper positions to occasion the throw of the controller switch at the points at which it is desired to stop the travel of the  
110 turret,—and, manifestly, the principle of the devices shown in Figures 3, 4, 5, and 6, is essentially the same as that shown in Figures 1 and 2, the arrangement of devices in the one set of figures being merely the reverse of that shown in the other set of figures. 115

Manifestly, also, any preferred train of devices may be employed to transmit the movement of the tripping rock arm M to the controller valve or switch K.

Having thus described my invention, I claim  
120 and desire to secure by Letters Patent—

1. In combination with a movable turret, and a motor and motor controlling devices carried by said turret, stationary devices arranged to trip or throw said controlling de-  
125 vices at predetermined points in the travel of the turret, substantially as set forth.

2. In combination with a turret, a motor carried by said turret, a controlling mechanism for said motor also carried by said turret,  
130 and a tripping device for said controlling mechanism which consists of two parts one of which is mounted upon and carried by the turret and the other of which is stationary



and exterior to the turret, and one of which also is formed as a cam pivotally connected at one end to its support, and as to its body is provided with devices by which it may be  
5 set to various positions of adjustment, substantially as set forth.

3. In combination with a turret, a motor, a controlling device for said motor, and a trip consisting of two parts one of which is stationary and formed as a cam pivotally connected at one end to its support, and as to its  
10 body provided with devices by which its set may be adjusted, and the other of which travels with the turret and the contact of which  
15 two parts trips the controlling device and reverses the motor, substantially as set forth.

4. In combination, a rotatable turret, a motor mounted upon and carried by said turret, a motor-controlling device mounted upon and carried by said turret, a cam supported in  
20 the vicinity of said turret, and a train of devices connected with said controller and terminating in a rock arm which depends in such position as to encounter the cam in the travel  
of the turret, substantially as set forth. 25

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 26th day of July, A. D. 1897.

NATHAN P. TOWNE.

In presence of—

J. BONSALE TAYLOR,  
F. NORMAN DIXON.