

No. 710,244.

Patented Sept. 30, 1902.

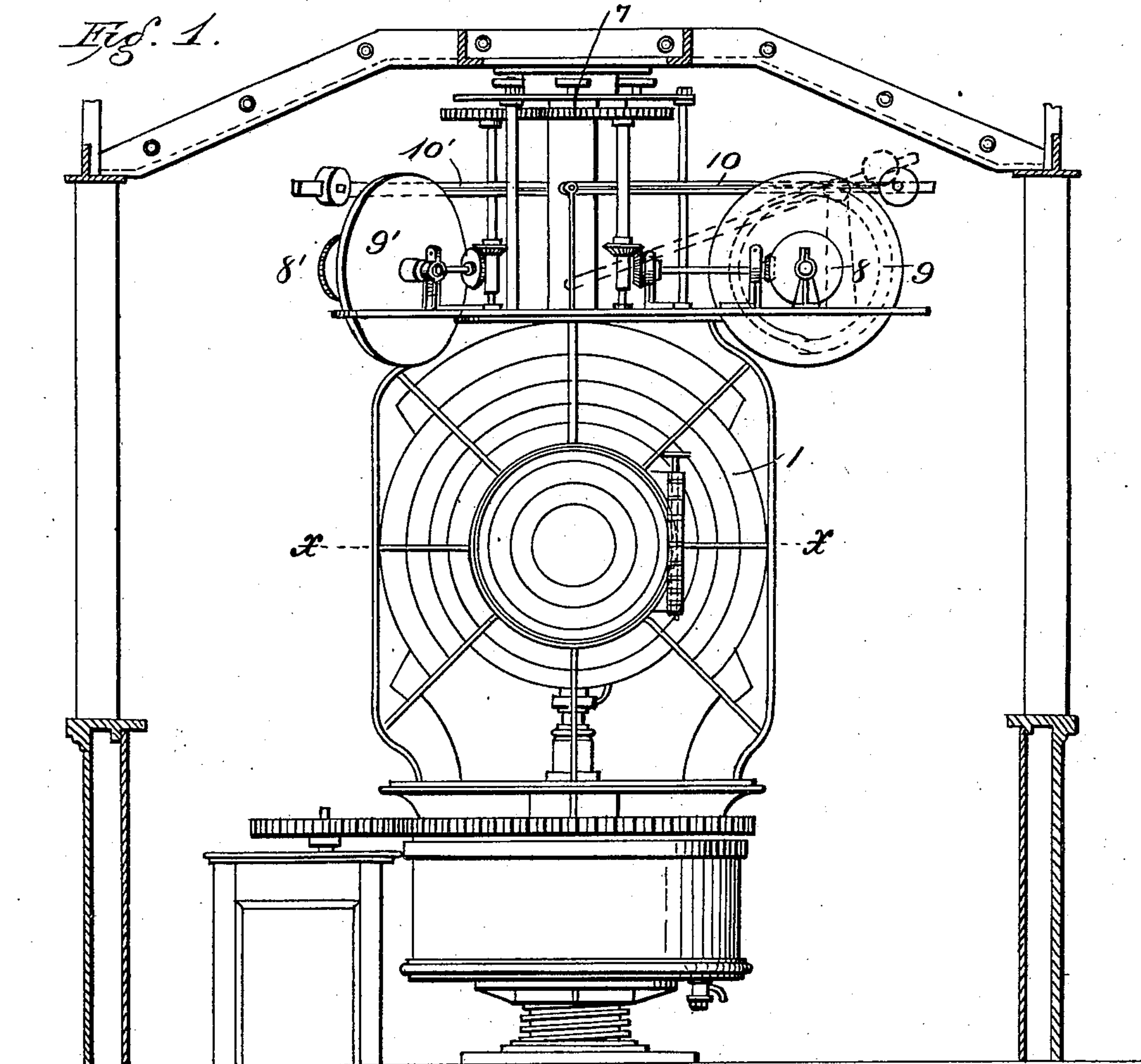
A. BREBNER.  
REVOLVING GROUP FLASHING APPARATUS.

(Application filed Apr. 9, 1902.)

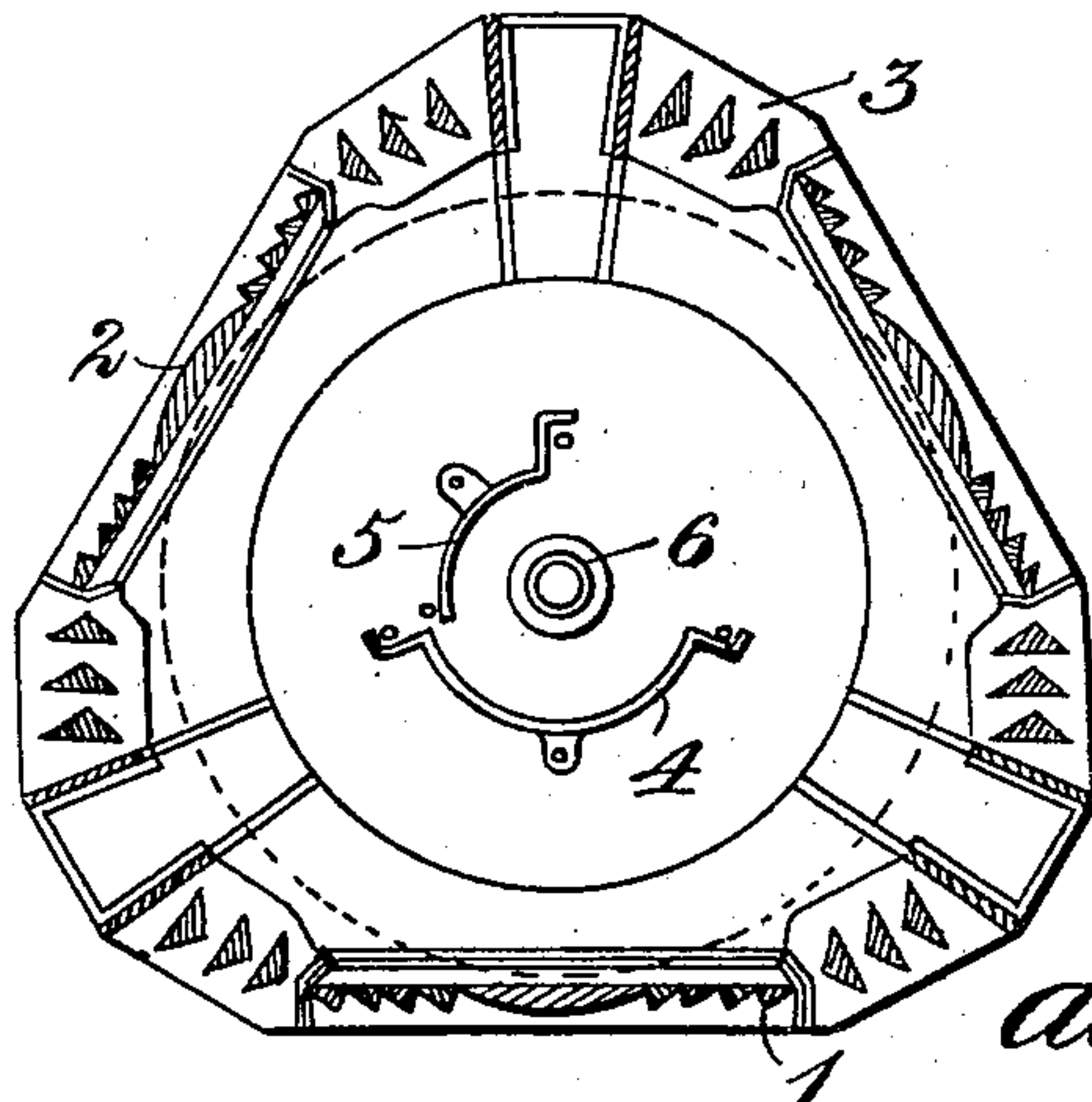
(No Model.)

2 Sheets—Sheet 1.

*Fig. 1.*



*Fig. 2.*



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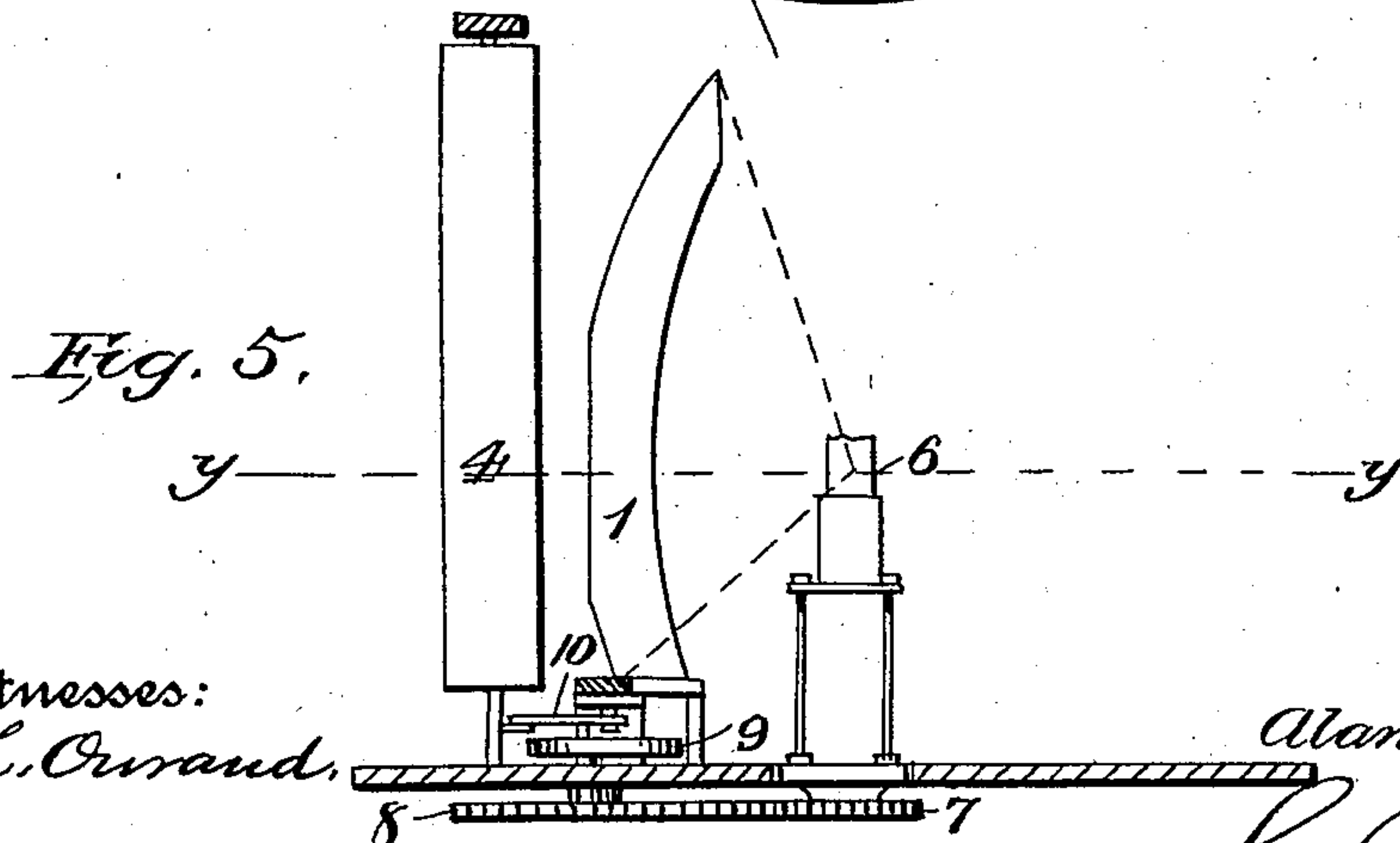
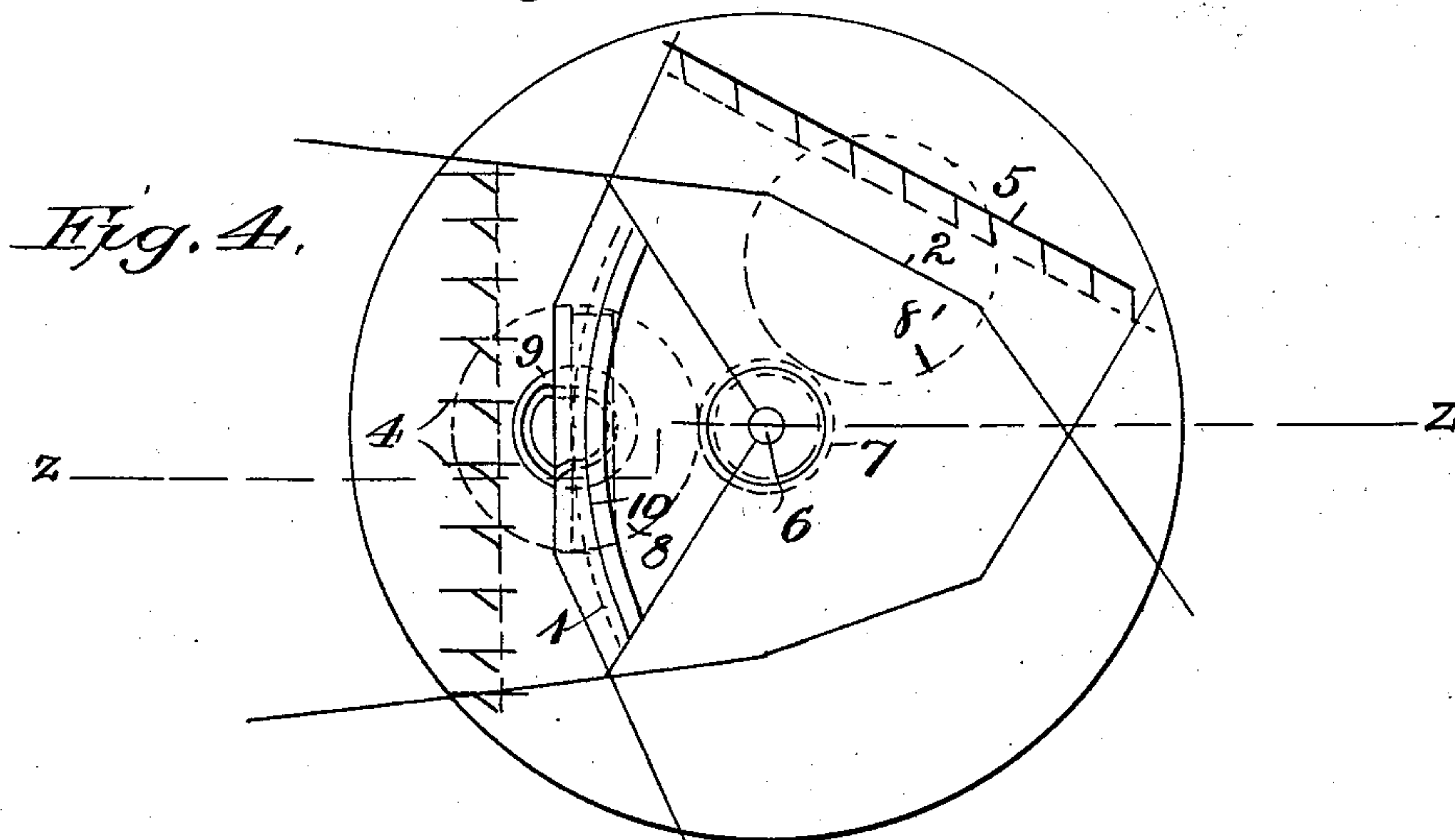
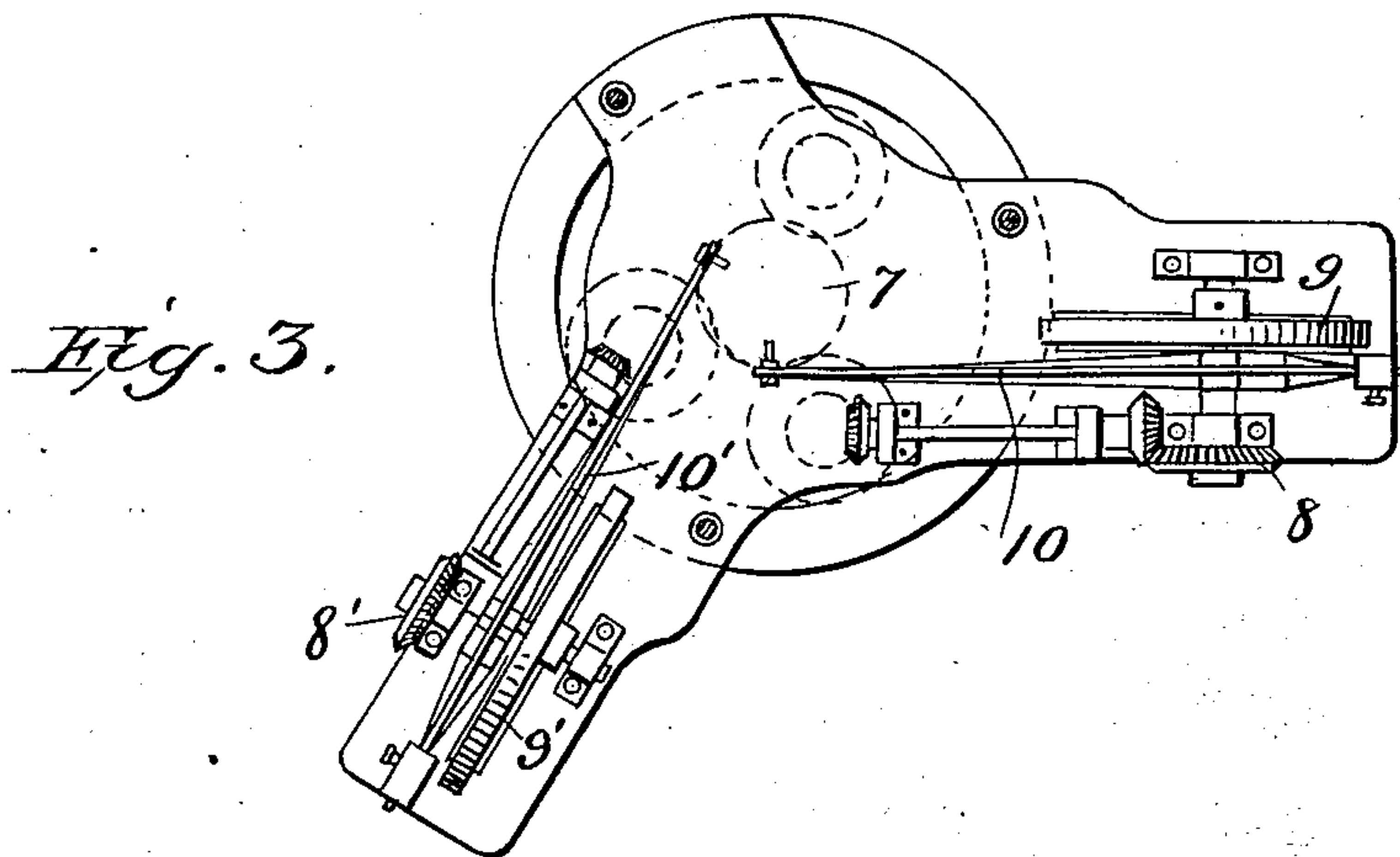
A. BREBNER.

REVOLVING GROUP FLASHING APPARATUS.

(Application filed Apr. 9, 1902.)

(No Model.)

2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

ALAN BREBNER, OF LONDON, ENGLAND.

## REVOLVING GROUP-FLASHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 710,244, dated September 30, 1902.

Application filed April 9, 1902. Serial No. 102,042. (No model.)

*To all whom it may concern:*

Be it known that I, ALAN BREBNER, a subject of His Majesty the King of Great Britain, residing at 10 Hereford road, Acton, London, W., in the county of Middlesex, England, have invented a new and useful Revolving Group-Flashing Apparatus, of which the following is a specification.

My invention relates to improved means for producing group-flashing signals in light-houses or elsewhere. These consist of a luminary of a revolving optical apparatus of three or more sides, two of which sides only are provided with screens by which the light falling on them from the luminary can be eclipsed before or after passing through these sides and of mechanisms for operating the screens.

I shall describe one important case which will sufficiently illustrate and explain the whole invention. In this case a two-part screen is used in combination with a revolving optical apparatus of three sides, two of which are provided with screens, while the third is without any screen.

Figure 1 is a vertical elevation of the entire inventive combination. Figs. 2 and 4 are partial horizontal sectional plans at  $x x$  and  $y y$  of Figs. 1 and 5, respectively. Fig. 3 shows the mechanism of Fig. 1 in plan. Fig. 5 is a partial vertical sectional elevation at  $z z$  in Fig. 4.

Figs. 1, 2, and 3 illustrate this case when the screens cut off the light from the corresponding sides of optic before it falls on these sides. Figs. 4 and 5 illustrate the same case when the screens cut off the light after it has passed through these sides of optic.

In Figs. 1 to 3 the screens consist of two entire subdivisions moving independently of each other, while in Figs. 4 and 5 the screens consist of two independent portions, each of which is itself composed of a number of interdependent parts. In Fig. 1 a common form of motor for rotating the optical apparatus is shown roughly—namely, a weight-driven clockwork, a pinion from which gears with a toothed ring attached to a mercury float carrying the optic and its adjuncts.

The principal parts composing the inventive combination are marked where they appear in the five figures by the numbers 1 to 10.

1, 2, and 3 are the sides of the optic, of which

1 and 2 have screens revolving with them, while 3 has no screen.

4 and 5 are the two portions of screen revolving with 1 and 2, respectively.

6 is the luminary.

7 is a toothed ring fixed to the stationary lantern.

8 is a toothed wheel gearing with 7, either through a train of intermediate gearing, as in Figs. 1 and 3, or directly, as in Figs. 4 and 5.

9 is a cam-grooved wheel fixed to the same axle as 8.

10 is a lever, balanced if necessary, connected at one end with screen 4 and having a pin and roller fixed to it near its pivot, which pin and roller penetrate within the cam-groove of 9.

In Figs. 1 and 3 the mechanism actuating each of the two levers and screens is shown, the numbers of the second set being distinguished by a dash. As screen 4 is connected to lever 10 so screen 5 is connected to lever 10'.

In Fig. 4 the only portion of the second mechanism shown is the wheel 8'.

The lenses 1, 2, and 3 may be of any form, the most commonly used form being shown in detail in Figs. 1 and 2 and in diagrammatic skeleton outline in Figs. 4 and 5.

The circular cam-grooves of wheel 9, Figs. 1 and 4, are more remote from the center for about half their extent than for the opposite half, these portions of different radii being connected by short straight grooves. As mentioned already, roller-pins fixed to levers 10 penetrate within the cam-grooves of 9. Thus as the wheels 9 rotate they cause the levers to rise and fall once in Fig. 1 or come and go once in Fig. 4 for each revolution they make. The cam-wheels 9 in the case shown make one revolution for each double revolution of the optic. Consequently as the apparatus revolves at uniform speed the sides of optic 1 and 2 have their respective screens 4 and 5 open during one revolution, closed during the following revolution, and so on repeatedly. Hence results a quadruple flashing light. The opening or closing of the screens occurs while the lever roller-pins are in the short straight portions of the cam-grooves, and the arc subtended by these straight portions of cam-grooves can be arranged so as to effect the opening or closing of the screens while the



beams from the corresponding lenses 1 and 2 are pointing over the dark arc of a lighthouse. In the case illustrated in the drawings the optic making one complete revolution in seven and one-half seconds and a luminary of suitable size being used the characteristic quadruple flash is given as follows: flash, 0.1 second; short eclipse, 2.4 seconds; flash, 0.1 second; short eclipse, 2.4 seconds; flash, 0.1 second; short eclipse, 2.4 seconds; flash, 0.1 second; long eclipse, 7.4 seconds; total period, fifteen seconds. The characteristic quadruple flash is thus repeated regularly once in every fifteen seconds. Similarly other group-flash characters result from the combination of partial two-part screens with optics of more than three sides.

Having described my invention, what I claim as new, and wish to secure by Letters Patent, is—

1. A revolving optical apparatus of not less than three sides together with screens fitted to two only of these sides, with mechanism for opening and closing the screens and with a central luminary, substantially as set forth and for the production of certain group-flash signals.

2. In a device of the character described a central luminary, a revolving optical apparatus of not less than three sides, a screen attached to each of two only of these sides and capable of intercepting all light from the luminary falling on each of these two sides,

a lever connected to each screen and carrying a pin and roller, a cam-grooved wheel causing each screen to open and remain open for a certain time and to close and remain closed for a certain time, and gearing-wheels revolving with each screen-provided side of revolving optical apparatus and kept in motion relatively to the optical apparatus by a toothed ring fixed to the stationary lantern, substantially as set forth and for the production of group-flash signals.

3. In combination, a luminary, a revolving optical apparatus of not less than three sides, a two-part partial screen and the necessary mechanism for operating the said two-part partial screen, substantially as set forth and for the production of group-flash signals in lighthouses or elsewhere.

4. In any combination of continuously-revolving optical apparatus and screens for producing group-flashing characteristics, a continuously-revolving cam-grooved wheel by means of which said screens are operated and kept constantly under control, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALAN BREBNER.

Witnesses:

ALAN BREBNER,

FRANCES A. BREBNER.