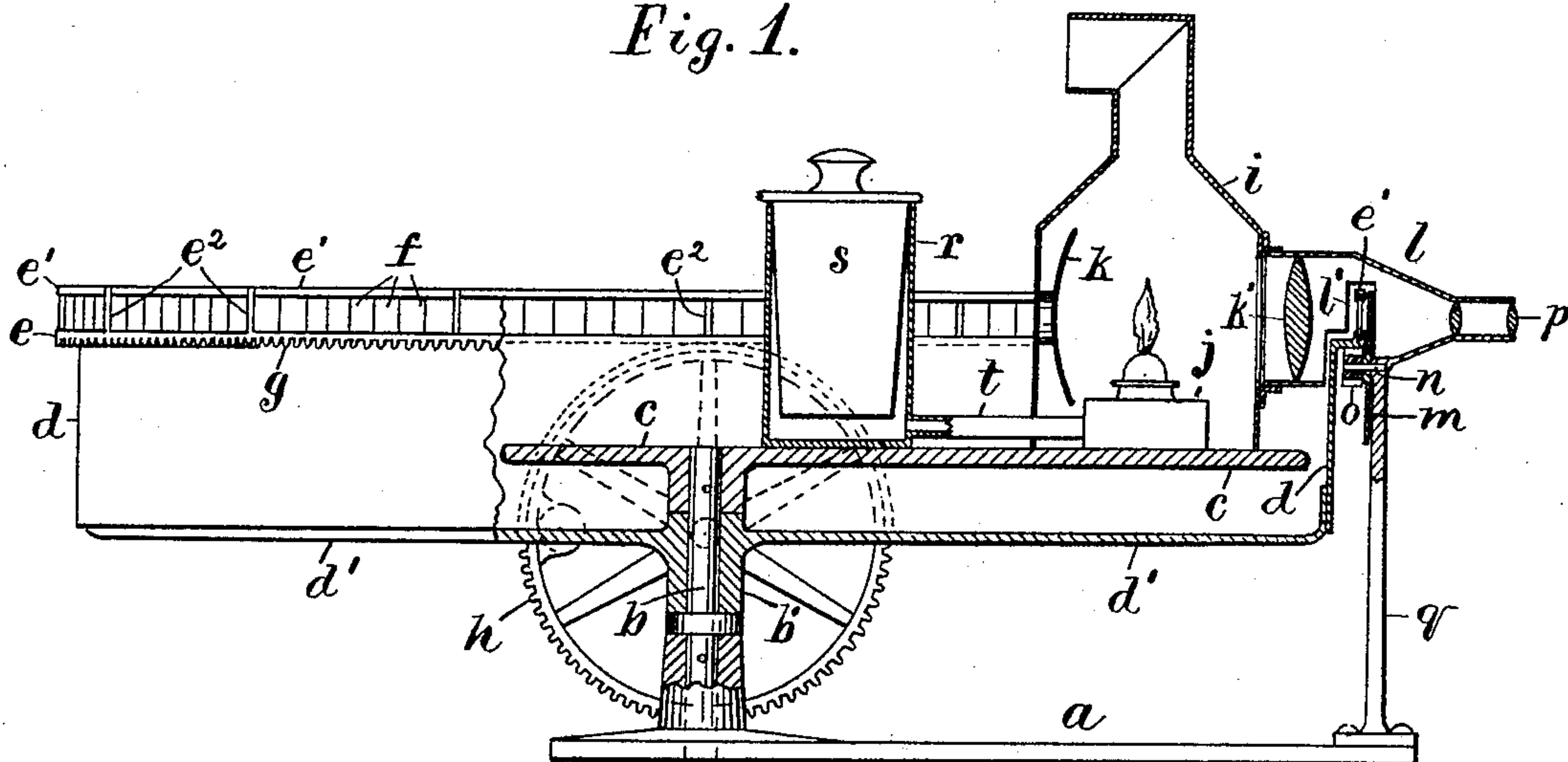


J. E. BLACKMORE.  
MOTOR OPTICON.

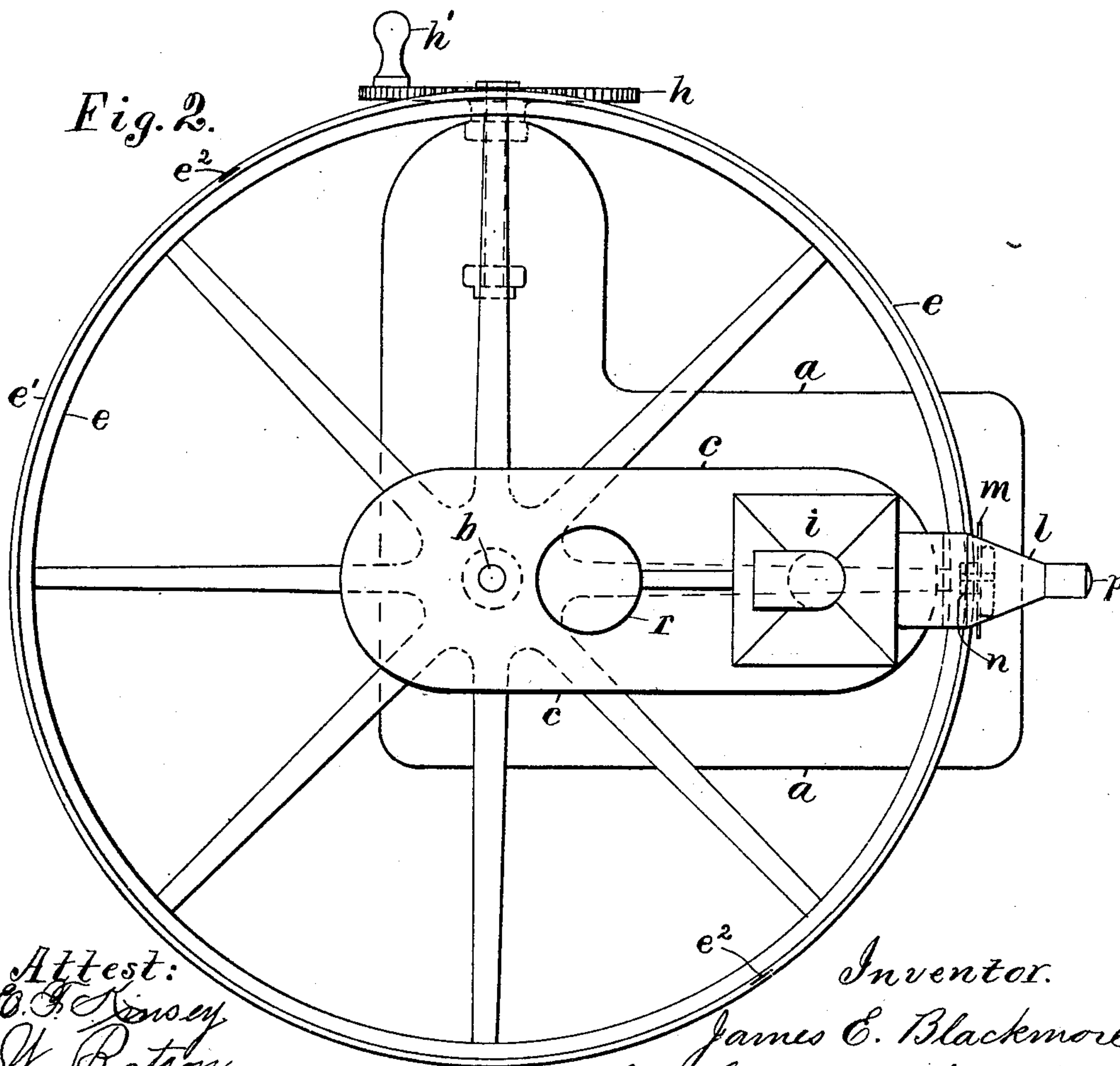
No. 520,030.

Patented May 22, 1894.

*Fig. 1.*



*Fig. 2.*



Attest:  
C. F. Kinsey  
W. Patton.

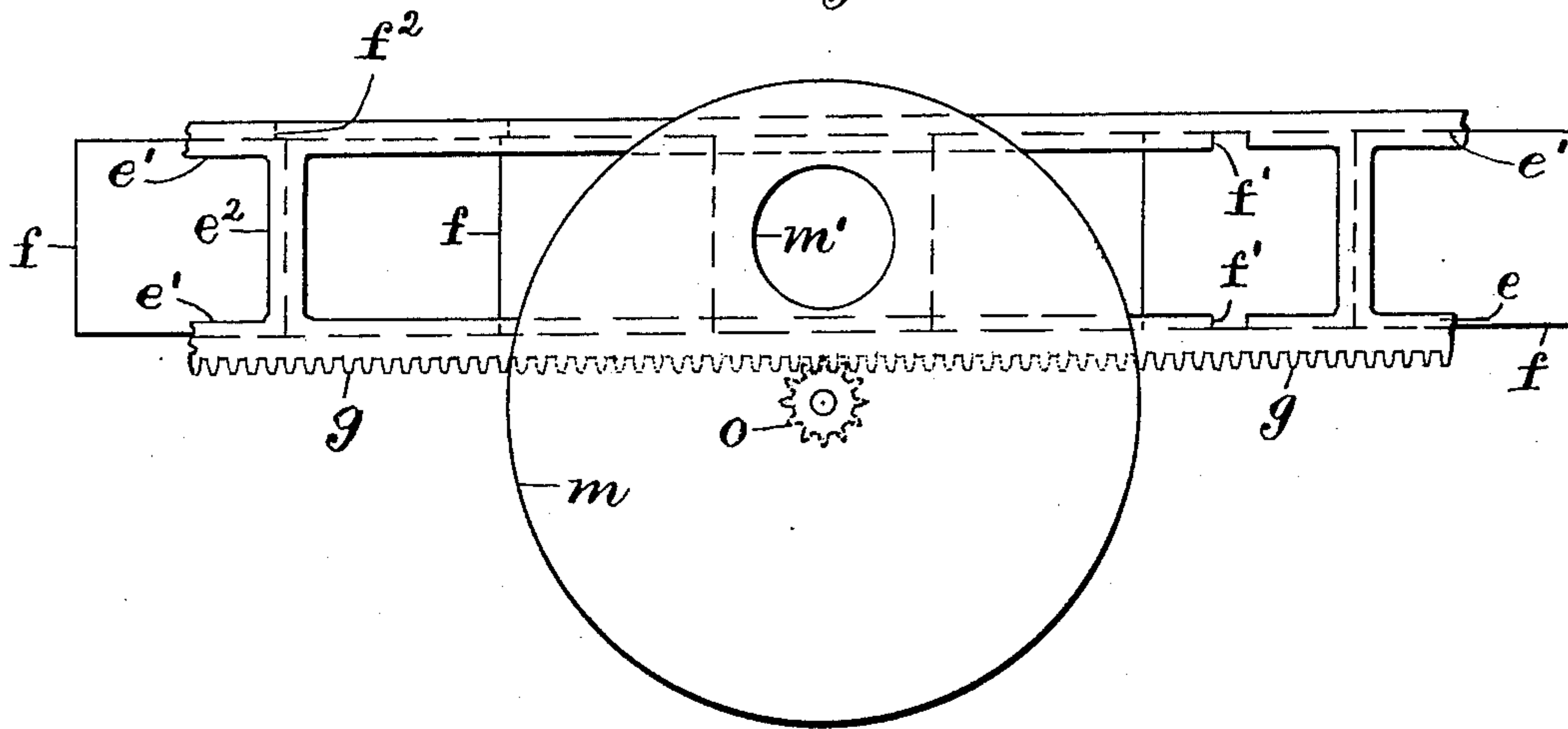
Inventor.  
James E. Blackmore,  
per Crane & Miller, Attys.

J. E. BLACKMORE.  
MOTOR OPTICON.

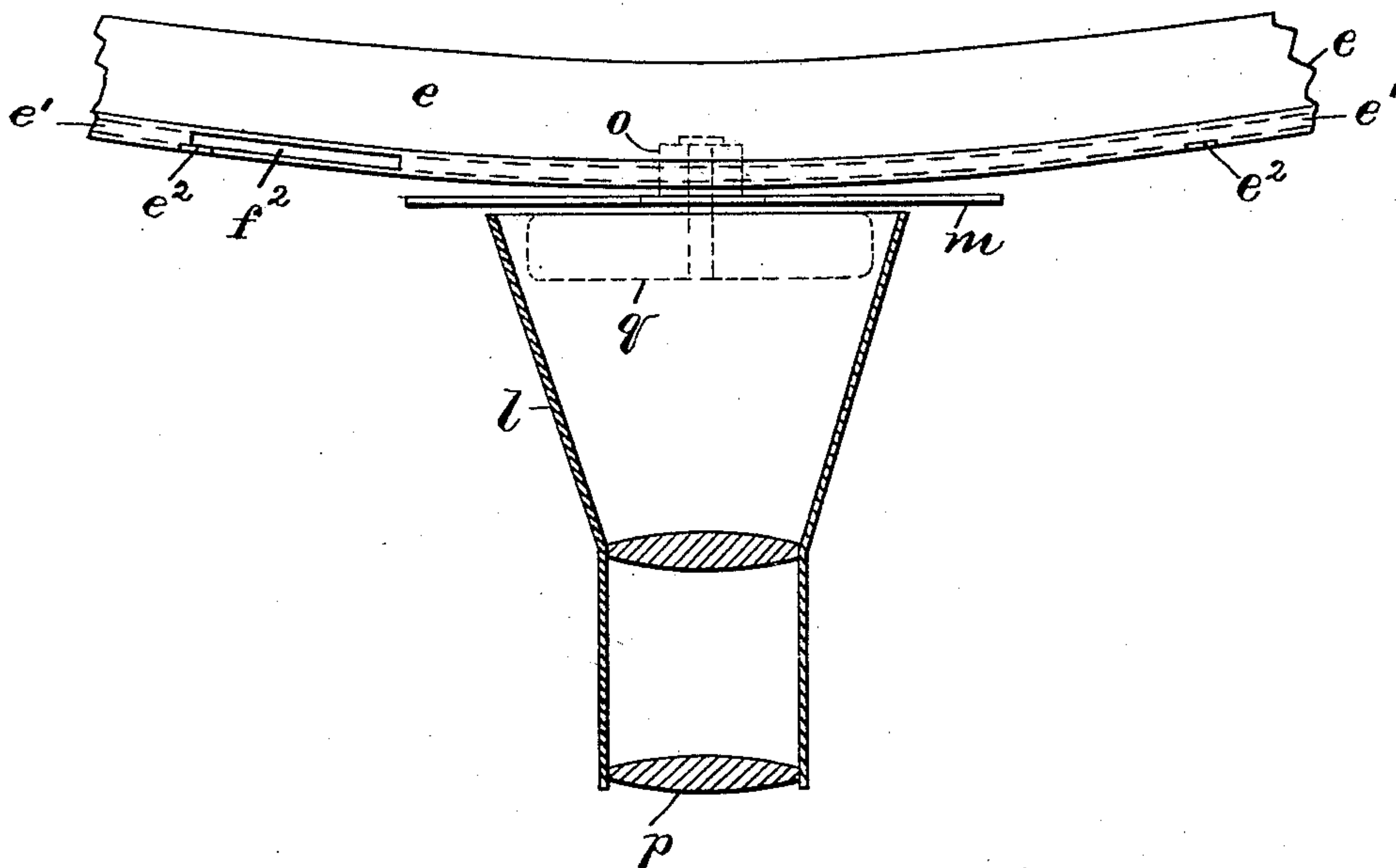
No. 520,030.

Patented May 22, 1894.

*Fig. 3.*



*Fig. 4.*



*Attest:*  
*E. F. Kasey*  
*W. Batson.*

*Inventor*  
*James E. Blackmore*  
*per Crane & Miller, Attys.*



# UNITED STATES PATENT OFFICE.

JAMES EDWARD BLACKMORE, OF NEWARK, NEW JERSEY.

## MOTOR-OPTICON.

SPECIFICATION forming part of Letters Patent No. 520,030, dated May 22, 1894.

Application filed June 19, 1893. Serial No. 478,116. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES EDWARD BLACKMORE, a citizen of the United States, residing at Newark, Essex county, New Jersey, have  
5 invented certain new and useful Improvements in Motor-Opticons, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 The object of this invention is to furnish a simple and effective means of projecting the light of a stereopticon in rapid succession through a series of transparent photographs of a moving object.

15 This invention consists of a stereopticon having a lantern with its condenser held in a stationary position within a cylindrical rotary carrier; the carrier moving a series of transparent photographs behind the lens; and  
20 a shutter being provided outside of the lens and connected by gearing to the carrier, so as to expose the lens as each photograph is presented thereto. A rotary shutter is preferably used, and by gearing the same directly  
25 to a series of teeth upon the rotary carrier, the two are adapted to rotate in perfect unison, and to thus move an opening in the shutter past each transparency, in turn.

To operate the carrier in connection with a  
30 stereopticon, the lantern is preferably mounted upon the top of a post and the carrier wheel is pivoted upon the post below the lantern. This arrangement will be understood by reference to the annexed drawings, in  
35 which—

Figure 1 is an elevation of the apparatus, partly in section at the center line where hatched. Fig. 2 is a plan of the same. Fig. 3 is a front elevation of the shutter with a  
40 part of the carrier; and Fig. 4 is a plan of the same parts with the lens tube in section at the center line.

$a$  is a base, having a post  $b$  fixed in a hub thereon. A platform  $c$  is secured to the top  
45 of the post, and the carrier wheel is fitted by its hub  $b'$  to the post beneath the platform. The carrier wheel is formed with cylindrical rim  $d$  attached to the hub  $b'$  by arms  $d'$ , and having upon the top a grooved seat  $e$  and  
50 grooved cover  $e'$  forming a holder to receive the transparencies  $f$ . Notches  $f^2$  and  $f'$  are

provided to insert the transparencies. An annular gear  $g$  is projected downward from the under side of the seat  $e$ , and a spur wheel  $h$  is mounted upon the base  $a$  at one side to  
55 mesh with the gear  $g$ . The wheel  $h$  is provided with a crank  $h'$  to turn the same by hand. A lantern  $i$  containing lamp  $j$  and reflector  $k$  is mounted upon the platform  $c$  near the inner side of the transparencies  $f$ . The  
60 lens tube  $l$  is provided with a condenser lens  $k'$ , and is projected from the front of the lantern beyond the transparencies; outside of which it is provided with the lenses  $p$ . The tube  $l$  is formed upon the under side with a  
65 notch  $l'$  to admit the holders and a revolving shutter. The shutter disk  $m$  is pivoted upon the lantern tube by stud  $n$ , and is provided with a pinion  $o$  meshing into the gear  $g$ . The  
70 tube  $l$  is shown supported, outside of the transparencies, by a standard  $q$  attached to the base  $a$ . The light within the lantern, the reflector  $k$  and the lenses of the tube  $l$ , are arranged in line with the center of the trans-  
75 parencies  $f$ , and the shutter is arranged to rotate in front of the transparencies, and is provided with an aperture  $m'$  to project them in turn, by the light from the lantern.

An oil well  $r$  is arranged upon the platform  $c$  adjacent to the lantern and is connected  
80 with the lamp  $j$  by pipe  $t$ . The well is provided with an inverted oil reservoir  $s$  such as is commonly used in the German student lamps, and operates, through the medium of the pipe  $t$ , to maintain the oil at a uniform  
85 level in the lamp  $j$ . By this construction the reservoir may be made to keep the lamp in operation for any desired length of time.

The transparencies, for insertion in the holders, are made by taking a succession of  
90 negatives of an object in motion at the rate of fifteen or twenty per second.

The transparencies may be printed upon glass from such negatives, and fitted remov-  
95 ably to the holders through the notch  $f^2$ ; or upon a continuous film and inserted endwise in the holder through the notches  $f'$ .

The apparatus is operated by lighting the lamp and projecting the light intermittingly  
100 through the lens tube upon a suitable screen to form a picture of the desired size, and at the same time turning the hand-wheel  $h$  to



rotate the carrier, bearing the holder  $e, e'$ . By the connection of the carrier with the shutter, the shutter is suitably revolved to move the aperture  $m'$  past each transparency 5 as the latter is in line with the lenses  $p$ , as shown in Figs. 3 and 4, and the light is thus intermittingly flashed through each picture upon the screen.

The transparencies are arranged in proper 10 succession in the holders, and a suitable number of transparencies is used to represent a cycle of the movements, so that each time the wheel revolves a moving image of the object, performing a given actor motion, is presented 15 upon the screen.

The persistence of vision is such that, when fifteen or twenty impressions are made upon the eye per second, a simple unconfused image results, and such an impression may be 20 produced by the succession of pictures upon the screen, by rotating the carrier wheel at a suitable rate to present fifteen or twenty pictures in each second.

The stereopticon may be readily supported, 25 by means of the platform  $c$ , within a carrier wheel from two to four feet in diameter, and eighty or one hundred transparencies may be readily fitted to the circumference of such a wheel, and thus exhibit the motions of an ob- 30 ject during a space of from four to six seconds. The method of taking the photographs in proper succession is not a part of the present invention, but is shown and claimed in another application filed by me.

My invention is adapted to use as an at- 35 tachment for stereopticons, in public and private exhibitions; and may be used, with a proper series of photographic transparencies, to exhibit correctly the motions of men, ani- 40 mals, machinery, or other objects. Such attachment adds greatly to the interest of a stereopticon exhibition, and as the apparatus is of simple construction, it may be made at a very moderate cost.

By pivoting the carrier wheel upon a post, 45 to the top of which the platform  $c$  is attached, I adapt the apparatus to use with any stereopticon having a notch  $l'$  in the lens tube, to

permit the passage of the wheel which carries the photographs. 50

Having thus set forth the nature of my invention, what I claim herein is—

1. In a stereopticon, the combination, with a stationary lantern provided with a condenser and lens, of a cylindrical rotary car- 55 rier surrounding the lantern and carrying a series of photographs behind the lens and a rotary shutter with gearing connecting the shutter and carrier, and operated to expose the lens as each photograph is presented 60 thereto, substantially as herein set forth.

2. In a stereopticon, the combination, with a suitable base, of a post projected upward thereon, a carrier wheel mounted thereon, 65 with a series of transparencies fitted to its periphery a platform upon the top of the post, a lantern and lens sustained upon such platform, and a shutter adapted to expose the pictures to the lens in succession, as set forth.

3. In a stereopticon, the combination, with 70 a suitable base, of a carrier wheel rotated horizontally thereon, and provided with teeth upon its edge and holder for a series of transparent photographs, a lantern and condenser sustained within the wheel with a lens sus- 75 tained in line with such condenser, a shutter rotated between the condenser and lens with pinion connected to the said teeth, and a gear with hand-crank for rotating the carrier wheel, substantially as herein set forth. 80

4. An attachment for stereopticons, consisting in a base, a post projected upward therefrom, a platform upon the top of the post to sustain the lantern, a carrier wheel 85 pivoted upon the post beneath the platform with holder for a series of transparencies, and a shutter geared to the carrier wheel, as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 90 witnesses.

JAMES EDWARD BLACKMORE.

Witnesses:

W. BATSON,  
T. S. CRANE.