

No. 741,730.

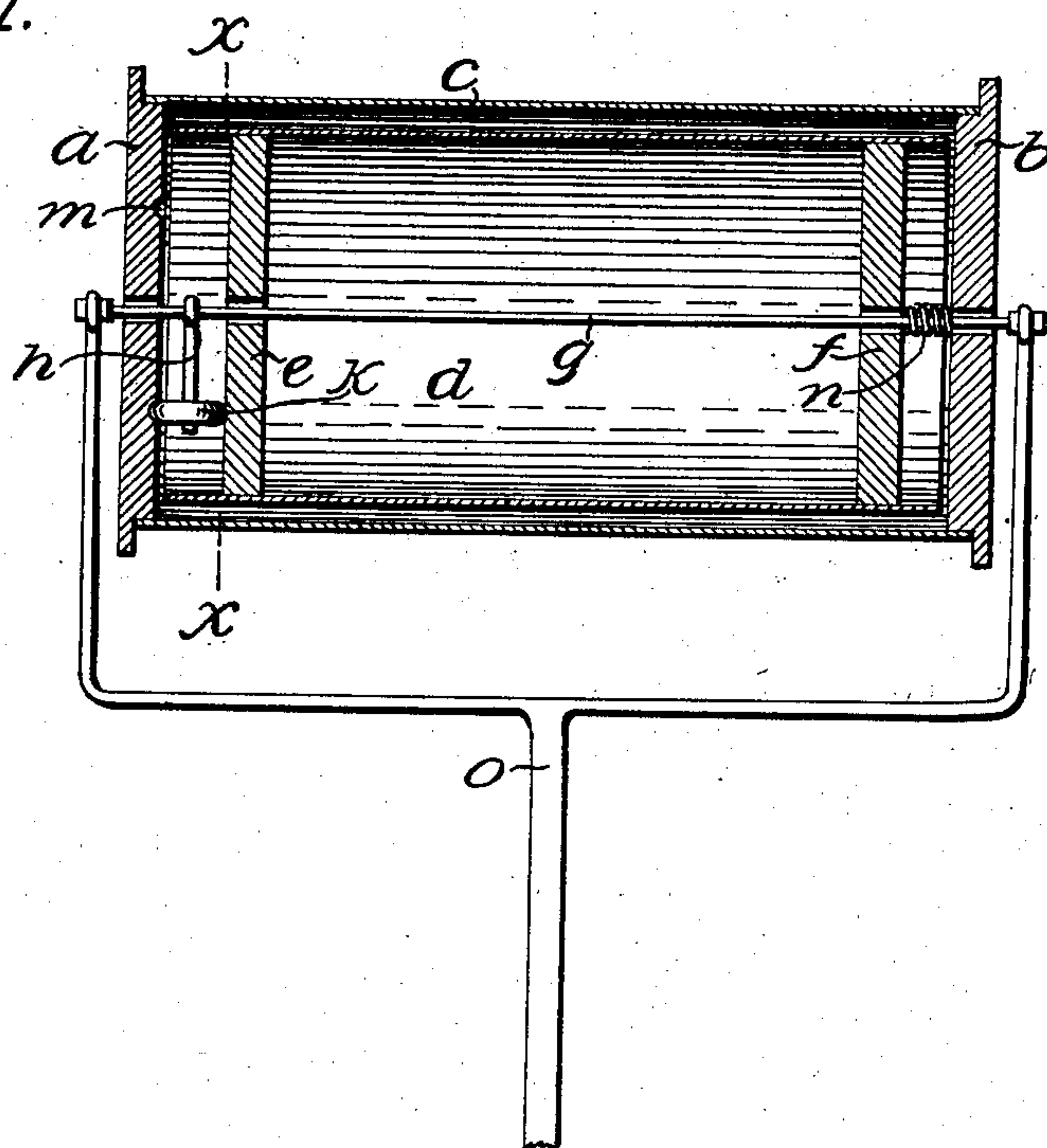
PATENTED OCT. 20, 1903.

P. D. SMITH.  
OPTICAL TOY.

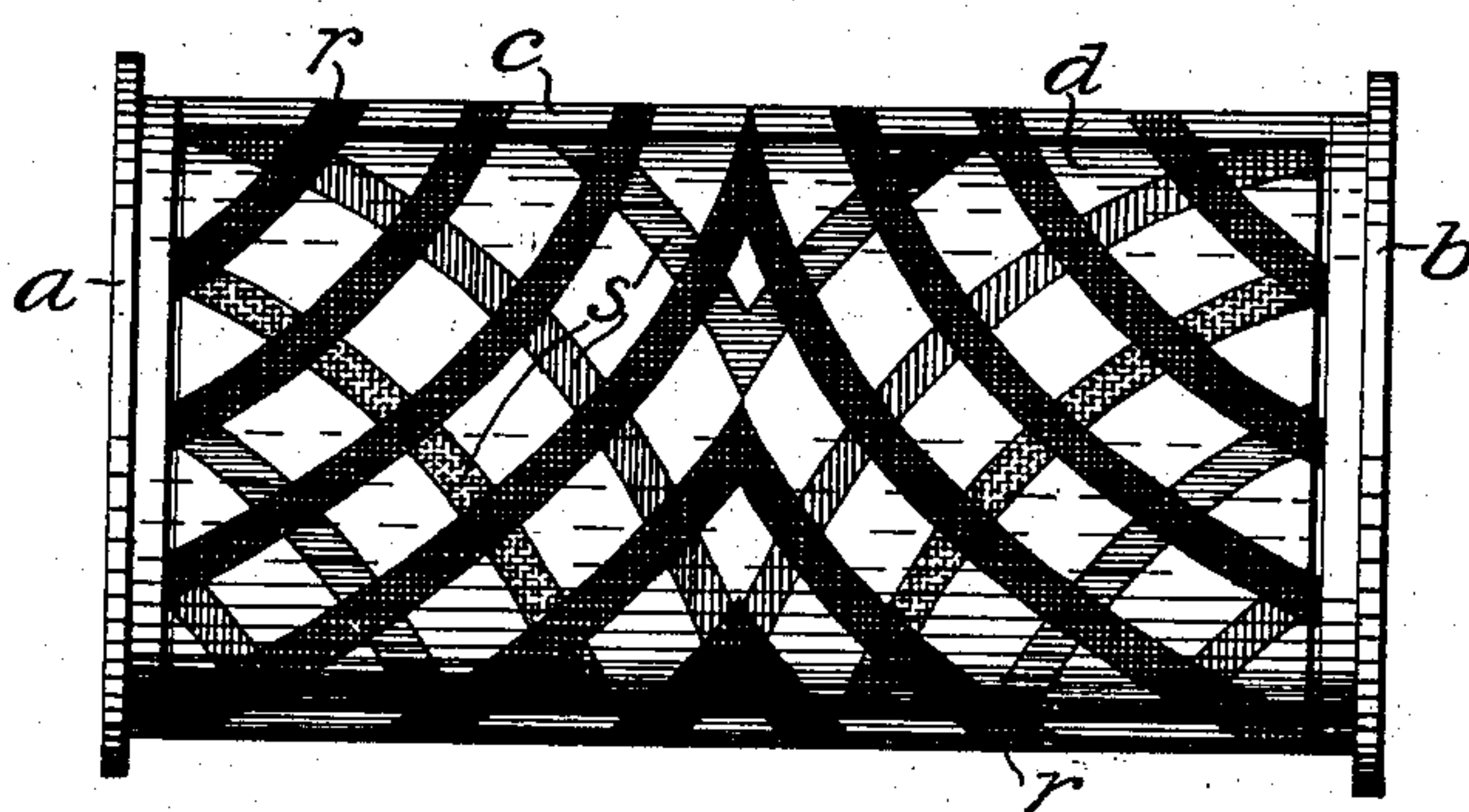
APPLICATION FILED FEB. 24, 1903.

NO MODEL.

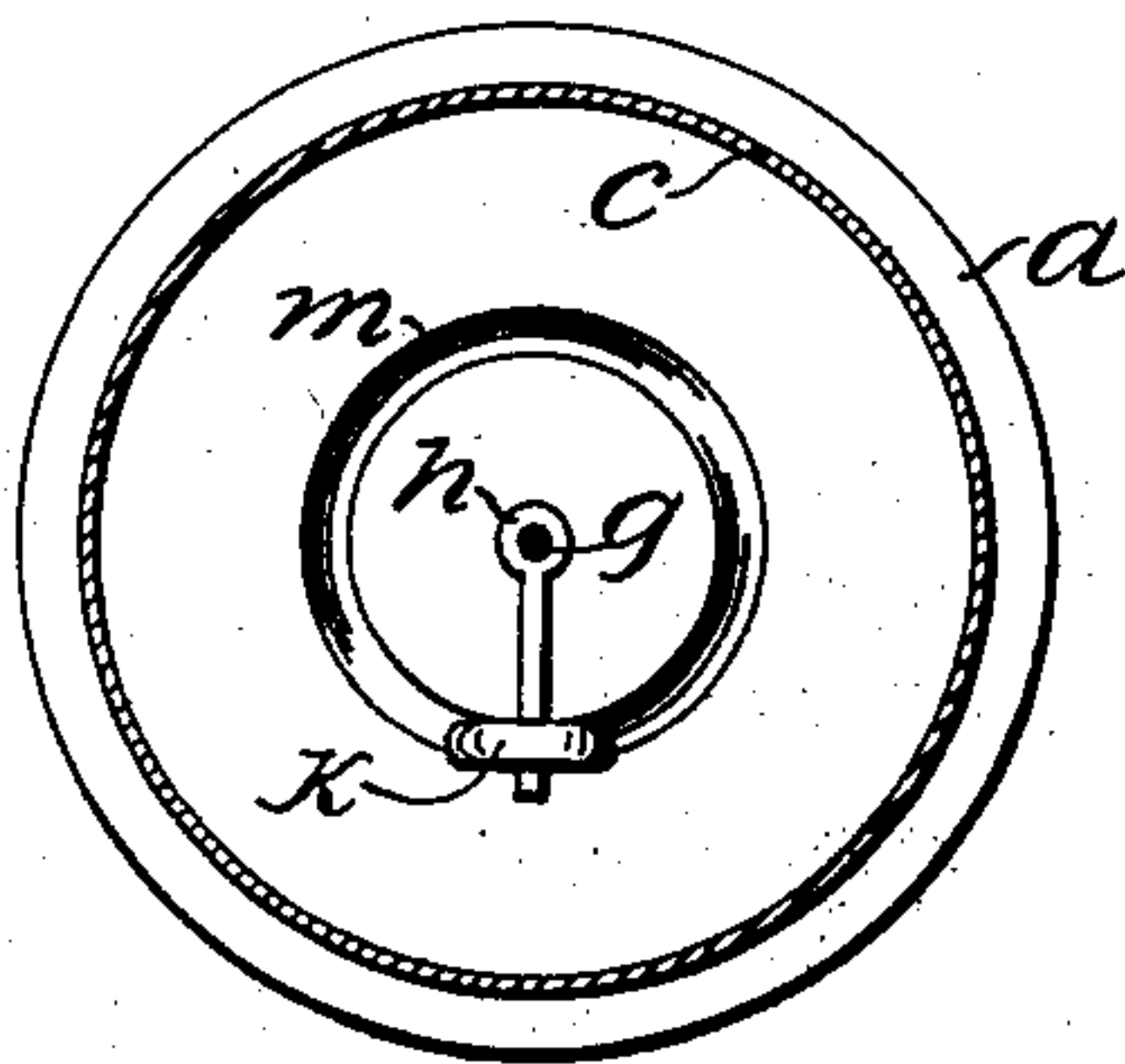
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

PUTNAM D. SMITH, OF WATERLOO, IOWA.

## OPTICAL TOY.

SPECIFICATION forming part of Letters Patent No. 741,730, dated October 20, 1903.

Application filed February 24, 1903. Serial No. 144,782. (No model.)

*To all whom it may concern:*

Be it known that I, PUTNAM D. SMITH, a citizen of the United States of America, and a resident of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Optical Toys, of which the following is a specification.

My invention relates to optical toys; and the object of my invention is to produce a pleasing intermingling of colors by means of the opposite rotations of varicolored cylinders, one contained within the other, the outer one constructed of such material as to permit of the inner one being visible through it. This object I effect by the means illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of my optical toy. Fig. 2 is an outer view of the two cylinders, and Fig. 3 is a transverse section of said cylinders on the line *xx* of Fig. 1.

Similar letters refer to similar parts throughout the several views.

Both the outer cylinder *c* and the inner cylinder *d* are rotatable about the same shaft *g*, but in opposite directions. The outer cylinder *c* has the heads *a* and *b*, which are provided with flanges. The inner cylinder *d* has its heads *e* and *f* placed within a short distance from the ends. The inner cylinder *d* may be opaque; but the outer cylinder *c* must be constructed of some suitable transparent or translucent material. The surfaces of both cylinders may be decorated with varicolored bands, as shown, or in any other manner desired. An auxiliary shaft *h* is fixed at right angles to the fixed shaft *g* and carries a rotatable friction-wheel *k*. One side of the friction-wheel *k* contacts with the surface of the groove *m* in the inner face of the head *a*, while the other side of said wheel bears against the outer face of the head *e*. The forks of the handle *o* are attached to the ends of the shaft *g*. A spring *n* is placed between the heads *f* and *b* in order to keep the heads *a* and *e* in frictional contact with the edge of the wheel *k*.

When by means of the handle *o* the flanges of the heads *a* and *b* are placed in contact with and rolled over any suitable surface, their movement causes the rotation of the wheel *k* by means of the friction between them. The slot *m* forms a bearing, which keeps the wheel *k* in position. The frictional contact of the edge of the wheel *k* against it causes the head *e* and inner cylinder *d* to revolve in opposite direction to that of the outer cylinder *c*. It is obvious that power may be applied to rotate the outer cylinder in any other convenient and equivalent manner.

As the outer cylinder *c* permits the outer surface of the inner cylinder *d* to be seen through it, the play and intermingling of colors produces a striking effect pleasing to the eye, and variations in the effect may be produced by the substitution for each other of cylinders of different patterns.

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

1. An optical toy consisting of inner and outer cylinders decoratively patterned and headed oppositely rotatable on the same shaft, substantially as shown and described.

2. An optical toy consisting of inner and outer headed cylinders oppositely rotatable on the same shaft, and provided with an intermediate friction-wheel between two of their adjacent heads, substantially as shown and described.

3. An optical toy consisting of inner and outer headed cylinders oppositely rotatable on the same shaft, a friction-wheel between two of their heads, and a spring, substantially as shown and described.

4. An optical toy consisting of inner and outer headed cylinders, flanges on the heads of outer cylinder, a common shaft for both cylinders, a friction-wheel rotatable about a stud on said shaft, and means for keeping the edge of friction-wheel in contact with the inner surface of one head of outer cylinder and the outer surface of one head of inner cylinder, substantially as shown and described.

5. An optical toy consisting of inner and outer headed cylinders, flanges on the heads of outer cylinder, a common shaft for both cylinders, a forked handle attached thereto, a friction-wheel rotatable about a stud on said shaft, and means for keeping the edge of friction-wheel in contact with the inner surface of one head of outer cylinder and the outer surface of one head of inner cylinder, substantially as shown and described. 10

Signed at Waterloo, Iowa, this 30th day of January, 1903.

PUTNAM D. SMITH.

Witnesses:

J. F. ALBRECHT,  
C. B. KENNEDY.