

No. 813,082.

PATENTED FEB. 20, 1906.

H. COTTRELL.  
MECHANICAL AND MAGNETIC TOY.  
APPLICATION FILED FEB. 27, 1900.

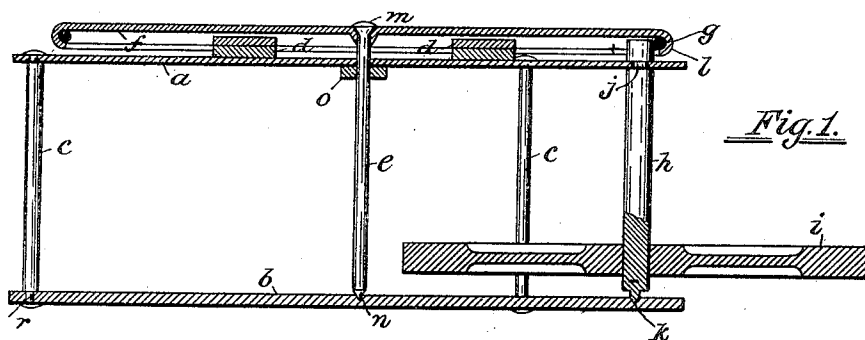


Fig. 1.

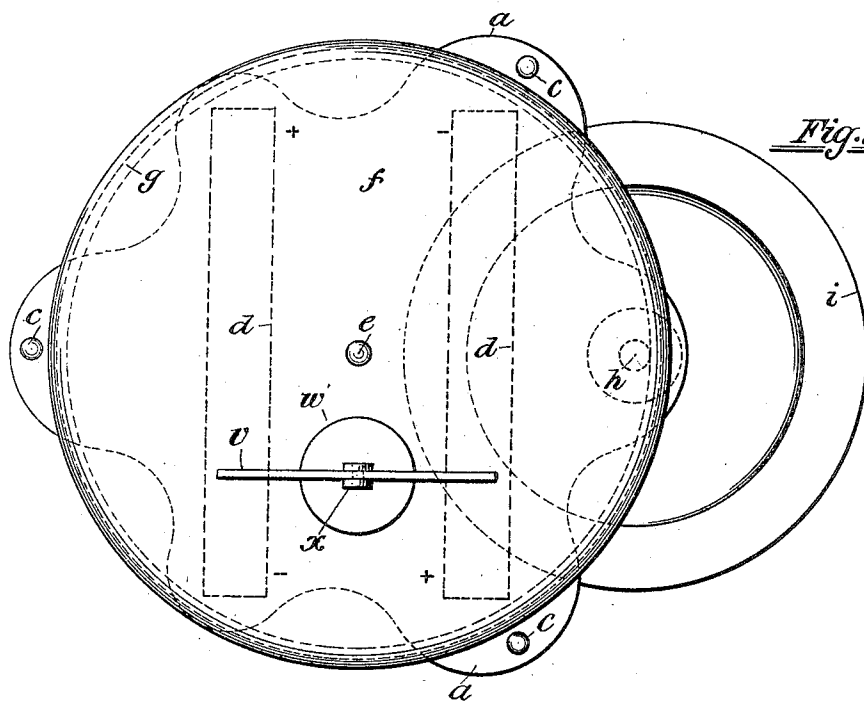


Fig. 2.

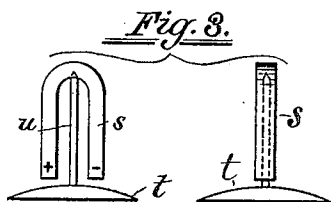


Fig. 3.

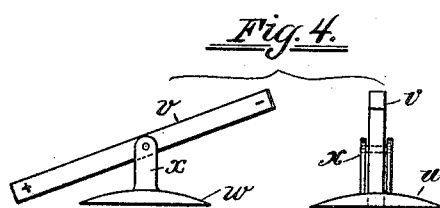


Fig. 4.

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Fig. 5.

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## MECHANICAL AND MAGNETIC TOY.

No. 813,082.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed February 27, 1900. Serial No. 6,700.

*To all whom it may concern:*

Be it known that I, HERBERT COTTRELL, of the city of Newark, county of Essex, State of New Jersey, have invented certain Improve-  
5 ments in Mechanical and Magnetic Toys, of which the following is a specification.

My invention consists in producing a novel mechanical and magnetic device in which by means of alternate magnetic attraction and  
10 repulsion various figures and apparatus placed upon top of the toy may be caused to "seesaw" or to rotate (waltz) or to perform eccentric movements. To do this, I provide a suitable frame to hold one or more magnets,  
15 placed, preferably, in a horizontal position upon the top of the frame. I also provide a balance-wheel, fixed upon a spindle of steel made permanently magnetic, placed, prefer-  
20 ably, in a vertical position and adapted to rotate a table provided with a circular rim of iron wire by means of the attractive contact of the magnetic spindle therewith. I also provide separate permanent magnets of both straight  
25 and horseshoe form, mounted upon suitable movable supports, which may be placed upon the table and be caused to move in various ways when the mechanism is in motion by means of magnetic attraction and repulsion. These movable magnets may have paper or  
30 other figures mounted thereon and make an attractive or amusing display.

Referring to the accompanying drawings, which form part of this specification, Figure 1 is a vertical section in which the main fea-  
35 tures of my mechanical and magnetic device is shown. Fig. 2 is a plan of the same. Fig. 3 shows a horseshoe-magnet pivoted upon a movable support and is adapted to rotate and reverse when in action upon the table.  
40 Fig. 4 shows a straight magnet pivoted upon a movable support and adapted to seesaw when in use. Fig. 5 shows a straight magnet attached to a slightly-convexed plate and is adapted to perform eccentric movements  
45 when used as described.

Throughout the drawings similar letters of reference refer to similar parts.

Referring to Fig. 1, the operation is as follows: The balance-wheel *i*, mounted upon a  
50 magnetized shaft *h*, may be caused to spin upon point *k* in recess in plate *b* and is held vertically in journal *j*, fitted loosely in plate *a*, which plate is of non-magnetic material. A circular plate *f* is mounted upon shaft *e*, piv-  
55 oted at *n*, plate *b*, and loosely held by plate *a* and kept in place by collar *o*. Said plate *f* is

of non-magnetic material and is centrally swaged to receive head *m* of shaft *e*. It is also preferably flat on top with edges turned, as at *l*, to hold an iron wire *g*. This iron wire  
60 is attracted by magnetized shaft *h*, and as *h*, carrying balance-wheel *i*, spins the attraction between shaft *h* and iron wire rim of plate *f* causes plate *f* to rotate. By this means friction is reduced to the minimum,  
65 and a slight impulse keeps the toy in motion a long time. In a space between plates *a* and *f* magnets *d d* are held. (Shown as to position in Fig. 2.) These magnets *d d* are placed,  
70 preferably, parallel, with opposite poles opposed; but other positions and other form of magnets may be used without departing from my invention. The poles of the magnets are  
placed so far apart as not to cause figures or apparatus placed on top of the toy to tend to  
75 cling to or follow them, but only to act by intermittent attraction and repulsion, so that the device shown at Fig. 4, for instance, may be caused to seesaw when placed at any  
point on top of the toy. Little paper figures  
80 may be mounted upon the magnet *v* of Fig. 4 and make an attractive display. Fig. 3 shows another form of magnet *s*, mounted so as to turn loosely upon point *u*, held in base *t*. When this device is placed on top of toy when  
85 spinning, the attraction and repulsion of the magnets give it a waltzing or turning motion, so that any odd or pleasing figure may be attached thereto and make an interesting exhibit. Fig. 5 consists of an oblong or button-  
90 shaped plate *y*, carrying magnet *z*. Its lower surface is slightly bulged, so that it may turn freely, and this may carry amusing figures and be operated like the foregoing. These specified devices are only given as instances  
95 of what may be employed. The range of apparatus operated by this toy may be extended indefinitely.

It is obvious that the plate *f* might be placed below the plate *a* within the structure  
100 and may be used to carry and rotate magnets *d d* and that the seesaws, &c., could then be operated upon plate *a* without departing from my invention.

Having thus described my mechanical and  
105 magnetic toy and given instances of its operation of devices, what I claim, and desire to secure by Letters Patent, is—

1. A mechanical and magnetic toy, comprising a frame, a central spindle having  
110 bearings in said frame, and carrying a non-magnetic table-plate having an iron rim upon

its periphery, a magnetic shaft having a balance-wheel fixed thereon, and having its upper end in contact with the iron rim, bearings in the frame for the said magnetized shaft, a  
5 permanent magnet or magnets supported by the frame beneath the table-plate, and magnetized objects on top of said table-plate, substantially as shown and described.

2. A mechanical and magnetic toy, comprising a main frame having bearings to support a shaft carrying a balance-wheel, a table-plate fixed upon a spindle held in bearings in said frame, adapted to be rotated by motion imparted by said balance-wheel; in combination with a magnet or magnets so disposed and held, that movable permanently-magnetized objects placed upon the said ta-

ble-plate may be alternately attracted and repelled by the said magnet or magnets, substantially as described. 20

3. A mechanical and magnetic toy, comprising a rotatable non-magnetic table or carrier, having an iron peripheral rim; a rotatable magnetized shaft held in a frame in bearings, and having a balance-wheel fixed thereon; the said iron peripheral rim arranged in contact with the said magnetized shaft to adapt it to be rotated by magnetic attraction, substantially as described. 25

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