J. A. WATT.

MECHANICAL TOY.

APPLICATION FILED FEB. 6, 1913.

1,091,448. Patented Mar. 24, 1914.

Fig. 1.

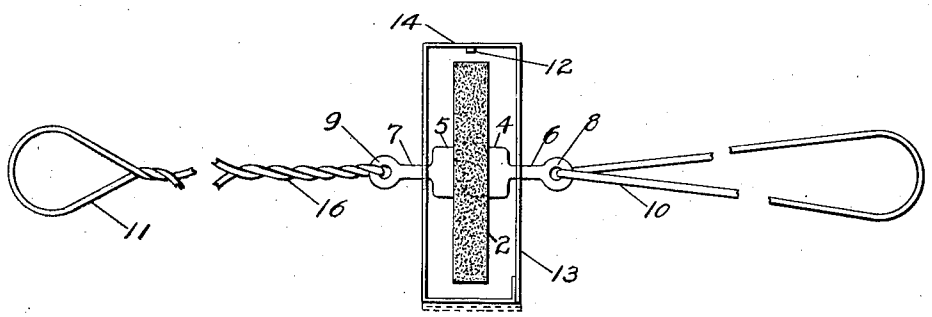


Fig. 2.

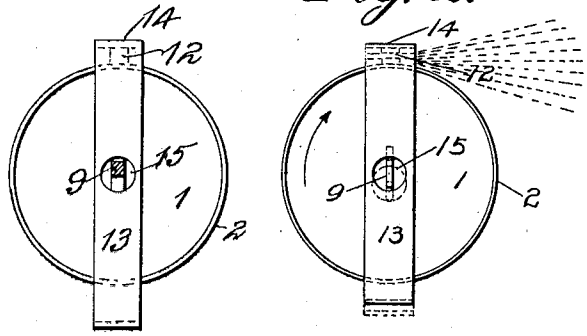


Fig. 3.

Witnesses:
Yoshiro Okabe.
G. E. Sterritte.

Inventor
James A. Watt
By his Attorney
Antony Phelps Marvel

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES A. WATT, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM ARTHUR DE HART, OF NEW YORK, N. Y.

MECHANICAL TOY.

1,091,448. Specification of Letters Patent. Patented Mar. 24, 1914.

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To all whom it may concern:

Be it known that I, JAMES ANDREW WATT, a subject of the King of England, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Mechanical Toys, of which the following is a specification.

This invention relates to devices wherein a principle is used, though not new in itself is here developed in a manner that results in the production of an attractive easily operated toy.

I employ a wheel which may be of carborundum or other abrasive substance or which may as shown in the drawing be of wood or card board having upon its periphery finely powdered emery or other similar hard substance. Arranged adjacent to this abrasive surface and to the periphery of the wheel is a hard metallic or mineral block that is, by certain actions of gravity and the rotation of the parts caused to intermittently impinge upon the abrasive wheels thus causing a series of brilliant sparks to be discharged from the periphery of the wheel.

I have provided simple means for rotating the wheel at the desirable high rate of speed, and I have provided efficient means for supporting the hard metallic point in such a manner that it may be traversed over the whole surface of the abrasive material. Other advantages and the means of operating the device will be set forth as the specification progresses.

The following is what I consider the best means of carrying out this invention.

The accompanying drawings form a part of this specification, in which:

Figure 1 shows in elevation the complete device, in this figure only one of the cords are shown twisted. Fig. 2 shows the device in side elevation though with the cord omitted for clearness. Fig. 3 shows a box member of greater length and having the perforation somewhat nearer the upper end. This figure may be considered an exaggerated view of Fig. 2.

Similar reference numerals indicate like parts in all the figures where they appear.

At 1, I have shown a wheel which may be of card board or of any other suitable material and I prefer that this wheel shall be light though sufficiently rigid to support an abrasive surface 2. In my development this abrasive surface is shown as a narrow strip of emery cloth or paper cut to the proper length and glued to the periphery of the wheel 1, though I have found that to place an adhesive upon the periphery of the disk and then scatter powdered carborundum thereon is a convenient way to obtain the desirable surface. I have also found that to produce this wheel entirely of carborundum or other similar material might be found advantageous though because of the weight of the wheel thus formed I have not employed this method.

It is desirable to rotate the wheel 1 and to accomplish this I produce a shaft which has a plurality of wings 4 and 5 provided certain distances from the center. A plurality of extensions of smaller size formed integral with the wings 4 and 5 and each terminating in an eye. The extensions are indicated at 6 and 7 and the eyes at 8 and 9 respectively. I slit the wheel 1 directly through the center and then insert the shafts causing an equal length of the shaft to project upon each side of the wheel. Cords 10 and 11 are then knotted or secured in the eyes 8 and 9, and it is by means of these cords that I rotate the wheel 1 utilizing therefor the twist of the cords and their tendency to unwind when pulled taking care that the pull be sufficient to impart a speed to the wheel that will cause it to rewind the cords, or retwist the cords in the opposite direction.

For the purpose of accomplishing the desirable result it is necessary to support a contacting member adjacent to the periphery of the wheel 1 so that it will operate upon the abrasive material 2. Such a contacting member is shown in the block 12 and to support it I provide a box 13 closed on four sides only, I prefer to form this box member 13 of sheet metal so flexible that when the contact member 12 wears the bar 14, which supports it may be depressed inward if this is found necessary to cause the member 12 to touch the wheel at the proper time.

The box member 13 is oblong in shape and at midlength of each of its longest sides I produce a perforation 15. These perforations are large and although it is intended that the projection 6 and 7 shall pass into the perforations 15, it is not intended that they shall be closely confined therein, but

that the box member 13 shall have some latitude for longitudinal reciprocations.

From the foregoing description it is thought that the operation of my device will be readily understood but as it is peculiar to itself I will describe it.

The ends of the cords 10 and 11 are held in the fingers and the device swinging freely thereon is rotated until the cords are well twisted as shown at 16. A pull upon the ends of the cords will cause them to untwist while rotating the wheel 1 and the shaft passing therethrough. It will be found that the box 13 will also rotate but because of the imperfect fit between the shaft and the box member, this box member will rotate hesitatingly as though retarded by some means. About the time the box member is rotating at the speed of the wheel the cords have been rewound in the opposite direction and a pull thereon reverses the direction of rotation of the wheel. The loose bearing between the shaft and the box member 13 allows the box member to continue to rotate in the original direction for a short time after which its direction of rotation is slowly changed until it again synchronizes with the rotation of the wheel. It is this rotation of the box member due to its centrifugal and independent motion and the slowness of this member in changing the direction of its motion that causes a spark of unusual brilliancy and length to be discharged from the point of contact of the abrasive materials.

To doubly assure an effective contact between the abrasive surfaces I may perforate the members of the box member 13 slightly out of center, that is I may carry the perforation 15 to a point somewhat nearer the upper end of the device as shown in Fig. 2. I will also take care to allow the box member 13 no longitudinal motion on the shaft as I desire that the block 12 shall travel upon about a center line, of the wheel 2.

I may find it desirable to slightly weight the lower side of the box member 13, that is the side opposite to that which supports the member 12 by folding an extension from the side one or more times across the bottom as shown in the dotted line 20 in Fig. 1, although I have not found that generally necessary.

Other modifications may be made within the scope of the appended claims without departing from the principle or sacrificing the advantages of this invention.

Having carefully and fully described my invention what I claim and desire to secure by Letters Patent is:—

1. A wheel having an abrasive upon its periphery thereof, a shaft extending through said wheel and secured thereto, a member loosely mounted upon said shaft and supporting an abrasive adjacent to the periphery of said wheel and means for imparting a rotary motion to said shaft and to said abrasive supporting means as herein specified.

2. A device of the character described having a wheel and means for rotating it in alternate directions, abrasive substance carried upon the periphery of said wheel a box member loosely surrounding said wheel and adapted to contact therewith, an abrasive substance supported by said box member and adapted to be interposed at the point of contact between said box member and said wheel for the purpose set forth.

3. A wheel, a flat shaft extending through said wheel and provided with means for securing the wheel thereon, means for rotating said shaft a flexible member loosely mounted upon said shaft and coöperating abrasive spark producing materials carried by the periphery of said wheel and said flexible member for the purpose set forth.

4. In a flat device of the character described, a shaft, a wheel secured thereto and having an abrasive material upon its periphery, a member loosely mounted upon said shaft, and extending over the periphery of said wheel for supporting an abrasive adjacent the periphery of said wheel, means secured to said shaft for imparting a rotary motion to said shaft and said wheel, and the edges of means upon said shaft being adapted to induce a rotary motion to the said abrasive supporting means loosely mounted upon said shaft as herein specified.

5. A toy having a wheel and shaft for supporting it and means for imparting to said wheel a rotary motion, first in one direction and then another and a box member having two of its sides open loosely supported upon said shaft and a plurality of abrasive and spark producing surfaces secured upon the periphery of said wheel and said box member as herein specified.

Signed at New York city, in the county and State of New York this 25 day of Jan. 1913.

JAS. A. WATT.

Witnesses:
G. E. Steirette,
Arthur Phelps Marr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."