

(No Model.)

2 Sheets—Sheet 1

A. MARTIN.  
MECHANICAL TOY.

No. 532,678.

Patented Jan. 15, 1895.

FIG. 2.

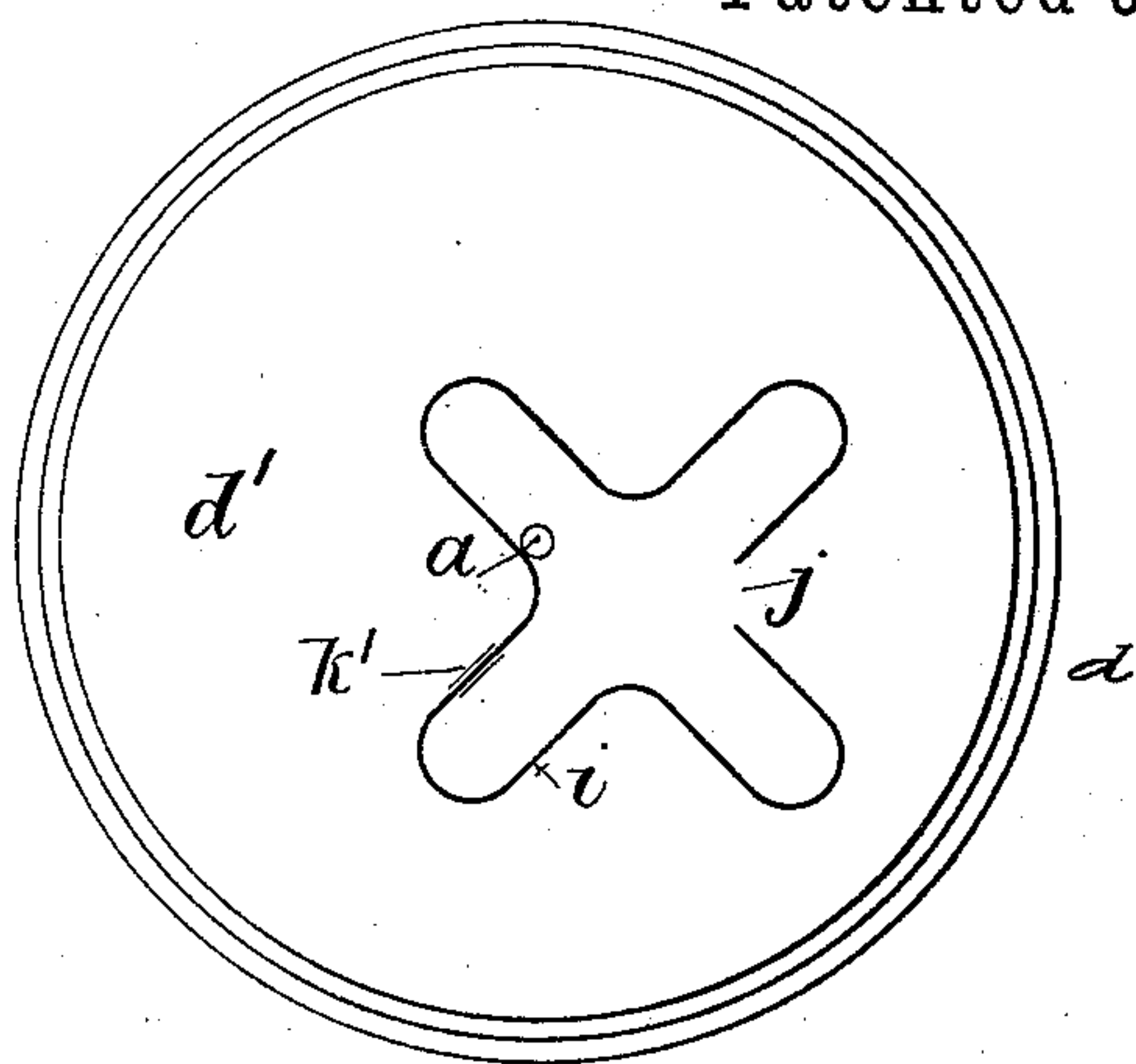


FIG. 1.

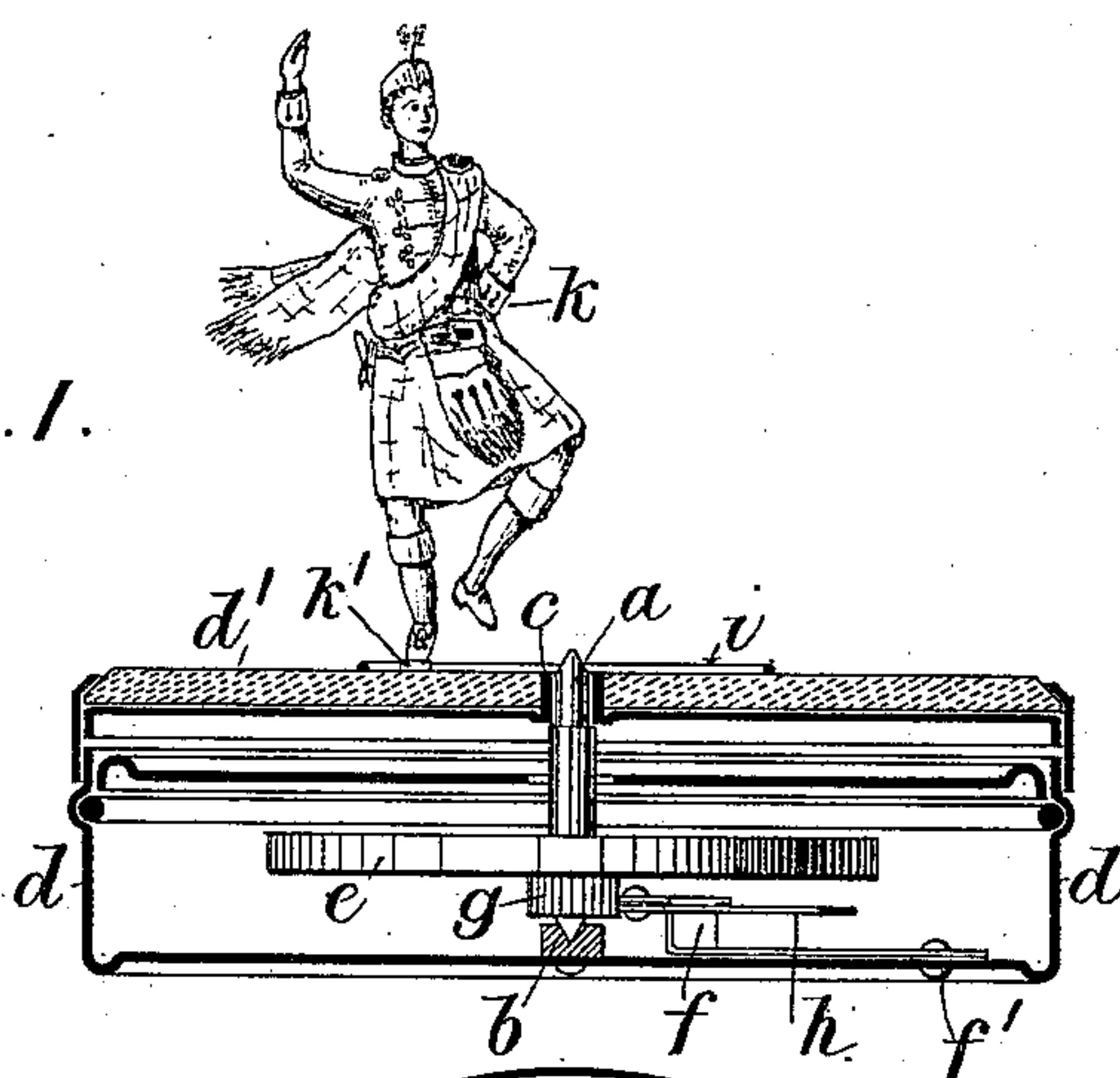
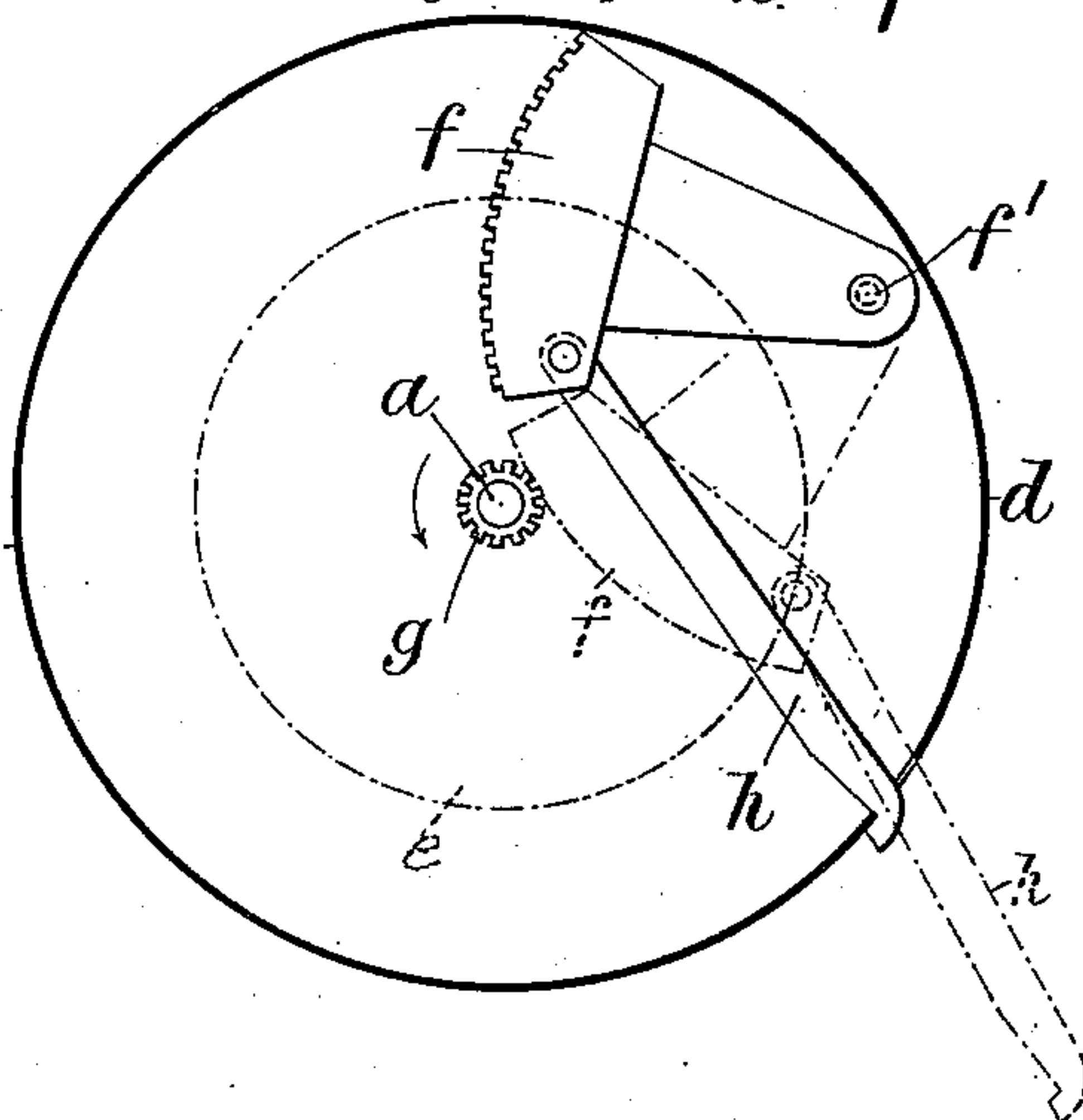


FIG. 3.



WITNESSES

*G. W. Hanaford.*  
*L. Sedgwick*

INVENTOR:

*A. Martin*

BY

*Munn & Co*

ATTORNEYS.

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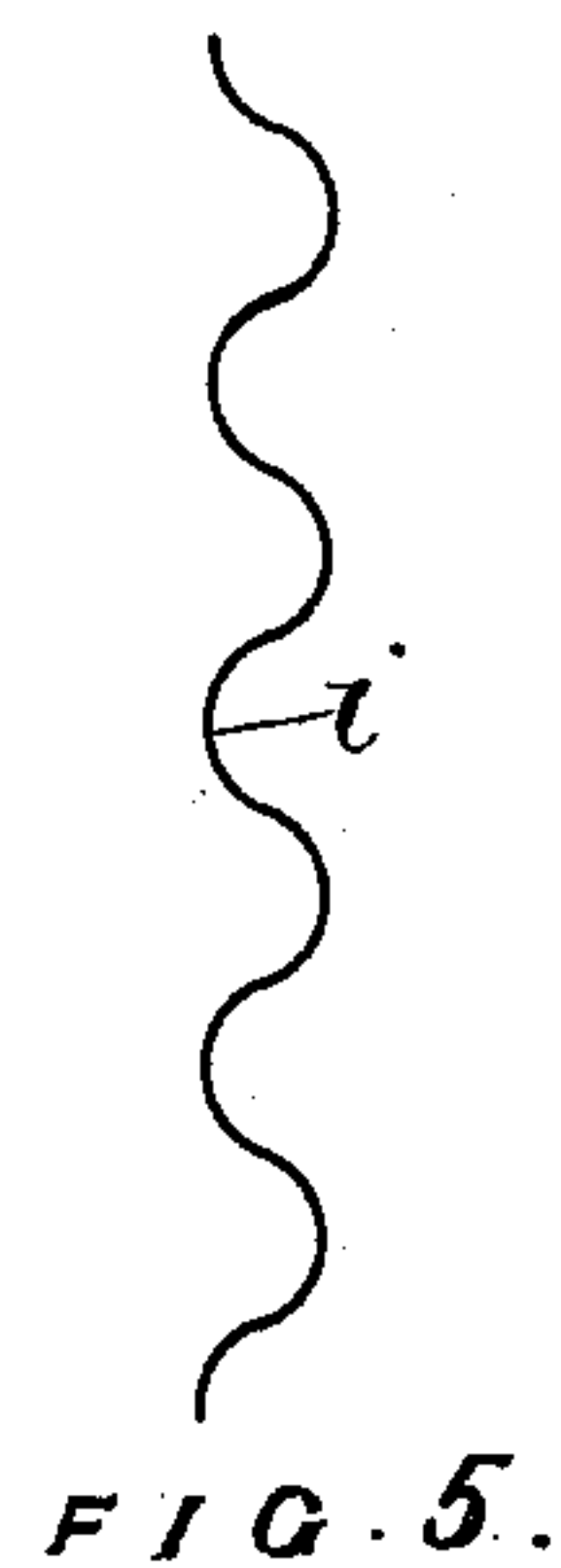
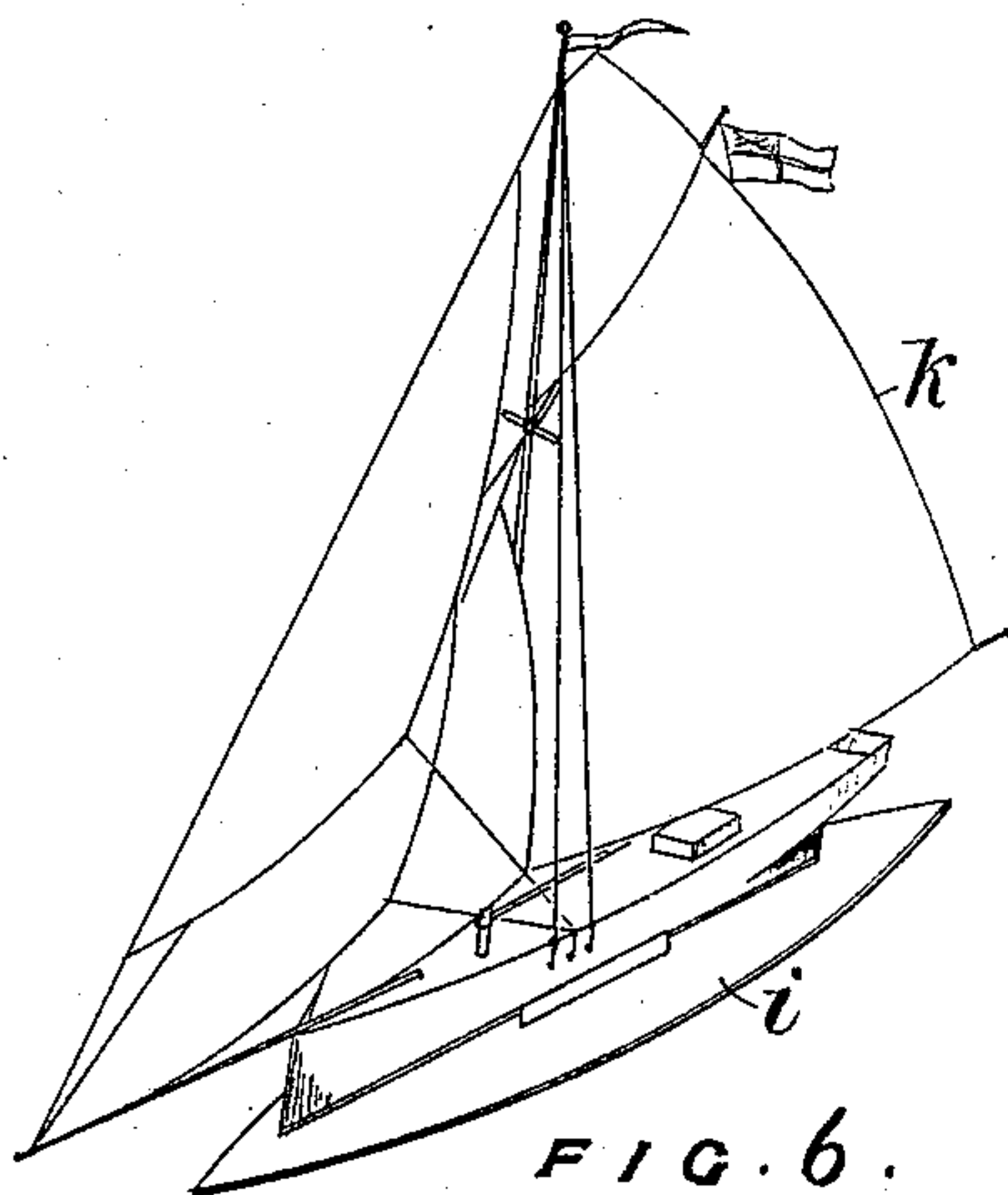
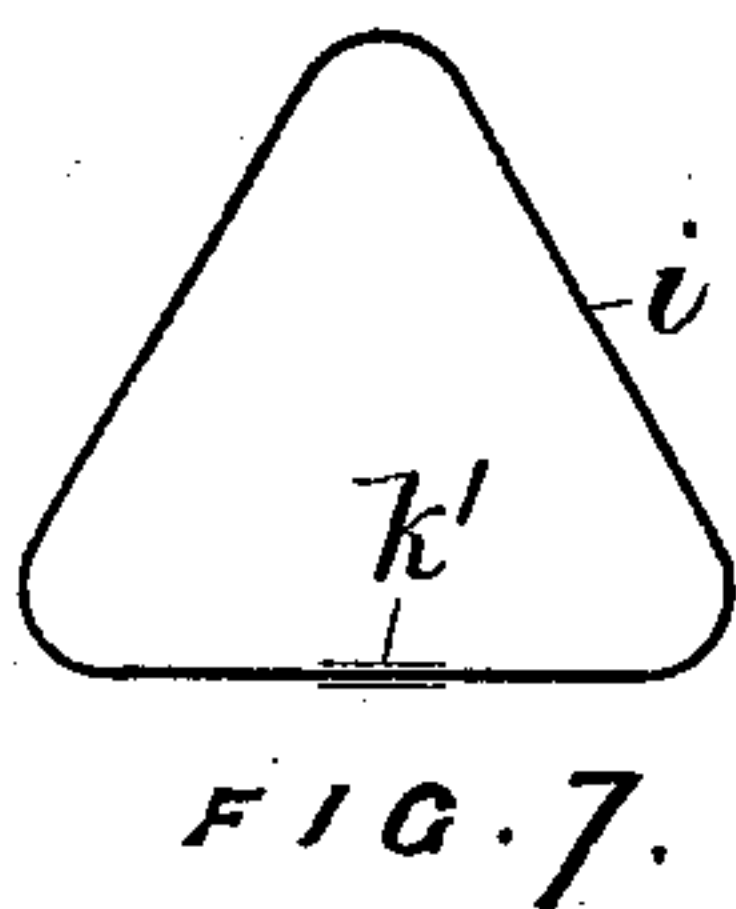
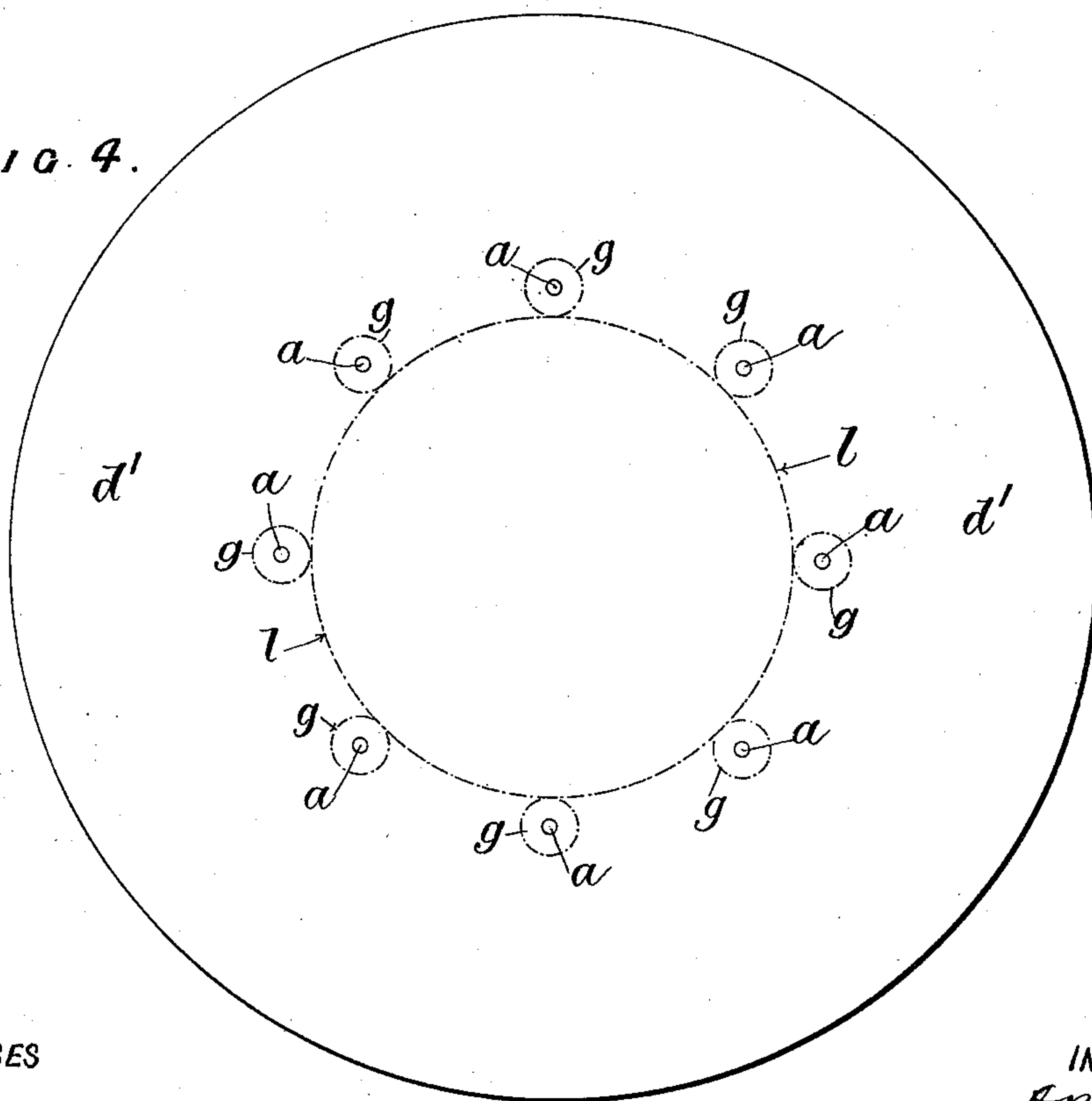


FIG. 4.



WITNESSES

*J. M. Hamford.*  
*E. Sedgwick*

INVENTOR

*A. Martin*

BY

*Munn & Co*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

ABRAHAM MARTIN, OF LONDON, ENGLAND.

## MECHANICAL TOY.

SPECIFICATION forming part of Letters Patent No. 532,678, dated January 15, 1895.

Application filed October 15, 1894. Serial No. 525,892. (No model.) Patented in France April 24, 1894, No. 238,012.

*To all whom it may concern:*

Be it known that I, ABRAHAM MARTIN, engineer, of Burgundy Villas, Pagoda Avenue, Richmond, London, in the county of Surrey, England, have invented a new and useful Mechanical Toy, (for which I have obtained Letters Patent in France, No. 238,012, dated April 24, 1894,) of which the following is a full, clear, and exact description.

My invention relates to a new mechanical toy comprising figures or objects to which eccentric gyratory or other movements of infinite variety are imparted by the revolution of a vertical spindle, the invention residing particularly in the means by which the figures or objects are held in driving connection with the spindle, and by which the variety of the movements is produced.

The driving connection between the spindle and the figures or objects to which motion is to be imparted is maintained by magnetic attraction, the spindle being magnetized and the parts of the figures or objects which are to be held in contact therewith being made of magnetizable material so as to be influenced by the magnetic properties of the spindle. These magnetizable parts, which for convenience I designate "armatures," may be made of iron wire bent to various regular or irregular curvilinear or angular forms by which the movements imparted to the figures or objects are determined. As the magnetic attraction will maintain the driving connection of the spindle, even with the end of the wire, the armatures may be of such form as to allow of the transfer of the driving contact from the external to the internal circumference of the armature, and vice-versa, so as to produce frequent reversals of the motion imparted by the spindle without loss of driving contact.

The armatures may form the bases of diminutive human or other figures, made of paper or other suitable material. The spindle would usually be mounted to rotate in bearings and be provided or geared with a fly-wheel to store power and regulate the rotary motion imparted through the medium of a string, a rack and pinion motion, or from a spring barrel, and the driving part of the spindle would project slightly through a smooth non-magnetizable surface or table upon which the figures would be supported

while performing their eccentric gyratory or other evolutions.

A number of similar magnetic driving spindles may be combined in one case or project through the same supporting surface, in order to cause a great number of figures to partake in mazy evolutions at one time, and the spindle or spindles may be combined with a musical box or other automatic musical instrument, and be driven by the same power, so that the motions of the figures will be accompanied by appropriate music.

The accompanying drawings illustrate the invention by way of example, but it will be understood that the invention is in no way limited to the examples illustrated but extends to all combinations of a magnetized driving spindle, or any number of such spindles, with magnetizable armatures adapted to be driven by contact with the spindle or spindles.

Figure 1 is a vertical section of a toy having but one magnetic driving spindle, and Fig. 2 is a plan showing an armature in contact with the spindle. Fig. 3 is a horizontal section showing the spindle driving mechanism. Fig. 4 is a plan showing a number of spindles driven by one spring barrel. Figs. 5, 6, and 7, show examples of different forms of armatures.

The same letters of reference indicate similar parts in all the figures.

In Fig. 1, *a* is a permanently magnetized steel spindle mounted to revolve in bearings *b, c*, in a box or casing *d*, through the top *d'* of which the upper end of the spindle slightly projects. Upon the spindle is mounted a fly wheel *e*, which, together with the spindle *a*, may be caused to rapidly revolve in the bearings *b, c*, by being spun with a string in the manner of a top, or by means of a quadrant rack *f* which is pivoted at *f'* in the casing and caused to gear with pinion *g* on the spindle by means of a handle *h* jointed to the quadrant and passing through the side of the casing. The motion of the quadrant is sufficient to carry it clear of the pinion, so that by first putting the quadrant into gear and then imparting a rapid motion to it about its pivot, the spindle may be set in motion at a high velocity and will continue, after the quadrant has passed out of gear with the pin-



ion, to revolve for a considerable time by virtue of the energy stored up in the fly wheel.

$i$  is an armature of iron wire bent, say, to the form shown in Fig. 2, which when placed on the top  $d'$  of the casing and brought into contact with the revolving magnetic spindle  $a$  will be caused to revolve alternately in the right and left handed direction as the contact of the spindle therewith becomes transferred to and from the outer and inner circumference of the ring by the passage of the spindle through the gap  $j$  in the armature. Upon this armature  $i$  as a base may be supported in a clip  $k'$  fixed to the armature any representation of a dancing or other figure  $k$  which partakes in the evolutions imparted to the armature.

The armature has been supposed to be of the "mutilated" cruciform shape shown in Fig. 2, the gap  $j$  giving passage to the spindle so as to allow it to make driving contact alternately with the inner and outer periphery of the armature. With this form of armature it will be evident that to and fro motion will be imparted to the figure successively in the direction of each of the arms of the cruciform figure, but any other regular or irregular form of armature may be adopted. For instance, the armature may be of straight, circular, triangular, square, or other angular or curvilinear form, either closed or open ("mutilated") or of any combination of such forms, and may be plain, or sinuous as shown in Fig. 5, the motion imparted to the figure being varied accordingly, it being, however, desirable to avoid sharp internal angles so that the armature shall not touch the circumference of the spindle at more points than one at a time.

Fig. 6 illustrates the representation of a boat supported upon an armature base  $i$  of elliptical form by the contact with which of a magnetic spindle, a to and fro motion is imparted to the figure. By suitably arranging two or more spindles in relation to one another, an armature of sufficient length may pass into contact with successive spindles and receive a continuous progressive motion.

In Fig. 4,  $a$  are a number of magnetized spindles, each provided with a pinion  $g$ , arranged in a circle and driven by a common spur or friction wheel  $l$  which may be on the

circumference of a spring barrel or may be driven by spur gear from a spring barrel arranged in any convenient manner and which may also actuate the pin drum of a musical box.

It will be evident that the spindle or spindles need not be permanently magnetized, but may be magnetized by induction and may be driven by an electric motor instead of by hand or spring power.

It will also be evident that the driving surface, instead of being formed by the upper end of the spindle itself, may be formed by a small magnetized boss or hub on the end of the spindle, and that, under the term spindle, as herein used, is included any such boss or hub acting as the equivalent of the spindle itself for the purpose of actuating figures and the like, as herein described.

I claim—

1. In a mechanical toy, the combination, with a magnetic or magnetized spindle mounted to rotate in bearings, of an armature or driven part adapted to be held by magnetic attraction in driving contact with the spindle, so as to receive motion therefrom, as specified.

2. In a mechanical toy, the combination, with a magnetic or magnetized spindle mounted to rotate in bearings, of an armature or driven part adapted to be held by magnetic attraction in driving contact with the spindle so as to receive motion therefrom, a support for the armature or driven part through which the spindle projects, and a figure or object carried by the armature or driven part, to which eccentric movements, depending on the form of the armature, are imparted by the revolution of the spindle, as specified.

3. In a mechanical toy, a magnetic or magnetized spindle mounted vertically to revolve in bearings and provided with a fly wheel, in combination with a quadrant rack and pinion gear for imparting motion to the spindle and fly wheel, as and for the purpose specified.

ABRAHAM MARTIN.

In presence of—

C. G. CLARK,  
Clerk to A. M. & Wm. Clark, Patent Agents,  
53 Chancery Lane, London.

T. F. BARNES,  
17 Gracechurch Street, London, E. C.,  
Notary's Clerk.