

No. 704,513.

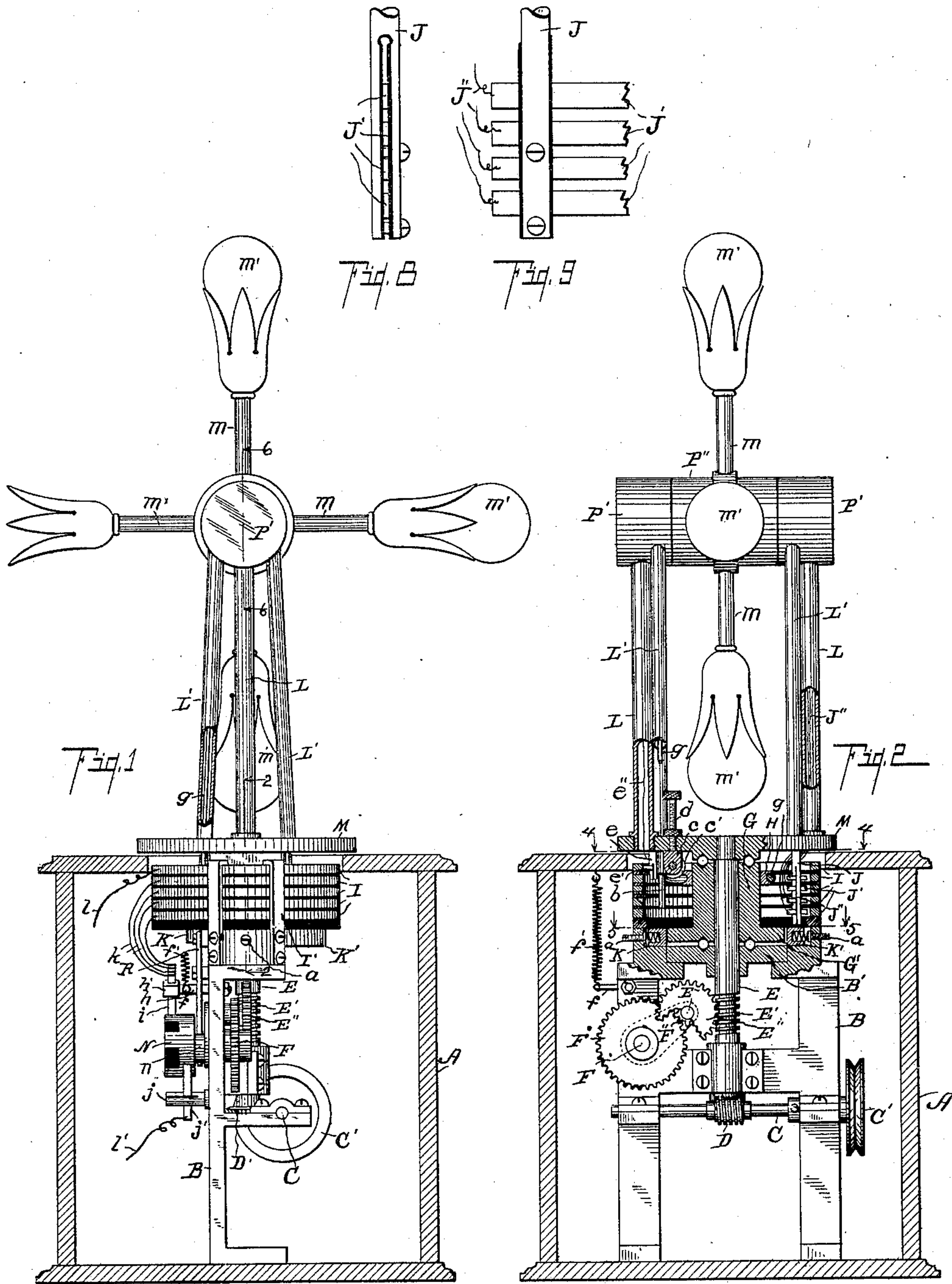
Patented July 15, 1902.

S. L. CAMPBELL.  
DISPLAY DEVICE.

(Application filed Aug. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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Att'y.





# UNITED STATES PATENT OFFICE.

STEWART L. CAMPBELL, OF KALAMAZOO, MICHIGAN.

## DISPLAY DEVICE.

SPECIFICATION forming part of Letters Patent No. 704,513, dated July 15, 1902.

Application filed August 22, 1901. Serial No. 72,908. (No model.)

*To all whom it may concern:*

Be it known that I, STEWART L. CAMPBELL, a citizen of the United States, residing at the city of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a certain new and useful Display Device, of which the following is a specification.

This invention relates to improvements in electrical display or advertising devices.

The objects of the invention are, first, to produce an apparatus by which a variety of movements and effects of incandescent bulbs is accomplished; second, to provide an improved apparatus for effecting complex movements of lights or other display devices; third, to provide, in an electrical display device, a wheel supported on a turn-table with means of effecting both the rotation of the wheel on its axis and the turning of the turn-table and means for regulating the relative movement of each and for effecting connections for delivering a current to the lights on the same; fourth, to provide such an apparatus with shifting connections for the lights; fifth, to provide an improved mechanism for actuating movable electric lights.

Further objects will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in this specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detail elevation view, the casing for the driving mechanism being shown in sections and other portions being broken away. Fig. 2 is a vertical detail view, partially in section, on a line corresponding to line 2 2 of Fig. 1, the various parts being in the position there indicated. Fig. 3 is an enlarged detail view of the driving mechanism and connected parts. Fig. 4 is an enlarged detail sectional view taken on line 4 4 of Fig. 2. Fig. 5 is an enlarged detail sectional view taken on line 5 5 of Fig. 2, showing the brake mechanism. Fig. 6 is an enlarged detail longitudinal sectional view taken on lines 6 6 of Figs. 1 and 7. Fig. 7 is an enlarged detail

sectional view taken on line 7 7 of Fig. 6.

Fig. 8 is an enlarged detail view of the brush-holder J, and Fig. 9 is a side view of the same.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the sectional lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the lettered parts of the drawings, A is the main casing and base. Within the same is supported a frame B, which supports the driving mechanism and electrical connections. Extending vertically and centrally through this frame is the shaft E. This is provided with a worm-gear D' at the bottom, which is actuated by a worm D on shaft C, a pulley C' being on the end of the shaft to receive the power to drive the mechanism. On the upper end of the shaft E is supported a turn-table M, having standards L L', which support casings P' P' above. Projecting from the cylinder or hub P'' are arms m m m m. This hub revolves on a suitable axis U, the same being provided with ball-bearings like those of the rear wheel of a bicycle. These are supported in the casings P' by the standards. A pulley U' is on one end of the hub U and receives a belt g, which serves to turn the wheel or radial arms on their axis. The actuation and connections of this belt will be described farther on.

Below the turn-table M and surrounding shaft E is a revoluble sleeve G, having ball-bearings below it, the same being supported on the plate B' and having ball-bearings above it on which the turn-table M rests. A grooved pulley H, (see Figs. 2 and 4,) is adapted to slide up and down over a key s on this sleeve G, so that the same can move readily up and down, but cannot rotate independent of the sleeve G. A brake is provided to retard or entirely stop the rotation of the sleeve G. This brake consists of the lever-shoes K K', appearing distinctly in Fig. 5, which are pivoted at r r', respectively, the lever K acting upon the lever K' to throw it out of engagement. When it is thrown out of engagement, springs a' a', adjustable by the screws a a, serve to hold these lever-shoes in engagement with the wheel G'. A belt g is around the grooved pulley H and extends around guide-pulleys c', which are carried by the turn-table M and



are adapted to revolve with it. The bearings for these are adjustable up and down by the set-screws *d*, the framework *c*, carrying these guide-pulleys, playing up and down on the pins *b b*, which depend from the under side of the turn-table *M*. Suitable lock-nuts are provided for the set-screws *d*. When the shaft *E* is revolved and the brakes *K K'* are not applied to the wheel *G'*, the turn-table is revolved, but the wheel or radial arms *m m* remain stationary on their axes. When, however, the brake is applied to the wheel *G'* to retard its movement, this serves to induce a relative movement of the sleeve *G* and the turn-table *M*, and the result is that the driving-belt *g* on account of this relative movement acts upon the pulley *U'* and causes the wheel or radial arms *m m* to rotate on their axes at the same time. If the brake is set so that the sleeve *G* does not rotate at all, the arms *m* will be rotated at their highest rate of speed. If the brake is only partially applied, so that there is still some rotation of the sleeve *G*, the arms *m* will not rotate so rapidly, and from this it will be seen that the relative speed of the rotation of the arms *m* on their axes and of the turn-table *M* can be regulated and greatly varied. This variation is accomplished automatically by means of a lever *R*, which is pivoted at *o* (see Fig. 3) and connects to the lever brake-shoe *K* at its upper end, and the lower end rests against the cam *n*, which throws the brake out and in by its rotation. On the shaft *F*, which carries the cam *n*, is also supported a commutator, the function of which will be described later on.

On the shaft *E* is a worm *E'*, which acts upon a worm-gear *E''*, which is supported on a shaft *E'''*. A pinion *F''* is also on the shaft *E'''* and actuates the gear *F'* on the shaft *F*, these parts all being supported in the correct relative positions by a suitable framework attached to the main framework *B*. It will thus be seen that as the shaft *E* revolves through the worm *E'* it actuates this mechanism, which revolves the shaft *F*, which carries the cam *n*, whereby the lever *R* is moved out and in to apply or remove the brakes *K K'* to the wheel *G'* automatically as the machine is actuated. This describes the driving mechanism for the different parts. The device with only these parts will be found very effective as an advertising device by providing the radial arms *m* with suitable ornamental structure like bulbs *N'* on their outer ends. The device, however, is much more effective when the bulbs are actual electric-light bulbs of different colors or of the same color, and then the movements are much more conspicuous, and by providing means for turning the lights off and on automatically the effects are much more numerous than they would be from the mere movement of the lights alone burning continuously. I provide suitable switches and commutators for effecting this purpose of delivering the current on the radial arms and for regulating the

supply of current thereto. To accomplish this result, on the framework *B*, I provide a hollow cylindrical column of contact-rings *I I*, suitably insulated from each other and from the framework, as clearly illustrated in all of the figures. I provide a brush-holder *J*, depending from the under side of the turn-table *M* within the column which carries spring-brushes *J'*, adapted to contact with the insides of the said contact-rings *I*, as clearly appears in Fig. 2. Wires *J''* are carried from these brushes which are four in number, or of a number to correspond to the number of radial arms or groups thereof above. These wires *J''* are carried up through one of the standards *L* which is made hollow for that purpose, and are there connected to brush-holders *t* which rest and are held by suitable insulatory material *T'* on the standards *T*, and carry brushes *t' t'*, that rest on the peripheries of contact-rings *u u u u* on the hub *U* which carries the radial arm *m*. These contact-rings *u* are provided with connections *v*, from which wires *x'* extend out through the different radial arms *m* to the incandescent bulbs *m'*. The return-wire *x* connects to a single contact-ring *V* at the opposite end of the hub *U*, and the current therefrom is delivered through a brush *w'* to brush-holder *w*, to the return-wire *e''*, which extends down through one of the standards *L* on the opposite side of the machine from the ascending wires, where it connects to the brush-holder *e* and delivers the current through the brush *e'* to the top ring of the column before referred to, and thence to the ground or return wire *l*. The lower contact-rings *I* are connected by wires *k* to a series of brushes *i*, adapted to rest on the commutator *N*, which is provided with alternating segments of conductor and non-conductor material. A brush *j'* is supported in contact with this commutator, where there is a continuous metallic circuit around its periphery for the purpose of supplying current thereto at all times. The brush-holder *h'*, which carries the brushes *i*, is pivoted at *h*, and a coiled spring *f'* is connected from the casing *A* to a lever *f* to apply the necessary tension to the brushes. These brushes are positioned to contact at intervals around the periphery of the commutator, whereby a current will be delivered through the same and cut off from the same successively, thus turning on and cutting off the lights successively, and by making the lights on the radial arms of different colors very striking effects will thus be produced.

As I have before indicated, the number of radial arms can be increased or decreased, and the same can be lighted in groups or separately, the single conductor being provided for each individual light or group of lights, as desired. I will remark in this connection, however, that this structure is very effective when the current is turned on to all the lights all of the time, and if but a single arm *m* and light *m'* were provided its movements would



be very interesting, although, of course, by these means no variation of the coloring would be possible.

I have described the various contact devices in detail, and they are in the form which I think most effective and economical for manufacture; but I am aware that where I have shown rings with contact devices within rings with contact devices on the outside might be made use of, and vice versa, and where only a single connection is desired and it is desired to have the lights turned on all the time a single contact device and brush would be all that is required. I have shown the device in its most complete form and mention these variations and modifications as clearly embraced within my invention when broadly considered.

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

1. In an apparatus of the class described, the combination of a suitable base; a vertical shaft therein; a turn-table on the top of said shaft; standards upward from said shaft; a hub with one or more radial arms transverse to said standard and supported in suitable bearing therein; a sleeve surrounding said shaft beneath the turn-table; a pulley on the said hub; a movable pulley on said sleeve; guide-pulleys for guiding the belt from the pulley on said sleeve to the pulley on said hub; a brake for controlling the motion of said sleeve; a lever connected to said brake; a cam connected to the moving part of said apparatus for acting on the said lever, whereby the brake is applied and removed automatically to induce a variable complex motion; electric lights carried by the radial arms on said hubs; independent connections to each of said lights; contact-rings carried by said hub; brushes adapted to bear on said contact-rings; wires extending from said brushes down the standards through the turn-table; fixed contact-rings with the said brushes; contact independent connections from each of said contact-rings to brushes; and the revolving contact device made up of insulated segments revolving in contact with said brushes to connect and disconnect the same successively and alternately, all coacting for the purpose specified.

2. In an apparatus of the class described, the combination of a suitable base; a vertical shaft therein; a turn-table on the top of said shaft; standards upward from said shaft; a hub with one or more radial arms transverse to said standard and supported in suitable bearings therein; a sleeve surrounding said shaft beneath the turn-table; a pulley on the said hub; a movable pulley on said sleeve; guide-pulleys for guiding the belt from the pulley on said sleeve to the pulley on said hub; a brake for controlling the motion of said sleeve; a lever connected to said brake; a cam connected to the moving part of said apparatus for acting on the said lever, whereby

the brake is applied and removed automatically to induce a variable complex motion; electric lights on the ends of said radial arm or arms; suitable connections through the turn-table and hub for delivering the current to said radial arms, for the purpose specified.

3. In an apparatus of the class described, the combination of a suitable base; a vertical shaft therein; a turn-table on the top of said shaft; standards upward from said shaft; a hub with one or more radial arms transverse to said standard and supported in suitable bearings therein; a sleeve surrounding said shaft beneath the turn-table; a pulley on the said hub; and a movable pulley on said sleeve; guide-pulleys for guiding the belt from the pulley on said sleeve to the pulley on said hub; a brake for controlling the motion of said sleeve; a lever connected to said brake; a cam connected with a moving part of said apparatus for acting on the said lever whereby the brake is applied and removed automatically to induce a complex motion, coacting as specified.

4. In an apparatus of the class described, the combination of a suitable base; a vertical shaft therein; a turn-table on the top of said shaft; standards upward from said shaft; a hub with one or more radial arms transverse to said standard and supported in suitable bearings therein; a sleeve surrounding said shaft beneath the turn-table; a pulley on the said hub; a movable pulley on said sleeve; guide-pulleys for guiding the belt from the pulley on said sleeve to the pulley on said hub; a brake for controlling the motion of said sleeve; electric lights on the ends of said radial arm or arms; suitable connections through the turn-table and hub for delivering the current to said radial arms, for the purpose specified.

5. In an apparatus of the class described, the combination of a suitable base; a vertical shaft therein; a turn-table on the top of said shaft; standards upward from said shaft; a hub with one or more radial arms transverse to said standard and supported in suitable bearings therein; a sleeve surrounding said shaft beneath the turn-table; pulley on the said hub; and a movable pulley on said sleeve; guide-pulleys for guiding the belt from the pulley on said sleeve to the pulley on said hub; a brake for controlling the motion of said sleeve, coacting as specified.

6. In an apparatus of the class described, the combination of a turn-table having a standard projecting therefrom; a hub with radial arms supported in the axial line of said turn-table on suitable bearings carried by said standard and transversely thereto; means of rotating said turn-table and revolving the hub with the radial arms at the same time to produce a complex movement.

7. In an apparatus of the class described, the combination of a turn-table having a standard projecting therefrom; a hub with radial arms supported on suitable bearings carried



by said standard and transversely thereto; means of rotating said turn-table and revolving the hub with the radial arms at the same time to produce a complex movement and  
5 means of varying the relative speed of said turn-table and hub.

8. In an apparatus of the class described, the combination of a turn-table having a standard projecting therefrom; a hub with radial  
10 arms supported on suitable bearings carried by said standard transversely thereto; incandescent electric lights on the ends of said arms; and means of rotating said turn-table and revolving the hub with the radial arms at  
15 the same time, to produce a complex movement.

9. In an apparatus of the class described,

the combination of a turn-table having a standard projecting therefrom; a hub with radial arms supported on suitable bearings carried  
20 on said standard transversely thereto; incandescent electric lights on the ends of said arms; means of rotating said turn-table and revolving the hub with the radial arms at the same time, to produce a complex movement; 25 and means of varying the relative speeds of said turn-table and hub.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

STEWART L. CAMPBELL. [L. S.]

Witnesses:

ALICE E. HOUGHTON,  
OTIS A. EARL.