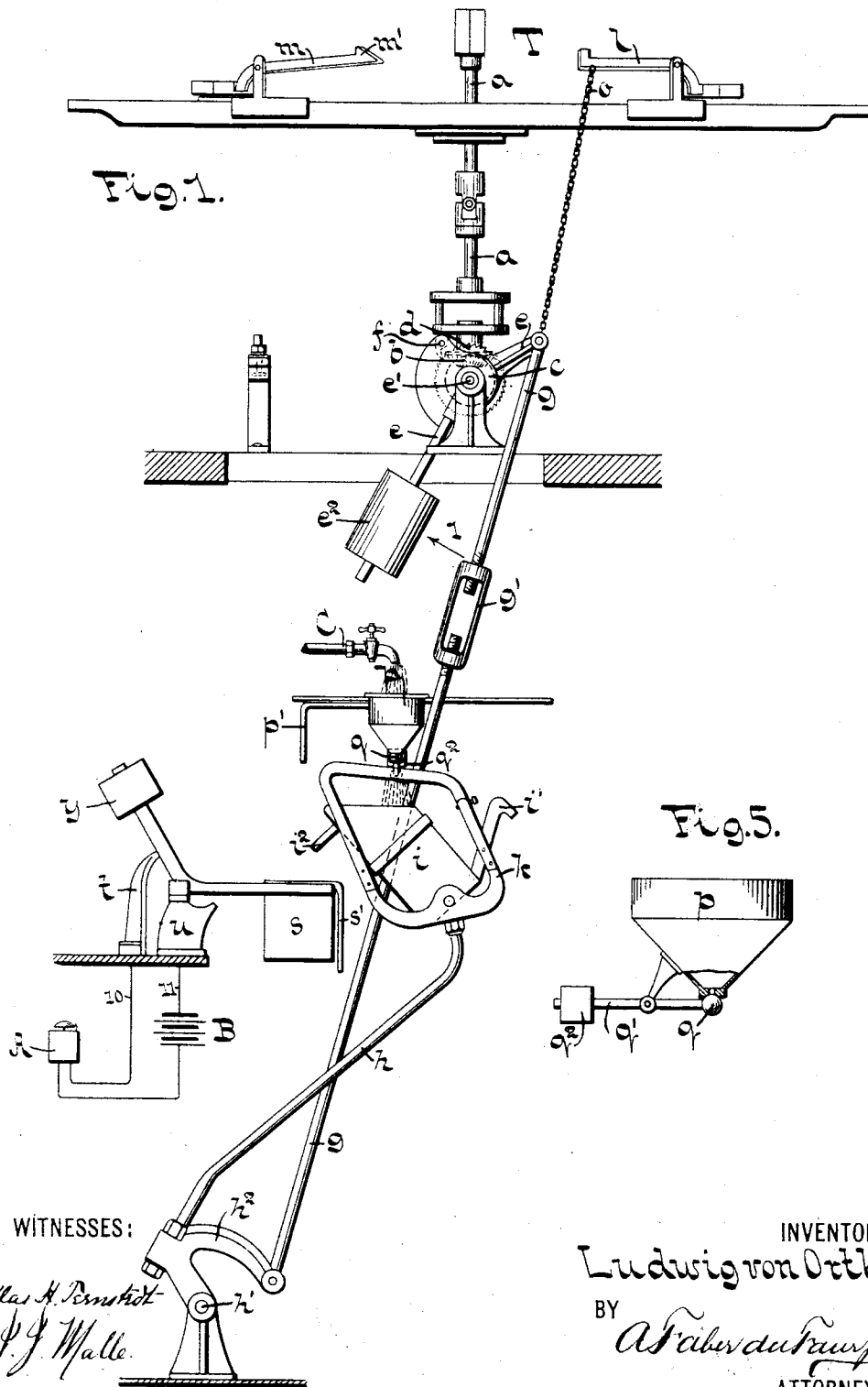


L. VON ORTH.
DISPLAY DEVICE.

No. 538,853.

Patented May 7, 1895.



(No Model.)

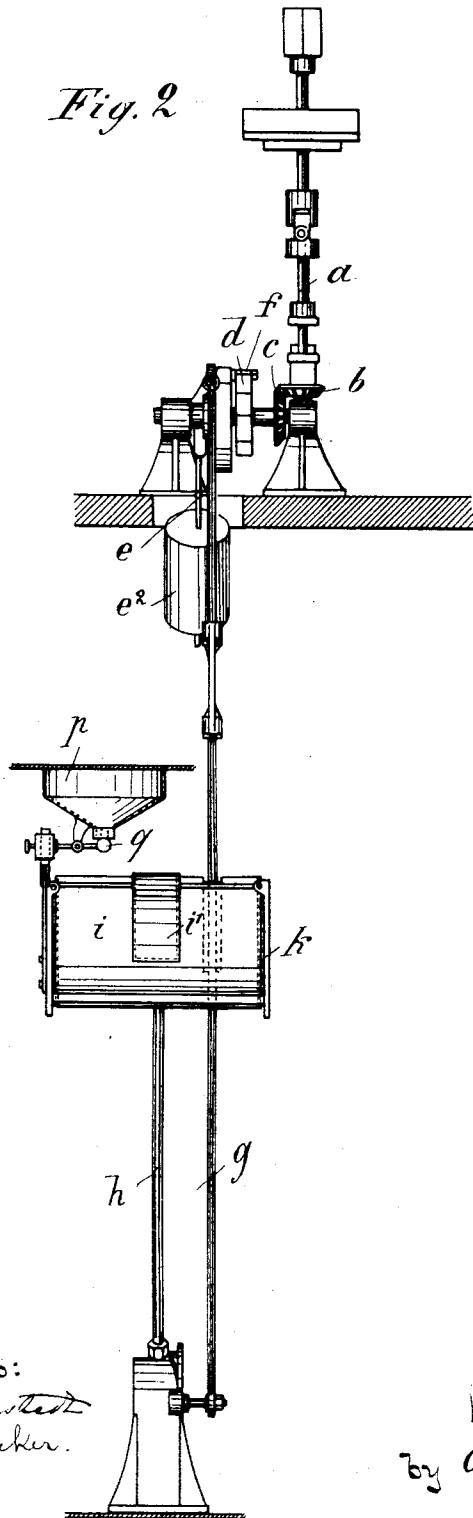
3 Sheets—Sheet 2.

L. VON ORTH.
DISPLAY DEVICE.

No. 538,853.

Patented May 7, 1895.

Fig. 2



Witnesses:
Klas H. Brewster
Benj. W. Tucker.

Inventor:
Ludwig von Orth
by *A. F. Auer du Rameau*
Attorney

L. VON ORTH.
DISPLAY DEVICE.

No. 538,853.

Patented May 7, 1895.

Fig. 4.

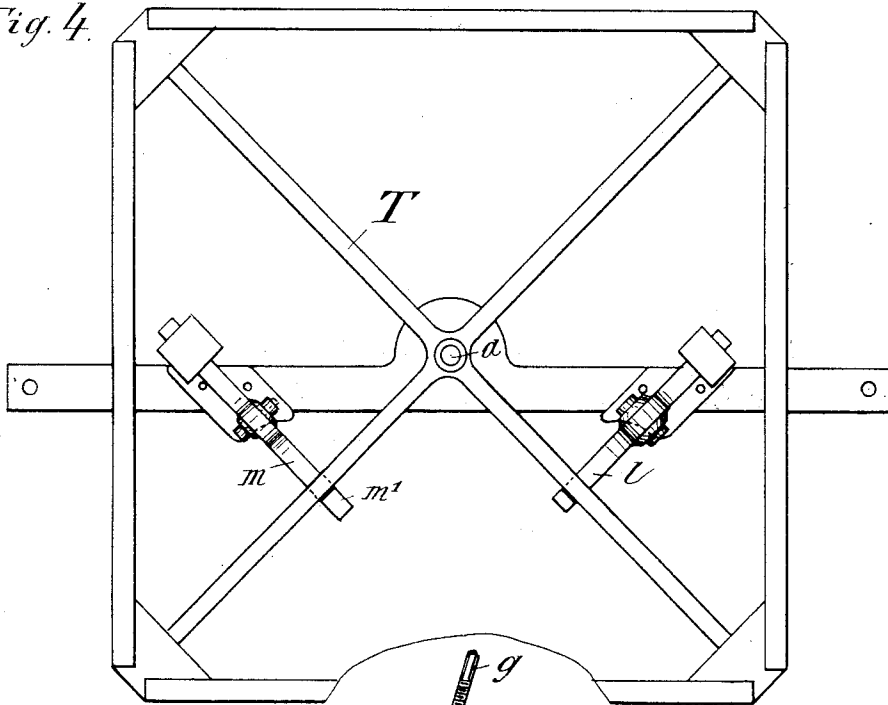
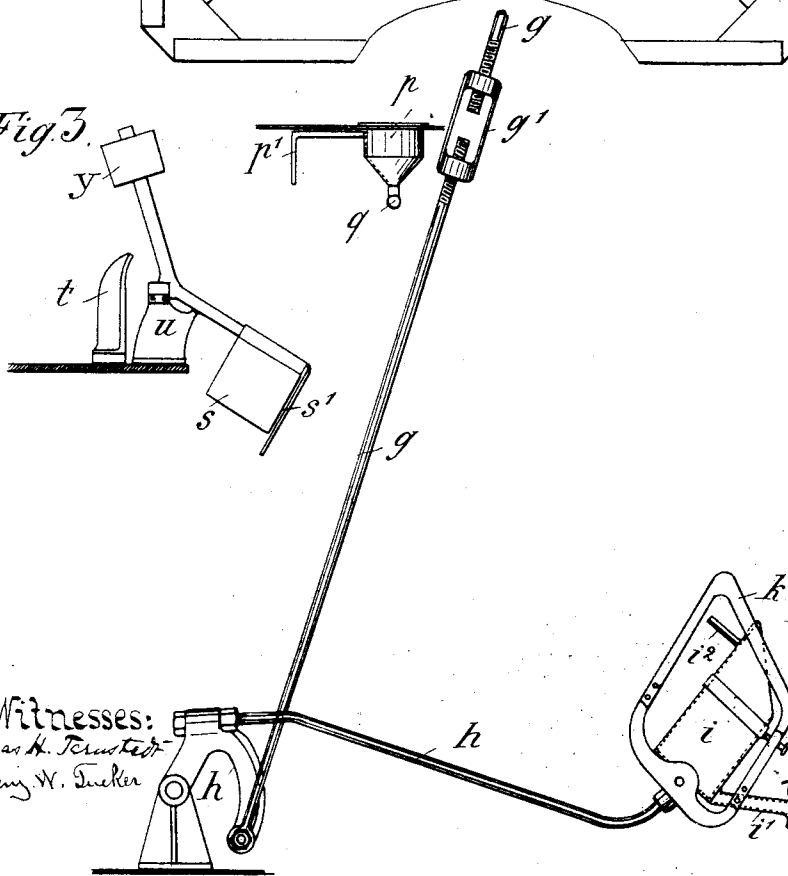


Fig. 3.



Witnesses:
Klar H. Perustich
Benj W. Tucker

Inventor
Ludwig von Orth
by A. Faber
Attorney.

UNITED STATES PATENT OFFICE.

LUDWIG VON ORTH, OF BERLIN, GERMANY.

DISPLAY DEVICE.

SPECIFICATION forming part of Letters Patent No. 538,853, dated May 7, 1895.

Application filed June 4, 1892, Serial No. 435,535. (No model.)

To all whom it may concern:

Be it known that I, LUDWIG VON ORTH, a subject of the King of Württemberg, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Display Devices, of which the following is a specification.

My invention has reference to improvements in display devices and especially to a water motor for imparting intermittent motion to a display drum mounted on a vertical shaft.

The nature of my invention will best be understood when described in connection with the annexed drawings, in which—

Figure 1 is a side elevation of an apparatus constructed according to my invention. Fig. 2 is a front elevation. Fig. 3 is a side elevation with parts broken away and showing the parts in different positions from Fig. 1. Fig. 4 is a top view. Fig. 5 is a sectional detail view.

Similar letters and numerals of reference indicate corresponding parts.

Referring to the drawings the letter *a* designates the vertical drum shaft carrying at its lower end a bevel gear *b* meshing into a similar gear *c* mounted on a horizontal shaft *e'*. On said shaft is made fast a ratchet wheel *d*, the pawl *f* of which is carried by a lever *e* mounted loosely on the shaft. The lower arm of the lever carries a weight *e'*. When the weighted end of the lever descends the pawl *f* engages and turns the ratchet wheel *d* and consequently the drum shaft *a* through a determined angle.

At a suitable distance below the lever *e* is pivoted at *h'* a lever *h* having a projecting portion *h'* above the pivotal line connected with the upper end of lever *e* by a rod *g*. The lever *h* supports a frame *k* in which is pivoted a vessel *i* normally in a state of unstable equilibrium and capable of occupying, with respect to the frame, two positions determined by suitable stops. One of these stops is located on the frame *k*, while the other may be formed, as here shown, by the rod *g*. It is provided with a discharge spout *i'*, and an overflow *i'*. Water is supplied to the vessel through a faucet *C*. To avoid waste of water during the time that the vessel *i* is in motion, a hopper *p* is arranged to receive the water from the faucet and to discharge it into the

vessel. To this end the hopper is closed by a valve *q* (Fig. 5) at the end of a lever *q'* carrying a counterweight *q'*. This lever is engaged by the frame *k* when the vessel is in its upper position, Fig. 1, and the valve is opened and so held. The hopper is also provided with an overflow pipe *p'*.

The overflow pipes *p'* and *i'* are arranged to discharge into a cup *s* carried by a weighted contact lever *y* adapted to engage a contact *t*. When the cup *s* is filled, the weight is overbalanced and the contact lever assumes the position shown in Fig. 3,—thereby breaking the circuit of a battery *B* and permitting action of an alarm *A* placed in the circuit of said battery.

The drum *T* is maintained in its several positions by two detents *l, m*, set in opposite directions. The detent *m* is provided with an inclined face *m'* so that on the forward motion of the drum it is depressed. Detent *l* is connected by a cord or chain *o* with the weighted lever *e* and is drawn downward to release the drum on the downward movement of said lever, to permit the former to be turned.

The operation of the apparatus is as follows: Assuming the parts to be in the position shown in Fig. 1, in which they are held by lever *e*, and the faucet *C* turned on. When the vessel *i* is filled to the prescribed limit, the weight of the water overbalances the weighted lever *e* and the lever *h* together with the vessel descends to the position shown in Fig. 3 while lever *e* turns in the direction of arrow 1, Fig. 1. When the vessel is in this position it tilts about its pivot in the frame *k* and comes to rest against the stop to the right hand. In this position the water discharges through spout *i'*. The counterweight *e'* of lever *e* now becomes predominant and the lever *e* turns, thereby turning the drum, which is freed from detent *l*, through a predetermined angle, and raising the vessel *i* at the same time. When in its upper position, (Fig. 1,) the vessel tilts to its original position against the rod *g*, and the frame *k* opens the valve *q* of the hopper *p*—which was closed by weight *q'* when the vessel began to descend.

Should the apparatus for any reason fail to work properly when the vessel *i* is either in its upper or lower position, the water from

overflow h' or i^2 , as the case may be, fills the cup s and causes the alarm A to sound.

In practice the two pivot points of the connecting rod g are at equal distances from the centers of the respective shafts e' and h' , and the lines connecting the centers of the shafts and pivots make always substantially the same angle with the connecting rod.

If the two levers e and h , or the lines drawn from their respective centers of gravity to their axes were parallel to each other, an equilibrium would just be established in each position with a given quantity of water; but when the lever e makes with the horizontal line a smaller angle than the lever h , the momentum of the water will increase with the descent of the vessel i in a greater proportion than that of the weight e^2 on lever e . It is therefore assured that the vessel i when once started will continue and complete with certainty its downward motion and cannot be stopped by accidentally increased resistance or friction.

An exact regulation of the increase of momentum can be effected by shortening or lengthening the connecting rod by the turn-buckle g' .

What I claim as new is—

1. In an apparatus of the character specified, the combination of a shaft, a weighted lever e , a tilting lever h , a rod g connecting said levers, a water vessel independently pivoted below its center of gravity on said tilting lever h to automatically tilt in opposite directions with the vibrations of said lever, stops for limiting the throw of the water vessel on opposite sides of its center line, a hopper arranged to discharge into said vessel and provided with a valved outlet, and an operative connection between the lever system and the shaft, substantially as described.

2. In an apparatus of the character speci-

fied, the combination of a shaft, a weighted lever e , a tilting lever h , a rod g connecting said levers, a water vessel independently pivoted below its center of gravity on said tilting lever h to automatically tilt in opposite directions with the vibrations of said lever, stops for limiting the throw of the water vessel on opposite sides of its center line, a hopper arranged to discharge into said vessel and provided with a valved outlet, means for opening said outlet when the vessel is in its receiving position, a cup s , an overflow on the tilting vessel discharging into said cup, a contact device actuated by the movement of said cup, a source of electricity, an alarm, and electrical connections, substantially as described.

3. In an apparatus of the character specified, the combination of a drum shaft, a weighted lever e in operative connection with the same, a tilting lever h , a rod g connecting the two levers, a water vessel carried by lever h , a water supply, detents l and m for the drum, and a connection between detent l and the lever system, substantially as described.

4. In an apparatus of the character specified, the combination with the tilting vessel i provided with an overflow, a cup s adapted to receive the overflow, a valved hopper for conducting water to the vessel i , and provided with an overflow discharging in cup s , a water supply for the hopper, a contact device actuated by the weight of water in cup s , an alarm, a source of electricity, and electrical connections, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUDWIG VON ORTH.

Witnesses:

W. H. EDWARDS,
GUSTAV HÜLSMANN.