

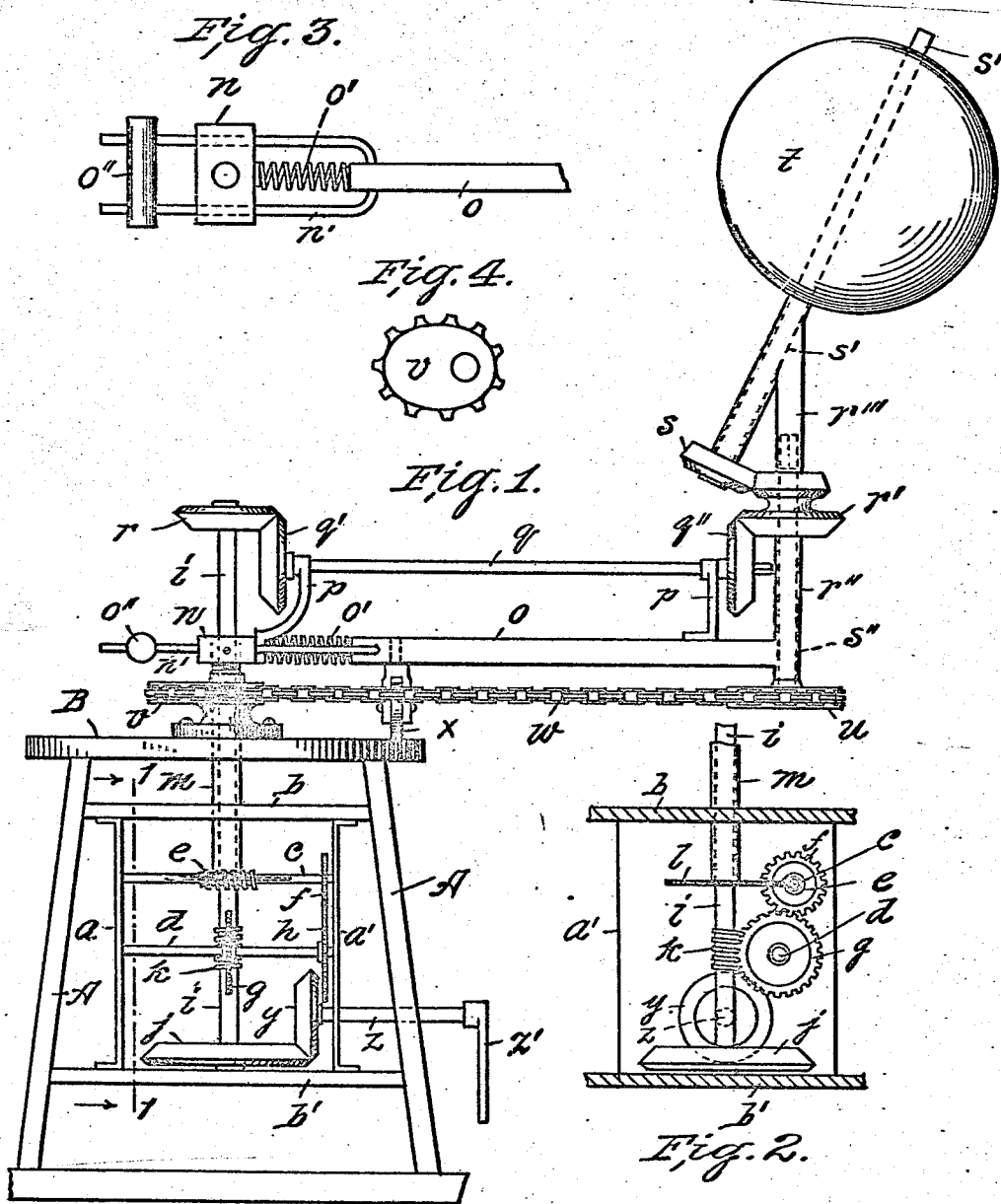
No. 895,020.

PATENTED AUG. 4, 1908.

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OPERATING MECHANISM FOR GEOGRAPHICAL GLOBES.

APPLICATION FILED APR. 16, 1906.



Witnesses:

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UNITED STATES PATENT OFFICE.

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OPERATING MECHANISM FOR GEOGRAPHICAL GLOBES.

No. 895,020.

Specification of Letters Patent.

Patented Aug. 4, 1908.

Application filed April 16, 1906. Serial No. 311,820.

To all whom it may concern:

Be it known that we, JOHN L. HUGHES and THOMAS F. ELY, citizens of the United States, residing in West Finley township, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Operating Mechanism for Geographical Globes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to operating mechanism for geographical globes, particularly for school purposes and the object is to provide suitable operating means for revolving the globe and keeping it pointed in a northwardly direction at all times and varying the distance of the globe with relation to the pivotal point or sun.

Our invention consists of certain novel features and details of construction as will be more fully described hereinafter and finally pointed out in the claims.

We will now describe our invention, reference being had to the accompanying drawings, in which,

Figure 1, is a side elevation of our invention. Fig. 2, is a vertical sectional view of the mechanism taken on line 1—1 of Fig. 1. Fig. 3, is a detail of the rear portion of the supporting arm employed. and Fig. 4, is a plan view of the oval shaped sprocket wheel.

Similar letters of reference indicate corresponding parts in the several figures of the drawings.

A, represents the frame which may be of any suitable construction, to the top of which is secured a circular plate B. Suitably secured in said frame is the operating mechanism, the construction of which is as follows: The upright pieces *a*, and *a'*, are provided and secured at their top and bottom ends to two cross pieces *b*, and *b'*. Journaled in the uprights *a*, and *a'*, are two shafts *c*, and *d*, the upper one of which is provided with a worm-gear *e*, near the center thereof and at one end with a pinion *f*. The lower shaft is provided with two gear wheels *g*, and *h*. Journaled in the lower cross piece *b'*, is the main upright shaft *i*. Secured at or near the lower end of which is a bevel gear *j*. This shaft is also provided with a worm-gear *k*, which meshes with the gear-wheel *g*, on the shaft *d*, and a gear-wheel *h*, on the opposite

end of said shaft engages with a pinion *f*, on the shaft *c*. The worm-gear *e*, on the shaft *c*, is adapted to mesh with a gear-wheel *l*, which is secured on the lower end of a hollow shaft *m*. This shaft *m*, is adapted to work over the main shaft *i*. Screwed or otherwise secured to the upper end of the shaft *m*, is a bar *n*, through which the fork *n'*, carrying the rear end of the supporting arm *o*, is movably connected. Between the rear end of the supporting arm *o*, and the bar *n*, is a spring *o'*, and on the outer end of said fork is a weight *o''*, for counterbalancing the weight of the opposite end of the arm *o*.

Secured to the arm *o*, are two brackets *p*, the upper ends of which are provided with journals or bearings for receiving a shaft *q*. Both ends of this shaft are provided with bevel gears *q'*, and *q''*. The gear *q'*, meshes with a bevel gear *r*, secured on the top end of the main shaft *i*. The gear *q''*, meshes with a double idler gear *r'*, carried by the upright *r''*, on the end of the main supporting arm *o*. One on the upper part of the double idler gear *r'*, engages with a bevel gear *s''*, on a shaft *s'*, to which is secured the globe *t*.

The upright *r''*, is hollow up to the idler *r'*, for the purpose of admitting a shaft *s''*. On the lower end of this shaft is a sprocket-wheel *u*, and on the top of the plate B, is an oval shaped sprocket-wheel *v*, which is stationarily secured thereto, and through which the main shaft *i*, and hollow shaft *m*, pass and work independent thereof. These sprocket-wheels *u*, and *v*, are connected together by means of a sprocket chain *w*. (These sprockets being of the same circumference). The weight of the arm *o*, is partly carried by a roller or caster *x*.

Meshing with the bevel gear *j*, is a bevel pinion *y*, which is secured on a shaft *z*, and to the opposite end of the shaft *z*, is a crank *z'*.

The extension upright *r'''*, which carries the globe *t*, is provided with a socket which fits over the end of shaft *s''*, the purpose of which will appear hereinafter.

We will now describe the operation of our device, which is as follows: Motion is imparted to the mechanism by means of the crank *z'*, or we may substitute a pulley for the crank and use any suitable motor power. As the shaft *z*, is revolved, the pinion *y*, on the inner end thereof causes the bevel gear *j*, to rotate which in turn causes the main shaft *i*, to be moved. The gear *r*, on the top

end of said shaft which engages with the gear q' , imparts motion to the shaft q , and the gear q'' , on the opposite end of this shaft meshing with the idler gear r' , and said idler gear being engaged by the gear s , causes the shaft s' to rotate which in turn revolves the globe. The worm gear k , on the main shaft i , engages with the gear g , on the shaft d , and causes said shaft to be rotated, and as the gear h , on the end of this shaft d , meshes with the pinion f , on the shaft c , motion is imparted to said shaft c . The worm-gear e , on this shaft engages with the gear l , on the hollow shaft m , and causes said shaft to rotate. The bar n , carrying the supporting arm o , being secured to the top of the hollow shaft m , is likewise caused to revolve.

The relative sizes of the gears and pinions being so proportioned as to cause the globe to revolve 365 times to one complete revolution of the supporting arm o , and the purpose of the sprockets u , and v , and chain w , being to keep the globe in the same position, and the angle thereof pointing in the same direction at all times during the complete revolution of the supporting arm o .

The globe is so adjusted or set, that the north pole thereof will at all times point in the direction of the north star and be maintained in such position during the revolution of the supporting arm o .

The top end of the shaft i , represents the position of the sun relative to the earth, and the object of the oval sprocket-wheel v , is to cause the arm o , to be moved in and out, illustrating or representing the varying distance of the world in relation to the sun during the year.

The 365 revolutions of the globe represent the number of revolutions of the earth during the year, and the one revolution of the supporting arm o , represents the world passing around the sun one time during the year.

Having described our invention, what we claim is:

1. The improvement in geographical globe operating mechanism consisting of a frame into which are secured uprights having journaled therein a horizontal shaft carrying a worm-gear, a gear-wheel secured on the lower end of a hollow-shaft which meshes with said worm-gear, a transverse bar secured to the upper end of said hollow-shaft which carries a fork having secured thereto a supporting-arm, a vertical shaft journaled in the outer end of the supporting-arm and having secured to the lower end thereof a sprocket-wheel and to the upper end the globe support, an adjustable weight carried by and secured on the outer end of said fork, together with a spring bearing against the supporting-arm at one end and the transverse bar at its opposite end, said transverse bar and supporting-arm having brackets secured thereto carrying an auxiliary shaft

mounted therein substantially as and for the purposes shown and described.

2. The improvement in geographical globe operating mechanism, consisting of a frame into which are secured uprights having journaled therein a horizontal shaft carrying a gear-wheel, a main-upright-shaft journaled in said frame and being provided with a worm-gear which meshes with the gear-wheel on said horizontal-shaft; a bevel-gear secured on the lower end of said upright-shaft and a bevel-pinion secured on the upper end thereof; a main-driving-shaft journaled in said frame and upright and provided with a bevel-pinion on its inner end which meshes with the bevel-gear on the lower end of the main-upright-shaft; an auxiliary-shaft mounted in brackets carried by the supporting-arm and bar, a bevel-pinion secured on the inner end of said auxiliary-shaft which meshes with the bevel-pinion on the upper end of the main-upright-shaft and a movable bevel-pinion secured on the opposite end of said auxiliary-shaft, a double-idler-pinion on the upright-shaft in the outer end of the supporting-arm; a globe-support connected to the upright-shaft in the outer end of the supporting-arm and a globe-shaft carried by said globe-support and having secured to its lower end a bevel-pinion which meshes with the double-idler-pinion on the said upright-shaft and a globe connected to the upper end of the globe-shaft; an oval shaped sprocket-wheel stationarily secured on the top of the frame and a sprocket-wheel on the lower end of the upright-shaft in the end of the supporting-arm and a sprocket-chain connecting said sprocket-wheels; all substantially as and for the purposes shown and described.

3. The improvement in geographical globe operating mechanism, consisting of a frame into which are secured uprights having journaled therein two horizontal-shafts, one of said shafts carrying a worm-gear and a pinion and the other shaft carrying two gear wheels; a main-upright-shaft journaled in said frame and having secured thereon a worm-gear which meshes with the gear on the horizontal-shaft, and a hollow-shaft journaled in said frame over the main-upright-shaft and provided with a gear-wheel which meshes with the worm-gear on the other horizontal-shaft, together with a pinion on one of said horizontal-shafts and a gear-wheel on the other horizontal-shaft which are adapted to mesh one with the other, for the purpose of imparting a reverse motion to the hollow-shaft and supporting-arm, a bevel-pinion secured on the upper end of said upright-shaft, an auxiliary-shaft mounted in brackets carried by the supporting-arm and bar, a bevel-pinion secured on the inner end of said auxiliary-shaft which meshes with the bevel-pinion on the upper end of the upright-shaft and a movable bevel-pinion secured on the

opposite end of said auxiliary-shaft, a double-idler-pinion on the upright-shaft in the outer end of the supporting-arm which meshes with the movable-bevel-pinion on the auxiliary-shaft, a globe support connected to the upper end of the upright-shaft and a globe-shaft carried by said globe-support, a bevel-pinion secured on the lower end of said globe-shaft and a globe representing the earth secured to the upper end of said shaft all to be

operated substantially as shown and for the purposes described.

In testimony whereof, we have hereunto set our hands this 9th day of April, 1906, in the presence of two witnesses.

JOHN L. HUGHES.
THOMAS F. ELY.

Witnesses:

FRED SPROWLS,
HARRY C. ELY.