No. 632,875. Patented Sept. 12, 1899.

F. W. MASE.

GEARING.

(Application filed Jan. 3, 1899.)

(No Model.) 2 Sheets—Sheet 1.

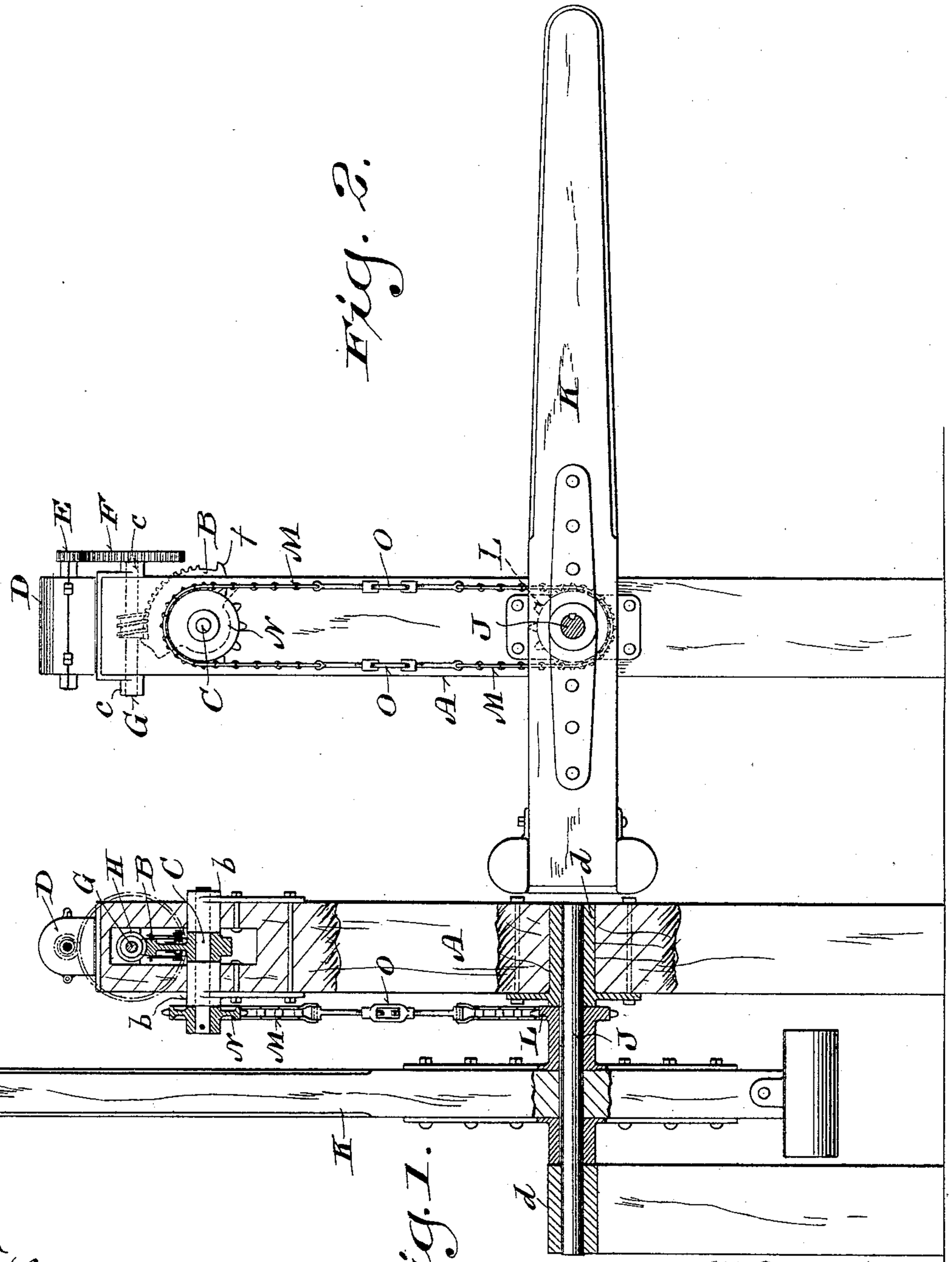

Fig. 2.

Fig. 1.

Witnesses:
Geo. W. Lamy,
N. E. Oliphant

Inventor:
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By H. G. Underwood
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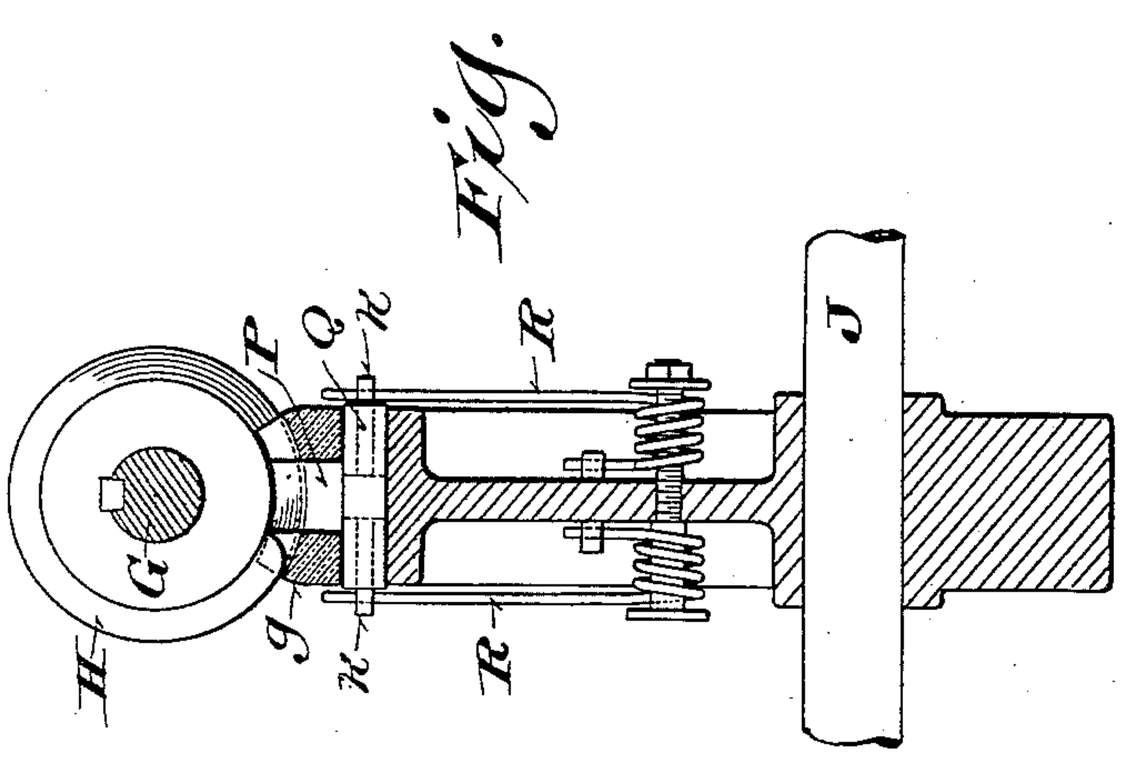

Fig. 4.

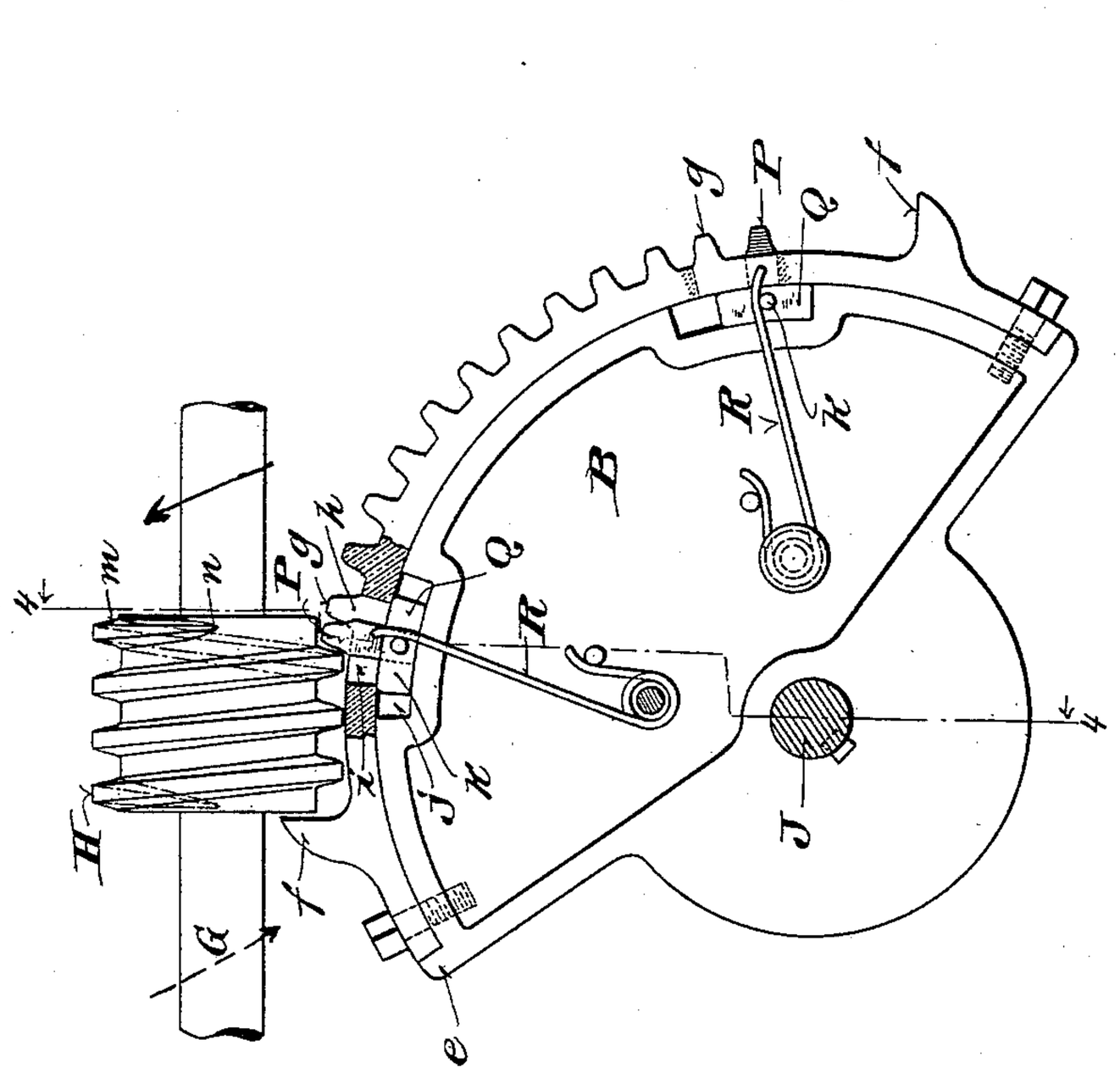

Fig. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

FREDERICK W. MASE, OF OSHKOSH, WISCONSIN, ASSIGNOR OF ONE-HALF TO AUGUST F. MASE, OF MILWAUKEE, WISCONSIN.

GEARING.

SPECIFICATION forming part of Letters Patent No. 632,875, dated September 12, 1899.

Application filed January 3, 1899. Serial No. 700,896. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. MASE, a citizen of the United States, and a resident of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Gearing; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide simple and economical gearing especially designed for operating barriers at bridge-approaches, railway-crossings, or elsewhere, but which is also applicable in connection with various machines to cause an automatic stop of the same or any part thereof at a predetermined time, although the driver may continue to run, as well as to effect a subsequent reverse operation when said driver is reversed. Therefore said invention consists in certain peculiarities of construction and combinations of parts, hereinafter particularly set forth with reference to the accompanying drawings and subsequently claimed.

Figure 1 of the drawings represents a partly-sectional side elevation of an assemblage of parts illustrating my improved gearing applied as a means for controlling the movement of a pivotal barrier, the latter being shown swung up out of the way; Fig. 2, a front elevation of the same, showing the barrier swung down to horizontal position; Fig. 3, a detail partly-sectional elevation of said gearing, and Fig. 4 a similar view indicated by line 4 4 in the preceding figure.

Referring by letter to the drawings, A indicates a post longitudinally slotted at its upper end to obtain clearance for a worm-sector B, the arbor C of which turns in metal bushings *b* set in the post. Mounted on the upper end of the post is a properly-incased electromotor D, having its shaft provided with a pinion E, in mesh with a spur-wheel F, the latter being fast on a shaft G, that turns in bearings *c*, provided on the aforesaid post. Within the longitudinally-slotted portion of the post a worm-pinion H on shaft G meshes with the worm-sector aforesaid.

The post A is placed at one side of a bridge-approach or crossing parallel to another support I, and both of these supports are provided with bearings *d* for the arbor J of a counterweighted barrier K, the latter being shown extended in opposite directions from its arbor to stand crosswise of a roadway and adjacent sidewalk when swung down to horizontal position. The arbor-engaging hub of the barrier is provided with a sprocket-wheel L, and a link-belt M is engaged by this sprocket-wheel and a similar wheel N, the latter being fast on the arbor C of the worm-sector. To facilitate tension-adjustment of the link-belt, the latter is made to include turnbuckles O, as herein clearly shown. As a matter of economy the worm-sector may comprise a cast-iron body-piece having transverse flanges *e* and a brass or steel face-plate, provided with the worm-teeth, as well as stop-lugs *f*, this plate to be bolted or otherwise made fast to the periphery of the body-piece between said flanges thereof. A construction and arrangement of parts constituting the worm-sector, as just specified, is best illustrated in Fig. 3.

Each terminal worm-tooth *g* of the sector B is shown cut away midway of its extremities to form a recess *h* for the reception of a cog P, corresponding in height and thickness to said tooth, this cog being in loose engagement with a circumferential guide-slot *i* in the face of said sector. The cog extends outward from a carrier loose in an elongated transverse aperture *j* in the aforesaid sector, and this carrier Q is shown provided with end lugs *k* in opposition to springs R, arranged in connection with the worm-sector. These springs operate to push the carrier Q in a direction to force cog P away from the corresponding worm-tooth a distance equal to the space between worm-teeth, this being as far as the opposite limit of guide-slot *i* will permit; but the worm-pinion H operating in one direction counteracts the power of said springs and eventually forces said cog into alinement with said worm-tooth, as hereinafter more particularly specified. In either direction of rotation on the part of worm-pinion H the working side of its thread will eventually force a cog P into alinement with a terminal tooth *g* of worm-sector B; but as said cog in this position is passed by said thread it is again carried into the worm-groove of said pinion by springs R, this operation

being repeated as long as the aforesaid pinion continues revolution in the same direction, said sector remaining stationary. Now if the revolution of the worm-pinion be reversed the point of its thread-terminal nearest the working cog P will enter between the latter and the corresponding notched terminal tooth of the sector B, and as said revolution continues said sector will be caused to move back until the operation above described is had with the other spring-controlling cog. The stop-lugs *f* of the worm-sector come against ends of the worm-pinion to prevent movement, from any cause, of said sector when the teeth of same pass out of mesh with said pinion.

In Fig. 3 the revolution of the worm-pinion and its shaft has been in the direction indicated by the point of the arrow on said shaft to the right of said pinion to swing the barrier K from vertical to horizontal position. Now it will be evidentfrom the showing and description that if the worm-pinion be allowed to continue its revolution in the same direction there will be no further movement on the part of the barrier. Therefore to raise said barrier to vertical position requires a reversal of the motor mechanism, whereupon the worm-pinion is caused to turn in the direction indicated by the point of the arrow on the shaft G at the left of said pinion in Fig. 3. Now as the worm-pinion begins to act upon the nearest slip-cog P of worm-sector B it will operate to accomplish the desired result; but thereafter, until the motor mechanism is stopped or again reversed, the other slip-cog will have reciprocation in its guide-slot while said sector remains at rest.

The link-belt and sprocket-wheel gear connecting the worm-sector and barrier arbors is utilized to economize material and space, as well as to lessen friction and provide for rotation of both arbors together in the same direction; but any well-known gearing may be substituted for that herein preferably set forth.

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

1. A worm-sector having fragmentary terminal teeth and spring-controlled slip-cogs normally out of alinement with said terminal teeth at a distance equal to one tooth interval of said sector, together with a sector-actuating worm-pinion operative against either slip-cog in the direction of its yield to eventually bring the same into alinement with the corresponding terminal tooth of the aforesaid sector ready to recoil into the worm-groove of said pinion when cleared by the thread.

2. A worm-sector having fragmentary terminal teeth and spring-controlled slip-cogs normally out of alinement with said terminal teeth at a distance equal to one tooth interval of said sector, a sector-actuating worm-pinion operative against either slip-cog in the direction of its yield to eventually bring the same into alinement with the corresponding terminal tooth of the sector ready to recoil into the worm-groove of said pinion when cleared by the thread, and stop-lugs on the aforesaid sector arranged to come against the aforesaid pinion.

3. A worm-sector having fragmentary terminal teeth and guide-slots, as well as elongated transverse apertures communicating with the slots, spring-controlled carriers engaging said apertures, cogs extending outward from the carriers through said slots at a distance from said terminal teeth equal to one tooth interval of the sector, and a sector-actuating worm-pinion operative against either cog in the direction of its yield to eventually bring the same into alinement with the corresponding terminal tooth of the aforesaid sector ready to recoil into the worm-groove of said pinion when cleared by the thread.

4. A gear device having at least one slip-cog normally out of alinement with a fragmentary fixed tooth of the same device at a distance equal to one tooth interval of said device, and another gear device constituting a driver for the one aforesaid, this driver being operative against said slip-cog in the direction of its yield to thereby cause the same to eventually aline with said fragmentary fixed tooth ready to recoil from the same as soon as cleared by said driver.

5. A gear device having spring-controlled slip-cogs each arranged to be normally out of alinement with a fragmentary fixed tooth of the same device at a distance equal to one tooth interval of said device, and another gear device constituting a driver for the one aforesaid, this driver being operative against either of said slip-cogs in the direction of its yield to thereby cause the same to eventually aline with a corresponding fragmentary fixed tooth of the driven gear device ready to recoil from the same as soon as cleared by said driver.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FREDERICK W. MASE.

Witnesses:
N. E. OLIPHANT,
B. C. ROLOFF.