No. 820,097. PATENTED MAY 8, 1906.

A. J. COLLAR.

WATER GATE.

APPLICATION FILED DEC. 20, 1904.

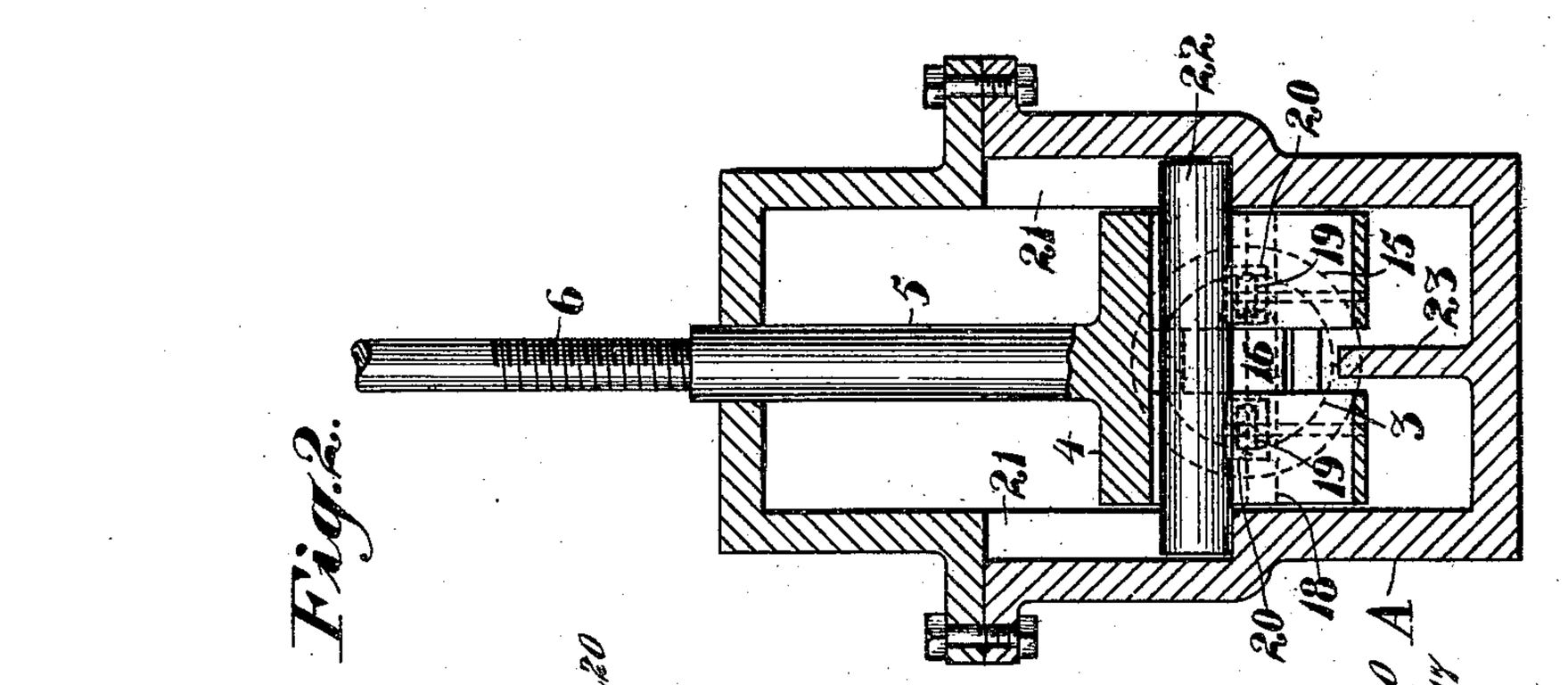

Fig. 2.

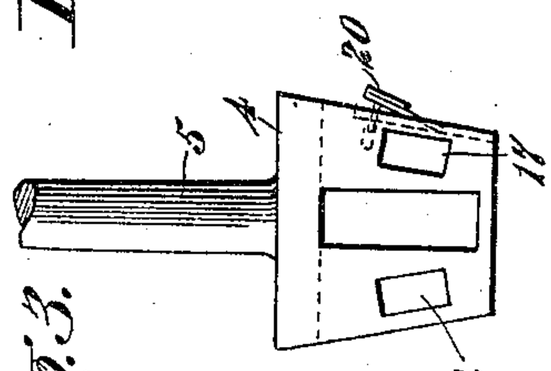

Fig. 3.

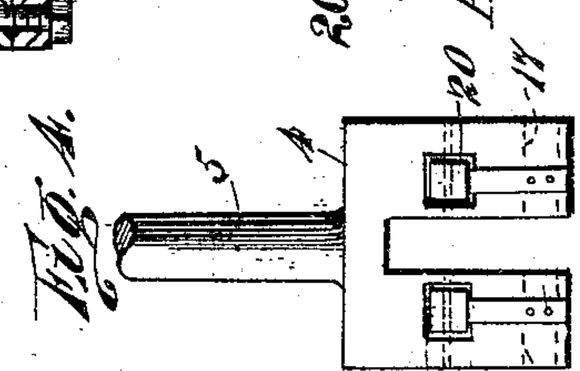

Fig. 4.

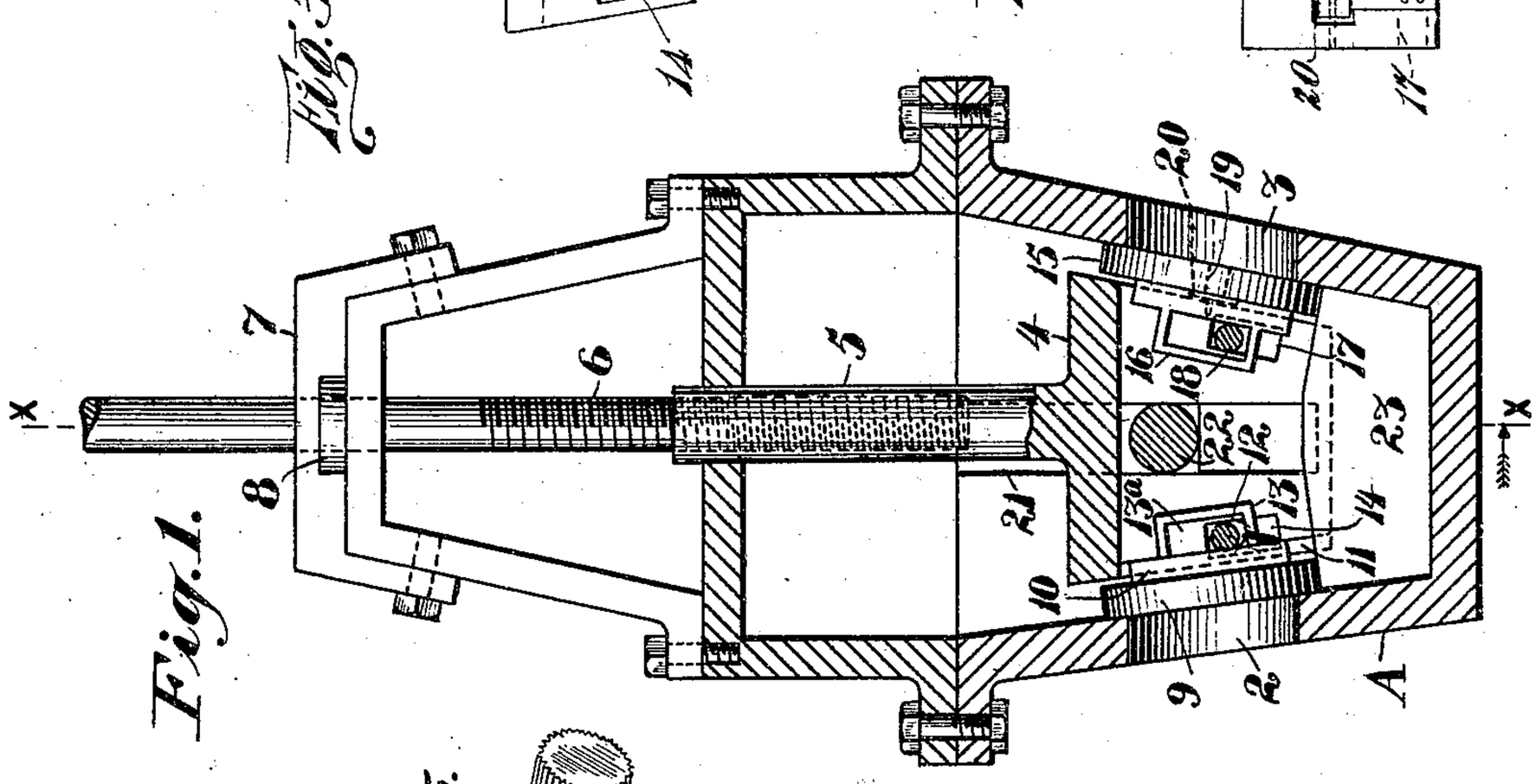

Fig. 1.

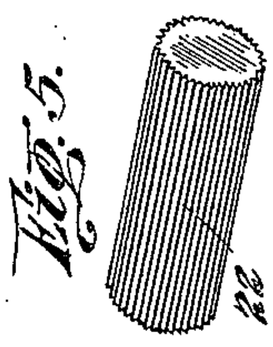

Fig. 5.

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UNITED STATES PATENT OFFICE.

ADONIRAM J. COLLAR, OF YREKA, CALIFORNIA.

WATER-GATE.

No. 820,097. Specification of Letters Patent. Patented May 8, 1906.

Application filed December 20, 1904. Serial No. 237,656.

To all whom it may concern:

Be it known that I, ADONIRAM J. COLLAR, a citizen of the United States, residing at Yreka, in the county of Siskiyou and State of California, have invented new and useful Improvements in Water-Gates, of which the following is a specification.

My invention relates to improvements in devices for controlling the flow of water in pipes.

It consists in the combination of devices and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a sectional view through the inlet and outlet ports of my device. Fig. 2 is a sectional view taken on line *x x* of Fig. 1. Figs. 3 and 4 are side views of the body or carrier of the gate detached, showing the spring-pressed valves 20. Fig. 5 is a detail of a roller of modified form.

As shown in the drawings, A is a casing of any suitable or desired shape adapted to contain the gate mechanism. This casing has an inlet-opening 2 at one side and a discharge-opening, as at 3, at the opposite side, these openings being substantially in line and provided with any suitable means connecting them with a conducting-pipe. The sides in which these openings are made and which form the seats for the closing-disks are inclined, as shown. The gate comprises a body or block 4, having a vertical tubular stem 5 extending upwardly through the top of the casing, with which it may form a tight joint, and having the interior of the upper end reduced and threaded to form a nut, into which a correspondingly-threaded stem 6 enters and is turnable. This stem extends up through the cross-bar of a yoke, as at 7, which serves to guide the stem and which is chambered to receive a collar fixed upon the stem, as at 8, so that the stem will be turned without advancing, and the screw-threaded portion turning in the nut of the tubular part 5 will raise or depress the part 5 and the block with which it is connected. This block has two faces, one of which corresponds with the inlet-opening 2 and the other with the outlet-opening 3 of the case A.

Upon the side of the body or carrier 4 which is adjacent to the inlet-opening is a disk 9, closable against the seat in the interior of the case and against the inlet-opening. This disk has an inwardly-extending slidable portion 10, which fits and is vertically movable in a corresponding channel, as at 11, formed in a contiguous end of the carrier 4. This portion of the carrier has a horizontal transverse channel 14 made through it and adapted to contain a roller, as at 12. The disk 9 has an inwardly-projecting lug or shank 13, which is vertically slotted to receive the roller 12. The roller extends through the opening at 13^a and lies within the channel 14, which is formed in this side of the block or carrier 4, and the operation will then be as follows: When the gate is closed and the disk 9 pressed against the seat of the inlet-opening, that part of the slot or channel 13^a which is coincident with the vertical side of the slide 10 presses against the roller, and the opposite side of the roller in turn presses against the back of the channel 14, the position of the roller being then substantially near the top of the slot or channel 14 and near the bottom of the slot or channel at 13^a. Then this being the condition, when the carrier or block 4 is raised the roller will revolve upon these two opposite contacts, and by reason of the inclination of this side of the carrier-block the disk 9 will be released from its contact with the seat and exert no pressure which would prevent the gate from being lifted when the roller has reached the end of its travel. Upon the opposite side of the carrier-block 4 is fitted a disk 15, similar to the one shown at 9 and having a shank 16 extending into a vertical channel in this side of the carrier-block, the shank being vertically slotted, as shown.

17 represents a slot or channel made transversely in the carrier-block 4, and within it is a roller 18, similar to the roller 12, previously described and operating in substantially the same manner to provide an antifrictional bearing, so that when the carrier-block 4 is raised this disk will be released from its pressure upon the discharge-opening seat. As there is a certain amount of water which may leak in around the inlet-controlling disk 9, and thus produce a pressure inside of the carrier-block and against the lower disk 15, I have shown a means for relieving this pressure, which consists of slots 19, made through the face of the disk 15 and communicating directly with the interior of the carrier-block.

20 represents small spring-pressed valves, which coincide with the openings 19 of the disk 15, and when the carrier-block 4 has been pushed down so that by reason of its

divergence and by the movement of the rollers 12 and 18 the two disks 9 and 15 have been forcibly closed against their respective seats, the movement of the carrier-block wedging them outwardly, as shown, the valves 20 will be moved in unison with the carrier-block and will close over the openings 19, thus preventing any escape of liquid through these openings.

As soon as the carrier-block is raised, as previously described, it will by reason of the rolling friction of the blocks move freely between the disks 9 and 15, the latter remaining in line with the seats against which they close until the rollers reach the bottom of their travel, and as the valves 20 are carried with the block 4 it will be seen that they will be raised, so as to expose the openings 19, thus allowing the escape of any water under pressure which may be contained and which will press against the disk 15, thus instantly relieving this disk from pressure and allowing it to be carried upwardly with the block 4, and thus open the passage through the gate. The incline upon this side of the case is greater than that upon the inlet side, and thus insures the more rapid opening of the discharge valve or disk. In order to still further relieve the moving parts from pressure, I have shown channels, as at 21, made in the sides of the gate-chamber, which are at right angles with the sides through which the water passes, and through the carrier-block 4 is a corresponding channel or opening within which fits a roller 22, the ends of which project into the channels 21, and thus provide a rolling friction as the carrier-block is raised or depressed, which makes it easy to be moved under any conditions. The ends and intermediate portion of the roller and its corresponding contacts in the channels and in the block 4 may be toothed or corrugated, as shown in Fig. 5, to insure the rolling friction.

In the bottom of the casing or chamber A is fitted a plate or bar 23, the ends of which incline downwardly from the center toward each of the openings 2 and 3, and this plate or bar is in such position that when the block 4 is depressed to close the passage the lower edges of the disks 9 and 15 will first rest upon these inclined surfaces, thus arresting the disks in the proper position to be subsequently closed against the seats when the block 4 is further depressed and by its wedge form acts to force the disks to close the openings. The rollers 12, 18, and 22, acting as previously described, allow the block to move with the least possible friction, and the gates 20 being moved with the block close the openings 19 in the disk 15, thus entirely closing the gate. The ends of the roller 22 will be arrested by the end walls of the guide-channels when the block is lowered to fully close the gates, while the rollers 12 and 18 similarly contact with the upper ends of the slots in which they trvael. All these rollers are removable endwise from the containing slots when the block has been lifted out of the casing. The by-pass valves 20 are loosely carried upon guide-pins which allow the valves to tilt freely, and thus seat themselves fairly over the by-pass openings, and as the incline of the discharge-seat is greater than the incline of the inlet-seat it will be seen that the discharge valve or disk will be the first released from pressure, so that the gate is very readily opened.

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

1. The combination in a water-gate of a casing having openings in opposite sides, a carrier-block, means for vertically moving it within said casing, disks loosely carried and slidable with relation to opposite faces of the block and closable against the openings, said disks having slotted shanks and rollers passing through said shanks.

2. In a water-gate, a casing having inclined opposed faces with inlet and discharge passages, disks adapted to close outwardly against said openings and having inwardly-projecting guides and vertically-slotted shanks, a wedge-shaped block or carrier, channels to receive said shanks, said carrier also having horizontal channels parallel with the disk-faces, rollers lying within said channels and passing through the slots in the disk-shanks, said roller contacts upon opposite sides whereby the disks are closed or released by the movements of the carrier-block.

3. In a water-gate, a casing having oppositely-inclined faces with inlet and outlet openings substantially in line, a similarly-inclined carrier-block having guide-channels in its opposite faces and channels with rollers contained therein at right angles with the guide-channels, guides and shanks projecting from the backs of the disks and entering the guide-channels of the block, said shanks having vertical slots transverse to the roller-channels, through which slots the rollers pass and a centrally-disposed vertical channel within the carrier-block, a roller located in said channel and with the ends projecting, and vertical guide-channels in the casing, in which said roller ends are movable.

4. In a water-gate, a casing having oppositely-inclined faces with inlet and outlet openings therethrough, a carrier-block having correspondingly-inclined faces and means whereby it is vertically movable, disks having inwardly-projecting and vertically-slotted shanks extending into corresponding channels in the faces of the block, transverse channels intersecting the slots of the disk-shanks, and rollers extending therethrough and forming bearings for the disks, a central vertical channel made through the block, a

roller having a corrugated surface and ends extending beyond the sides of the block, corrugated guide-channels in the casing into which the ends of said rollers extend, the bottom of said channels forming stops upon which the ends of the roller rest when the gate is closed.

5. In a water-gate, a casing having oppositely-inclined faces with inlet and outlet openings therethrough, a wedge-shaped block, and means whereby it is vertically movable in said casing, said block having a vertical central channel and guide-roller with projecting ends, slots in the casing sides into which the ends of the roller extend, disks having inwardly-extending vertically-slotted shanks projecting into corresponding channels in the inclined faces of the block, rollers extending through channels transverse to said shanks and movable therein, one of said disks forming a closure for the inlet-opening and the other for the outlet-opening, by-pass openings made through the outlet-disk, valves carried by the block and adapted to close over said by-pass openings when the valve is closed and to uncover said openings when the block commences to rise.

6. In a water-gate, a casing having oppositely-inclined faces with inlet and outlet openings therethrough, a wedge-shaped block and means for moving it vertically in the casing disks loosely carried upon the inclined faces of the block and closable against the inlet and outlet openings, antifrictional rollers forming bearings between the disks and the block having stops to terminate the rolling movement and to afterward lift the disks in unison with the movement of the block, by-pass openings through the discharge-disk, loosely-mounted spring-pressed valves carried by the block closable over the by-pass openings when the block is depressed, said valves being moved to uncover the by-pass openings with the first upward movement of the block.

7. In a water-gate, a casing having oppositely-inclined faces with inlet and outlet openings therethrough, the face containing the outlet-opening having a greater inclination than that containing the inlet-opening, a block having correspondingly-inclined faces coincident with those of the casing and means by which said block is raised or depressed, loosely-mounted disks carried by said inclined faces and antifrictional rollers forming bearings between the disks and the block, by-pass openings through the discharge-disk, loosely-mounted spring-pressed valves carried by the block and closable over the by-pass openings when the block is depressed, contact-surfaces upon which the disks rest when depressed so that the continued downward movement of the block will force them against their seats, said movement also carrying the valves to close the by-pass openings, a central vertical channel through the block, an antifrictional roller in said channel having its ends projecting beyond the block, guide-slots in the sides of the casing to receive the ends of said roller, and stops upon which the roller rests when the valve is fully closed.

8. In a water-gate a casing interposed in the conductor said casing having the egress-seat at a greater inclination than the ingress-seat, disks closable against each seat and a transversely-movable carrier-block with which the disks are connected, said egress-disk having a valve for relieving pressure within the block before the main discharge-passage is opened.

9. In a water-gate, a casing interposed in the conductor said casing having the egress-seat at a greater incline than the ingress-seat, disks closable against each seat, a transversely-movable carrier-block with which the disks are connected, and by-pass valves in the egress-disk adapted to be opened before the main discharge-passage.

10. In a water-gate, a casing interposed in the conductor, said casing having inclined seats, disks closable against each seat, a transversely-movable carrier-block with which the disks are connected, by-pass openings in the egress-disk and spring-pressed valves carried by the block and controlling the by-pass openings.

11. In a water-gate, a casing interposed in the conductor and having the egress-seat at a greater incline than the ingress-seat, disks closable against each seat, a transversely-movable carrier-block with which the disks are connected, by-pass openings in the egress-disk, valves carried by the block and opened thereby, and before the disk, to relieve internal pressure therefrom.

12. In a water-gate, a casing interposed in the conductor and having inclined ingress and egress seats and disks closable thereon, a transversely-movable carrier with which the disks are connected, by-pass openings in the egress-disk, valves controlling said openings, springs mounted upon the carrier and pins connecting the valves with the springs.

13. In a water-gate, a casing interposed in the conductor, with ingress and egress seats upon opposite sides, and disks closable thereon, a transversely-movable carrier-block and means whereby the disks are carried thereby, said carrier-block provided with channels, and antifriction-rollers within the channels of the carrier-block, the end walls of said channels forming stops against which the rollers contact at the termination of the travel of the carrier-block.

14. In a water-gate, a casing interposed in the conductor and having an inclined seat, a carrier and means by which it may be reciprocated within the casing, a roller interposed between the carrier and the casing, a disk closable against the seat, said disk having a

slotted shank extending into the carrier, and a roller passing through a slot in the carrier and through the shank of the disk.

15. In a water-gate, a casing interposed in the conductor and having an inclined seat, a transversely-slotted carrier and means by which it may be reciprocated within the casing, a roller interposed between the carrier and casing, a disk with a vertically-slotted shank entering the carrier and a roller movable against one side of the carrier-slot, and forming a rolling bearing for the opposite side of the slot in the disk-shank.

16. In a water-gate, a casing interposed in the conductor and having an inclined seat, a transversely-slotted carrier, and means by which it may be reciprocated within the casing, a roller interposed between the carrier and casing, a disk closable against the egress-seat and having ports made through it, with controlling-valves upon the carrier, a vertically-slotted shank connecting the disk with the carrier and a roller forming an antifrictional bearing and connection between the disk and the carrier.

17. In a water-gate, a casing interposed in the conductor and having an inclined seat, a transversely-slotted carrier, and means by which it may be reciprocated within the casing, a roller interposed between the carrier and casing, a disk closable against the seat and having a vertically-slotted shank connecting the disk with the carrier, a roller forming an antifrictional bearing and connection between the disk-shank and the carrier, and stops to limit the travel of the rollers in either direction.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ADONIRAM J. COLLAR.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.