

W. C. BAIRD, DEC'D.
 G. S. BAIRD, ADMINISTRATRIX.
 FIRE ESCAPE.
 APPLICATION FILED APR. 17, 1908.

Patented Jan. 11, 1910.

3 SHEETS—SHEET 1.

946,194.

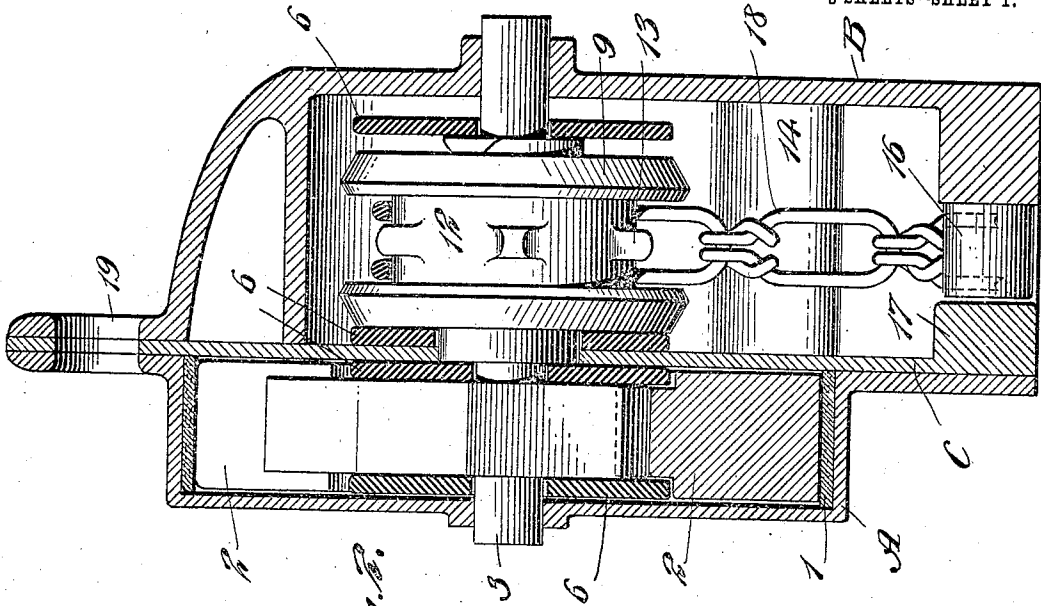


Fig. 2.

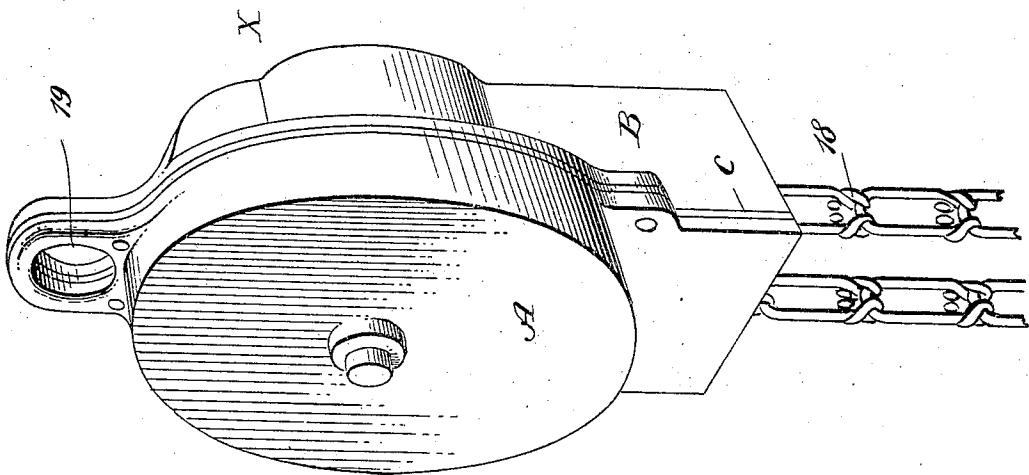


Fig. 1.

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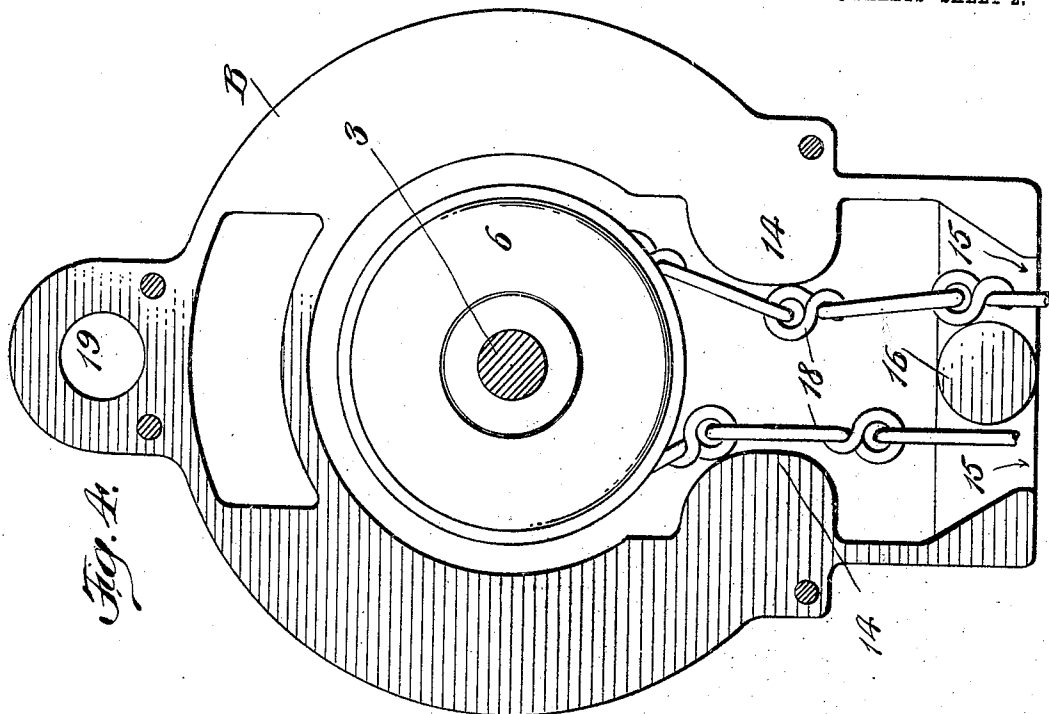


Fig. 4.

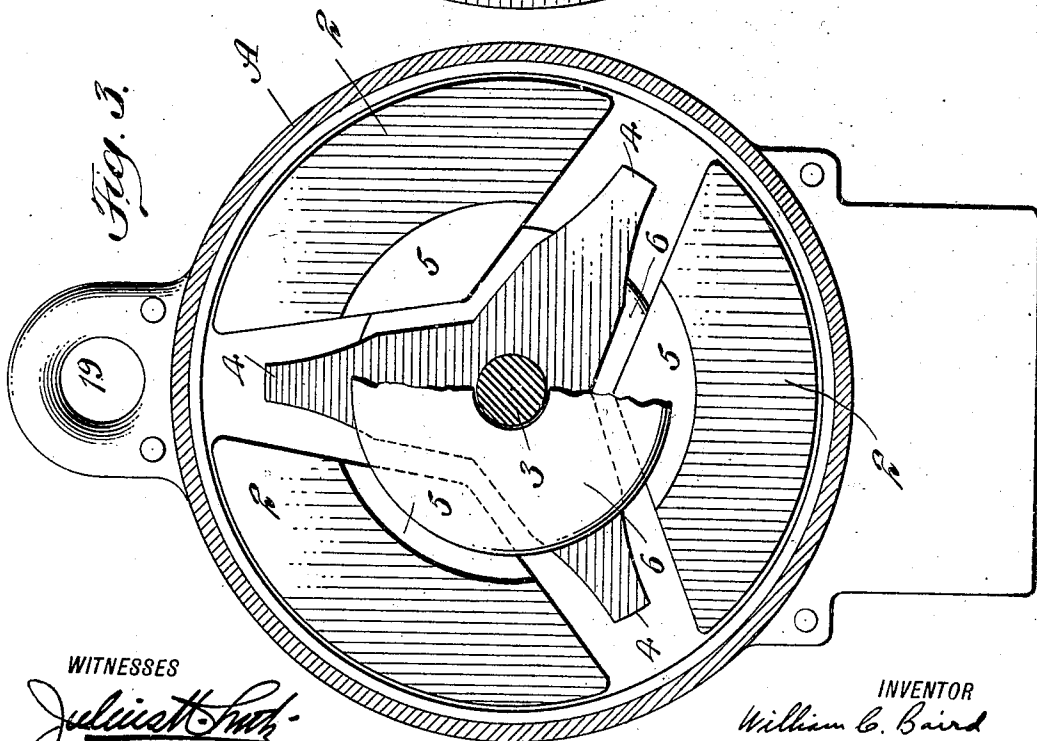


Fig. 3.

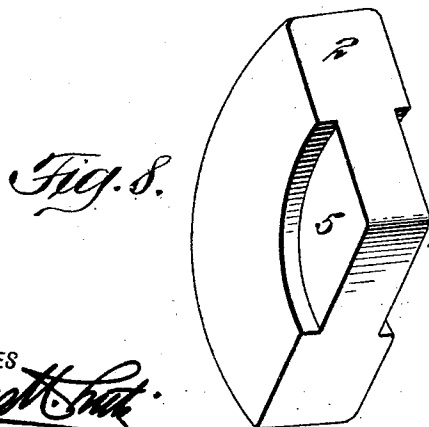
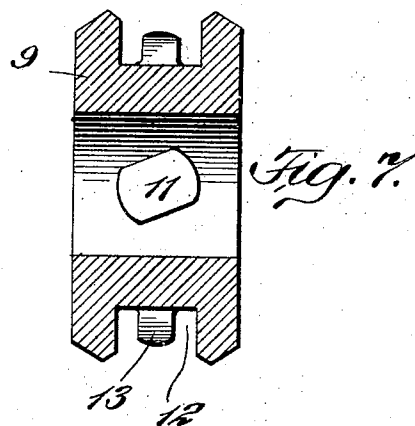
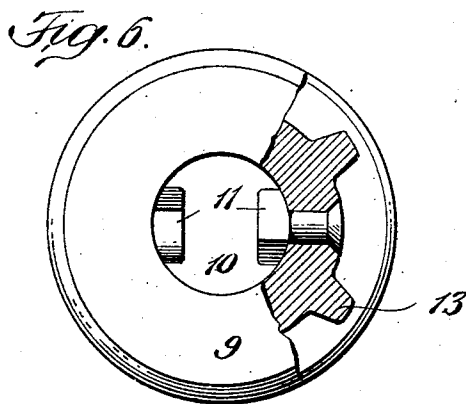
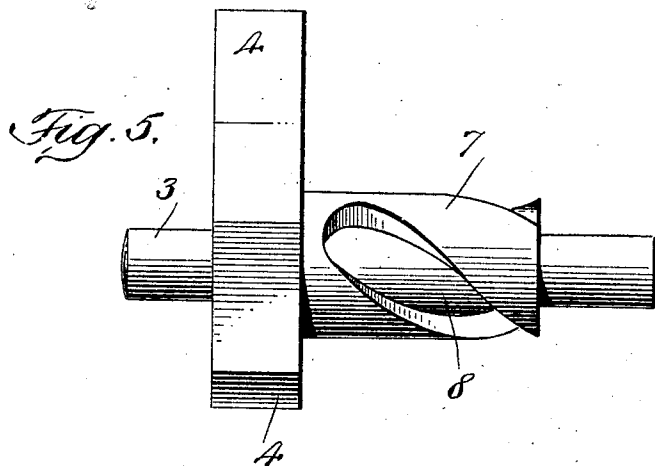
WITNESSES
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FIRE-ESCAPE.

946,194.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM C. BAIRD, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, county and State of New York, have
5 invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

My invention relates to the class of fire
10 escapes shown in Letters Patent No. 447,501 to Hamberry Wilson and No. 864,689 to C. H. Redman, of which patents I am now the sole owner.

It has heretofore been customary to use
15 rope as a lowering means in connection with fire escapes and while such rope is practically non-inflammable when in motion, nevertheless, when stationary, it cannot withstand the action of flame, and objection has been
20 taken thereto.

It has, therefore, been my purpose to provide a device whereby a chain may be used as a lowering means in connection with a friction controlled escape and I have also
25 provided certain additional friction devices to aid in controlling the speed of an object lowered thereby.

I have shown in the drawings herewith and described hereafter the form of device
30 preferred by me as embodying my invention, but I do not desire to limit myself thereto, my invention consisting in the construction, combination and arrangement of parts set forth in and falling within the scope of the
35 claims hereto appended.

In all the figures of the drawings herewith which form a part of this specification, like characters of reference denote like parts, and all are made with substantial accuracy
40 to a scale from an operative apparatus.

Figure 1 represents a view in perspective of a fire escape embodying my invention; Fig. 2 represents a sectional view in side elevation of a fire escape embodying my invention; Fig. 3 represents a front view in
45 elevation of a fire escape embodying my invention with the front wall of the casing removed and a portion of a friction disk therein broken away; Fig. 4 represents a front view in elevation of a fire escape embodying my invention with the front portion of the casing removed; Fig. 5 represents a side view in elevation of the spur
50 wheel and spiral grooved shaft embodying

certain features of my invention; Fig. 6
55 represents a face view in elevation partially in section of the pulley sprocket wheel which is a part of my invention; Fig. 7 represents a sectional view in vertical elevation taken through the pulley sprocket shown in Fig. 6; Fig. 8 represents a view in perspective of a friction or brake block.

I will now describe my invention in detail and in order that a complete understanding thereof may be had, I will describe in connection therewith certain parts shown in the
65 patents above referred to.

The device X comprises two parts or casings A and B, (each with one side open) adapted to be secured together with a plate
70 member C interposed between the parts A and B. Part A comprises an open front circular casing, the inner surface of the circumference of which is lined with a leather
75 strip 1 or any desired material suitable for forming a friction surface; within this casing are located sector-shaped metal friction or brake blocks 2, their outer surfaces being rounded concentric with the inner surface of the casing. Mounted in a bearing in the
80 center of the rear wall of the casing A is a shaft 3 bearing a star wheel integral therewith provided with radial arms 4 (see Fig. 3). The arms 4 are adapted to lie between the blocks 2, the size of the parts being such
85 that each arm 4 has a certain amount of play between adjacent blocks 2. Such brake blocks and star wheel are of the type described in the patents above referred to and I will now describe the new and useful
90 features of my invention which are adapted to be used in connection therewith. The upper and lower faces of the brake blocks 2 are cut away adjacent the inner point thereof to form circular cut-away portions 5, concentric with the outer face of the block.
95 (Figs. 3 and 4.) Between the rear wall of casing A and the blocks 2, loosely mounted on shaft 3, and resting in the recess formed by the cut-away portions 5 of the lower faces of the blocks 2 is placed a circular friction
100 disk 6, preferably of fiber, of slightly less circumference, than said recess; a second disk is in a like manner placed between the plate member C and the blocks 2.

When the various parts are assembled and the plate member C secured in position closing casing A, the rotation of shaft 3 results

in the engagement of arms 4 with blocks 2, whereby the blocks 2 are moved around in the casing in the direction of the rotation of the shaft 3, and retard the movement of said shaft by reason of friction between the blocks and facing 1. At the same time the rear friction disk 6 engages with the wall of casing A and blocks 2 and the front disk 6 engages with the rear side of plate member C and the blocks 2, thereby increasing the retarding action on the rotation of the shaft 3.

The shaft 3 projects through and beyond the plate member C, its outer end being adapted to rotate in a bearing in the casing B, when this casing is secured in place. Between the rear face of plate member C and its bearing in casing B, shaft 3 is formed with an enlarged portion 7 formed with oppositely disposed spiral grooves 8. A sprocket pulley member 9, with a center opening 10 of a size to fit around the enlarged portion 7 of shaft 3, is provided on the inner surface of the center opening 10 with projecting members 11, oppositely inclined at an angle with the horizontal axis of the pulley member 9, adapted to fit in the spiral grooves 8 of the shaft 3; the rotation of the pulley member 9 with the shaft 3 is thereby secured, when the pulley member is mounted on the shaft and held by retaining surfaces (C and casing B) at either end. Between the plate member C and pulley 9 is placed a third friction disk 6, a fourth disk being placed between the pulley 9 and the casing B. The location of these friction disks and of all parts when assembled may be seen by reference to Fig. 2.

The pulley member 9 is provided in its periphery with an annular groove 12 in which are formed radial sprocket teeth 13 suitably spaced.

The upper portion of the casing B is of such a form as to inclose the pulley member 9, while the lower portion is preferably oblong and is provided in each inner surface with a projection portion 14 suitably positioned so that when the casing B is in position they will extend below and under pulley member 9 as shown in Fig. 4. The bottom of the casing B is open and is divided, to form two apertures 15, by a central projecting portion 16 of B. A projecting portion 17 of the plate member C forms the inner end of these apertures.

For use in connection with my device, for the purpose of illustration I have shown a well known form of chain of links 18 which are formed of an integral piece of stout wire bent in a U-shaped form with the sides of the U parallel; said sides converge at the open end of the link and are passed through the U-portion of a second link and bent back, up and over themselves to form a secure link as shown. When in position over the pulley

sprocket 9 (Figs. 2 and 4), resting in the annular groove 12, the chain does not hang straight down from the pulley 9 and engage with only the upper half of its periphery, but the pendent chain portions are brought in toward the center by the projecting portions 14 of the casing B, thereby providing for a more complete engagement of the chain with the periphery of the pulley 9, and for security against disengagement.

The operation of my device will readily be seen from the foregoing description and in brief, is as follows: The escape having been hung in a suitable place by means of the hanger portion 19, when its use is required the chain is thrown out of the window, one end being adjacent the escape and the other hanging down. Suitable belts may be attached to each end of the chain and that attached to the upper end having been placed around a person, the person may descend, the rate of descent being automatically governed by the friction devices and being uniform irrespective of the weight of the person. The lower belt having been drawn up as the person descends and having reached its position adjacent the escape a second person may descend in turn and so on, as each person is lowered and an empty belt elevated. As desired, belts may be dispensed with and the ends of the chain (having preferably been covered for a suitable distance) may be provided with hooks adapted to engage with a link in the body of the chain to form a loop around the body of a person.

It will be noted that the pulley sprocket 9 is allowed a certain amount of play between the wall of the casing B and plate C (Fig. 2) and since the pulley, were it not restricted at either end, (by plate C and casing B) would tend to rotate off of shaft 3, by reason of the projections 11 on its inner surface which rest in the spiral grooves 18 of the shaft 3, it will be seen that, in accordance with the direction of rotation of the shaft 3, the sprocket pulley 9 will move as far as possible toward one of the ends of the shaft 3 and will be brought into intimate contact with and will constantly press against one of the disks 6, which in turn rests against the casing B or plate C, thereby producing a maximum braking effect.

Among the many advantages incident to a device embodying my invention it will be seen that I have provided an improved form of friction controlled escape comprising friction members of novel construction and securing a constant pressing engagement of friction surfaces; that I have provided for the use of a non-inflammable lowering means and that I have provided security against slipping or disengagement of such lowering means. My improved escape comprises parts of simple and durable construction, readily assembled, of small size, and offer-

ing means for the substantially continuous escape of persons from a height at a desired uniform rate of speed.

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

1. In a device of the class described, the combination with a shaft provided with means adapted to retard the rotation of the shaft, of a pulley member, and a friction member on said shaft, and means comprising a spiral groove adapted, upon the rotation of the pulley, to bring the latter into contact with the friction member and to hold the latter in pressing engagement with said friction member upon continued rotation of the pulley, said means being adapted to cause the rotation of the shaft with the pulley, to permit of said continued rotation of the pulley, after said contact.

2. In a device of the class described, the combination with a shaft provided with means adapted to retard the rotation of the shaft of a pulley member, and a friction member on said shaft, and means comprising a spiral groove and a stud member bearing in said groove adapted, upon the rotation of the pulley, to bring the latter into contact with the friction member and to hold the latter in pressing engagement with said friction member upon continued rotation of the pulley, said means being adapted to cause the rotation of the shaft with the pulley, to permit of said continued rotation of the pulley, after said contact.

3. In a device of the class described, in combination a shaft provided with means adapted to retard the rotation thereof, a pulley member and a friction member on the shaft, and means comprising a spiral groove and a stud member projecting inwardly from the pulley and bearing in the groove adapted, upon the rotation of the pulley, to bring the latter into contact with the friction member and to hold the latter in pressing engagement with said friction member upon continued rotation of the pulley, said means being adapted to cause the rotation of the shaft with the pulley, to permit of said continued rotation of the pulley, after said contact.

4. In a device of the class described, in combination a shaft provided with means adapted to retard the rotation thereof, a pulley member and a friction member on the shaft, and means comprising a plurality of spiral grooves and a plurality of stud members projecting inwardly from the pulley member and set at an angle to the horizontal plane of the axis thereof adapted, upon the rotation of the pulley, to bring the latter into contact with the friction member and to hold the latter in pressing engagement with the friction member upon continued rotation of the pulley, said means

being adapted to cause the rotation of the shaft with the pulley, to permit of said continued rotation of the pulley, after said contact.

5. In a device of the class described, in combination, a shaft, a pulley member thereon, a friction disk member on the shaft adjacent one side of the pulley, a second friction disk member on the shaft adjacent the opposite side of the pulley, and means for bringing the pulley member in contact with one of said friction disk members upon rotation of the pulley in one direction and for bringing the pulley in contact with the second friction disk member upon rotation of the pulley in the opposite direction.

6. In a device of the class described, in combination a shaft provided with means adapted to retard the rotation thereof, a pulley thereon, a friction member on said shaft, and means adapted upon the rotation of the pulley to bring the latter into contact with the friction member and to hold the latter in pressing engagement with said friction member upon continued rotation of the pulley, said means being adapted to cause the rotation of the shaft with the pulley, to permit said continued rotation of the pulley, after said contact.

7. In a device of the class described, in combination a shaft, a pulley member thereon, a friction disk member on the shaft adjacent one side of the pulley, a second friction disk member on the shaft adjacent the opposite side of the pulley, and means adapted, upon the rotation of the pulley, to bring the same into contact with one of said friction members and to hold the pulley in pressing engagement therewith during the continued rotation of the pulley and to bring the pulley in contact with the second friction disk member upon rotation of the pulley in the opposite direction and to hold the same in pressing engagement therewith during the continued rotation of the pulley.

8. In a device of the class described, in combination, a shaft, a pulley member thereon, a friction disk member on the shaft adjacent one side of the pulley, a second friction disk member on the shaft adjacent the opposite side of the pulley, and means for bringing the pulley member in contact with one of said friction members upon the rotation of the pulley in one direction and in contact with the second friction member upon rotation of the pulley in the opposite direction, said means comprising a spiral groove in the face of the shaft, and a stud projecting inwardly from the pulley and resting in said groove.

9. In a device of the class described, in combination, a shaft, a pulley member thereon, a friction disk member on the shaft adjacent one side of the pulley, a second friction disk member on the shaft adjacent the

opposite side of the pulley, and means for bringing the pulley member in contact with one of said friction members upon the rotation of the pulley in one direction and in
5 contact with the second friction member upon rotation of the pulley in the opposite direction, said means comprising a plurality of spiral grooves in the face of the shaft, and two studs projecting from the pulley
10 and set at opposite angles to the horizontal plane of the axis thereof adapted to rest in said grooves.

10. In a device of the class described, in combination, a casing, a shaft mounted in
15 the casing, a star wheel on the shaft, a plurality of friction block members within the casing adjacent to the star wheel and adapted to be brought in frictional engagement with the inner surface of the casing by the
20 star wheel upon the rotation of the shaft, a friction disk member on said shaft at one side of the star wheel, a pulley member on said shaft, and means adapted to bring the star wheel in contact with the friction mem-
25 ber upon the rotation of the pulley.

11. In a device of the class described, in combination, a casing, a shaft mounted in
the casing, a star wheel on the shaft, a plu-
30 rality of friction block members within the casing adjacent the star wheel and adapted to be brought in frictional engagement with the inner surface of the casing by the star wheel upon the rotation of the shaft, a friction disk member upon said shaft at one side

of the star wheel, a second friction disk mem- 35
ber on the shaft at the opposite side of the star wheel, a pulley member on the shaft, and means adapted to bring the star wheel in pressing engagement with one of the friction members upon rotation of the pulley, 40
and to bring the star wheel in pressing engagement with the second friction member upon the rotation of the pulley in the opposite direction.

12. In a device of the class described, in 45
combination, a casing, a shaft mounted in the casing, a star wheel on the shaft, a plurality of friction block members within the casing adjacent the star wheel and adapted to be brought in frictional engagement with 50
the inner surface of the casing by the star wheel upon rotation of the shaft, a friction disk member on said shaft adjacent each side of the star wheel, a pulley member on said shaft and a friction disk member on the 55
shaft adjacent each side of the pulley member, and means adapted upon the rotation of the pulley to bring the same into pressing engagement with the friction member at one side of the pulley and to bring the star 60
wheel into pressing engagement with the friction member on the opposite side of the star wheel.

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Witnesses:

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