Feb. 26, 1924. 1,485,002

W. G. WILSON

METHOD OF OPERATING MECHANISM BY GRAVITY

Filed Sept. 22, 1922 4 Sheets-Sheet 1

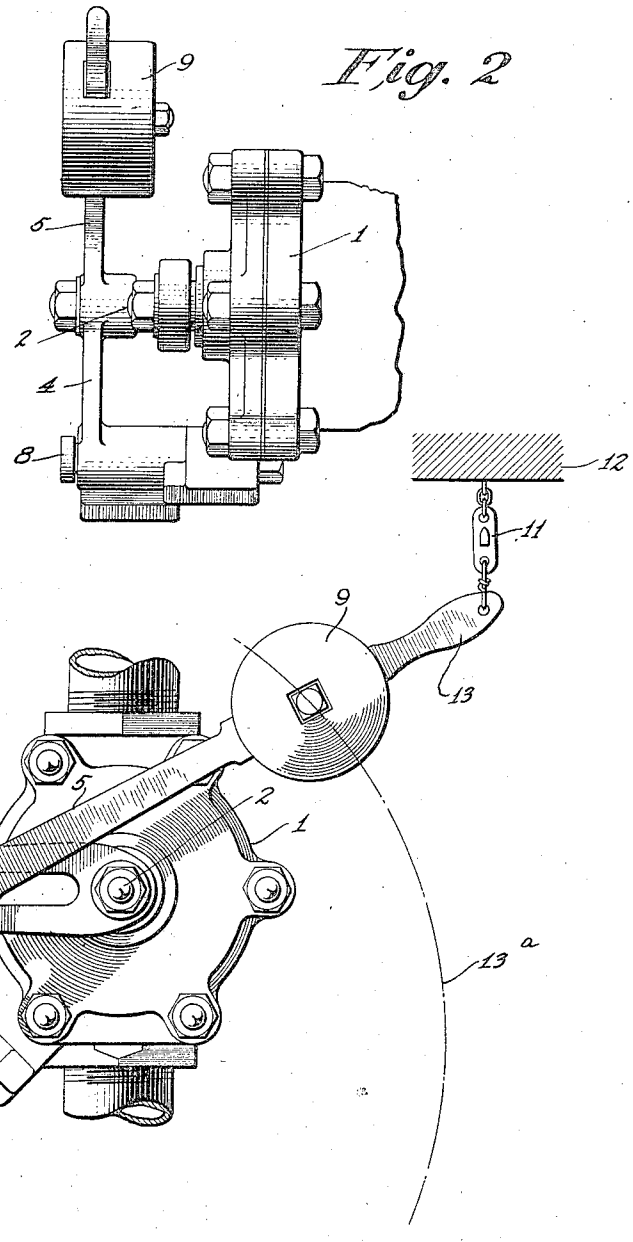


Fig. 2

Fig. 1

INVENTOR.
Wylie G. Wilson
By Stewart & Perry
his ATTORNEYS.

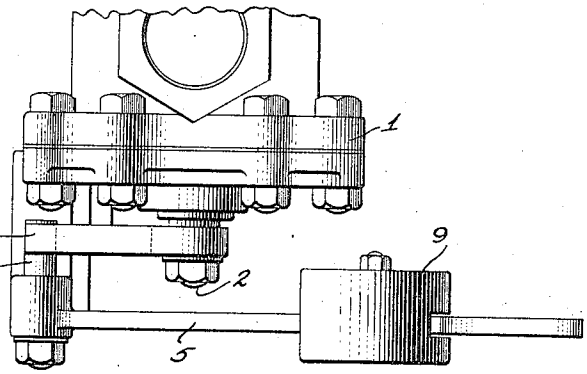
Feb. 26, 1924. 1,485,002

W. G. WILSON

METHOD OF OPERATING MECHANISM BY GRAVITY

Filed Sept. 22, 1922 4 Sheets-Sheet 2

Fig. 3



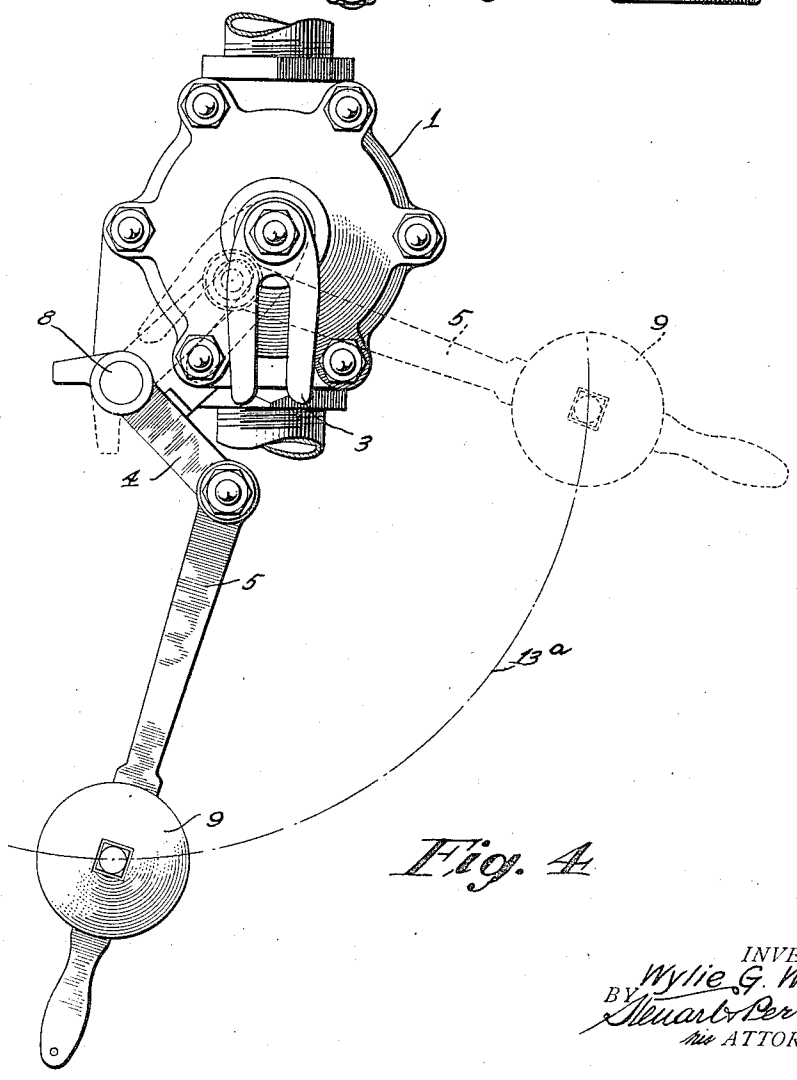


Fig. 4

INVENTOR.
Wylie G. Wilson
BY Stewart & Perry
his ATTORNEYS.

Feb. 26, 1924. 1,485,002

W. G. WILSON

METHOD OF OPERATING MECHANISM BY GRAVITY

Filed Sept. 22, 1922 4 Sheets-Sheet 3

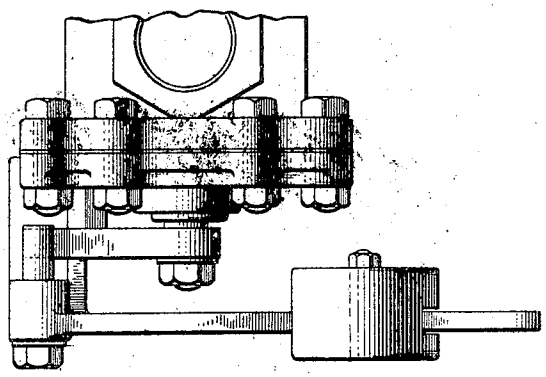


Fig. 6

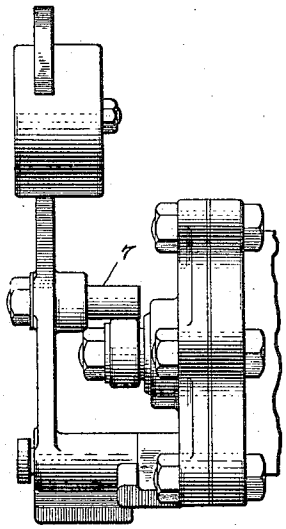


Fig. 7

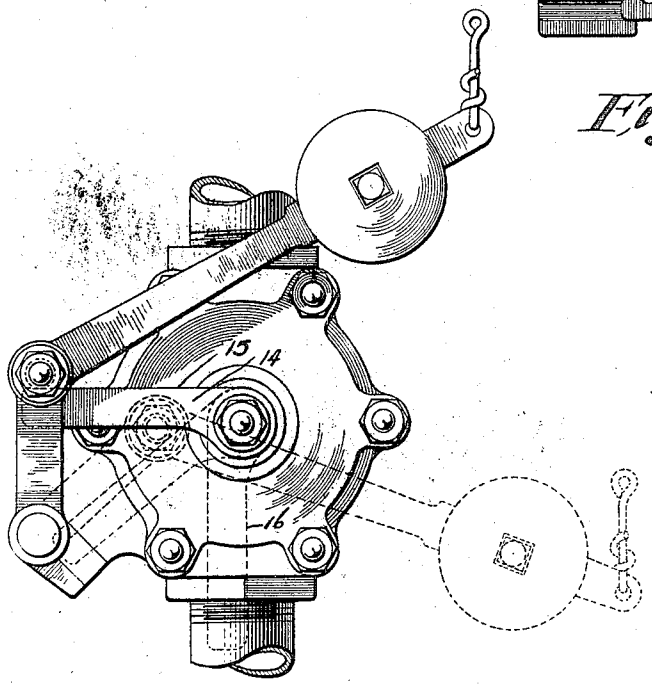


Fig. 5

INVENTOR.
Wylie G. Wilson
BY
Stewart & Perry
ATTORNEYS.

Feb. 26, 1924. 1,485,002

W. G. WILSON

METHOD OF OPERATING MECHANISM BY GRAVITY

Filed Sept. 22, 1922 4 Sheets-Sheet 4

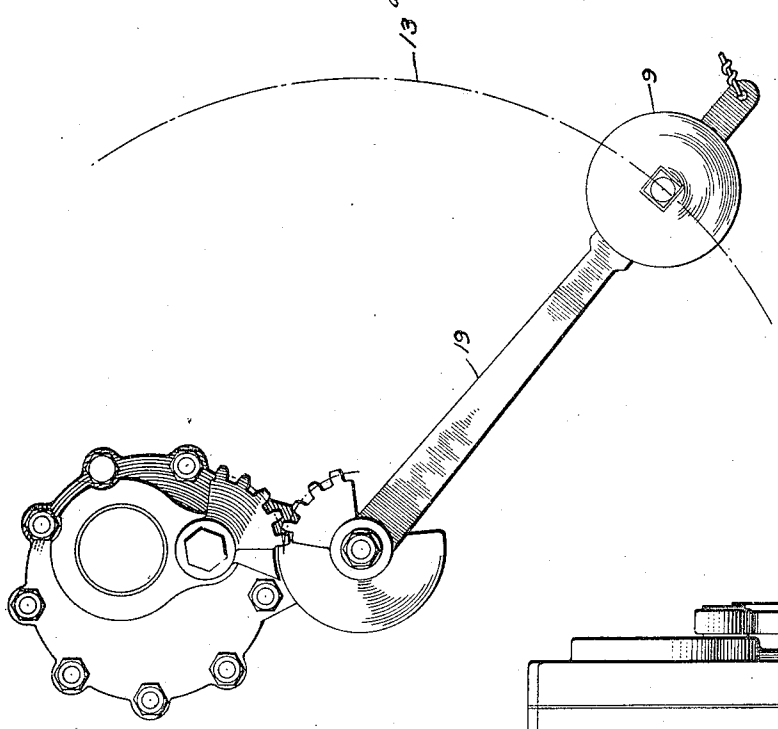


Fig. 9

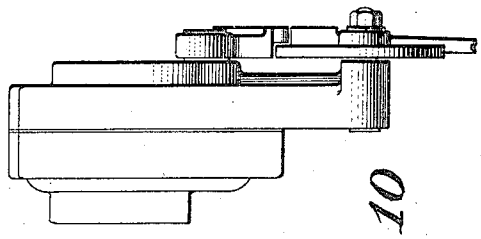


Fig. 10

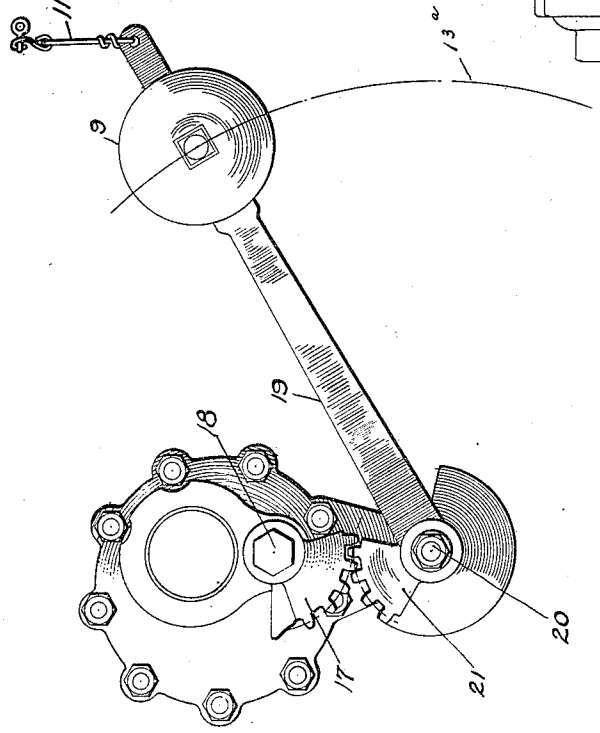


Fig. 8

INVENTOR.
Wylie G. Wilson
BY
Stewart & Perry
ATTORNEYS.

Patented Feb. 26, 1924. 1,485,002

UNITED STATES PATENT OFFICE.

WYLIE G. WILSON, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO LOOSE SEAT VALVE COMPANY, A CORPORATION OF DELAWARE.

METHOD OF OPERATING MECHANISM BY GRAVITY.

Application filed September 22, 1922. Serial No. 589,732.

To all whom it may concern:

Be it known that I, WYLIE G. WILSON, a subject of the King of Great Britain, and resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements Pertaining to a Method of Operating Mechanism by Gravity, of which the following is a specification.

This invention relates to apparatus adapted for the utilization of the motive force inherent in a loaded element when suspended and the providing of means by which when said loaded element is released said force will be utilized to perform work, and when said work is accomplished the loaded element will be caused to come to rest without shock or strain either to the mechanism on which the work is performed or the apparatus by which the loaded element is carried.

The invention is illustrated as applied to mechanism adapted to operate a rotary valve. It will be obvious, however, that it may be employed in many other relations.

I have illustrated the invention in the accompanying drawings, designating the parts by numerals, referring to like parts by like numerals.

Figure 1 is an elevation showing the mechanism in its primary position;

Figure 2 is a side view of Figure 1;

Figure 3 is a plan view of the same;

Figure 4 is a side view of Figure 1 illustrating the final position of the operative parts when the loaded element has been released and the work performed;

Figure 5 is an elevation of another form of construction of the same device as shown in Figure 1;

Figure 6 is a plan view of Figure 5;

Figure 7 is a side view of Figure 5;

Figure 8 is an elevation of another form of construction showing the device in its primary position;

Figure 9 is the same as Figure 8 showing the device approaching its final position; and

Figure 10 is a top plan view of Figure 9 showing closed position of the valve.

1 is a valve body having a valve (not shown) operated by a rotary means such as a central shaft 2 on which is mounted a bifurcated member 3. 4 and 5 comprise an integral lever. 7 is a stud emanating from the lever 4 and 5 at 6 adapted to slide within the bifurcated member 3. Said lever is pivotally mounted to move on an axis 8 and is loaded by a weight as 9. It is also preferably provided with a handle as 13. 11 is a fusible link interposed between a stationary support as 12 and a handle 13. In the position shown in Figure 1 the valve is either open or closed as the particular service required thereof may dictate. The lever is suspended in said position by the fusible link 11 or it may be suspended by any other suitable means subject to being released automatically or at will, or the link may be omitted and the lever sustained manually.

In the event that the support 11 is released or the hand of the operator is withdrawn the lever 4 and 5 carrying its loaded element 9 falls subject to natural forces in the arc of a circle the center of which is the pivotal point 8, the path of the loaded element being indicated by the line 13^a. In the operation of the mechanism the weight is intended to be sufficient to cause the said lever to rotate in the path indicated and in so doing to cause the stud 7 to reciprocate within the bifurcated arm 3 and as the loaded lever passes through a segment of the arc of its rotation the stud 7 will cause the bifurcated member to rotate on its axis through a segment of an arc, thus moving said bifurcated element to a predetermined point and rotating the valve a corresponding amount. The lever, carrying its loaded element continuing its movement about its axis after the stud has disengaged itself from the bifurcated member, will oscillate about the lowest point in its circular path and eventually come to rest at such lowest point, all in the manner of the operation of a pendulum suspended from a point.

Referring to Figure 5 its construction and operation is in all respects the same as that last described with reference to Figures 1 and 4 with the exception that the arm 14 is substituted in place of the bifurcated arm 3, in which case the stud 7 rides on the upper surface 15 of the arm 14 and in its operation rotates the said arm to the position shown in dotted lines at 16.

In Figures 8, 9 and 10 I show a construction wherein I employ segmental gears which perform the same function as that illustrated in Figures 1 and 5. In this con-

struction 17 is a segmental gear axially mounted to rotate the valve as at 18. The lever designated at 19 in this construction is pivoted at 20 and carries the segmental gear 21 which is adapted to mesh with the gear 17. When the fusible link or other temporary support 11 is released the loaded element 9 and lever 19 fall in the power of natural forces. The segmental gears engage to rotate the valve until the teeth pass out of mesh at which point the gear 21 ceases to move the gear 17 and the lever 19 and loaded element 9 continue their rotation in a circular path 13^a and after a pendulous operation about the lowest point of said circle of rotation the same come to rest.

As regards the mechanism operated upon, as in this case the valve, the pin 7 carried by the loaded lever operates between the jaws of the bifurcated member 3 and as said lever passes through a segment of its circular motion it causes the said bifurcated lever to rotate through a segment of an arc of its rotation and when said segment is traversed the pin 7 ceases to act upon said bifurcated arm 3 and does not impart to the same any shock incident to the movement of the weight. The same is true with reference to the constructions shown in Figures 5 to 7 where the pin 7 passes out of engagement with the lever 14 and in the construction shown in Figures 7 to 10 where the segmental connections 17 and 21 engage and disengage in a manner well understood in the art.

In like manner the loaded element continues in its path of rotation until it passes the lowest point in its cycle of movement about which point it oscillates as a pendulum until it finally comes to rest, thus providing an apparatus by which such a weight may be employed and brought to rest without shock or strain as previously stated.

The utility of a device of this nature is found in the fact that any shock or strain incident to the arresting of the movement of a falling weight, when such strain is imparted to or taken up by the mechanism operated upon, as in this case the elements which go to constitute a valve mechanism, is likely to injure the valve mechanism. Hence it is important that such devices be so constructed as to entirely relieve the mechanism operated upon from the burden of arresting the movement of such motive power, and again it is desirable that the loaded element should be mounted to move under such control that its motive energy will be neutralized by natural forces which cause it to come to rest at a predetermined point after its work has been accomplished.

I may employ a fusible link as 11 to support the loaded element, the same being adapted to automatically release the same under conditions of excessive temperature. Any other device might be employed for this purpose, adapted to operate automatically or manually.

In the construction shown in Figures 8 to 10 wherein segmental gears are employed in connection with the operation of the device, attention is called to the fact that while the teeth of said segments engage and disengage the construction is such that the gear 17 is prevented from moving after the teeth of the gears 17 and 21 pass out of mesh, this result being obtained by the peripheral engagement of the convex surface of the gear 21 and the concave surface of the gear 17.

What I claim is:

1. A loaded element pivotally mounted to move in a circular path traversing a vertical plane so that when said loaded element is raised adjacent the highest point of the circle and released it will fall in the power of natural forces and come to rest after an oscillatory movement about the lowest point in said circle, in combination with means carried by said loaded element adapted to move cooperative mechanism during the period of its passage through a predetermined segment of its circular movement and to cease to move the same at the end of such period, and mechanism adapted to cooperate with and be moved by said means carried by said loaded element during its segmental movement as stated.

2. A loaded element pivotally mounted to move in a circular path traversing a vertical plane so that when said loaded element is raised adjacent the highest point of the circle and released it will fall in the power of natural forces and come to rest after an oscillatory movement about the lowest point in said circle, in combination with means carried by said loaded element adapted to move cooperative mechanism during the period of its passage through a predetermined segment of its circular movement and to cease to move the same at the end of such period, and mechanism adapted to cooperate with and be moved by said means carried by said loaded element during its segmental movement as stated, with means controlled by thermic conditions adapted to support said loaded element in a predetermined position.

3. A loaded element pivotally mounted to move in a circular path traversing a vertical plane so that when said loaded element is raised adjacent the highest point of the circle and released it will fall in the power of natural forces and come to rest after an oscillatory movement about the lowest point in said circle, in combination with a bifurcated lever mounted on an axis parallel with that of said loaded element, a stud carried by said loaded element adapted to reciprocate within said bifurcated lever as the loaded element passes through a predeter-

mined segment of its circular movement and to move said lever through a segment of a circle.

4. A loaded element pivotally mounted to move in a circular path traversing a vertical plane so that when said loaded element is raised adjacent the highest point of the circle and released it will fall in the power of natural forces and come to rest after an oscillatory movement about the lowest point in said circle, in combination with a bifurcated lever mounted on an axis parallel with that of said loaded element, a stud carried by said loaded element adapted to reciprocate within said bifurcated lever as the loaded element passes through a predetermined segment of its circular movement and to move said lever through a segment of a circle, with means consisting of a fusible link adapted to support said loaded element in a predetermined position.

Signed by me at New York, N. Y., this 19th day of September, 1922.

WYLIE G. WILSON.

Witnesses:
BERTRAND D. DEPIERRIS,
SADIE H. OLIKER.