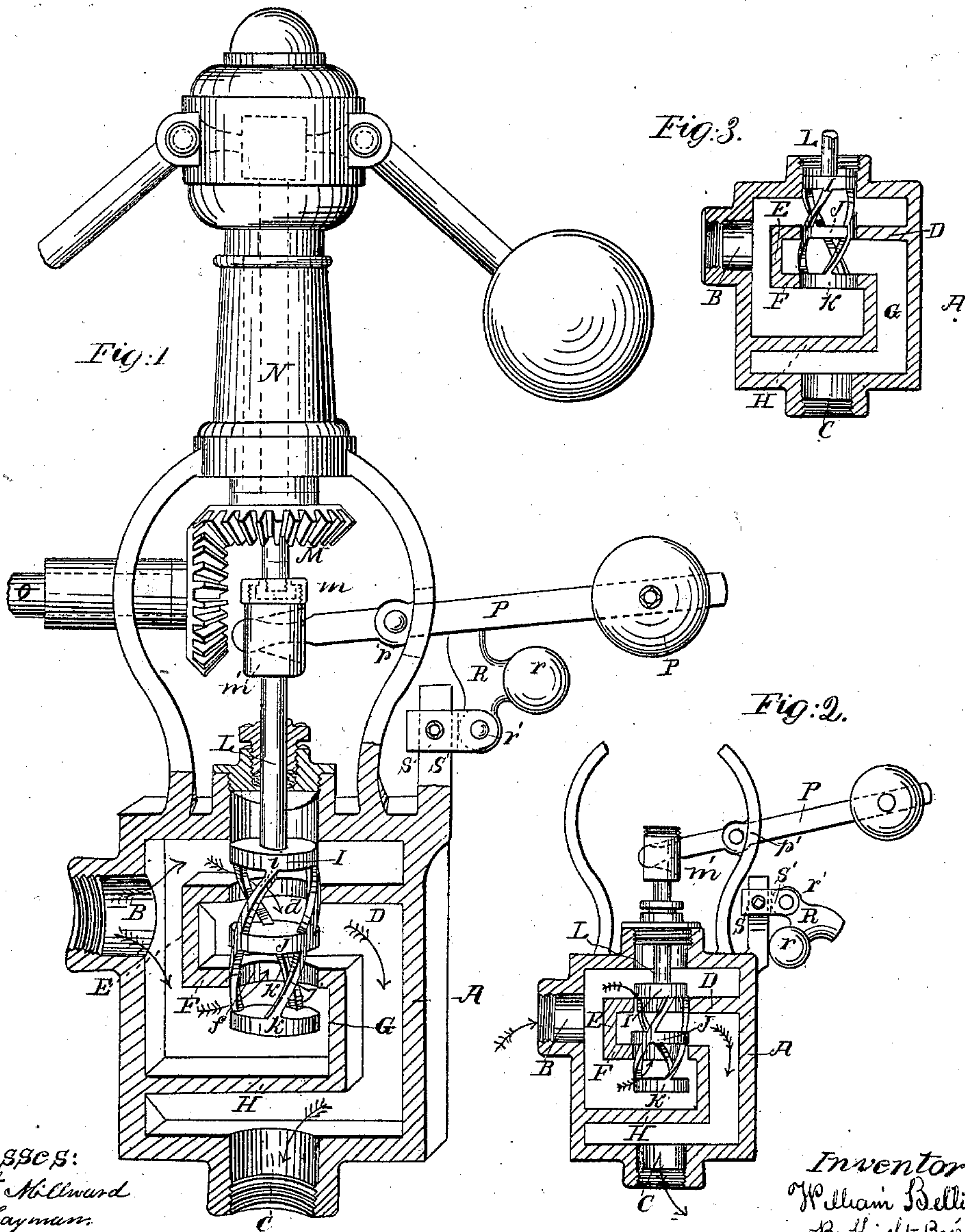


W. Bellis,
Governor.

No. 78,782.

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Witnesses:
Frank Millward
for H. Layman.

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United States Patent Office.

WILLIAM BELLIS, OF RICHMOND, INDIANA.

Letters Patent No. 78,782, dated June 9, 1868.

IMPROVEMENT IN GOVERNORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, WILLIAM BELLIS, of Richmond, Wayne county, Indiana, have invented a new and useful Improvement in Steam-Engine Governors; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

The first part of my invention relates to a form of governor-valve, which, in addition to the advantages of great compactness and mobility, possesses the faculty of closing automatically in the event of the snapping or running off of the governor-belt, or the sudden suspension of governor-action from any other cause or accident.

The second part of my invention relates to a device for holding such governor-valve open when the throttle is shut, so as to enable the engine to be started by the opening of said throttle.

Figure 1 is an axial section of a valve and its accessories embodying my invention, the governor being at rest, the valve open, and the steam just entering from the opened throttle.

Figure 2 shows the same valve with the gravitating catch or tumbler released, and the valve under control of the governor.

Figure 3 shows the valve automatically closed in consequence of the running off of the belt or other accident to the governor.

The valve-chamber A may have the represented rectangular or other external form, and has the customary inlet-neck, B, and outlet-neck, C, which necks are separated by an S-formed diaphragm, D E F G H, of which the portions D, F, and H form horizontal shelves, connected by vertical walls E and G.

Of these parts the shelves D and F are traversed by circular ports *d* and *f* of equal size.

My valve proper consists of three precisely equal parallel and equidistant disks, I J K, of which the upper and lower disks I and K are separated from the middle disk J the precise distance which separates the shelves D and F.

The disks are connected by wings, ribs, or bars, *i j k*, which I prefer to make flush with the peripheries of the disks, and of spiral form, as shown, in order that in the vertical oscillation of the valve it may be guided easily and truly with the openings of the seats, and that every part of the seats may be equally subjected to wear.

L is the valve-stem, which is connected to the governor-stem M by swivel *m*.

N is an ordinary governor; of which O is the driving-shaft. The stem-coupling *m'* is slotted, as shown, to receive the lever P, which is fitted with an adjustable weight or counterpoise, *p*, and is fulcrumed at *p'*. This weighted lever may be used to give a variety of speeds to the engine, or to adjust its velocity to a certain number of revolutions, but I also use it to sustain the valve I J K in the open position when the engine and governor are at rest. This is accomplished in connection with a prop, gravitating-catch, or tumbler, R, which is weighted at *r* and pivoted at *r'* to a sliding block, S, which is adjustable by set-screw *s*.

When the engine is to be started, the valve I J K is held open by the weighted stop or prop R being turned up under the lever P. The stop R is held in position by the weight of the governor-balls and weighted lever P. The steam being applied, the governor begins to operate, and as soon as it attains sufficient velocity, the balls rise and release the stop R, the weight on which immediately causes it to drop out of the way, and leaves the governor and valve to operate in the usual manner.

It will be observed, by reference to the construction and arrangement of the valve and apertures I J K *d f*, that the ports are closed both by the extreme extension and by the extreme contraction of the governor-balls, so that the ports *d f* may be closed or partially so, as may be required, to check the engine in the regular legitimate action of the governor while in motion, or the ports may be suddenly and completely closed and the engine stopped by the breaking or running off of the governor-belt.

With this arrangement it is always necessary either to prop the lever P in the manner described, or to elevate the same by hand before starting the engine.

When the valve is closed by the extreme extension of the balls, the disks I J occupy the ports *d f*, and

prevent the passage of steam, and when it is closed by the extreme contraction of the balls, the disks J K occupy the ports *d f*, and equally prevent its passage.

Besides the feature of closing in either direction, the provision of double ports and the peculiar construction of the triple valve I J K with an open centre justifies the employment of a valve of small diameter. Thus, an ordinary governor-valve of two inches in diameter has an area of 3.1416 square inches. This area can be obtained by the use of an inch and a half valve of my construction, the area of the two disks being 3.534, from which deduct .375 for the bars or wings *i j k*, and an area of 3.159 is left for the passage of steam.

A small valve has less friction, and as it requires less power to operate it than a larger one, the governor is more sensitive and mobile.

My said valve further possesses the advantages of being completely steam-balanced, whether open or shut, and under every pressure of steam.

While preferring the spiral form of bars *i j k*, I reserve the right to connect my disks I J K by means of straight bars, or by radial wings, if desired, and while preferring that such bars be three in number, as leaving the most open passage compatible with the proper action of the valve, yet two ribs or more than three in number may be employed.

I claim herein as new, and of my invention—

1. The construction of the triple-disk valve I J K *i j k*, substantially as and for the purpose set forth.
2. The diaphragm D *d* E F *f* G H, constructed as described, when arranged in relation to the triple-disk valve I J K, substantially as and for the purpose specified.
3. The combination of the adjustable bracket S, weighted prop or latch R *r*, and weighted lever P *p*, with the governor-valve I J K and governor N, all constructed, arranged, and operating substantially as and for the purpose described.

In testimony of which invention, I hereunto set my hand.

WILLIAM BELLIS.

Witnesses:

GEO. H. KNIGHT,
BURTON EGLE.