

B. BRAZELLE.  
GOVERNOR.

No. 172,602.

Patented Jan. 25, 1876.

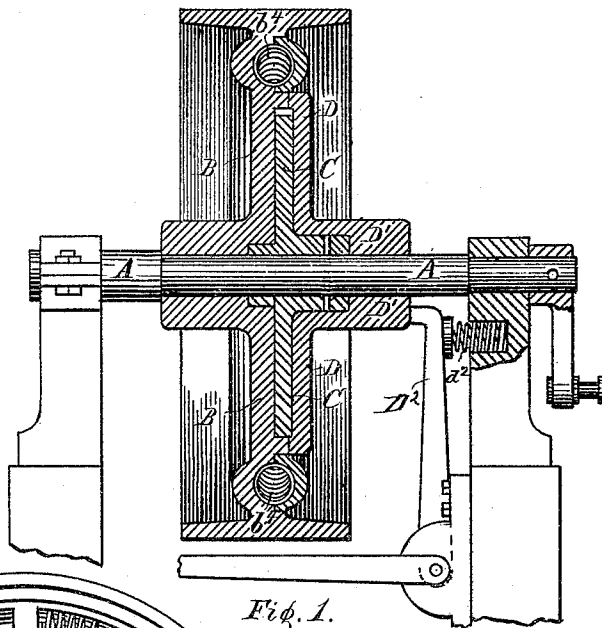


Fig. 1.

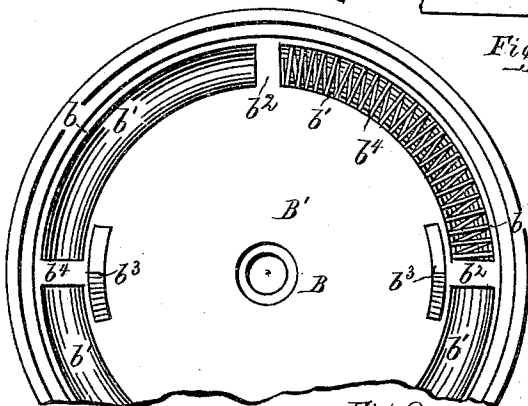


Fig. 2.

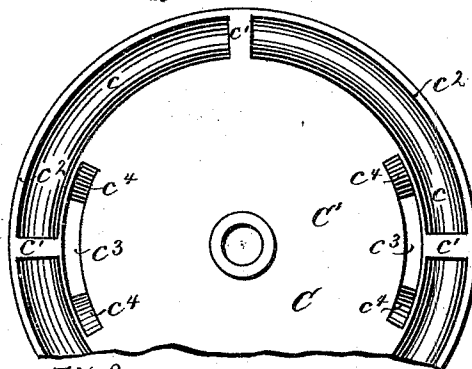


Fig. 3.

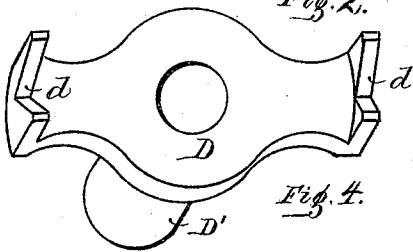


Fig. 4.

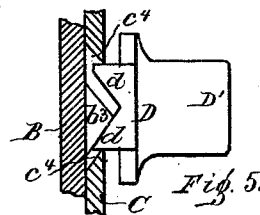


Fig. 5.

WITNESSES

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# UNITED STATES PATENT OFFICE

BENJAMIN BRAZELLE, OF ST. LOUIS, MISSOURI.

## IMPROVEMENT IN GOVERNORS.

Specification forming part of Letters Patent No. **172,602**, dated January 25, 1876; application filed September 6, 1875.

*To all whom it may concern:*

Be it known that I, BENJAMIN BRAZELLE, of St. Louis, Missouri, have invented an Improved Governor for Steam-Engines, of which the following is a specification:

This invention relates to that class of governors in which the combined action of the steam-pressure on the piston of the engine and the resistance offered by the load driven produces the operation of the governor.

My invention, however, consists simply in the novel construction and combination of parts composing the governor, and as now will more fully appear.

Of the drawing, Figure 1 is a sectional elevation representing my invention as applied in use, the connection with the cut-off being broken. Fig. 2 is a plan view of the disk operated by the resisting force. Fig. 3 is a plan view of fixed disk. Fig. 4 is a perspective view of the sliding collar. Fig. 5 is a detail view, showing the cams on sliding collar acted upon by the cams of the loose disk.

A is the driving-shaft, which is connected to the piston of the engine, as ordinarily. I provide the shaft A with two disks, B and C, each of which is constructed as follows: As indicated in Fig. 1, the disk B is like a belt-wheel having a belt-rim. Said disk has an annular bearing at *b*, parallel with its face B'. (See Fig. 2.) Between the bearing *b* and face B' the disk has chambers, *b*<sup>1</sup>, which are divided by abutments *b*<sup>2</sup>. (Clearly shown in Fig. 2.) Also, as shown, (see Fig. 2,) and made of the constructive shape shown in Fig. 5, are cams *b*<sup>3</sup> on the face B' of the disk B. Otherwise the disk is made to fit by its journal on the shaft A. In the chambers *b*<sup>1</sup> are one or more springs, *b*<sup>4</sup>, these being the devices to impart a sensitive operation to the governor, and, when acted upon, impart their action to other parts, hereinafter described, to regulate and control the admission of steam to the engine. The cams *b*<sup>3</sup> are to operate a sliding collar to control the attachment of the governor to the engine, the disk B thus constructed being fitted on the shaft, so as to turn with same as long as no resisting force is brought to bear on said disk. The disk C I construct to present a contiguous face, C', (see Fig. 3,) to that of B' when placed together. (See Fig. 1.) This

disk has also chambers *c*, divided likewise by abutments *c*<sup>1</sup>. (See Fig. 3.) *c*<sup>2</sup> is the annular bearing to turn on that of *b*. In the disk C *c*<sup>3</sup> are slots, the inner ends of which are beveled to an incline, *c*<sup>4</sup>, Fig. 3, to facilitate the passage over the cams. Projecting from both sides of the disk C are its journals, (clearly shown in Fig. 1,) by means whereof it is firmly keyed to the shaft, and also receives the socket of the sliding collar. The disks B and C thus constructed are arranged in operative relation by fitting the latter to contiguously engage the former.

The further connection of the governor to the engine is as follows: I form a sliding collar, D, the constructive shape thereof being shown in Fig. 4, its arms having cams *d*, the faces of which correspond to those of the cams *b*<sup>3</sup>. By its collar D<sup>1</sup>, (see Figs. 1, 4, 5,) said sliding collar is adjustably fitted on the shaft A, and so that its cams *d* shall engage the cams *b*<sup>3</sup>, as indicated in Figs. 1 and 5. The sliding collar D actuates a pivoted arm, D<sup>2</sup>, which at top abuts against springs *d*<sup>2</sup>. (See Fig. 1.) From said arm the connection to the engine is properly made.

The operation of my governor is as follows: Power being applied to the shaft, as it rotates it carries the disks B C with it without compressing the springs *b*<sup>4</sup>, and causing the abutments in both disks to stand directly opposite each other as long as no resisting force takes place. When the load is applied the resisting force acts to retard the revolution of the disk B, thereby compressing the springs *b*<sup>4</sup>, which causes said disk to be slightly ahead of its complement disk; in other words, the abutments will not be directly opposite, but one ahead of the other, as indicated in Fig. 5. The compression of the springs, as apparent, varies according to the resistance of the load to be overcome. Thus there is a constant changing of the position of the disks with relation to each other. The said changing positions of the disks also change the relative position of the cams *b*<sup>3</sup> and *d*, so that the former cause the latter, or properly the sliding collar, to move in or out, its adjustability regulating and controlling the admission of steam to the engine, just as the nature of the case requires.

The construction of the parts, as above de-

scribed, permits the engine to be reversed without interfering with the operation of the governor to control the cut-off. Thus it will be seen that the disk B can be operated to pass ahead of the disk C, or, vice versa, the latter be made to pass ahead of the former, according to the operation of the engine, either direct or when same is reversed. I am, therefore, enabled to accomplish a new result not achieved by the patent of Wm. H. Elliot, dated March 27, 1855, No. 12,586, and the parts of which I hereby disclaim; but

What I do claim is—

The combination of the parts—viz., the disk

B, formed to have chambers  $b^1$ , abutments  $b^2$ , cams  $b^3$ , the disk C, having chambers  $c$ , abutments  $c^1$ , slots  $c^2$ , the spiral springs  $b^4$ , sliding collar D, having cams  $d$ , said parts being arranged with relation to each other and capable of reverse action on a shaft, A, and the whole constructed to operate in the manner and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

BENJAMIN BRAZELLE.

Witnesses:

WILLIAM W. HERTHEL,

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