

(No Model.)

E. HAUG.

BALANCED SLIDE VALVE.

No. 250,808.

Patented Dec. 13, 1881.

Fig. 1.

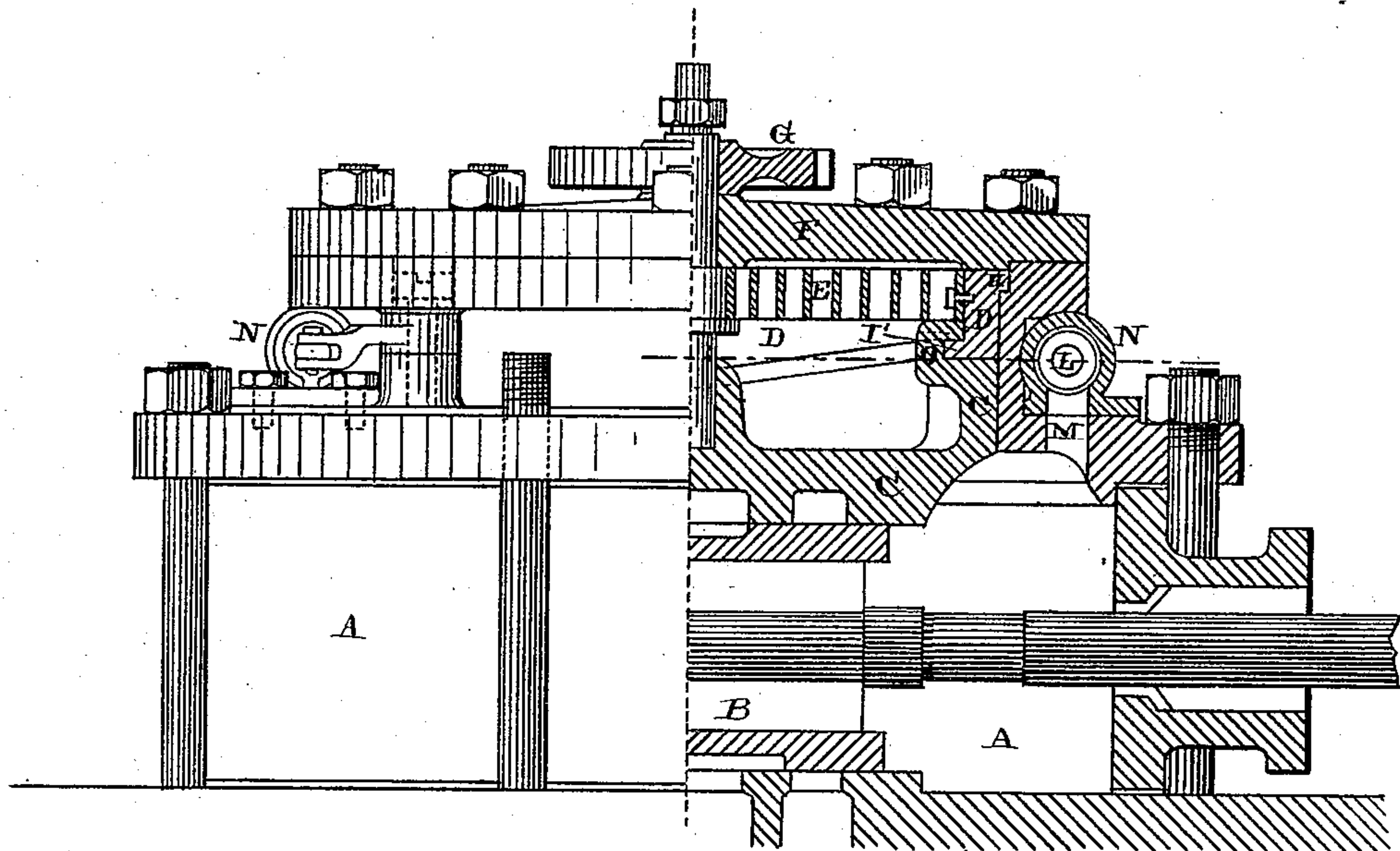
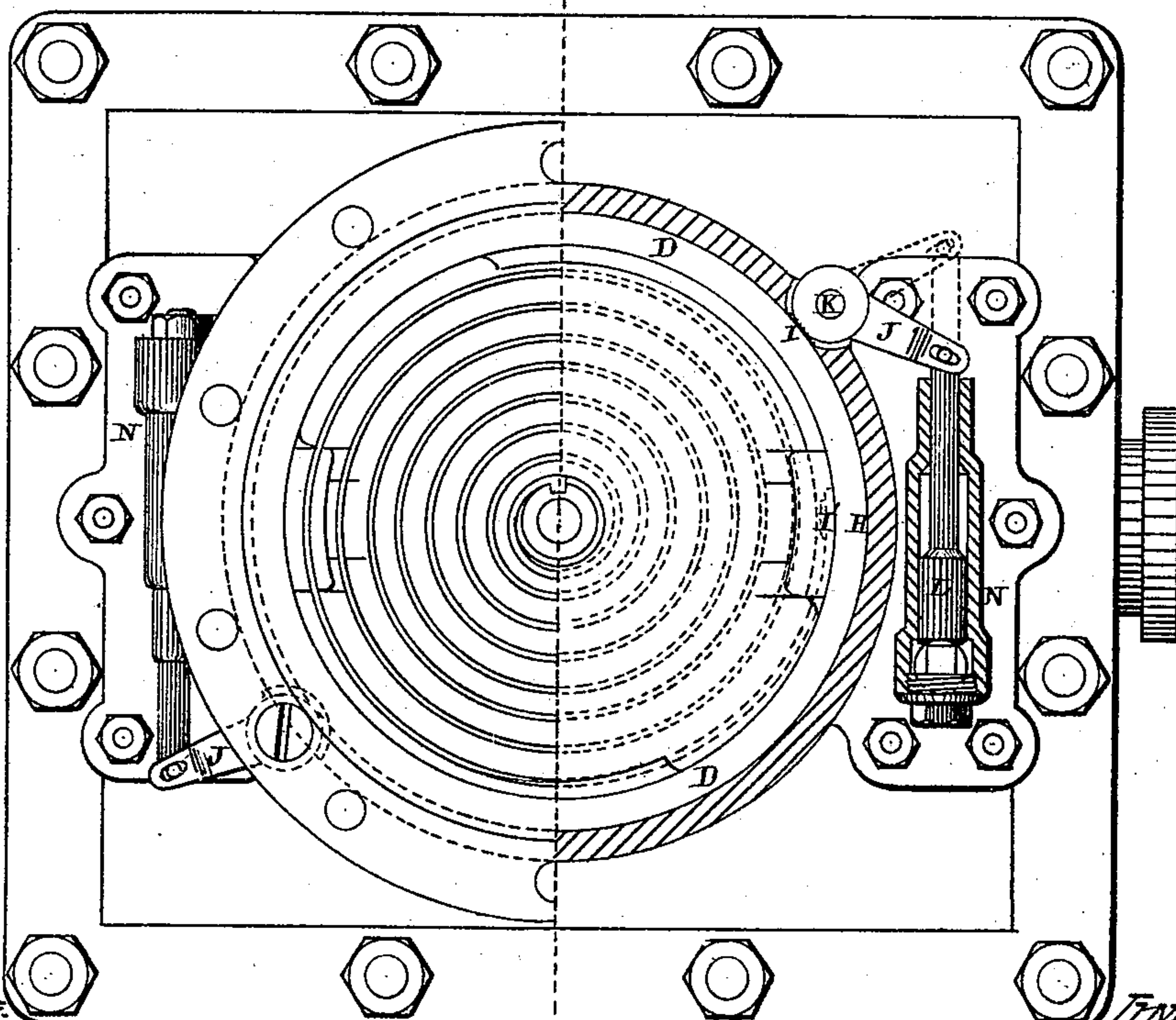


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 250,808, dated December 13, 1881.

Application filed June 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDMUND HAUG, of Whistler, in the county of Mobile and State of Alabama, have invented a new and useful Improvement in Balanced Slide-Valves for Steam and other Engines, of which the following is a full and clear description, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in balanced slide-valves for steam-engines; and it consists, first, in the combination of one or more automatically-acting steam and air pistons with a balanced slide-valve; second, in a balanced slide-valve, in combination with one or more automatically-acting steam and air pistons, cranks provided with toothed hubs, and a rotating ring having its lower edge formed into inclined planes, for the purpose of pressing the cylindrical chamber down upon the top of the slide-valve; third, in automatically-acting pistons, cranks, and rotating ring with inclined planes, having a projecting rim on its outer circumference and projecting lips on the bottom part of its inner circumference, said lips running parallel with the inclined planes; fourth, in automatically-acting steam and air pistons, cranks with toothed hubs connected to the pistons, a rotating ring provided with teeth and made to engage with the cranks, a cylindrical casting for bearing down upon the slide-valve, and which is provided with guiding-pieces to catch over the lips formed on the rotating ring, as will be more fully described hereinafter.

The object of my invention is to relieve the slide-valve of all the undue pressure and friction which almost all balanced slide-valves have to contend with when the steam is shut off and the engine continues to run from momentum, as is specially the case with locomotives in running upon downgrades.

Figure 1 is a side elevation, showing one-half in vertical section. Fig. 2 is a plan view of the same, showing a portion of the cover and a part of one of the pistons removed.

A represents a steam-chest; B, the slide-valve; C, the cylindrical chamber which bears upon the top of the slide-valve; D, the rotating ring, which is placed inside of the circular top

part of the steam-chest, and which has its lower edge formed into inclined planes, so as to correspond to the inclined planes which are formed upon the top edge of the cylindrical chamber; E, the coiled spring which serves to rotate the ring and cause the ring to bear down upon the top edge of the circular casting; F, the cover, and G a device of any suitable description for increasing or decreasing the tension of the spring, so as to cause a greater or less pressure of the ring upon the circular casting. All these parts are fully described in my former Patent No. 225,370, and hence need not be more particularly described in this connection.

The present improvement consists in the addition of certain automatically-acting steam and air pistons for causing the ring to rotate when the steam is shut off, and thus relieve the pressure upon the slide-valve.

The ring D has formed upon its upper outer edge the projection or rim H, which fits in a corresponding recess made in the top part of the steam-chest, and upon the outer circumference of the ring D are formed teeth I, which mesh with the teeth which are formed upon the inner edges of the hubs of the cranks J. These cranks are pivoted upon suitable pins and projections K, cast with or secured to the side of the upper portion of the chamber, and the outer ends of the cranks are connected in any suitable manner with the air and steam pistons L. Through the top of the steam-chest are made the two openings M, which communicate with the inside of the steam-chest and of the cylinders N, in which the pistons L move. While the steam is turned on it passes up through these openings and forces the pistons outward, thereby turning the cranks to such an extent that their teeth do not engage with the ring D, and hence the spring exerts its full force upon the inclined ring, so as to force it down upon the top of the circular chamber and slide-valve. When, however, the steam is shut off from the chest and there is more or less vacuum formed therein, the pressure of the atmosphere against the outer ends of the pistons force them inward, and, the cranks being turned as shown in Fig. 2, the teeth of the cranks are made to engage with the teeth of the ring D. As the pistons are forced inward by the pressure of the atmosphere the ring is caused to rotate against the tension of

the spring and to cause its inclined planes to move up the inclined planes formed on the top of the circular casting or chamber.

In order that the rotation of the ring D may lift the circular casting up from the top of the slide-valve, and thus remove all unnecessary friction from the valve, suitable lips, I', are formed upon opposite and inner sides of the ring, and these lips run in a parallel line with the inclined planes formed on the lower edge of the ring. The circular casting has formed upon its top inner edges suitable U-shaped lips or flanges, which catch over the lips formed upon the inner side of the ring, and which U-shaped flanges are shorter than the lips formed upon the ring. As the ring is made to rotate and move up the inclined planes formed upon the top of the circular casting the latter is raised by the action of the ring so as to take all the pressure from the top of the valve, and hence the valve can work freely back and forth in the chest with no other friction than its bearing upon the top of the cylinder-valve seat.

I claim—

1. The combination of a balanced slide-valve with one or more automatically-acting steam and air pistons, substantially as shown.

2. In a balanced slide-valve, the combination of one or more automatic-acting pistons, cranks provided with toothed hubs, and a ring provided with inclined planes, and which exerts a pressure upon the slide-valve to keep it upon its seat, substantially as described.

3. The combination of the automatically-acting pistons, cranks provided with toothed hubs, a ring provided with inclined planes, a projecting rim on its outer circumference, and projecting lips on its inner bottom edge, said lips running parallel with said inclined planes, substantially as set forth.

4. The combination of the automatically-acting pistons, the cranks attached thereto and acting upon the ring so as to cause it to oscillate, and the cylindrical chamber in which the ring is placed, the chamber being provided with guide-pieces to fit over the lips of the ring, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of June, 1881.

EDMUND HAUG.

Witnesses:

GEO. W. DALY,
S. T. OWEN.