

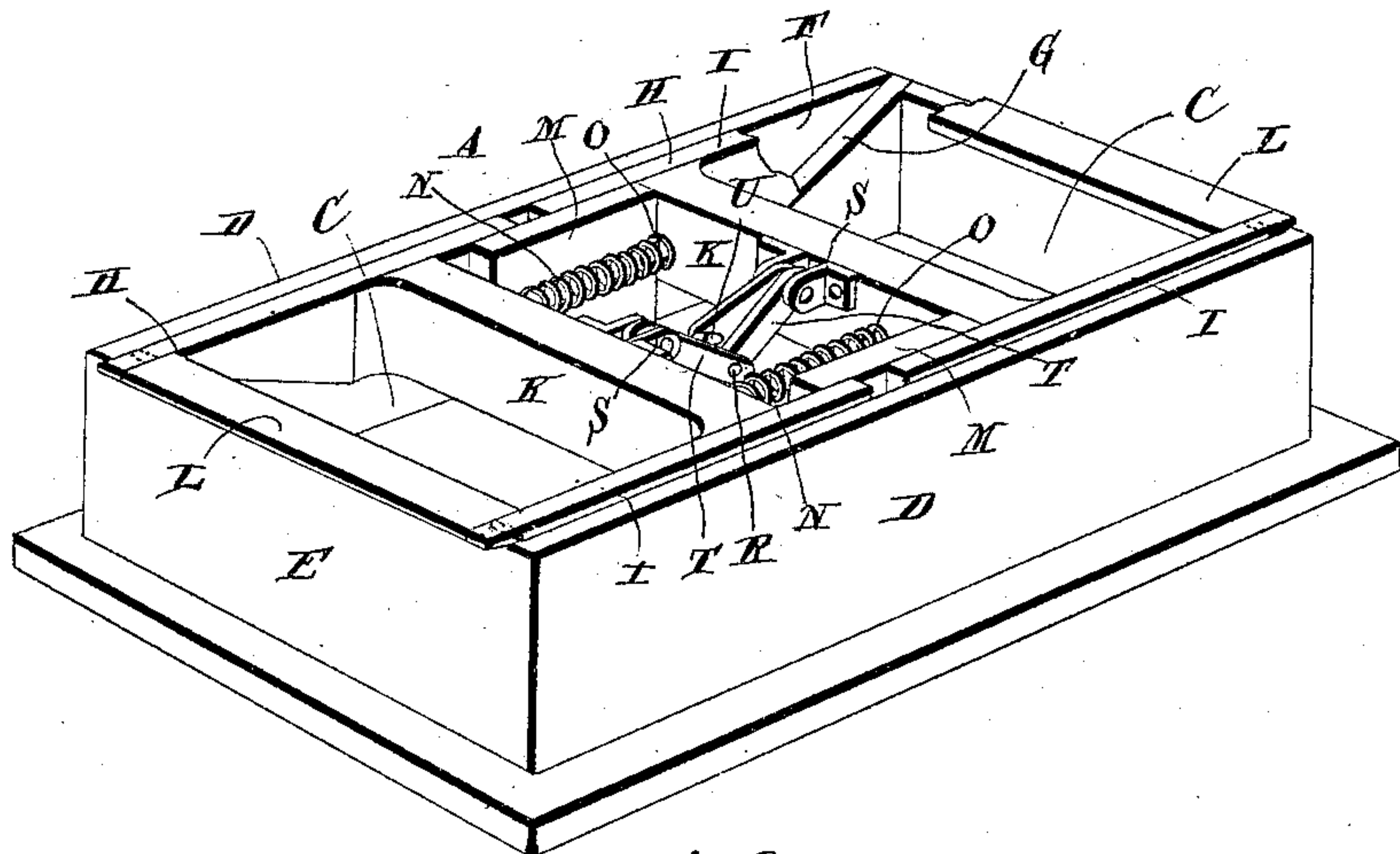
(No Model.)

L. ADAMS.  
BALANCED SLIDE VALVE.

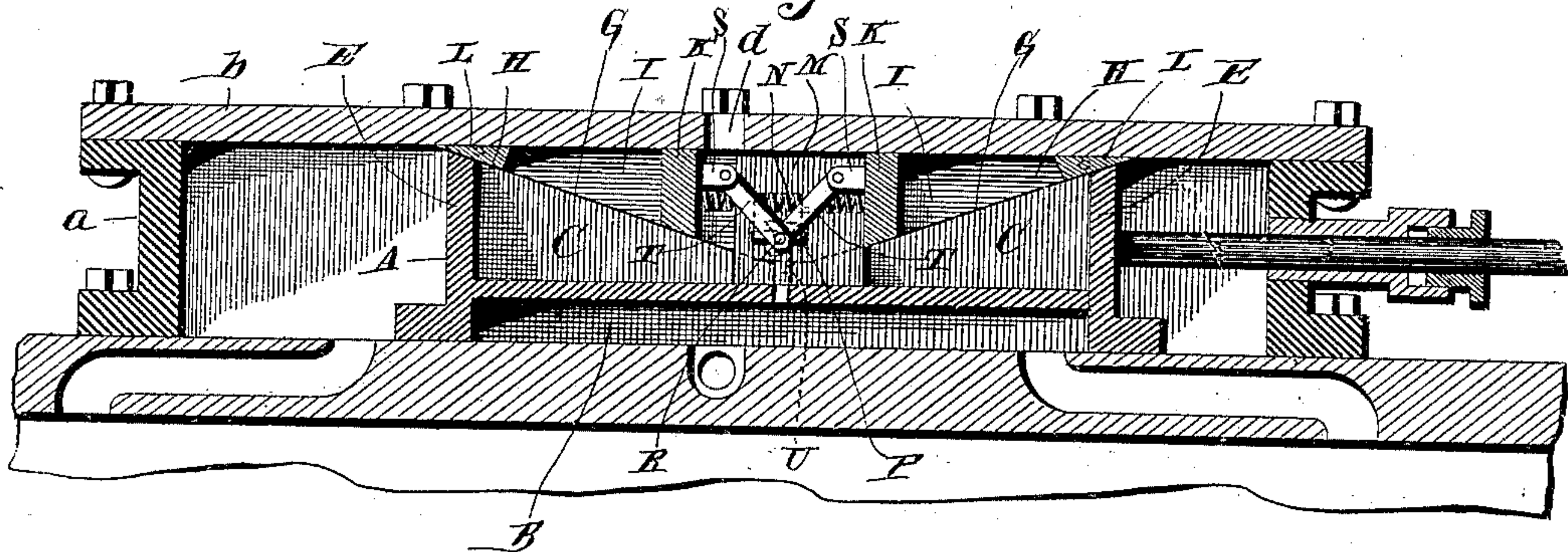
No. 378,751.

Patented Feb. 28, 1888.

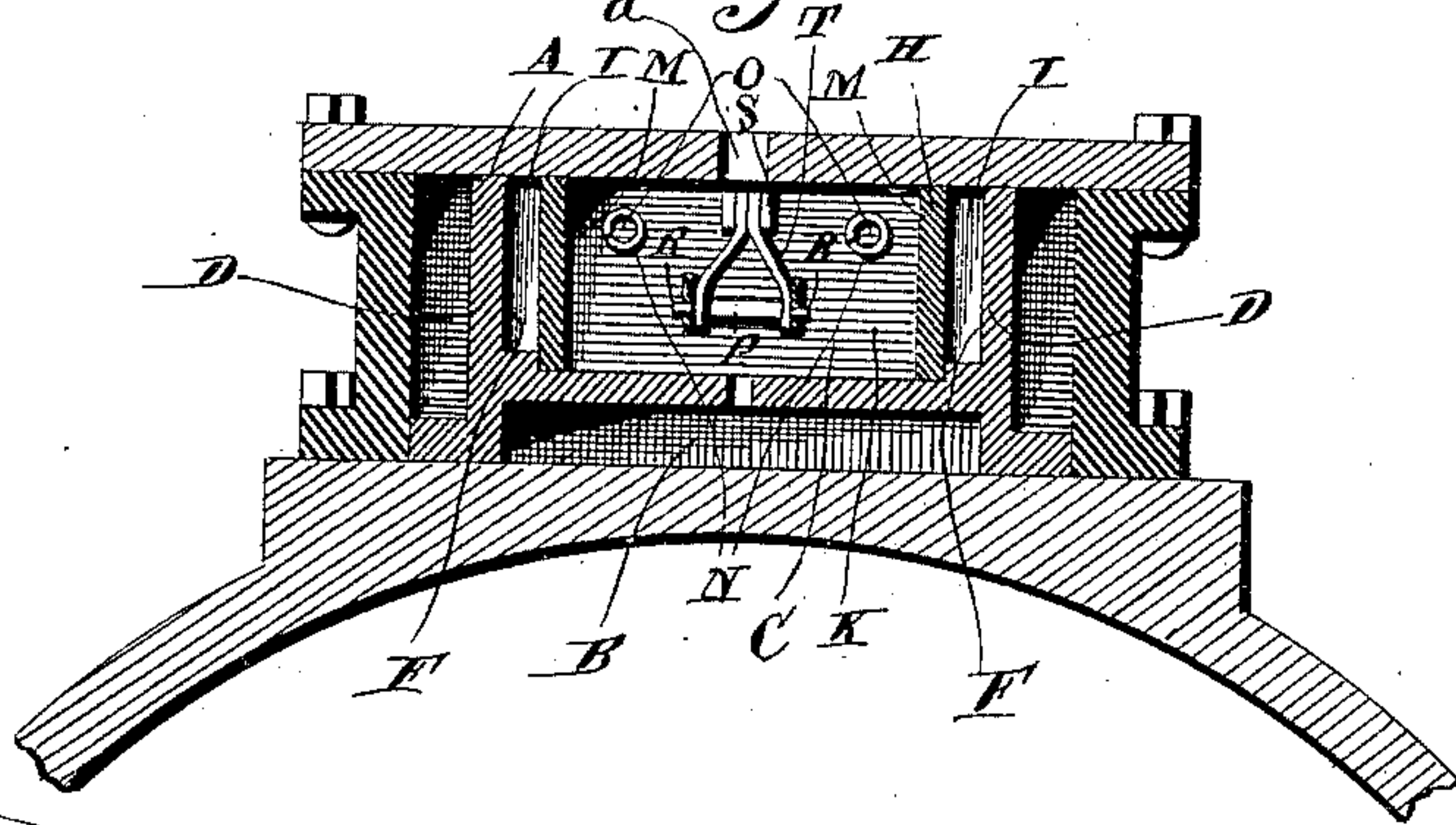
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses

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# UNITED STATES PATENT OFFICE.

LOUIS ADAMS, OF TERRE HAUTE, INDIANA.

## BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 378,751, dated February 28, 1888.

Application filed November 9, 1887. Serial No. 254,695. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS ADAMS, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented a new and useful Improvement in Balanced Slide-Valves, of which the following is a specification.

My invention relates to an improvement in balanced slide-valves for steam-engines; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a balanced slide-valve embodying my improvements. Fig. 2 is a vertical central longitudinal sectional view of the same arranged in position in the steam-chest of a steam-engine. Fig. 3 is a vertical transverse sectional view of my improved slide-valve.

A represents a slide-valve, which is provided on its lower side with the usual recess, B. In the upper side of the valve is formed a vertical rectangular recess, C, the sides of the said recess forming side flanges, D, and end flanges, E. The said side flanges, D, are provided on their inner sides with recesses F, the bottoms of which incline from the centers of the side flanges at a point only slightly above the bottom of the recess C to the outer upper corners of the flanges F, thereby forming incline cams G on the inner sides of the side flanges, as will be readily understood. The upper edges of the end flanges, E, are beveled to correspond with the upper sides of the cams.

H represents a pair of packing-frames, which are preferably made of brass or other suitable soft metal or alloy, and each comprises a pair of arms, I, connected near their rear ends by a cross-bar, K, and at their outer ends by a cross-plate, L, the said cross-plates L having their ends pivoted between the outer ends of the arms I. The lower sides of the said arms I are inclined to correspond with the inclined cams G, the said arms I being thereby rendered wedge-shaped, and having their upper sides arranged in perfectly horizontal planes. The length of each frame H is exactly equal to one-half the length of the side flanges, D, so that the inner ends of the

said frames H meet. The under sides of the pivoted plates L are beveled to correspond with the beveled upper edges of the end flanges, E, and thereby effect steam-tight ground joints there.

One of the frames H is provided at its inner end with projecting plates M, which lap over the inner ends of the sides I of the opposing frame and effect steam-tight break joints therewith.

N represents a pair of coiled extensile springs, which are arranged longitudinally between the cross-bars K of the frames H, and have their ends bearing against the opposing sides of the said cross-bars and fitted on steady-pins or studs O, with which the said cross-bars are provided.

P represents a circular collar, having at opposite sides a pair of projecting trunnions or spindles, R.

S represents ears which are formed with or secured to the inner sides of the cross-bars K, and to the said ears are pivoted the outer upper ends of links T, the inner lower ends of the said links being pivoted to the trunnions of the collar P. A screw, U, passes down through the said collar and enters a threaded opening in the bottom of the recess C, at the center thereof, the head of the said screw bearing on the collar P.

The operation of my invention is as follows: Before placing the valve in the steam-chest the screw U is turned by a suitable screw-driver or wrench until it forces the collar P downward a sufficient distance to cause the links to draw the frames H toward each other against the tension of the springs N until the inner ends of the said springs meet, and they are thereby lowered on the cam G to their fullest extent. The top plate, b, of the steam-chest a is then bolted to the case, the valve is coupled to the valve-rod in the usual manner, and is moved to a position in the center of the steam-chest directly under the opening d in the top plate, through which lubricating-oil is fed to the valve. The screw U is then removed by inserting the screw-driver or wrench through the said opening and causing the same to engage the screw, and as the screw relaxes its downward pressure on the collar P the lat-



ter rises and the springs N force the frames H outward and cause them to rise on the wedge-shaped cams until their upper sides bear so snugly against the under side of the top plate as to effect perfectly steam-tight joints there-  
 5 with, and thereby prevent the steam from entering the recess C and exerting downward pressure on the valve, as will be readily understood.

10 The function of the springs N is to keep the frames H forced outward, so that their upper sides will always be in contact with the lower sides of the top plate, and thus compensate for wear.

15 A slide-valve thus constructed will be free from downward pressure of the steam, and will consequently be enabled to be operated with a very greatly-decreased expenditure of power, and consequently the capacity of the  
 20 engine for work will be correspondingly increased.

Having thus described my invention, I claim—

1. The combination of the valve having the  
 25 cams G on its upper side with the frames H, bearing on the said cams, and means, substantially as set forth, to move the said frames outward, for the purpose set forth, substantially as described.

30 2. The combination, with the valve having the cams G on its upper side extending in opposite direction, of the wedge-shaped packing-frames H, arranged on the said cams, and the springs to force the packing-frames out-  
 35 ward, substantially as described.

3. The valve having the recess C on its up-

per side, the sides of which are provided with the oppositely-extending inclined cams G, in combination with the wedge-shaped frame H, bearing on the said inclined cam, and having  
 40 the pivoted beveled plates L at their outer ends, and the springs normally pressing the said frames apart, substantially as described.

4. The combination of the valve having the recess C in its upper side, and the outward-  
 45 extended wedge-shaped cams G formed on the sides of the said recess, with the packing-frames H, arranged on the said wedge-shaped cams G, the ring P, connections between the same and the frames, and the screw passing  
 50 through the said ring and engaging the valve, substantially as described.

5. The combination, with the valve having the recess C on its upper side, and the inclined  
 55 cams G on the inside of the said recess, of the packing-frames H, bearing on the inclined cam, one of said frames having the lap-plates M at its inner end bearing against the inner end of the opposing frames, for the purpose  
 60 set forth, substantially as described.

6. In combination with the packing-frames  
 65 H, the springs to force the same outward, the links T, connected to the frames and adapted to draw the same together against the tension of the springs.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

LOUIS ADAMS.

Witnesses:

JOHN F. REILLY,  
 AUGUST W. ELLER.