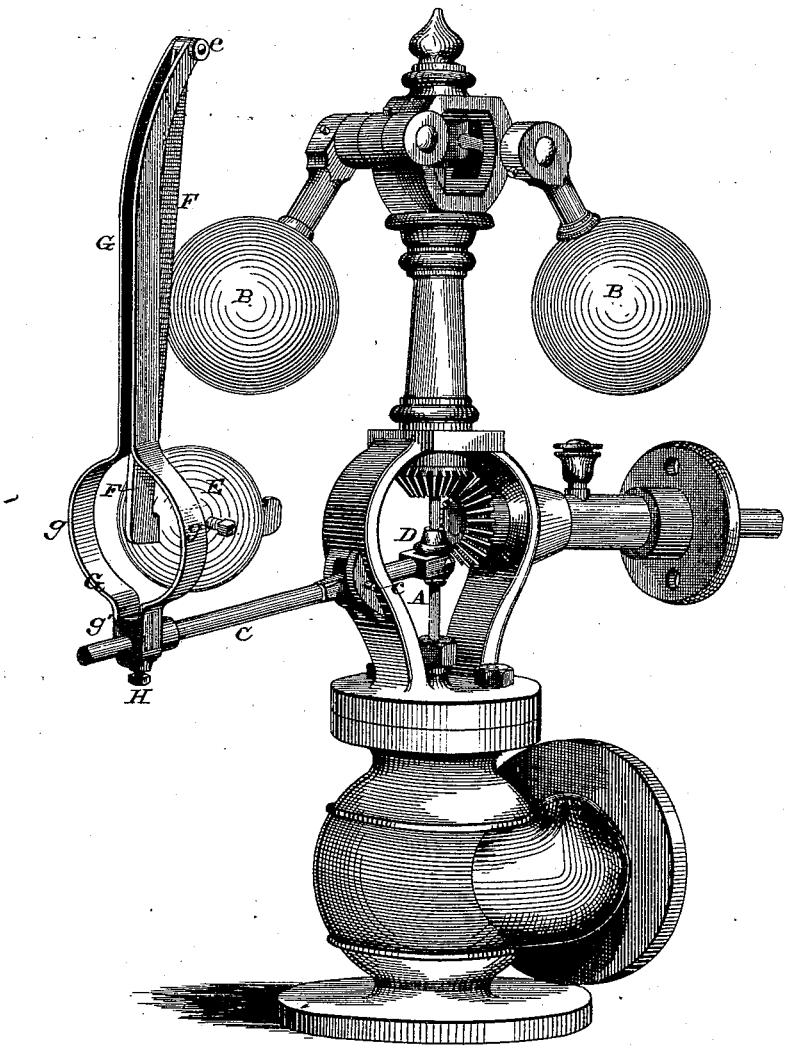
J. KURTEN & L. KRAMER.

Governor for Steam Engine.

No. 196,236. Patented Oct. 16, 1877.



ATTEST:

Chas. Hall

Chas. J. Cook

INVENTORS.

Joseph Kurten

Louis Kramer

By Knight Bros.

Attys.

UNITED STATES PATENT OFFICE.

JOSEPH KURTEN AND LOUIS KRAMER, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **196,236,** dated October 16, 1877; application filed September 3, 1877.

To all whom it may concern:

Be it known that we, JOSEPH KURTEN and LOUIS KRAMER, both of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Governors for Steam-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This is an improvement in that class of governors having a counter-balance lever, tending to raise the valve-stem in opposition to the centrifugal action of the rotating balls, the weight on said lever being adjustable, so as to increase or diminish its influence on the stem.

Our improvement consists in supporting the counter-balance weight at the lower end of a swinging rod, oscillating upon a standard, which is adjustably attached to the counter-balance lever. The purpose of this construction is to make the action of the governor more sensitive by the automatic outward movement of the ball when the lever descends, thus increasing the influence of the lever upon the valve-stem, and vice versa.

The drawing is a perspective view of a governor with our improvement applied thereto.

We claim no novelty in any part of the governor except in the devices for the support of the counter-balance weight upon the counter-balance lever, and it will be superfluous to give a general description of the governor. It will be understood that the upward movement of the valve and valve-stem increases the size of the valve-port, and that the centrifugal force of the balls B tends to force down the valve-stem A and decreases the area of the steam-ports.

The counter-balance lever C has the usual pivotal collar-connection D with valve-stem. Said lever C is fulcrumed at *c*, and extends outward for the support of the counter-balance weight E. This weight is supported upon the lower end of the pendulum-rod F, supported at the upper end upon the standard G, said standard being bowed outward at *g* to allow the ball or weight E free oscillation upon its pivot *e*, at the top of the standard. The foot *g'* of the standard has a socket through which passes the lever C, the standard being adjustable endwise upon the lever, and being fixed in position thereupon by a set-screw, H, or by other means.

The part of the lever C passing through the socket may be angular or provided with a feather-key, to prevent the standard from turning on the lever.

The weight may be attached to the rod F as indicated in the drawing, or in any other suitable manner.

The operation of our improvement is as follows: The standard G is adjusted upon the lever so as to give the required mean speed to the engine. On an increase of "duty" on the engine it will "slow up," and the weighted end of the lever C will descend, giving more steam. The descent of the lever will tilt outward the top of the standard G, and this will cause the weight E to swing outward, increasing its influence on the lever, and, consequently, the sensitiveness of the governor is increased and its action accelerated. On a machine being stopped, so as to decrease the duty of the engine, the weight E moves inward, and the increased speed of the engine is at once checked, as the lever does not oppose the lifting of the rotary balls to the same extent as it would if the weight E was fixed upon the lever.

We claim as our invention—

The combination, with lever C, of the standard G and hanging weight E F, for the purpose set forth.

JOSEPH KURTEN.
LOUIS KRAMER.

Witnesses:
SAML. KNIGHT,
CHAS. HALL.