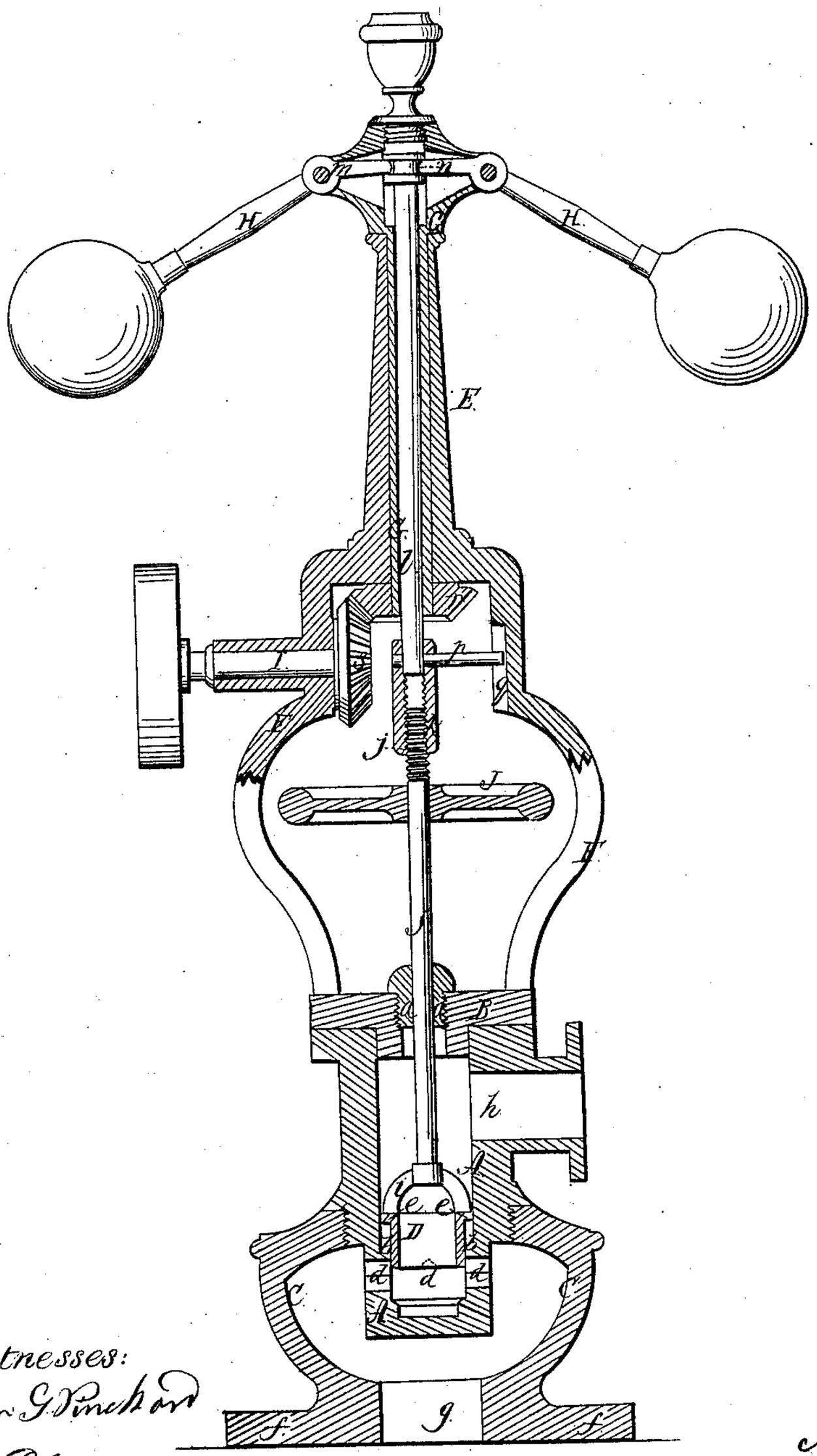
N. C. Travis,

Governor.

No. 25,794. Patented Oct. 11, 1859.




Witnesses:

William G. Pinchard

S. E. Stearns.

Inventor:

N. C. Travis

# UNITED STATES PATENT OFFICE.

NATHAN C. TRAVIS, OF ALTON, ILLINOIS, ASSIGNOR TO HIMSELF, NATHAN JOHNSON, AND R. EMERSON, OF SAME PLACE.

## REGULATOR-VALVE FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 25,794, dated October 11, 1859; Reissued September 25, 1860, No. 1,051.

*To all whom it may concern:*

Be it known that I, NATHAN C. TRAVIS, of Alton, in the county of Madison and State of Illinois, have invented a new and Improved Balanced Regulating and Stop Valve for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, said drawing representing a vertical section of my improved valve with governor and stop-screw applied.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A, is the valve box of upright cylindrical form having a closed bottom and a close cover B, fitted with a stuffing box *a*.

*b*, and *c*, are the two valve seats of the form commonly used for puppet valves one at or near the bottom of the box and the other some distance above.

*d*, *d*, are the openings which may be of square or rhombic shape, arranged with their angles at top and bottom in what is commonly termed diamond form, said openings being two or more in number arranged at equal distances apart.

C, is the annular steam casing surrounding the lower part of the valve box A, and communicating therewith by means of the openings *d*, *d*. This casing forms a base to the valve box and has an outlet *g*, in the bottom surrounded by a flanch *f*, by which it is to be bolted to the steam chest or steam pipe of the engine. Above the upper valve seat *b*, is the inlet *h*, of the valve box, to which is bolted the steam pipe from the boiler.

D, is the valve consisting of a short cylindrical tube having a narrow flanch *e*, around its upper part and having its lower extremity and the lower face of its flanch *e*, beveled like the faces of ordinary puppet valves and fitted to the two seats *b*, *c*, said seats and faces being at such distances apart that the valve may fit steam tight into both seats at once. The cylindrical portion of the valve below the flanch *e*, is fitted to work snugly but easily within the portion of the interior of the box between the valve seats. The valve has a bridge piece *i*, across its top, connecting it with the stem *j*, which works through the stuffing box *a*, and which has a screw thread *j'*, cut on its upper part to fit the screwed interior of a socket *k*, which is fast on the lower end of the governor rod *l*.

E, is the pillar which supports the governor supported by a bridge piece F, on the cover B, of the valve box directly over the center of the valve.

G, is the main spindle of the governor made hollow and fitted to rotate within the pillar E.

H, H, are the ball arms attached to the spindle by pins *m*, *m*, and having their upper or inner extremities fitted into a groove *n*, in the head of the rod *l*, which is suspended therefrom within the main spindle and which is prevented turning with the governor, though permitted to work up and down with the movement of the balls by means of an arm *p*, which projects from its socket *k*, into a vertical groove *q*, provided in the bridge piece F.

I, is the driving shaft of the governor geared with the main spindle G, by a pair of bevel gears *r*, *s*.

J, is a hand wheel on the valve stem for adjusting or closing the valve.

The valve is raised and lowered and thereby caused to uncover a greater or less portion of the openings *d*, *d*, of the valve box by the changes in the plane of revolution of the governor balls consequent upon increased or diminished velocity. The steam entering the box at *h*, passes down through the interior of the valve and under the bottom thereof through the openings *d*, *d*, into the hollow base or casing C, and thence through the outlet *g*, to the steam chest of the engine. As the valve is exposed on all opposite surfaces alike, to the steam, it is perfectly balanced and therefore works with the greatest freedom. The diamond form of the openings causes the movement of the valve up or down from the position in which the openings *d*, *d*, are severally half uncovered to produce at first a rapid increase or diminution of the movement and causes such increase or diminution to be less rapid as it progresses, thereby making the governor act

very quickly on the engine and yet preventing its action being followed by an unsteady motion of the engine.

When it is desired to stop the engine, the valve, though connected with the governor, may be screwed down like an ordinary stop valve, by turning the wheel J, in a direction to make the screw thread on the stem work down within the screw of the socket *k*. When the valve is closed in its two seats the steam is shut off from the openings *d*, *d*; and the two seats and valve faces are necessary for this purpose.

It will be observed that the lower end of the valve box is suspended within the casing C, and is entirely independent thereof, whereby the flow and entrance of the steam is not impeded by any braces or other obstacle, but the interior of the casing is left entirely open and free. The valve box being thus independently suspended within the casing C, the latter may be at any time readily unscrewed and removed from the valve box, when the valve and all its adjuncts may be conveniently examined.

Having thus described my invention I claim as new and desire to secure by Letters Patent,

1. The arrangement and combination of the valve box A and casing C as and for the purposes herein shown and described.

2. The arrangement and combination of the screw socket *k*, stem (*j*,) rod (*l*,) arm (*p*,) groove (*q*) and band wheel J, so that by turning the band wheel J, the stem (*j*) may be elevated and depressed, irrespective of the rise and fall of the rod (*l*) and without rotating the latter, all as herein shown and described.

N. C. TRAVIS.

Witnesses:
A. E. STEARNS,
WILLIAM G. PINKARD.