

(No Model.)

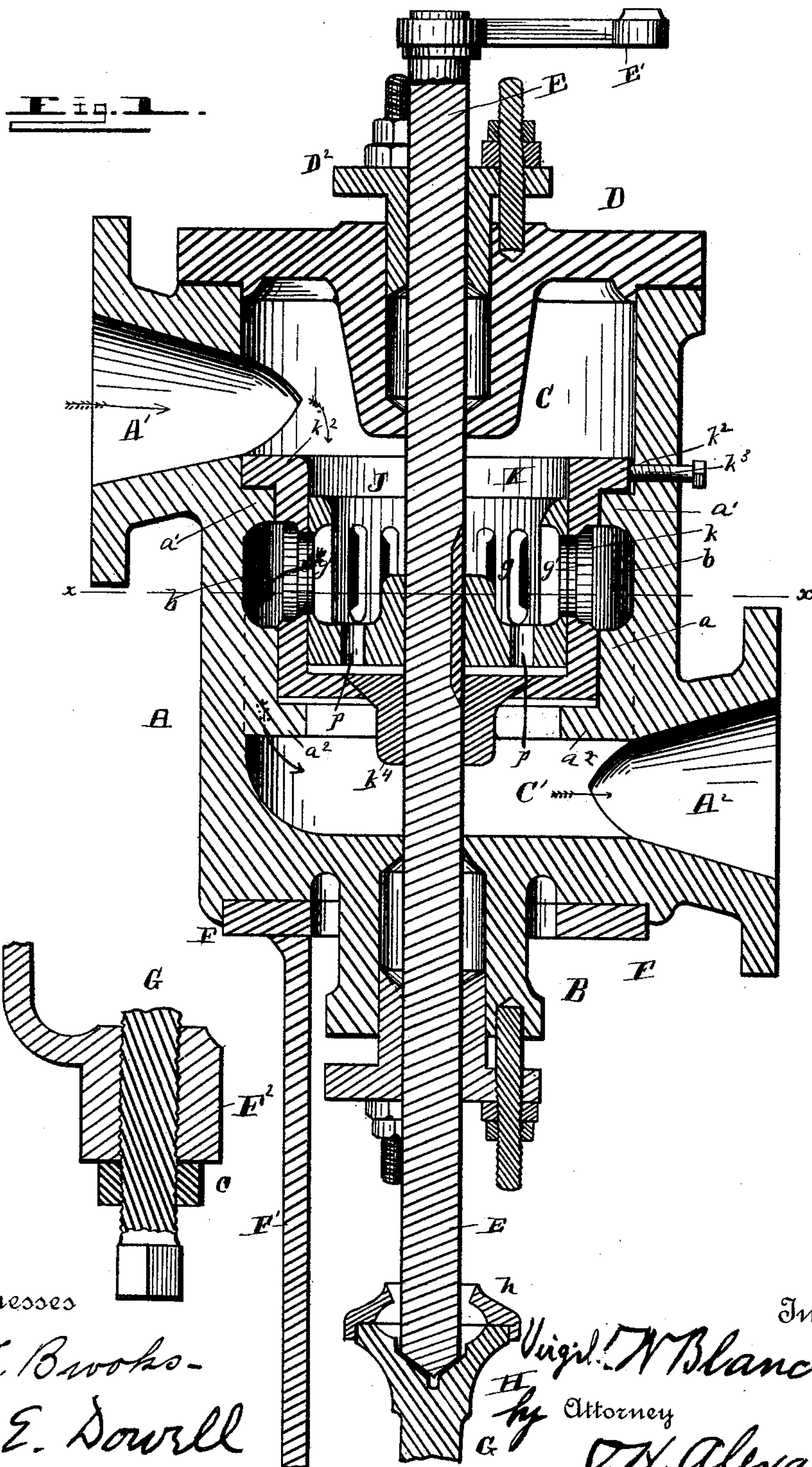
2 Sheets—Sheet 1.

V. W. BLANCHARD.

VALVE.

No. 414,136.

Patented Oct. 29, 1889.



Witnesses

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Inventor

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Fig. 2.

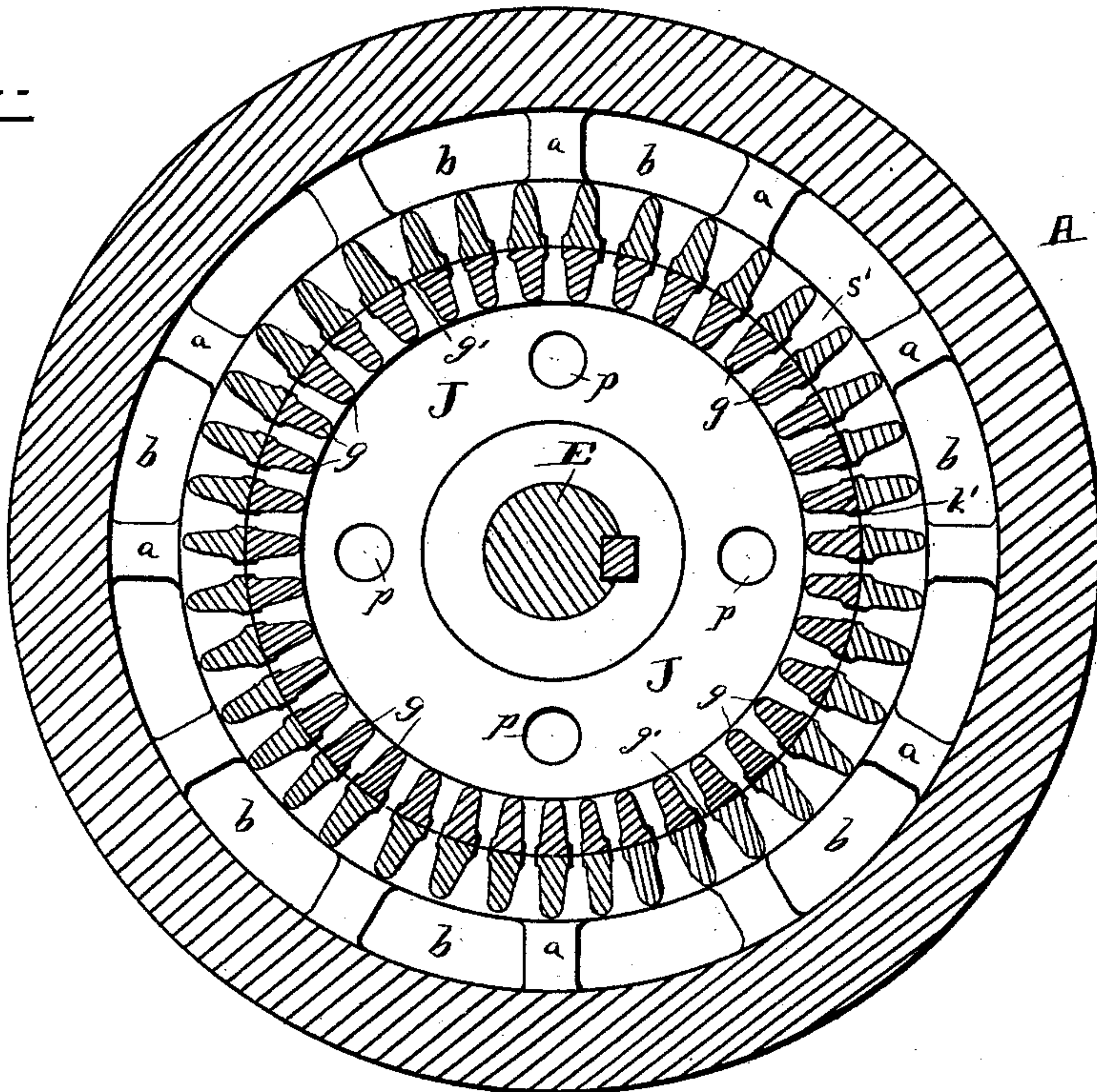
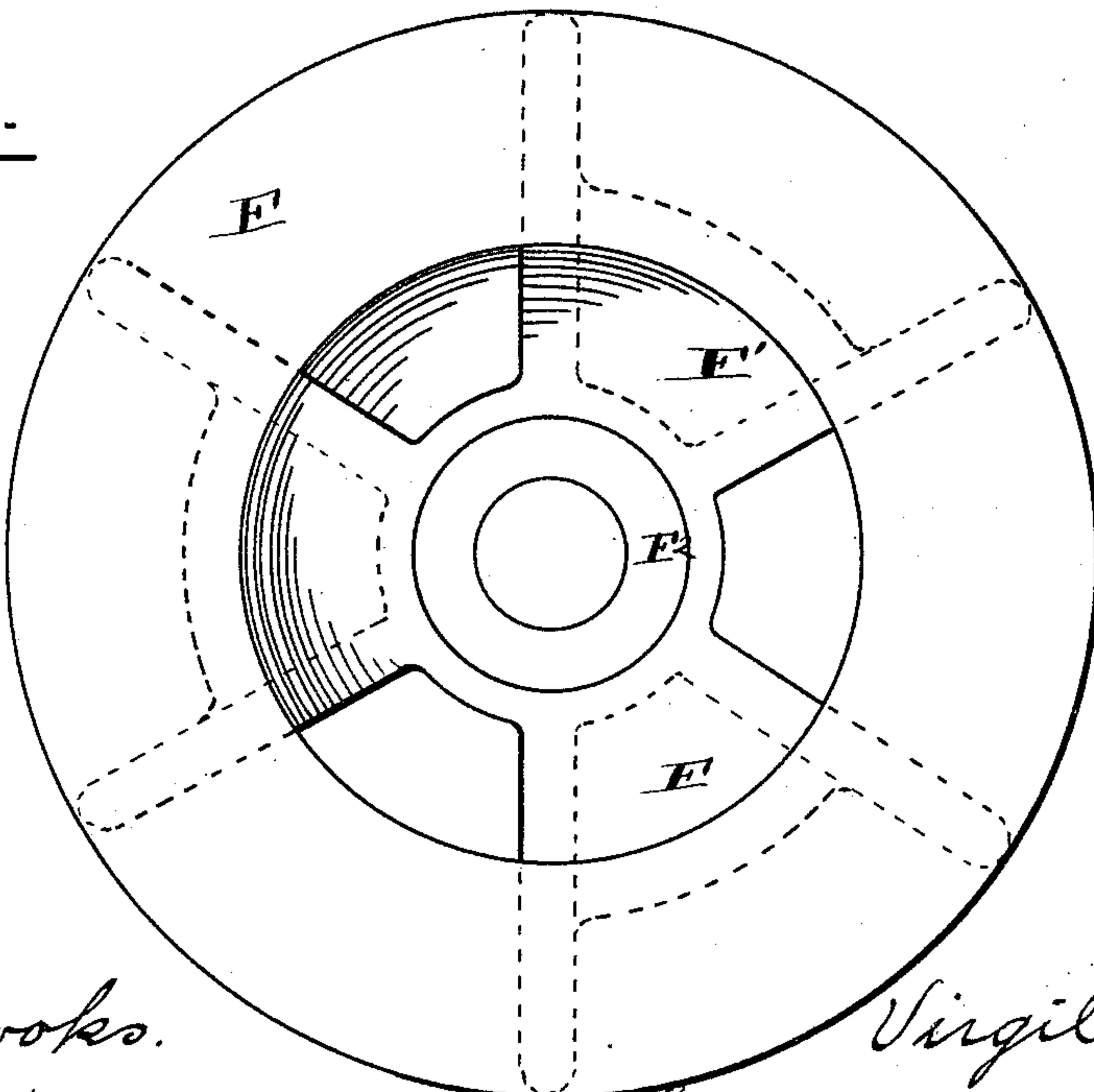


Fig. 3.



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# UNITED STATES PATENT OFFICE.

VIRGIL W. BLANCHARD, OF NEW YORK, N. Y.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 414,136, dated October 29, 1889.

Application filed April 1, 1889. Serial No. 305,623. (No model.)

*To all whom it may concern:*

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a vertical section taken centrally through my improved oscillating valve. Fig. 2 is a section taken through the valve in the horizontal plane indicated by dotted line  $xx$  on Fig. 1. Fig. 3 is a top view of the ribbed frame which supports the adjustable oil-cup step for the valve-stem.

The object of this invention is to construct an oscillating valve so that it shall be absolutely balanced and practically free from undue friction; and it consists in an oscillating cup-shaped valve having lateral and vertical passages through it, and applied in a stationary cupped guide, also having lateral passages through it and fitted into a valve-box having outlet-passages surrounding said cups and forming communications between the inlet and exhaust chambers of the valve-box, as will be hereinafter clearly described and claimed.

The valve is designed not only for a steam-valve to be used as a cut-off for the inlet and exhaust ports of a steam-engine cylinder, but it is also designed for use with water and air, and for all purposes where a balanced oscillating valve may be found useful.

Referring by letters to the drawings, A designates the valve-box, which is of cast metal and truly bored out in a lathe, and having a removable cap or head D, provided with a stuffing-box D' and a gland D<sup>2</sup>. This valve-box is also constructed with a stuffing-box B at its lower end and with an inlet-passage A', leading into a chamber C, and an outlet-passage A<sup>2</sup>, leading from a chamber C'.

E designates the stem or rod of the valve, which passes through boxes D' B and bears on its upper end a crank-arm E'. The lower conical end of the valve-stem is stepped in an oil-cup H, having a cap  $h$ , and formed on the

upper end of a vertical screw-threaded rod G, that is tapped through an enlargement F<sup>2</sup> of a supporting-frame. By turning rod G the valve-stem can be vertically adjusted, and it can then be rigidly fixed by setting home a jam-nut  $c$ . The enlargement F<sup>2</sup> is formed on the lower end of a frame, which is composed of vertical ribs F' and a ring F, the latter being firmly bolted to the lower end of valve-box A. On the inside of valve-box A are cast radial ribs  $a$ , which are equidistant and leave vertical channels  $b$ , and at certain times establish communication between the chamber C above and the exhaust-chamber C' below the valve. The top of said chamber  $b$  is a continuous annular flange  $a'$ , cast on the inner side of the valve-box.

K designates a cupped valve-seat, which is concentrically arranged within the radial ribs  $a$  and flange  $a'$ , and is supported by a rim  $k^2$  on this flange and also upon a flange  $a^2$  at the lower ends of ribs  $a$ . This cupped valve-seat is rigidly fixed in place by screws  $k^3$ , and the valve-rod E passes freely, but steam-tight, through a long hub  $k^4$ , formed on the bottom of the valve-seat, as shown in Fig. 1. The vertical cylindrical wall of the cupped valve-seat is interiorly bored out true, and through this wall are radial passages  $s'$  of equal size, which are formed by the vertical ribs or divisions  $k$ , that are tapered outwardly and square-shouldered at  $k'$  for allowing their inner surfaces to be truly dressed by means of a suitable instrument. The passages  $s'$  all communicate with passages  $b$ , outside of the circumference of the cupped valve K, as shown in Figs. 1 and 2.

J designates my improved cup-shaped balanced valve keyed on valve-stem E, and constructed with apertures  $p$  through its bottom to admit steam between it and the floor of the valve-seat K, and thus balance the valve within this seat. The vertical cylindrical wall of this balanced valve is vertically slotted, forming ribs  $g$ , having square shoulders  $g'$  and radial outlets  $s$ , which can be caused to register with the corresponding outlets  $s'$  through the vertical wall of the valve-seat cup K, as shown in Fig. 2. The external faces of the vertical ribs  $g$  are all turned truly, so that they are concentric to the axis of the



valve-rod E and accurately match the internal concentric surfaces of the vertical ribs  $k$  of the valve-seat.

Instead of having only one or a few outlet-passages through a valve, which would necessitate long throws thereof to open and close said passages or ports, I construct the cylindrical wall of my valve with a great number of lateral outlet-passages that are very narrow, but which, when considered as one passage, gives a large steam-opening that can be opened and closed by a very slight and short oscillation of the valve.

Having thus described my invention, what I claim is—

1. The combination of the valve-box having interior upper and lower flanges  $a' a^2$ , substantially as described, and a removable cup-shaped valve-seat having a rim  $k^2$ , and supported therein upon said flanges and laterally perforated, with a cup-shaped valve laterally perforated and fitted to said seat, and the vertically-adjustable valve-stem carrying said valve, all substantially as set forth.

2. The combination of a valve-box having ribs and flanges  $a' a^2$ , vertical passages  $b$ , and a fixed laterally-perforated valve-seat supported on flanges  $a' a^2$ , with a laterally

and vertically perforated oscillating valve, substantially as described.

3. The combination of a valve-box having chambers C C' communicating with inlet and outlet ports, an annular series of vertical passages  $b$  between said chambers, and a laterally-perforated valve-seat to the inside of said passages, with a vertically-adjustable laterally-perforated oscillating valve fitted in said seat, substantially as described.

4. A valve-box having an inlet leading into a chamber C and an outlet leading from a chamber C', vertical ribs, horizontal flanges, and stuffing-boxes in its heads, in combination with a fixed laterally-perforated valve-seat flanged and cup-shaped, as described, the vertically and laterally perforated oscillating valve, also cup-shaped, and a vertically-adjustable valve-stem, to which said valve is secured, all constructed substantially as and for the purpose specified.

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

VIRGIL W. BLANCHARD.

Witnesses:

CHAS. R. CLARKE,

THOS. M. WYATT.