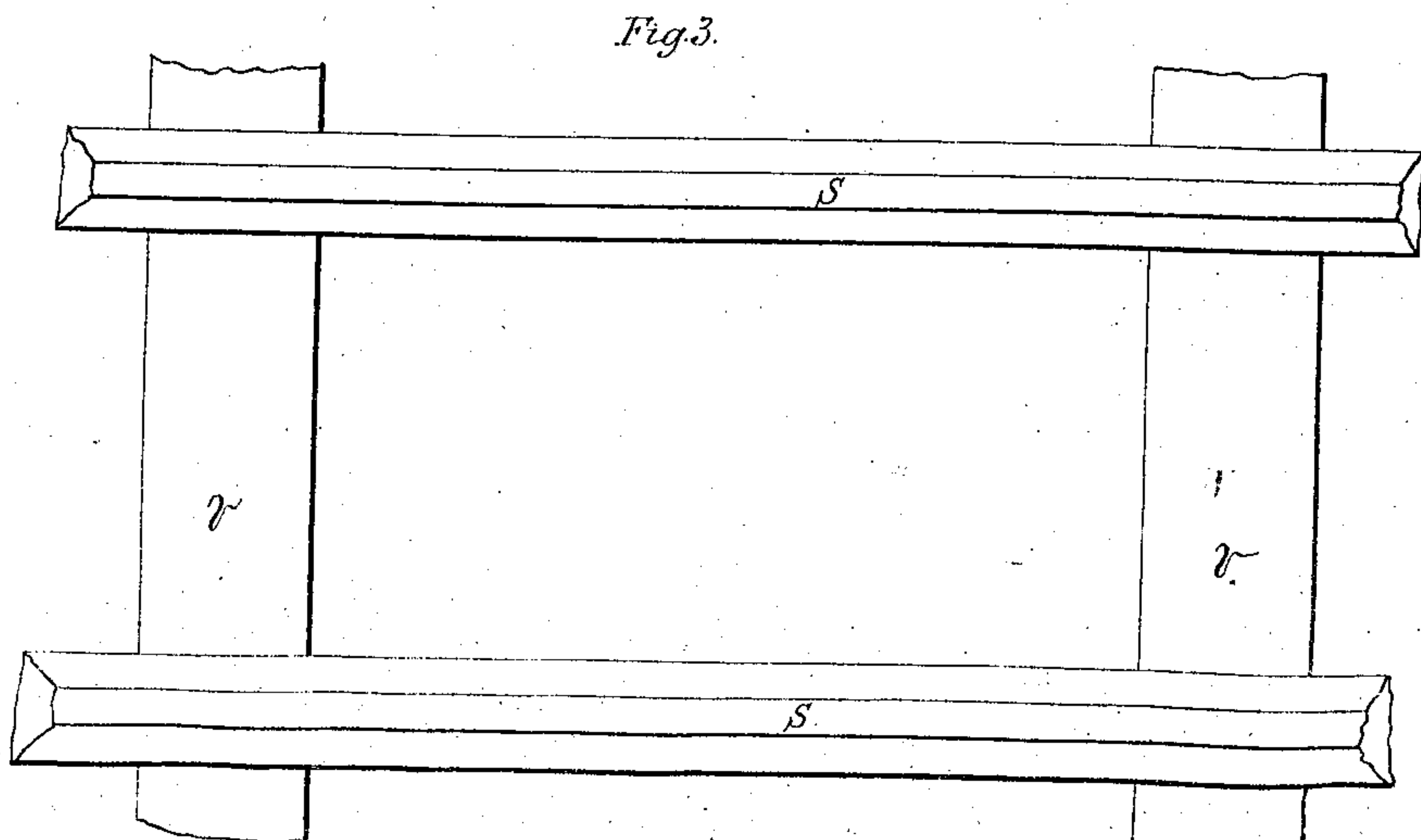
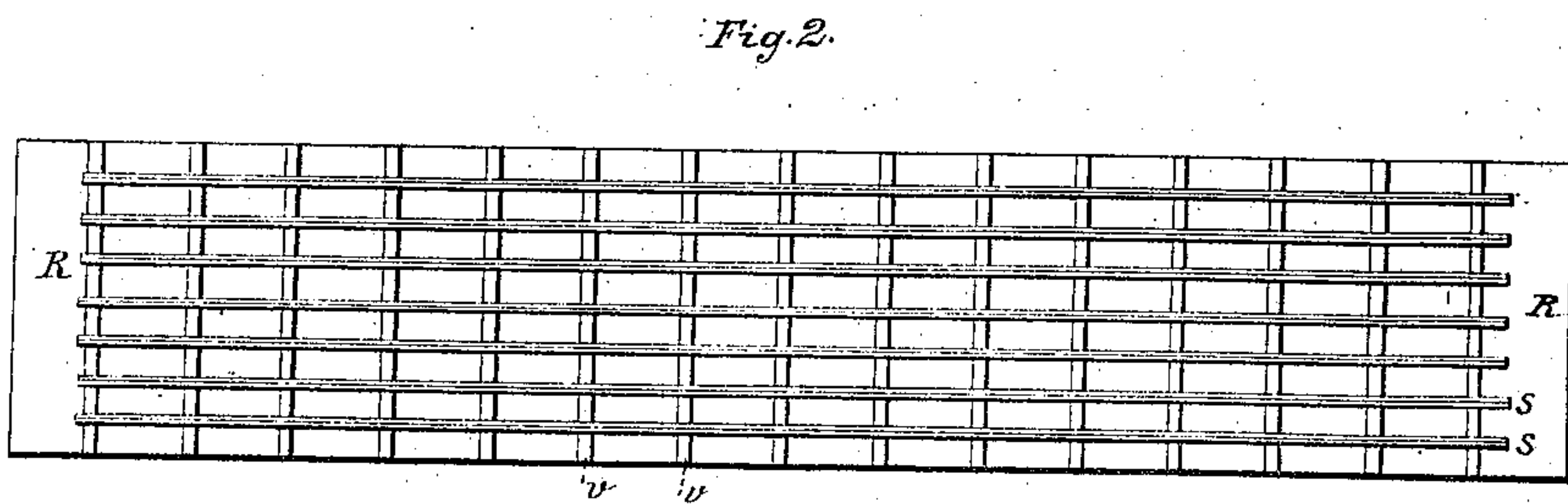
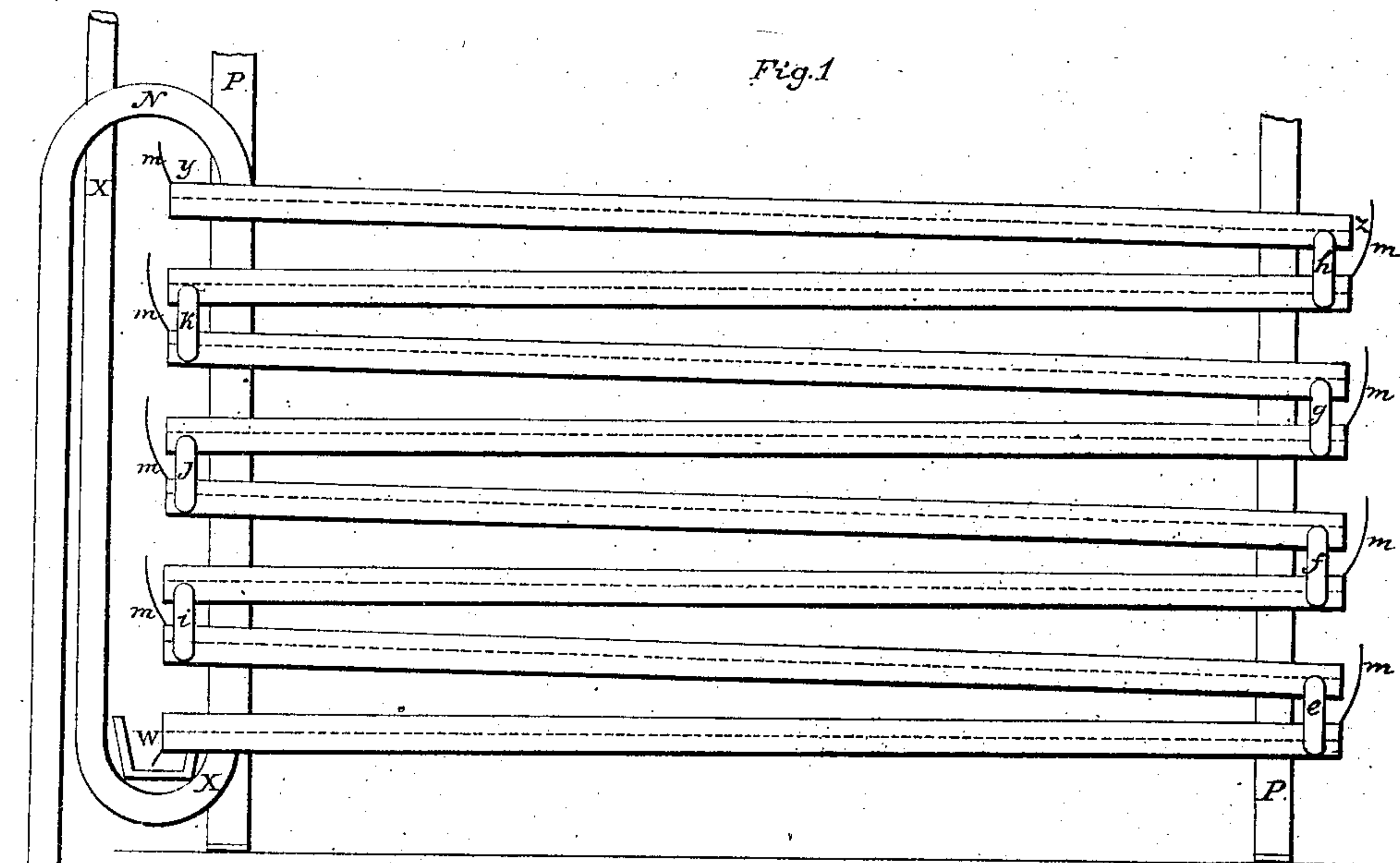


H. HATHAWAY & B. LATHROP.  
APPARATUS FOR EVAPORATING LIQUIDS.

No. 31,018.

Patented Jan. 1, 1861.



Witnesses.  
Thos. Christie  
David Allen

Inventor.  
Henry Hathaway  
B. Lathrop.

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Fig. 4.

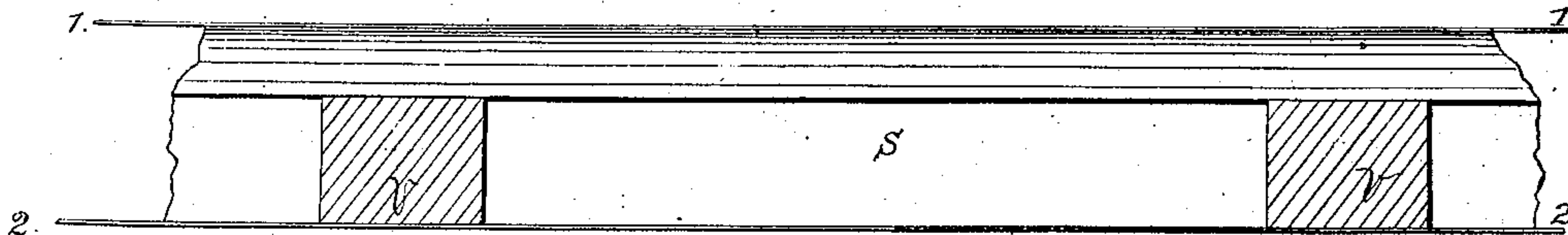


Fig. 5.

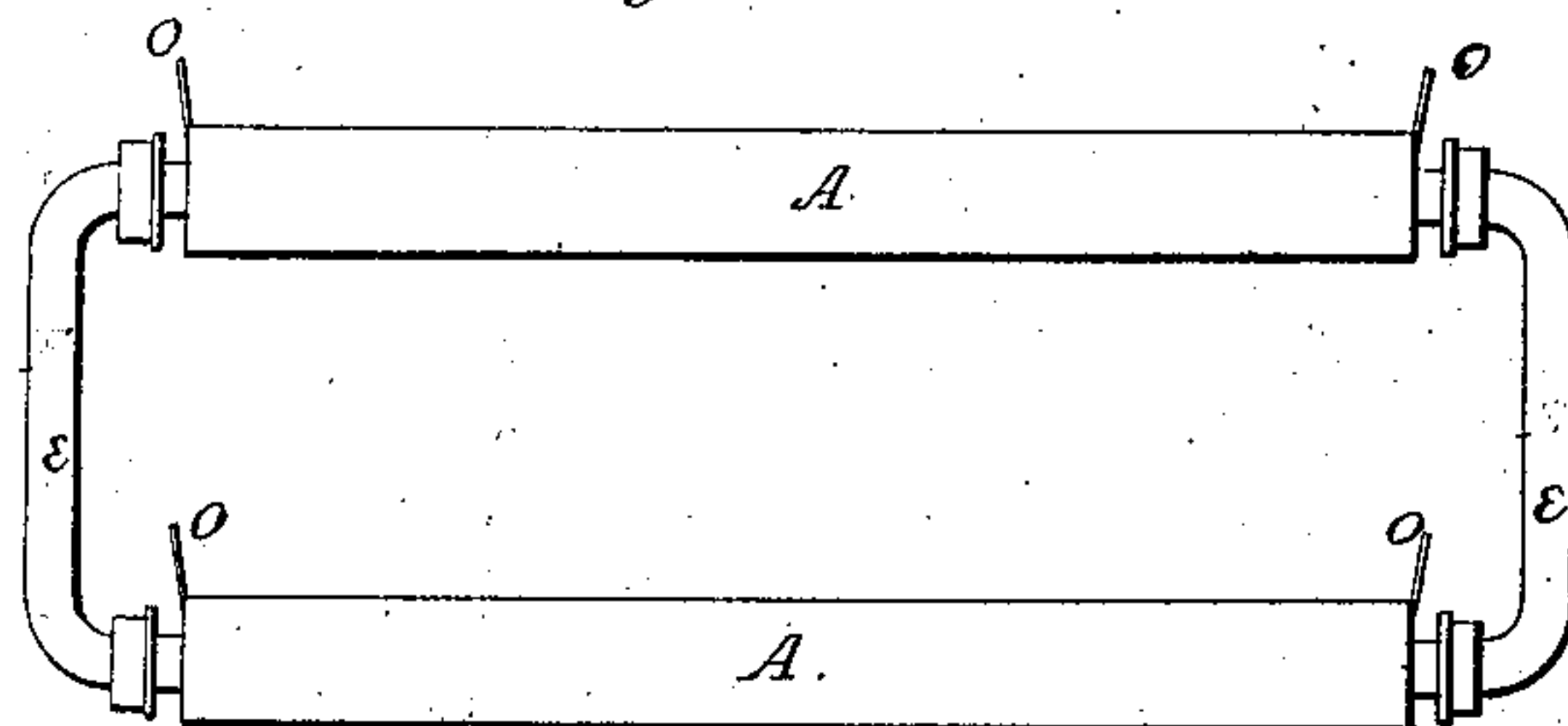
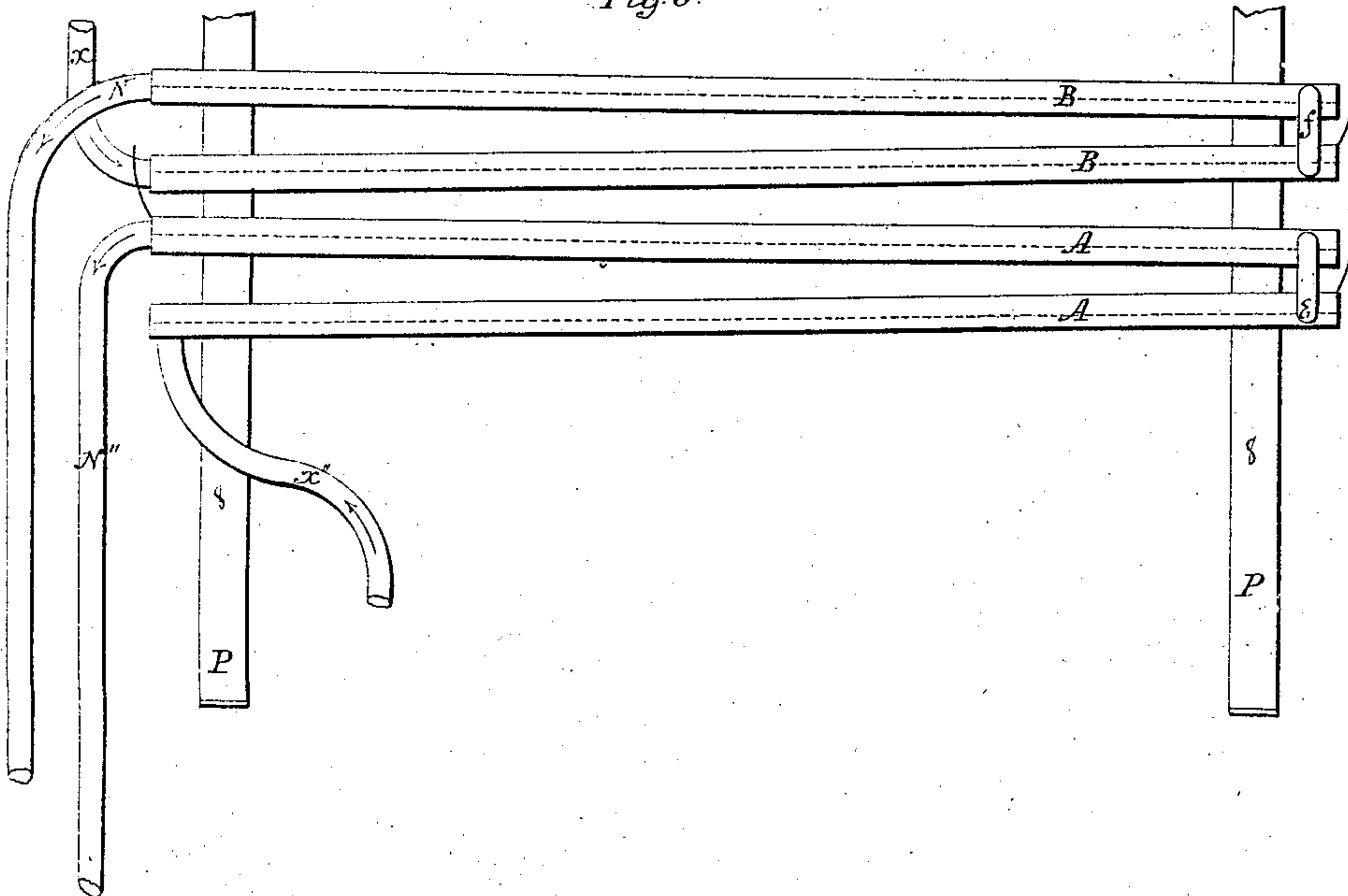


Fig. 6.



Witnesses  
Thos. Christie.  
David A. Reine.

Inventor.  
Henry Hathaway  
B. Lathrop.



# UNITED STATES PATENT OFFICE.

H. HATHAWAY, OF DETROIT, MICHIGAN, AND B. LATHROP, OF TOLLAND, CONNECTICUT.

## IMPROVEMENT IN APPARATUS FOR EVAPORATING LIQUIDS.

Specification forming part of Letters Patent No. 31,018, dated January 1, 1861.

*To all whom it may concern:*

Be it known that we, HENRY HATHAWAY, of Detroit, in the county of Wayne and State of Michigan, and BENJAMIN LATHROP, of Tolland, in the county of Tolland and State of Connecticut, have invented a new and Improved Mode of Cooling Fluids, of which the following is a description of said invention, reference being had to the model and drawings accompanying this specification, which form a part of the description of said invention, similar letters in the different figures of the drawings referring in all cases to similar parts of the invention.

We first describe, in general terms, our invention, by means of which we cause the hot liquors or fluids to be cooled by passing over broad flat surfaces, sufficiently inclined to create a free current, and sufficiently extended to reduce the temperature as low as desired. These flat surfaces form the upper side of a hollow pan, and are constantly cooled by currents of cold water through the hollow of the pan, made efficient as possible by regurgitation throughout their entire course by mechanical contrivances. These cooling water-currents should be drawn through the pans by means of a siphon, thus making the pressure inward upon the pans, and which is easily sustained by very thin sheets of metal, supported internally by the wood or metallic grate inclosed in the pan, thus insuring rapid transmission and absorption of heat. These pans are constructed of thin iron or copper plate or other durable metal properly protected from oxidation, and may be from twenty to thirty inches in width, with a length of from eight to ten feet, or even much broader and longer, if the nature of the service demand, having a depth between the plates of from one to two inches for the water-currents. These pans have also vertical side flanges, of three to four inches in height, to form a channel for the hot fluid to flow over the upper surface of the pan in the process of being cooled. When used, these pans are assembled in bat-

teries of four, six, eight, ten, or twelve, as may be required, nearly horizontally, as shown at A B C D, Fig. 1, supported by the posts P P, of which only the two rear ones are shown.

The hot fluid to be cooled is supplied to the highest part of the battery at Y, Figure 1, which pan inclines to the right, off from which it flows, falling into the second pan at Z, which inclines to the left, and thus over the whole series of pans having alternate inclines until it falls into the trough at W as cool as required. At the same time the cold water is admitted into the lower pan through the pipe X, and through into the second pan by the side connection-pipes, E E, as shown in the end elevation of two pans in Fig. 5, and thus through the whole battery until discharged through the long leg of the siphon N, Fig. 1, carrying with it the heat from the fluid it has cooled in its passage. When greater rapidity in cooling is desired, or a lower temperature required than ordinary well or hydrant water will give, these pans may be used in pairs alone for water-currents while being used in full batteries for hot-liquor currents, as shown at Fig. 6, in which case the lower pair of pans may be economically supplied with ice-water.

The vertical flange forming the hot-liquor trough may be seen at O O O O, Fig. 5, and the grating of wood or metal, which lies in the water-passage of each pan, may be seen at Fig. 2, where the top sheet of the pan is removed to expose it, and where it performs the double office of supporting the walls of the pans against external pressure, and of regurgitating and mingling the hot and cold strata of the water-currents and compelling them constantly to impinge upon the under side of the hot-fluid sheet of the pan. In this grating the longitudinal bars S S fill vertically the space between the pan-sheets, while the cross-bars V V are sufficiently depressed at the top to allow the water-current to pass over them, thus creating a quick and slow movement of the eddying current of

the water. This arrangement is shown full size at Fig. 4, where 1 1 is the upper sheet of pan, and 2 2 the lower sheet of pan, and S the longitudinal grate-bar, and V V cross-sections of the cross-bars of the grate. Fig. 3 is a horizontal section of the plan of a pan-grating of one square, full size.

What we claim as our invention, and desire to secure by Letters Patent of the United States, is—

The use of the siphon, in combination with

the gratings, and arrangement of the pans, substantially as herein described.

HENRY HATHAWAY.

BENJ. LATHROP.

Witnesses to signature of Henry Hathaway:

JOHN H. THOMPSON,

ED. DUBOIS.

Witnesses to signature of Benjamin Lathrop:

THOS. S. CHRISTIE,

JAS. A. CHRISTIE.