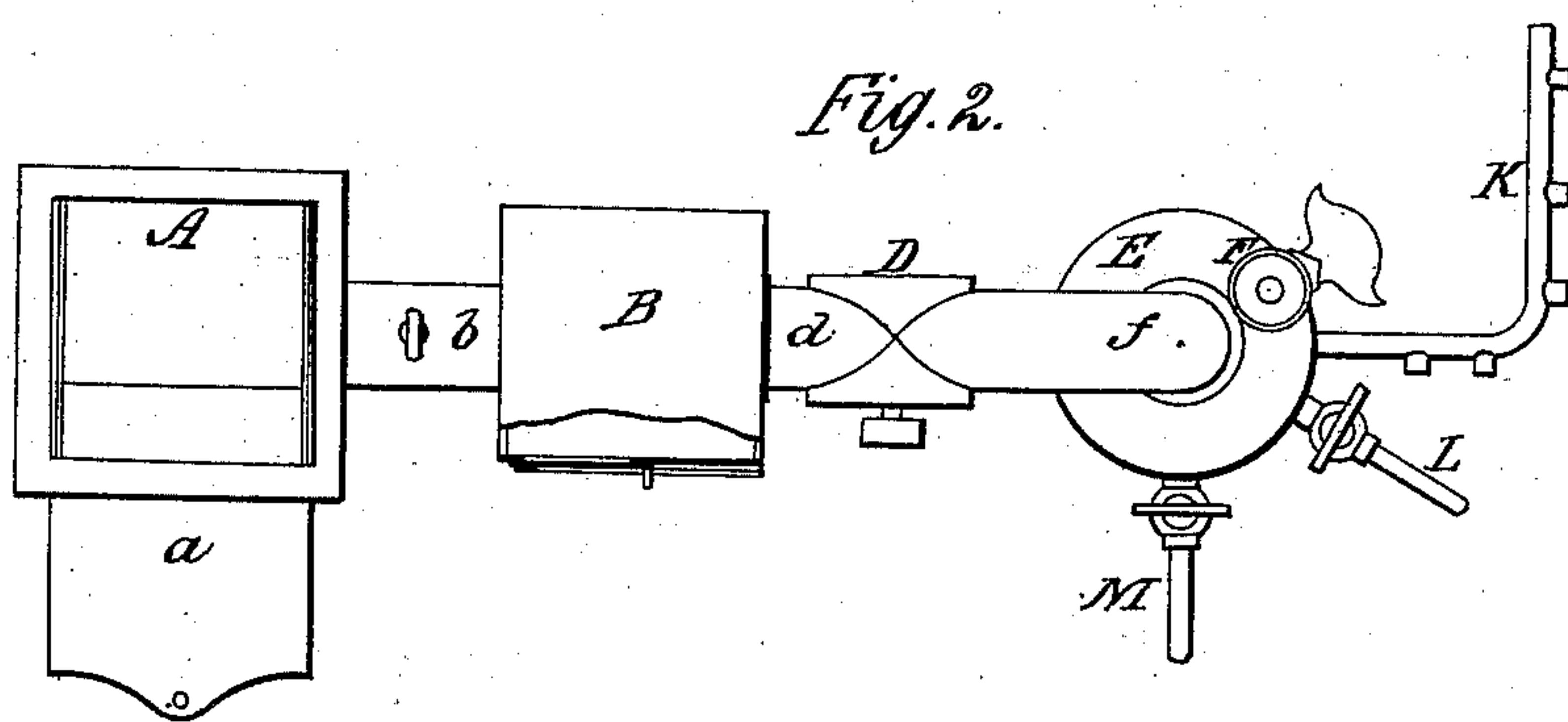
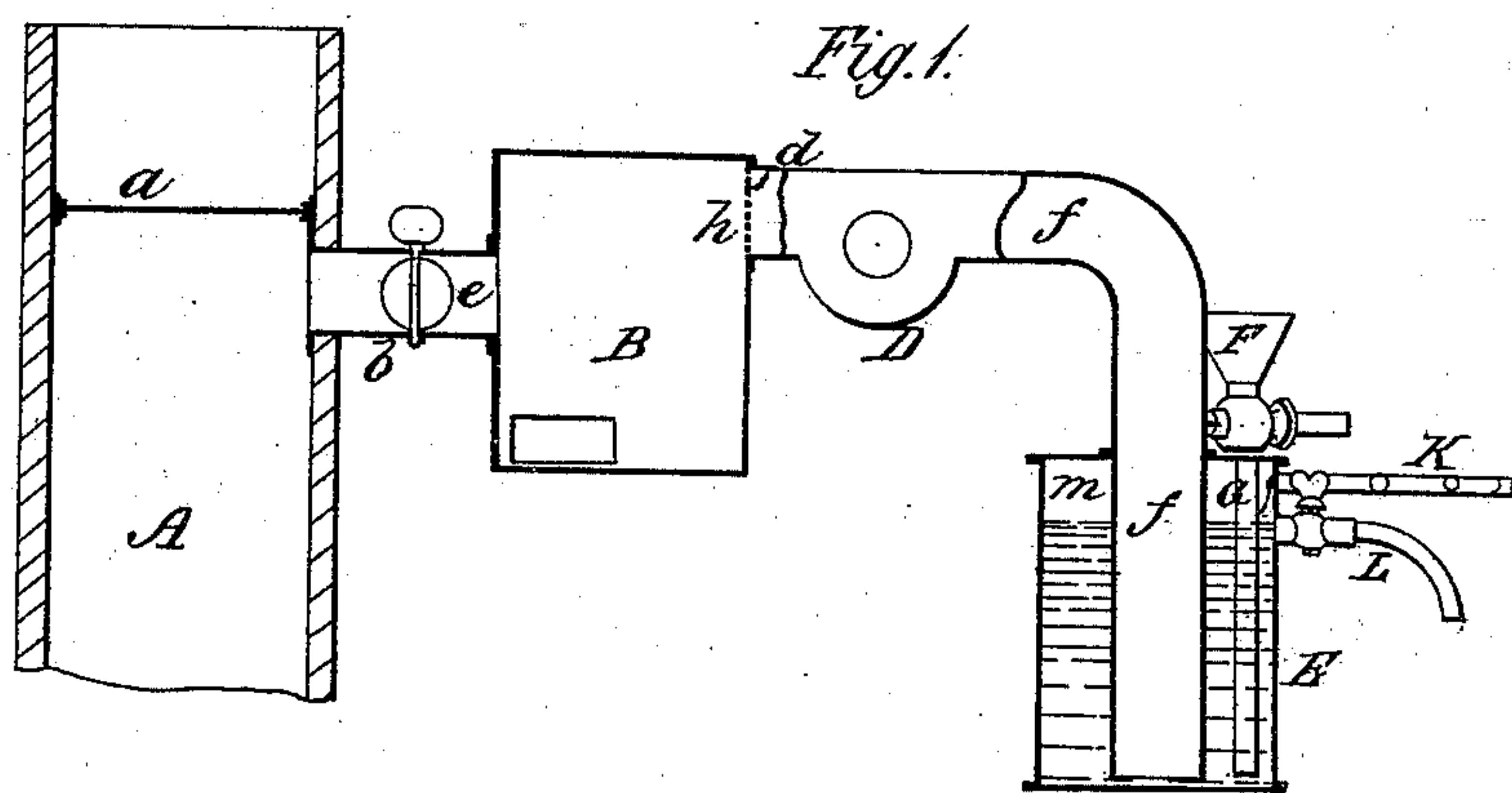


H. Hannen,

Mary White Lead.

No. 80,835,

Patented Feb. 9, 1869.



Witnesses,
Charles E. Foster
John Bulkley

Inventor:
H. Hannen
By his Atty
H. Howson,

UNITED STATES PATENT OFFICE.

HENRY HANNEN, OF PHILADELPHIA, PA., ASSIGNOR TO HIMSELF, THOMAS WOODS, AND B. F. PINE, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF WHITE LEAD, AND IN THE PURIFICATION OF THE PRODUCTS OF COMBUSTION FOR THE SAME.

Specification forming part of Letters Patent No. **86,835**, dated February 9, 1869; antedated February 1, 1869.

To all whom it may concern:

Be it known that I, HENRY HANNEN, of Philadelphia, Pennsylvania, have invented a Mode or Process of Utilizing the Waste Products of Combustion; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists in utilizing those gaseous products of combustion which are usually permitted to escape through chimneys into the atmosphere, by forcing the same through water impregnated with chlorine, or its equivalent, thereby converting them into pure carbonic-acid gas, to be used in the manufacture of white lead, or for other useful purposes.

In order to enable others to practice my invention, I will now proceed to describe a mode of carrying the same into effect, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a sectional elevation of apparatus which may be employed in practicing my invention, and Fig. 2 a plan view of the same.

A represents part of the chimney of any furnace or fire-place, and *a* a sliding damper, below which is a pipe, *b*, forming a communication between the chimney and the reservoir B, the said pipe being furnished with a valve, *e*. D is a fan, by means of which the contents of the reservoir are withdrawn through the pipe *d*, and forced through the pipe *f* into the closed vessel E, the pipe *f* extending nearly to the bottom of the vessel, and having a number of small lateral perforations.

Water impregnated with chlorine is introduced into the vessel E, through the funnel F and pipe G, in such quantities that there shall be within the vessel a space, *m*, for the accumulation of the carbonic-acid gas, under pressure caused by the action of the fan. This gas is discharged and distributed through the pipe K to white-lead-making or other apparatus, in which a pure carbonic-acid gas is available for any manufacturing purposes.

L is a try-cock, for determining the height of the chlorinated water in the vessel E, and

M a cock through which the contents of the vessel may be discharged.

In using the above-described apparatus, the valve *e* is closed, and the damper *a* permitted to remain open until the fuel in the furnace or fire-place is thoroughly ignited, when the damper *a* is closed, the valve *e* opened, and the fan D set in motion. The unconsumed gaseous products of combustion, accelerated by the exhaustive power of the fan, will rush first into the reservoir B, where particles of dust and refuse matter are deposited, owing to a screen, *h*, of perforated plate or wire-gauze at the entrance of the pipe *d*, after passing through which the gas is forced through the pipe *f*, and through the chlorinated water in the vessel E, by which the gas is purified and converted into a pure carbonic-acid gas, available for the manufacture of white lead, and for other useful purposes, the purified gas accumulating, under pressure caused by the fan D, in the vessel E, from which it is consequently forcibly ejected through the distributing-pipe K.

It will be understood that although I have described specific apparatus for carrying out my invention, the same may be altered and modified, and other apparatus substituted for that explained, and illustrated in the drawing.

Without confining myself, therefore, to any specific apparatus or mechanism for carrying my invention into effect,

I claim and desire to secure by Letters Patent—

The mode or process, substantially as herein described, of utilizing the waste gaseous products of combustion, by forcing the same through water impregnated with chlorine, or its equivalent, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY HANNEN.

Witnesses:

H. HOWSON,
HARRY SMITH.