

WILLIAM H. SOLEY.

Improvement in Apparatus for Drying Paper.

No. 115,375.

Patented May 30, 1871.

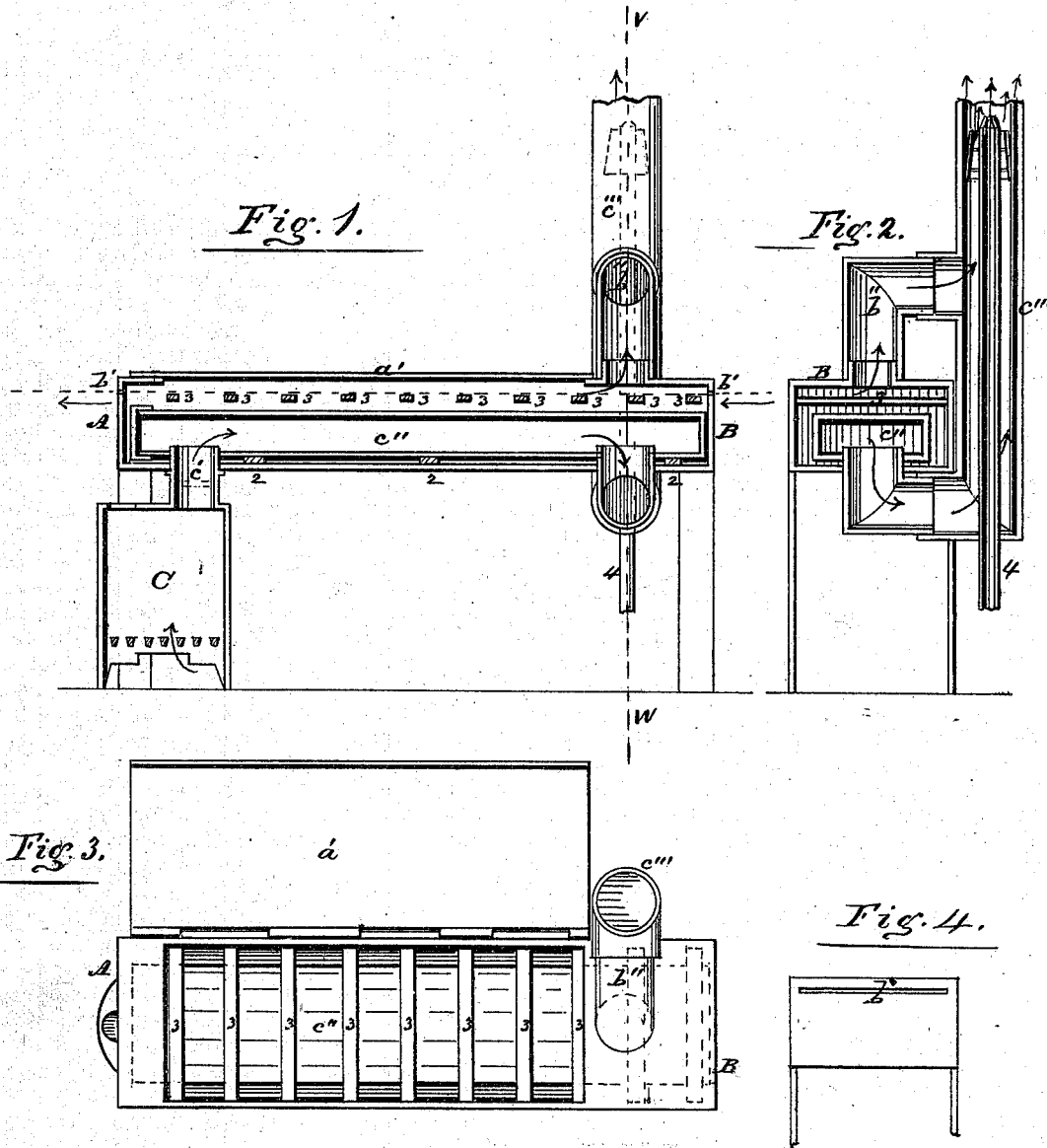


Fig. 3.

Fig. 4.

Witnesses:

Am. Morrison  
Wm. H. Morrison.

Inventor:

W. H. Soley

# UNITED STATES PATENT OFFICE.

WILLIAM H. SOLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
LEMUEL SMITH, OF NEW YORK CITY.

## IMPROVEMENT IN APPARATUS FOR DRYING PAPER.

Specification forming part of Letters Patent No. 115,375, dated May 30, 1871.

I, WILLIAM H. SOLEY, of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in the Apparatus for Drying Paper; of which the following is a specification:

### *Nature and Objects of the Invention.*

My invention relates to the combined arrangement of a furnace hot-draft flue, entering and extending along through the interior of a lengthy horizontal case, provided with a slot in each end for the entrance and exit of the paper to be dried, and transverse horizontally-arranged bars for the support of the same in its passage through the case, together with a vertical extension of the said hot-draft flue at or near the end of the case at which the paper enters the latter, and an exhaust-flue communicating with the same end of the interior of the case and opening into the vertical portion of the said hot-draft flue, so that as the wet paper enters and passes onward through the case it moves along forward over the moderately warm to the hottest portion of the hot-draft flue, while the draft through the vertical portion of the latter causes the aqueous vapor to tend toward and be exhausted through the flue leading from the case to the said vertical portion of the hot-flue. The object of my invention is to cause the drying process to begin at a comparatively low temperature, and thus allow the sizing and color to become perfectly and uniformly set before the more hardening and drying result takes place, and to facilitate the drying by causing the aqueous moisture to tend in a current toward the wettest portion of the paper during the drying operation of the same.

### *Description of the Accompanying Drawing.*

Figure 1 is a vertical longitudinal section of a paper-drying apparatus embodying my invention. Fig. 2 is a vertical transverse section on the left-hand side of the dotted line *vw* of Fig. 1. Fig. 3 is a plan view of Fig. 1, with the top lid of the case raised up. Fig. 4 is an end view of the case.

### *General Description.*

A B is a long flat rectangular case, supported in a horizontal position above a heat-gen-

erating furnace, C, the hot-draft flue *c'* of which enters near one end of the said case A B, and, extending along through the same nearly to its opposite end, passes out in downward and lateral directions *c''*, and finally upward as an escape-flue, *c'''*. The position of the flue *c''*, which, in the case, is rectangular and flattened, is a little above the bottom of the case, upon narrow supports 2 2, so as to allow the heat of the flue *c''* to radiate freely from all its sides. Just above the flue *c''* in the case A B there are numerous transverse bars, 3 3, all fixed in the same horizontal plane, which is about midway between the top surface of the horizontal flue *c''* and the cover or lid *a'* of the case A B; and in each end of the said case there is a horizontal slot, *b'*, in the same plane with the upper surfaces of the bars 3 3, for the entrance and exit of the paper. Directly above the outlet end of the hot-flue *c''* in the case A B the vapor-exhausting flue *b''* opens, and, extending upward and laterally, enters the vertical outlet part *c'''* of the hot-flue. Within the vertical outlet part of the hot-flue there is fixed a slender steam-pipe, 4, the lower end of which is intended to be connected with the exhaust of any suitable steam-engine, (not shown,) while the upper end is fitted with a hollow conical frustum in such a manner that the warm gases of the said upright flue may pass upward around both the inside and outside of the frustum, while the exhaust-steam jets pass out through the contracted upper end of the pipe 4, and thus increase the draft of the said vertical flue *c'''*.

In the operation of this apparatus the paper to be dried enters the slot *b'*, in the end B of the case, from the usual sizing or coloring cylinders, (not shown,) and is drawn along over the bars 3 3, and through the slot in the end A of the case, to the usual take-up cylinder, (not shown,) around which it is wound in a perfectly dry condition, the size and coloring being gradually and uniformly set as the paper is drawn over the bars 3 near the entrance end of the case, the moisture gradually evaporated as it advances, and the whole thoroughly dried as it passes over the hotter portions of the horizontal flue *c''* before the paper passes out to the take-up cylinder, the exhausting action of the vertical outlet-flue causing the evapo-

rated moisture or aqueous vapor to pass rapidly in a contrary direction to that of the paper in the case.

*Claims.*

I claim as my invention—

1. The combined arrangement of the horizontal part *c''* of the hot-draft flue *c'* within the case A B, substantially as and for the purpose hereinbefore set forth and described.

2. The arrangement of the heat-generating furnace C and the outlet of its flue *c''* in relation to the case A B, so that the hottest end of the horizontal part *c''* of said flue shall be near that end of the case A B at which the

paper passes out of the same, and the cooler end of the said flue *c''* near that end of the said case at which the paper enters, substantially as and for the purpose hereinbefore set forth and described.

3. The arrangement of the vapor-exhausting flue *b''* in relation to the case A B and the hot-draft flue *c''*, so that the current of vapor will be from the hottest end of the case toward the cooler end of the same, substantially as and for the purpose hereinbefore set forth and described.

Witnesses:

BENJ. MORISON,  
WM. H. MORISON.

WM. H. SOLEY.