

S. R. BECKWITH.  
GRANARY.

No. 50,790.

Patented Nov. 7, 1865.

Fig. 1.

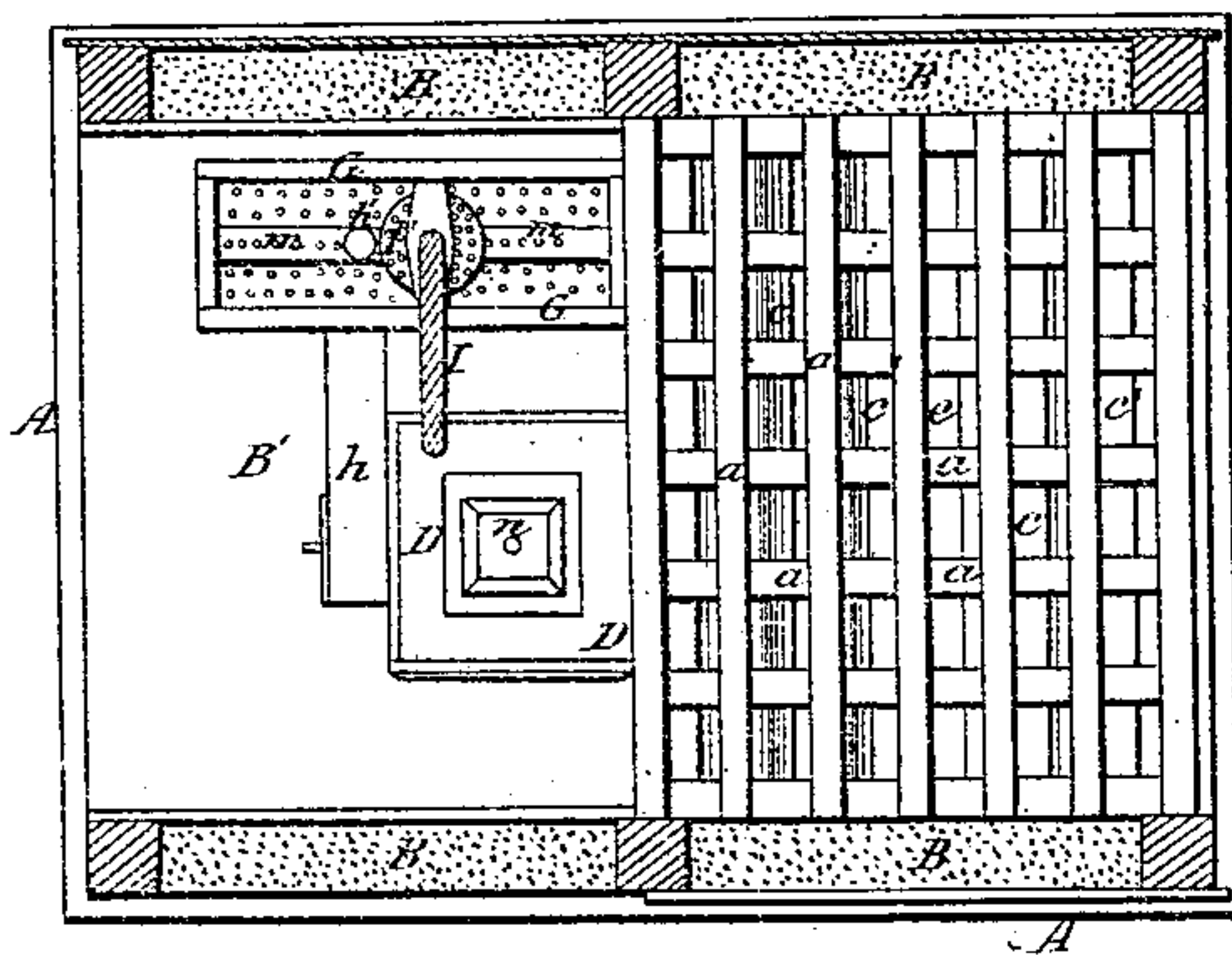


Fig. 5.

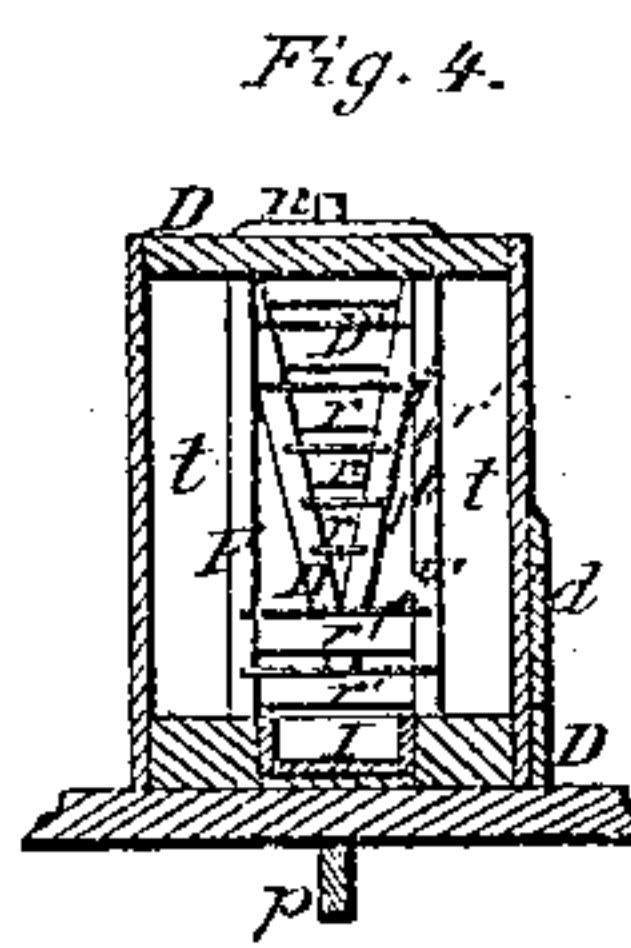


Fig. 2.

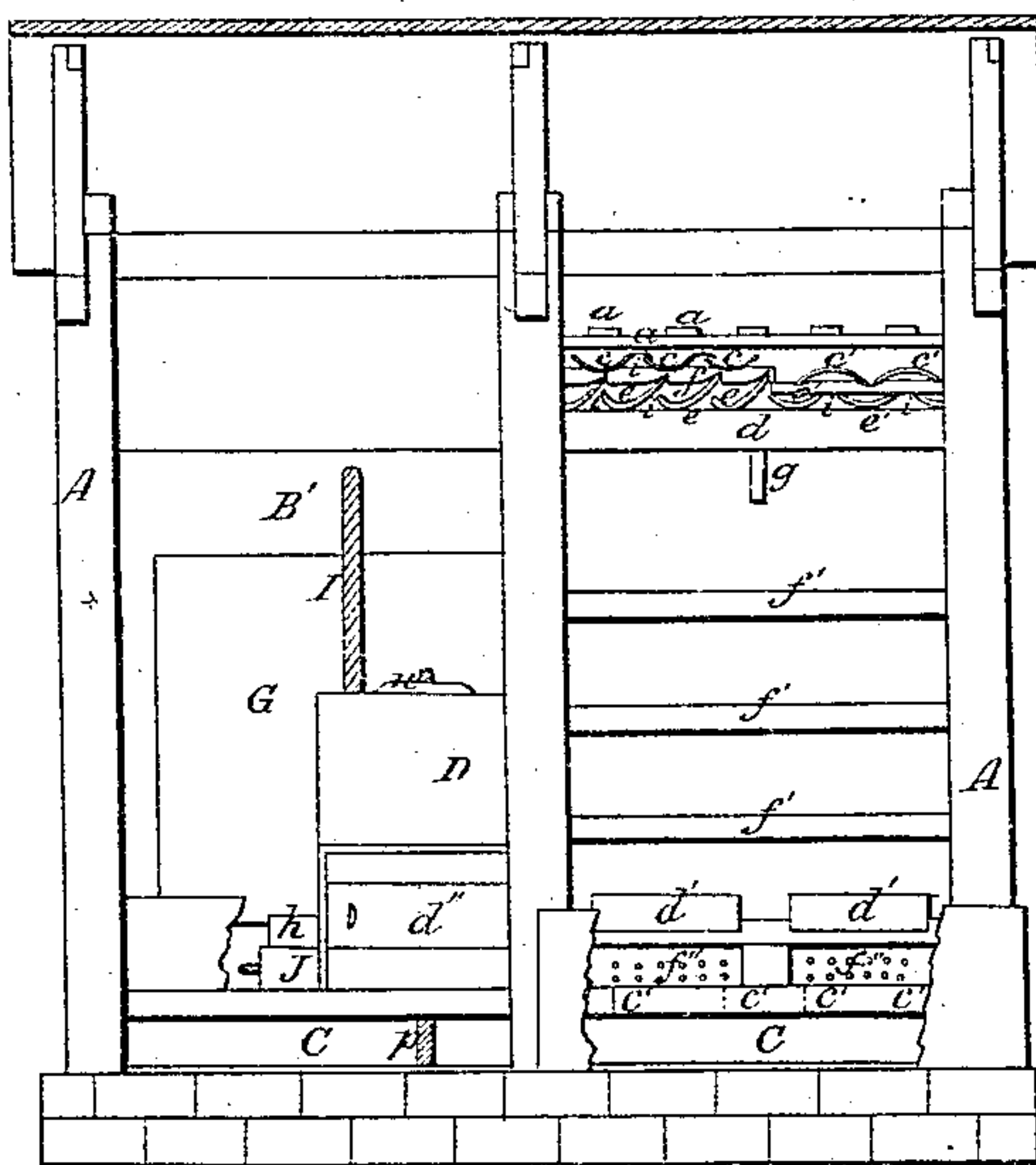
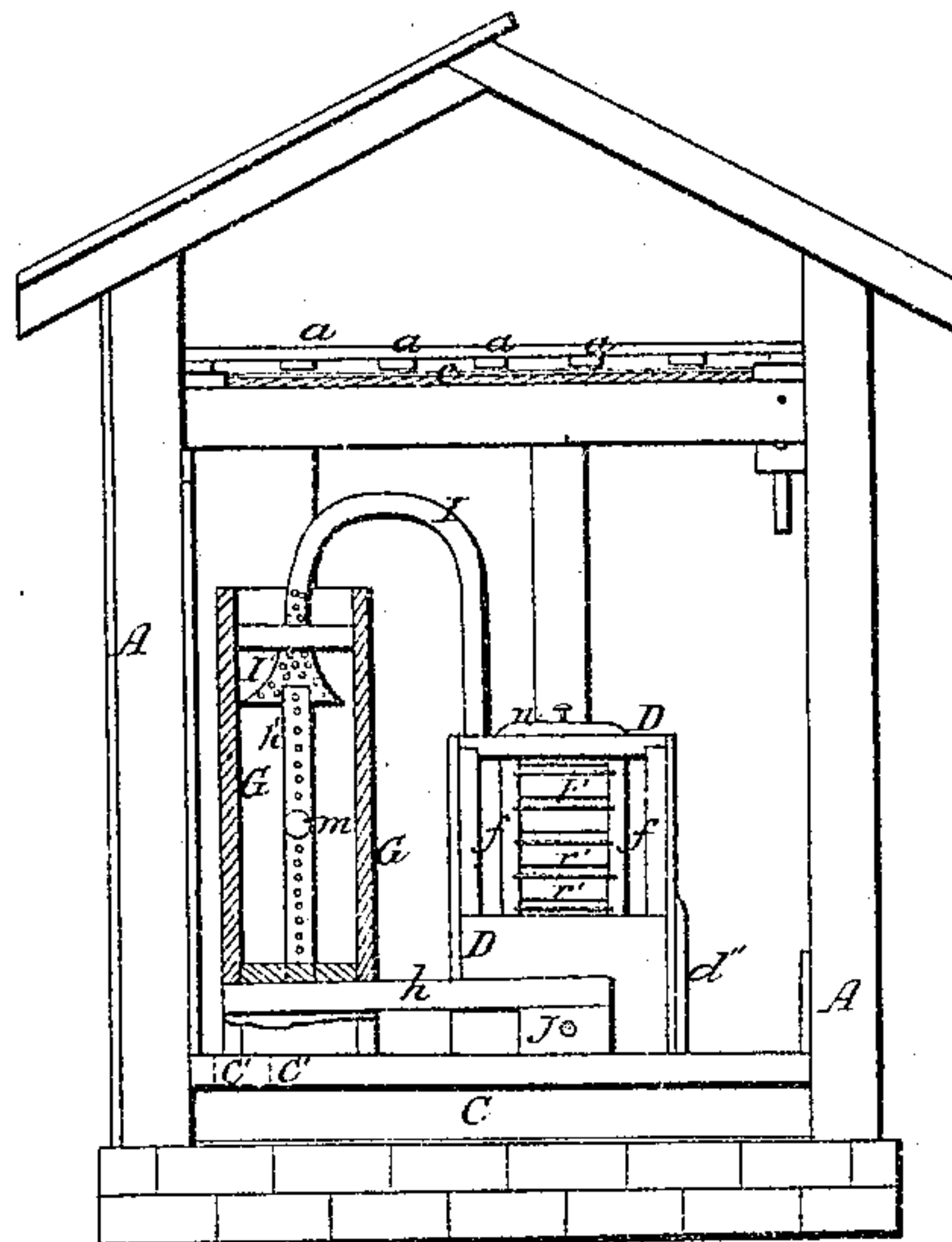


Fig. 3.



Witnesses.  
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## IMPROVEMENT IN GRANARIES AND FRUIT-HOUSES.

Specification forming part of Letters Patent No. 50,790, dated November 7, 1865.

*To all whom it may concern:*

Be it known that I, S. R. BECKWITH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Granaries and Fruit-Houses; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan view of the building with the roof removed. Fig. 2 is a side elevation with the side walls removed. Fig. 3 is an end elevation without the end walls. Fig. 4 is a sectional view through an ice-chamber. Fig. 5 will be referred to in the specification.

Like letters of reference refer to like parts in the different views.

My improvement relates to a building for preserving grain, fruit, vegetables, and fermented liquors, as hereinafter described.

A represents the frame of the building, that can be of any suitable size or form, the walls of which are double, as shown at B in Fig. 1, to contain some non-conductor of heat.

a is a slatted frame-work or floor, which may be made firm and substantial in the upper part of the building, and on which the ice is placed, and below this frame are placed metallic troughs c, (seen in Fig. 2,) resting on supports f. Underneath the metallic troughs are wooden gutters e, on which any dampness or moisture that may collect on the outside of the metallic troughs will fall, and thus prevented from entering the room below.

d is a trough at one end of the troughs c and gutters e, into which the water can run from them and be conveyed away through a tube or pipe, g. There is a space, i, between the gutters, and also between the troughs c, so that air can pass up from the room below into contact with the ice above.

The troughs and gutters can be arranged in another way, as seen at c' e', so that the edges hang over wooden troughs e', as represented, or they may be constructed and arranged in any other suitable manner to answer the same purpose. Each trough c can be made of one piece each, forming a corrugated floor in sections, as shown in Fig. 5, with air-spaces between each section.

In the lower part of the building, underneath the rooms, there is a chamber, C, (seen in Figs.

2 and 3,) formed between the upper and under floors, the lower floor being made of concrete on the ground, thereby preventing dampness from entering from below. This chamber communicates with the rooms above at the sides through openings. (Indicated by dotted lines C' in Fig. 2.)

The fruit-shelves f' are all perforated, so that the air can pass up freely through them. On the lower shelves there are troughs d', to contain absorbents for drying the atmosphere within the room. These troughs may be placed in any other position that may be found convenient. Underneath the lower shelf, at f'', the side wall is perforated to allow a communication of air between the wall and rooms, thereby preventing dampness in the filling between the outer and inner walls, which should be airtight.

It is desirable to have the rooms of varying temperatures, as some of the more delicate fruits require a higher temperature than others to preserve their natural flavor. For this purpose I arrange an ice-chamber, D, in one of the rooms, the internal structure of which is shown in Figs. 3 and 4. This consists of a rack, D', in the center for containing the ice. This rack D' is pointed at the lower end, and the sides are made of slats r, as represented in Fig. 4, overlapping each other inward, so as to prevent the water from the melting ice from flowing outward. This rack D' is inclosed in a slatted frame-work, F, with slats r' on the sides, as shown in Figs. 3 and 4. Outside of this, and inside of the casing, there is a chamber, t, either annular or rectangular, forming a receptacle for cold dry air. On one side of this chamber there is a sliding door, d'', that is opened more or less when it is desired to govern the temperature of the room. n is the cover or lid of the ice-rack.

J is a trough in the lower part of the chamber, in which an absorbent is placed for taking up the moisture from the atmosphere contained in the chamber from the melting of the ice or otherwise.

G is a bin for containing grain. This bin communicates with the ice-chamber D through a pipe, h, at the lower end, and at the top there is a bent tube, I, that enters the top of the ice-chamber and bin, where it terminates in a perforated bell-mouth, I'. From the pipe h extends upward a perforated pipe or tube,



$h'$ , and from this tube project one or more pipes,  $m$ , crosswise through the bin, so that the fresh cool air from the ice-chamber will be distributed through all the grain, thus preventing any part of it from being injured by heat or dampness. By means of the pipe  $I$  and bell-mouth  $I'$  the air is taken up from the grain as it rises to the top, producing a free circulation through the entire mass around through the ice-chamber.

The grain can be permanently kept in the bin as long as desired, or it can be thoroughly dried and cooled by passing it through the bin, letting it remain therein a sufficient length of time to cool and dry it, and then conveying it away through a chute or elevator at the lower end into another bin or other receptacle. There can be one or more bins in one room connected to the ice-chamber  $D$  in the same or in a similar manner, thus making a granary to preserve or dry grain in the most perfect manner.

By means of the ice-chamber  $D$ , as constructed, the temperature of the room  $B'$  can be regulated as desired.

For preserving fruits of a more delicate nature the temperature can be graduated by means of the doors  $d'$ , increasing it as may be required.

The troughs which underlie the ice-floor may be curved or angular in their structure and one foot or more in width.

The whole building as constructed has many advantages, the ice being supported on a slatted frame-work with gutters and troughs underneath, as described. All water from the melted ice and moisture arising from exhalations from the fruit condensing on the metallic troughs or upon the ice will run into the trough  $d$  and be conveyed away, thus taking up the moisture and keeping the atmosphere in the room very dry; and on account of the spaces  $i'$  there is a free circulation between the room and ice-chamber, allowing the warmer moist

air to rise and be condensed on the metallic troughs and ice and conveyed away. There is also a circulation of air around through the entire building from the chamber  $C$  underneath the floors up through the openings into the room; and by means of the perforations  $f''$  the air can pass up into the walls and be brought in contact with the ice-chamber. The side and end walls can be perforated, allowing the dry cold air to circulate entirely around the building, thus preventing dampness in the filling.

In a building thus constructed the rooms may be divided, each one having a separate ice-chamber above, by which means different degrees of temperature may be given to each room by a proper distribution of the ice, according to the nature of the fruit, &c., in the respective compartments.

The wooden gutters  $e$ , which have been previously described, should have their concave or inner surfaces coated with some waterproof substance to prevent the absorption of water into the pores of the wood, which would tend to their premature decay.

What I claim as my improvement, and desire to secure by Letters Patent, is—

1. The drying of grain in bins or boxes by causing a current of cold dry air to be circulated through the same by means of the pipes  $h$   $h'$  and  $I$ , in combination with the ice-chamber  $D$ , substantially as set forth.

2. The chamber  $D$ , rack  $D'$  slatted frame  $F$ , and annular or rectangular chamber  $t$ , in combination, when constructed substantially as and for the purpose set forth.

3. The ice-floor  $a$ , in combination with metallic troughs  $c$  and wood gutters  $e$ , constructed and arranged substantially as and for the purpose described.

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Witnesses:

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