No. 863,704. PATENTED AUG. 20, 1907.

A. O. DUPUY.

DRYING APPARATUS.

APPLICATION FILED DEC. 26, 1906.

3 SHEETS—SHEET 1.

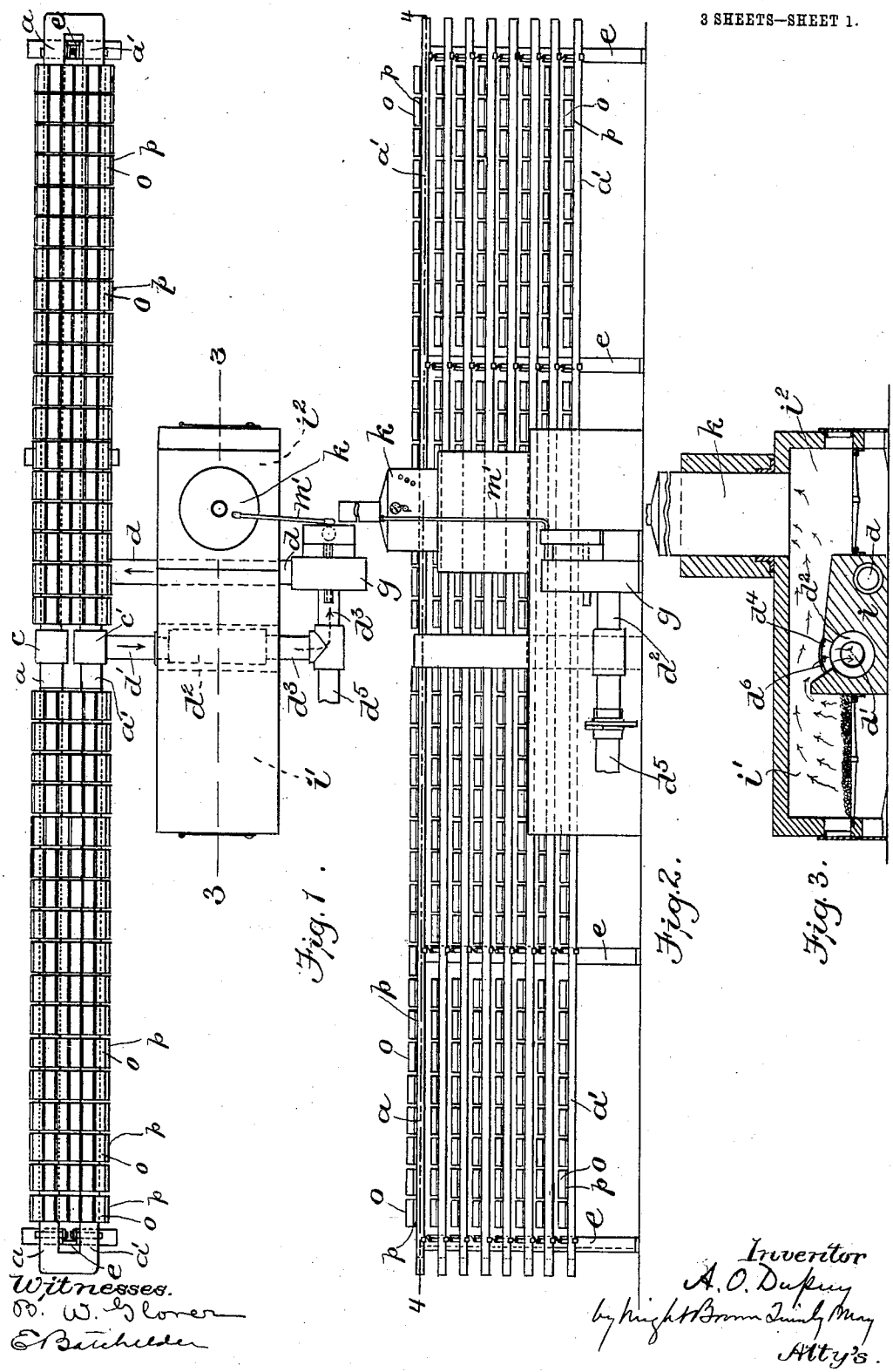


Fig. 1.

Fig. 2.

Fig. 3.

Witnesses.
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THE NORRIS PETERS CO., WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

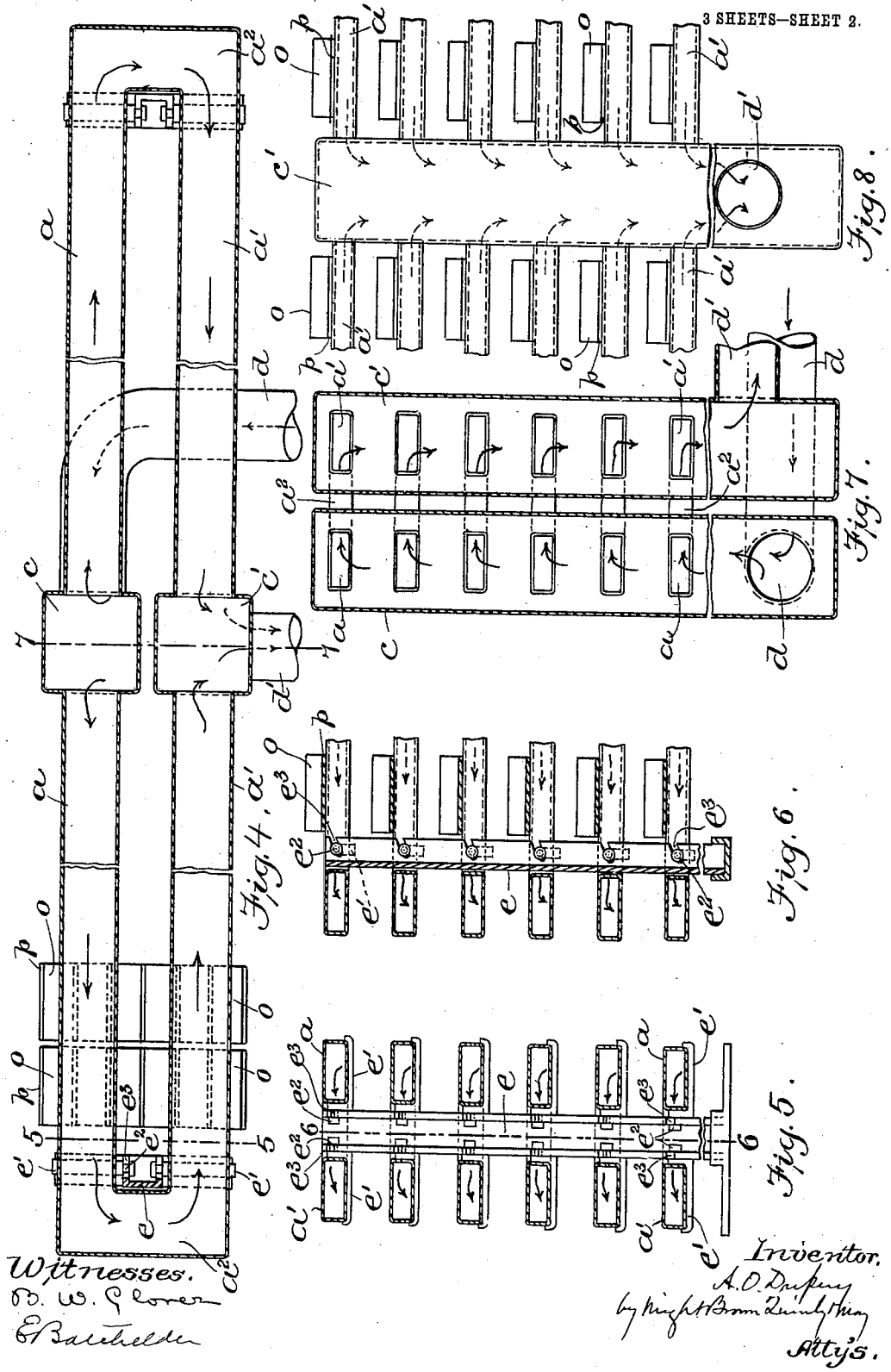


Fig. 8.

Fig. 7.

Fig. 6.

Fig. 5.

Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 9.

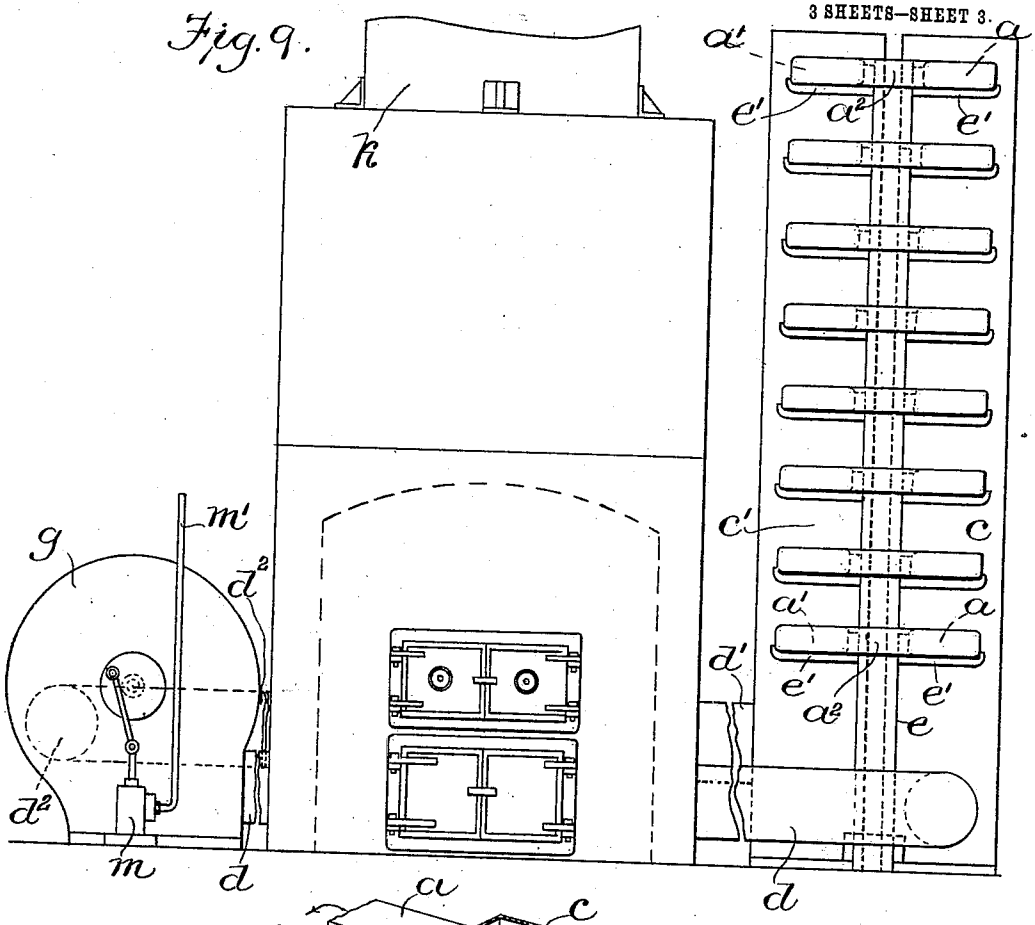
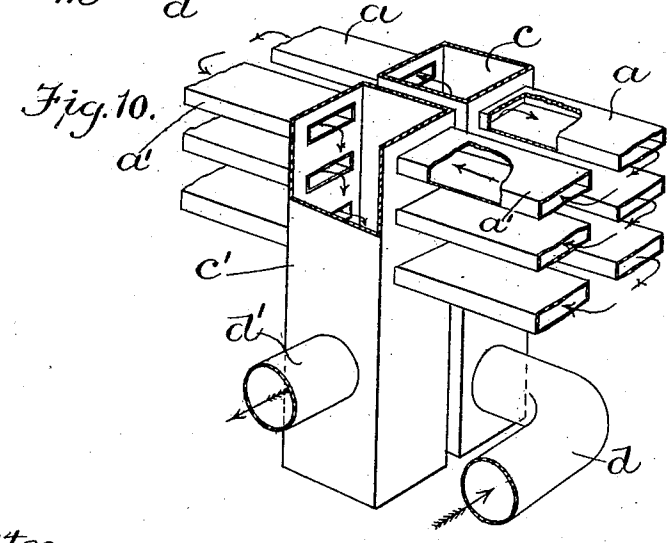


Fig. 10.



Witnesses.

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UNITED STATES PATENT OFFICE.

ARTHUR O. DUPUY, OF EAST BRIDGEWATER, MASSACHUSETTS.

DRYING APPARATUS.

No. 863,704. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed December 26, 1906. Serial No. 349,369.

To all whom it may concern:

Be it known that I, ARTHUR O. DUPUY, of East Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Drying Apparatus, of which the following is a specification.

This invention has for its object to provide a simple and efficient apparatus for drying bricks and other like articles, by the use of heated air circulated through return flues which form shelves, on which the articles to be dried are supported.

The invention consists in the several improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification,—Figure 1 represents a top plan view of a drying apparatus embodying my invention. Fig. 2 represents a side elevation of the same. Fig. 3 represents a section on line 3—3 of Fig. 1. Fig. 4 represents a section on line 4—4 of Fig. 2. Fig. 5 represents a section on line 5—5 of Fig. 4. Fig. 6 represents a section on line 6—6 of Fig. 5. Fig. 7 represents a section on line 7—7 of Fig. 4. Fig. 8 represents a side elevation showing parts of the apparatus. Fig. 9 represents an end elevation of the apparatus, and Fig. 10 represents a perspective sectional view illustrative of the circulation of air through the apparatus.

The same letters of reference indicate the same parts in all the figures.

In carrying out my invention I provide a series of substantially horizontal shelves, each composed of a return bend flue having stretches a a', and a connecting or neck portion a^2. The ends of the return flue enter two vertical headers c c', which are located side by side, the part c being hereinafter denominated a flow header, and the part c' a return header. Hot air is forced into the flow header through an inlet pipe d, and passes from the flow header through the return flues to the return header, which is provided with an outlet pipe d'. The return flues are preferably duplicated, there being two sets or tiers, as shown in the drawings. The said return flues are preferably made of sheet metal, and are provided with flat top and bottom surfaces, which are relatively close together, the cross section of each stretch being relatively wide horizontally and relatively narrow vertically. The inner ends of the stretches of the return flues are supported by the headers c c'. The outer ends of said stretches are supported by standards e, located between the stretches, each standard having two sets of oppositely-projecting brackets e' to which the flue stretches a a' are attached. The said brackets are preferably loosely connected with the standard in such manner that each bracket is adapted to have a limited sliding movement on the standard to compensate for expansion and contraction of the flue stretches a a'. To this end I have shown the inner ends of the brackets e' provided with headed studs e^2, which pass through slots e^3 in flanges forming the opposite sides of the standard e. The slots e^3 may be horizontal, but are preferably somewhat inclined, as shown in Fig. 4, and the studs are adapted to slide in said slots in the directions required by the expansion and contraction of the flue stretches a a'.

The inlet pipe d of the flow header is connected with the casing g of a blower, and conducts air from the blower casing to the flow header c. The outlet pipe d' communicates with the blower casing through a passage d^2 and a pipe d^3, constituting continuations of the pipe d', so that air is drawn from the return flue c' to the blower casing. The passage d^2 passes through the bridge wall i of a furnace, and has an inlet d^4 communicating with the fire box i' of the furnace so that hot air and gases are drawn from the fire box into the passage d^2, and pass from thence to the blower casing, and from the latter to the flow header c, the hot air circulating through the return flues, as indicated by the arrows in several figures of the drawings. The inlet d^4 may be provided with an adjustable cover or valve d^6. The blower may be driven by a steam engine or motor m, supplied with steam from a boiler k, which may receive heat from the fire box i', as indicated by arrows in Fig. 3. Another fire box i^2 is shown in position to supply heat to the boiler k, in case the heat supplied by the fire box i' is not sufficient. Steam is conducted from the boiler k to the engine through a supply pipe m'. The pipe d^3 may be connected by a pipe d^5 with a brick kiln, in such manner that the waste heat from the kiln will pass to the blower casing, and be caused to circulate through the return flues and headers.

The bricks or other articles o to be dried, may be placed upon pallets p, the latter being placed upon the return flues, and extending across the stretches a a' thereof. Heat is therefore conducted to the bricks through the walls of the return flues, and through the pallets. Heat radiated from the surfaces of the return flues which are not covered by the pallets, warms the air, and contributes to the drying operation.

It will be seen that the thin sheet metal walls of the return flues are adapted to be quickly heated, and to readily conduct heat so that the apparatus is effective for drying purposes.

In practice all the air that is forced into the headers and return flues by the blower is not returned through the pipe d', there being a certain loss due to leakage and friction of the air on the walls of the flues and headers. Owing to this fact the blower makes a constant draft on the fire box i', so that a continuous renewal of the heating medium is insured.

I claim:

1. A drying apparatus comprising a tier of substantially horizontal return bend flues, constituting shelves; sub-

stantially vertical flow and return headers connected with the ends of said flues, and means for circulating air through said headers and flues.

2. A drying apparatus comprising substantially horizontal return bend flues, constituting shelves, flow and return headers supporting the inner ends of said flues, and supports engaged with the outer portions of the flues.

3. A drying apparatus comprising substantially horizontal return bend flues, constituting shelves, flow and return headers supporting the inner ends of said flues, a standard located between the outer portions of the flue-stretches, and brackets engaged with said standard and supporting the outer portions of the flues, the said brackets being independently movable on the standard.

4. A drying apparatus comprising substantially horizontal return bend flues, constituting shelves, flow and return headers supporting the inner ends of said flues, a standard located between the outer portions of the flue stretches, and provided with slotted flanges, and brackets having headed studs engaged with said flanges, the studs being movable in the flange slots.

5. A drying apparatus comprising a tier of substantially horizontal return bend flues, constituting shelves, flow and return headers connected with the ends of said flues, a furnace or fire box, an air-forcing apparatus, and connections between the said headers and the air-forcing apparatus, said connections communicating with the fire box, so that hot air and products of combustion from the fire box may be caused by the air-forcing apparatus to circulate through the return bend flues.

6. A drying apparatus comprising a tier of substantially horizontal return bend flues, constituting shelves, flow and return headers connected with the ends of said flues, a furnace or fire box, an air-forcing apparatus, and conduits connecting said headers with the air-forcing apparatus, one of said conduits having an inlet communicating with the fire box, and permitting the passage of hot air and products of combustion from the fire box to the return bend flues.

In testimony whereof I have affixed my signature, in presence of two witnesses.

ARTHUR O. DUPUY.

Witnesses:
C. F. BROWN,
E. BATCHELDER.