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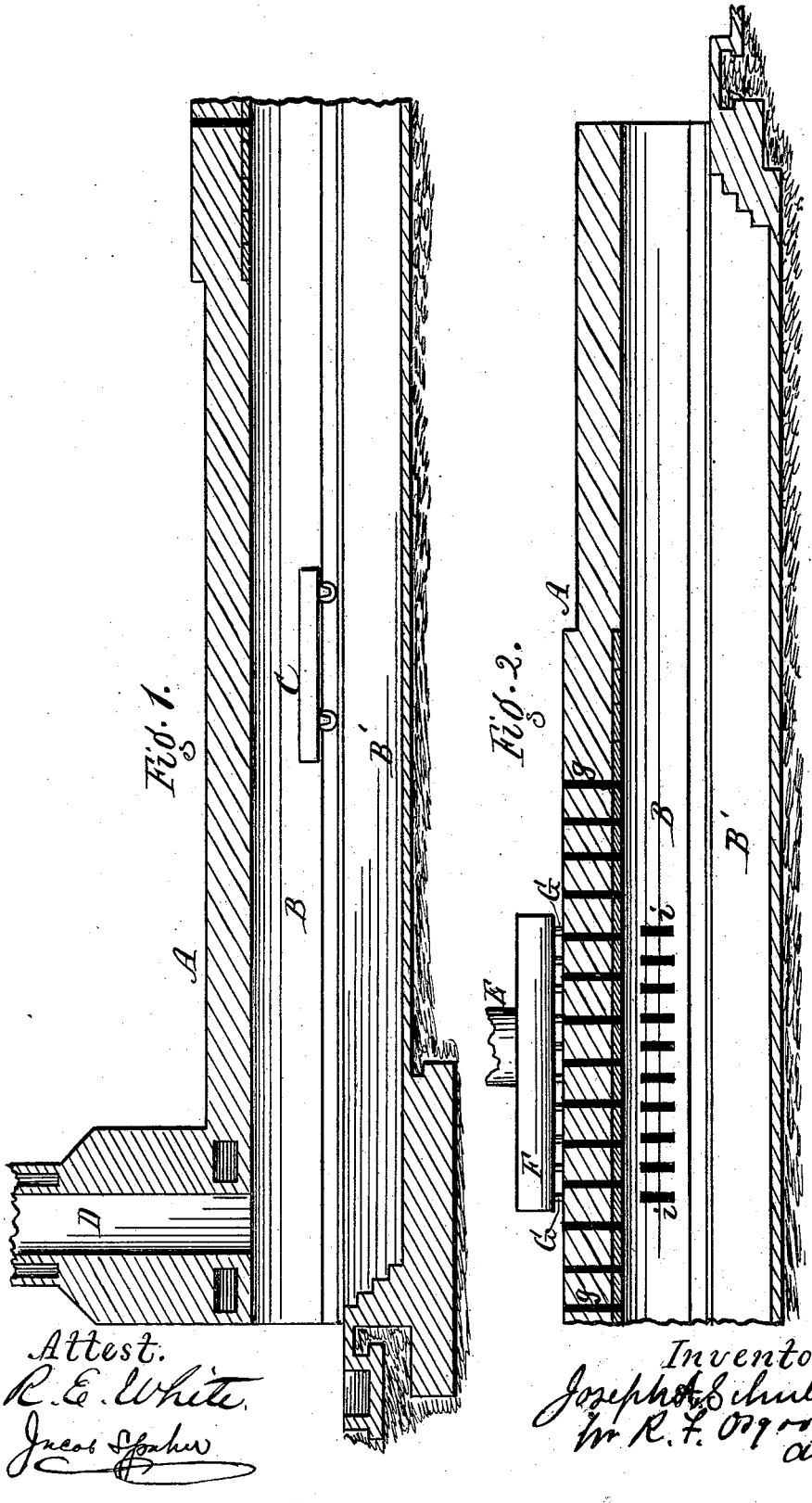
BRICK-KILN.

No. 191,376. Patented May 29, 1877.



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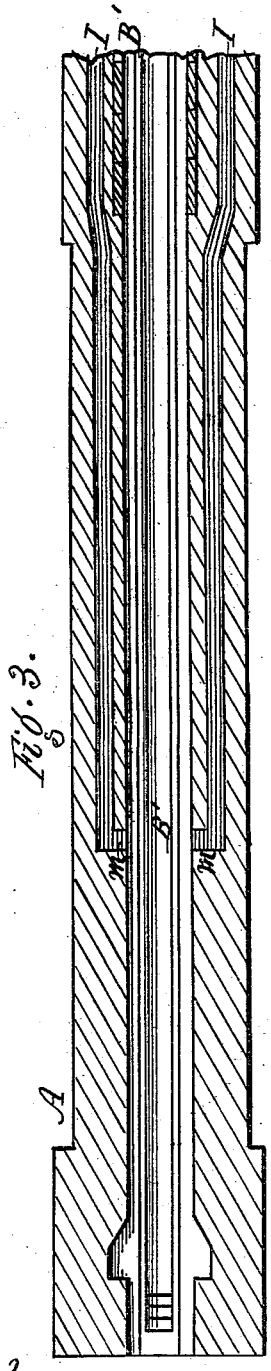

Fig. 3.

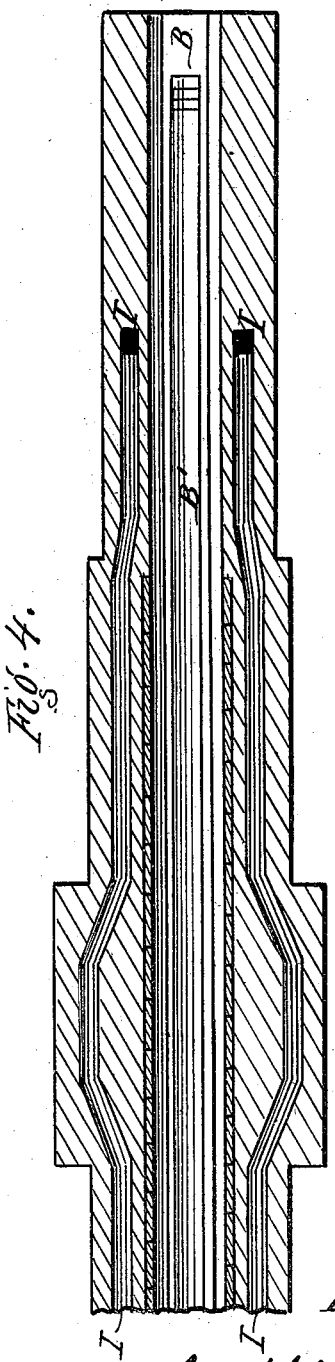

Fig. 4.

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Fig. 7.

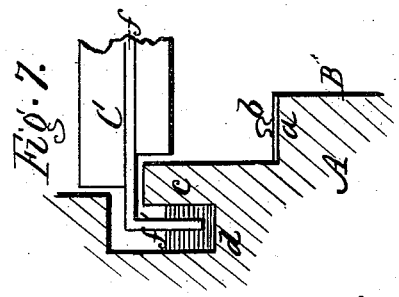


Fig. 8.

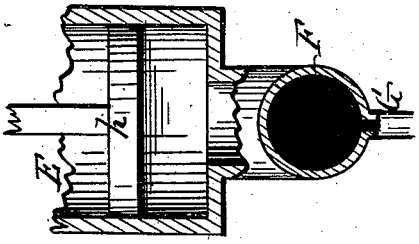


Fig. 5.

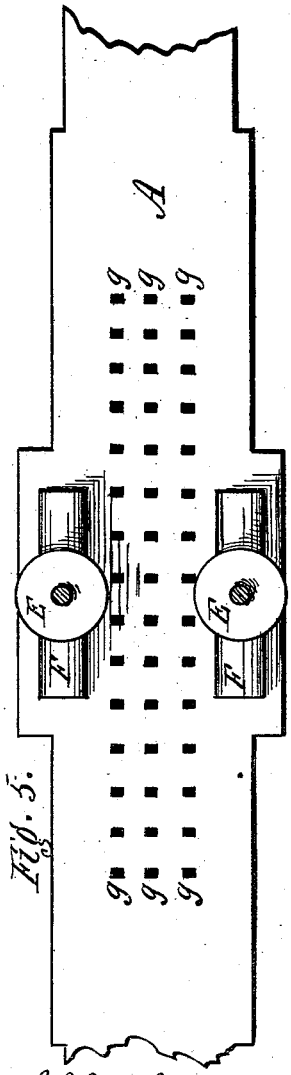
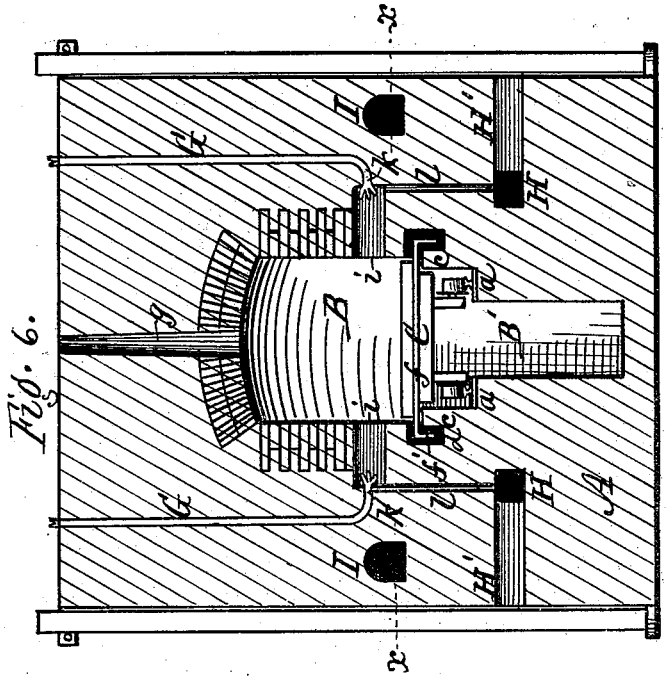


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH A. SCHULTZ, OF BATAVIA, NEW YORK.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. **191,376**, dated May 29, 1877; application filed April 9, 1877.

To all whom it may concern:

Be it known that I, JOSEPH A. SCHULTZ, of Batavia, in the county of Genesee and State of New York, have invented a certain new and useful Improvement in Brick Kilns or Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figures 1 and 2 represent a vertical section of my kiln or furnace, the parts represented in said figures joining end to end, and forming one continuous length. Figs. 3 and 4 are similar horizontal sections in line *x x* of Fig. 6. Fig. 5 is a plan or top view of the central portion of the apparatus. Fig. 6 is a cross-section through the central portion. Figs. 7 and 8 are detail views.

My improvement relates to a perpetual kiln or furnace in which the molded bricks are run in at one end on cars or trucks, and discharged at the other end perfectly burned, the operation being continuous.

The invention consists in the construction and arrangement of parts hereinafter more fully described and definitely claimed.

A represents the kiln or furnace. It may be of any desired size, but is made about one hundred and ninety-seven feet long, twenty feet wide, and sixteen feet high. It is built of brick, with an interior lining of fire-bricks where it is exposed to fire. In this kiln or furnace is an arch, B, extending longitudinally the whole length, and opening through the ends of the kiln, said ends being covered by iron doors, which can be opened to allow the entrance and exit of the loaded cars. This arch is made about twelve feet high from top to bottom; but the lower portion B′ is contracted in width, being only large enough to allow the passage of workmen through, while the upper part, which forms the arch proper, is of sufficient width to allow the passage of the cars, and also to form a furnace-space. Between these two widths of the arch are ledges *a a*, on which are laid iron rails *b b*, for the passage of the cars C C. Above the ledges *a a* are vertical walls *c c*, and behind these, within the brick-work, are longitudinal grooves *d d*, which extend the whole length of the kiln. The platform of the cars consists of a metallic plate, *f*, having flanges *f′ f′*, bent at right angles, overriding the top of the walls *c c*, and dipping into the grooves *d d*, as shown in Fig. 7. These grooves are filled or partially filled with water, sand, or other suitable material, which, covering the edges of the flanges as the cars move along, cut off the passage of heat from the arch-space above to that below. If water is used, it must be kept running to compensate for evaporation. As fast as the loaded cars are run in at one end their contiguous ends, which are hollowed for the purpose, are filled in with earth, which bakes and forms a fire-proof joint between the ends of the cars.

The iron platforms forming the bottom of the cars are also covered with fire-proof brick. By means of these several devices the heat is so shut off from the bottom of the arch-space that workmen can pass through while the furnace is in blast. Steps may be formed at the ends of the furnace to allow workmen to ascend and descend. While the cars thus project within the brick-work, and their flanges dip in the grooves, they have a free movement forward by reason of their wheels resting upon the track, and no part of the car bearing upon any other portion of the kiln. The chimney D is located at the induction end of the kiln, or that at which the cars enter; and at the opposite or eduction end the iron door has a valve, or is otherwise so arranged as to admit air. Therefore, as the cars advance from the induction end, they are gradually subjected to more and more heat as they approach the furnace, which is in the center, and after they have passed the furnace they grow cooler and cooler as they approach the eduction end. Another advantage of the insulation of the heat in the upper arch-space is, that it prevents warping of the rails and axles and the burning out of the wheels, as well as effects the saving of heat.

g g g are three tiers of passages opening through the top of the kiln into the upper arch-space in the center of the kiln. There are generally fifteen of these passages in each tier. They are metal-lined, and at the top the metal pipes are surrounded with sand, resting in depressions of the brick-work. The first of

the loaded cars which enter the kiln are covered with fine coal, or other combustible matter, and ignited as they enter the kiln. Fine coal, in pulverized form, is then fed down through the passages *g g g*, and as it falls it burns and supports the combustion. Being in such fine form, and dropping in a shower through the furnace-space, it burns with great rapidity and with intense heat, and is much more effective in burning the bricks than ordinary fires could be. It also produces a more uniform and regular heat throughout the furnace-space.

E E are tanks on top the kiln for containing petroleum. *h h* are pistons within the tanks for producing pressure upon the oil. The tanks are filled by supply-pipes opening beneath the pistons. F F are distributing-cylinders connected with the tanks. G G G are vertical pipes connected with the distributers, passing down through the kiln, and opening into recesses *i i i* on each side of the arch, where they end in small nozzles *k k k*, which serve to inject the petroleum in fine spray through the whole furnace-space, where it is ignited by coming in contact with the burning coal. Ten of these pipes are preferably used on each side. The flow may be controlled by suitable cocks or cut-offs.

H H are cold-air flues extending longitudinally, and fed by lateral flues H′ H′. *l l* are passages leading from the cold-air flues up into the recesses *i i*. The cold air which is drawn up these passages impinges against the nozzles which discharge the petroleum, and furnish the oxygen necessary to support combustion.

I I are hot-air flues on opposite sides, extending longitudinally and opening into the furnace-space at *m m*, Figs. 3 and 4, on the induction side. From these flues extend lateral flues, which open into the dry-house, which is located on one side of the kiln. This dry-house is for the purpose of drying the brick preparatory to being run into the kiln. The dry-house gets its heat from the kiln through the hot-air passages and lateral connections above described. The loaded cars are transferred from the dry-house to the kiln, and from the kiln to the place of deposit, by running them onto other cars standing at right angles on a cross-track. The hot-air flues also serve to produce a circuit through the furnace-space by carrying the hot air from one end to the other, thus equalizing the temperature.

In this kiln or furnace will be used only the very cheapest heating material—for instance, the refuse of coal or coal-dust, also the refuse of petroleum, or liquid tar.

The green bricks or other goods, as they are molded, are deposited by the press upon the cars, and thence go into the drying-room, as before described, and from the drying-room direct into the kiln or furnace, so that there is no handling of the bricks, or other manipulation, till the cars are removed from the furnace with the bricks fully burned and ready for shipment.

By the process of manufacture before described, and the cheapness of the heating material employed, a very great saving is made, as compared with the modern and improved furnaces now in use.

Having thus described my invention, what I claim as new is—

1. The kiln or furnace A, constructed with the upper arch B and lower passage B′, with ledges *a a*, provided with rails *b b*, and the grooves *d d*, whereby, when the loaded cars are run through the kiln, the lower space will be insulated or cut off from the heat above, as shown and described, and for the purpose specified.

2. In a brick kiln or furnace, the combination, with the side grooves *d d*, provided with a filling of water, sand, or equivalent material, of the cars C, constructed with flanges *f′ f′*, resting in the said grooves, and serving to cut off the passage of heat to the space beneath the cars, as shown and described, and for the purpose specified.

3. In a brick kiln or furnace, the combination, with the arch B, of the pipes G, cylinders F, and tanks E, for feeding petroleum or other combustible fluid to the fires, said pipes having nozzles *k*, entering recesses *i* of the arch, as shown and described, and for the purpose specified.

4. In combination with the pipes G and recesses *i*, the cold-air passages H and tubes *l*, as and for the purpose specified.

5. In combination with the arch-space B, the hot-air flues I, extending longitudinally, and opening at the extremities into said arch, to form a circuit, as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH A. SCHULTZ.

Witnesses:
R. F. OSGOOD,
CHAUNCEY NASH.