

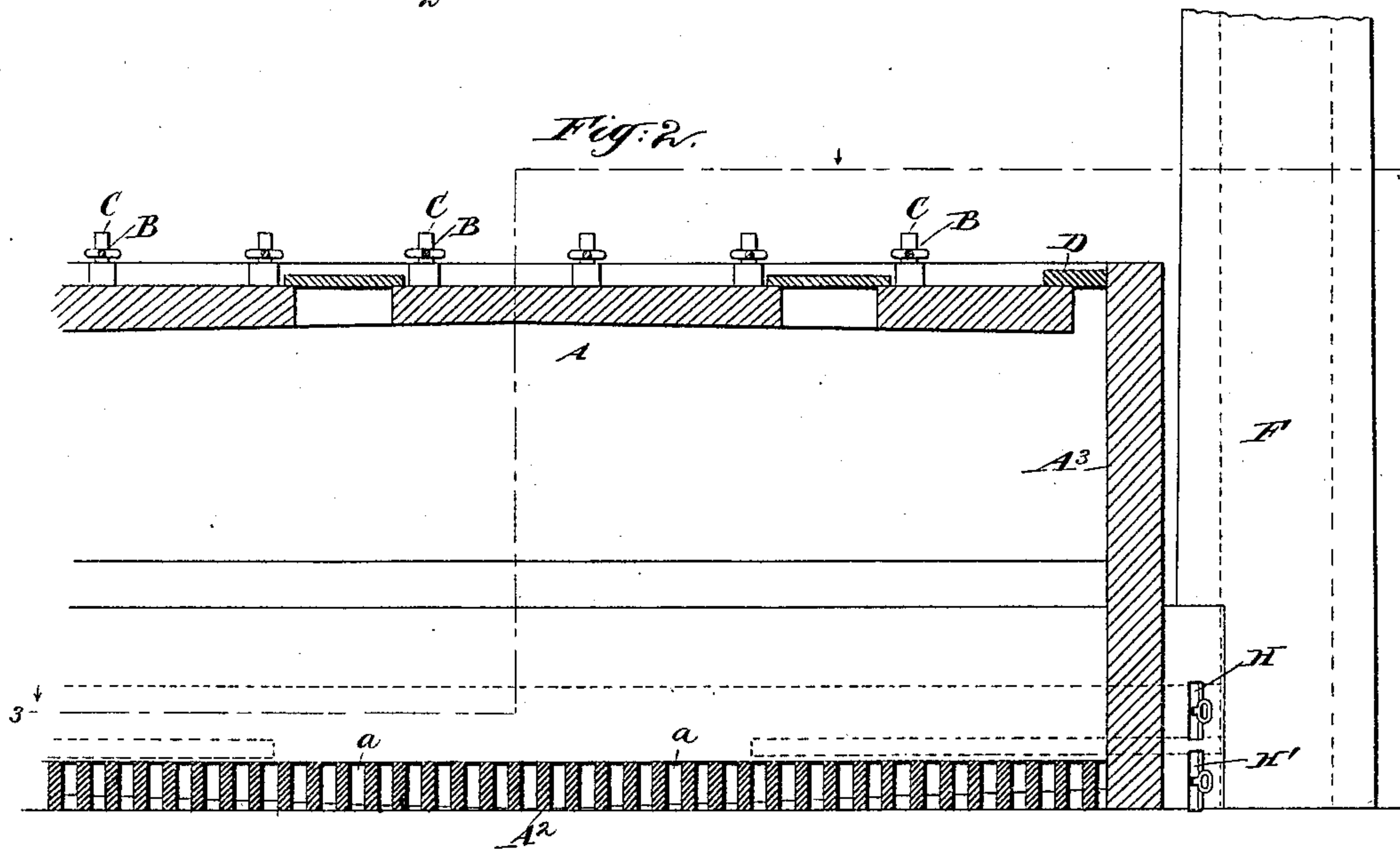
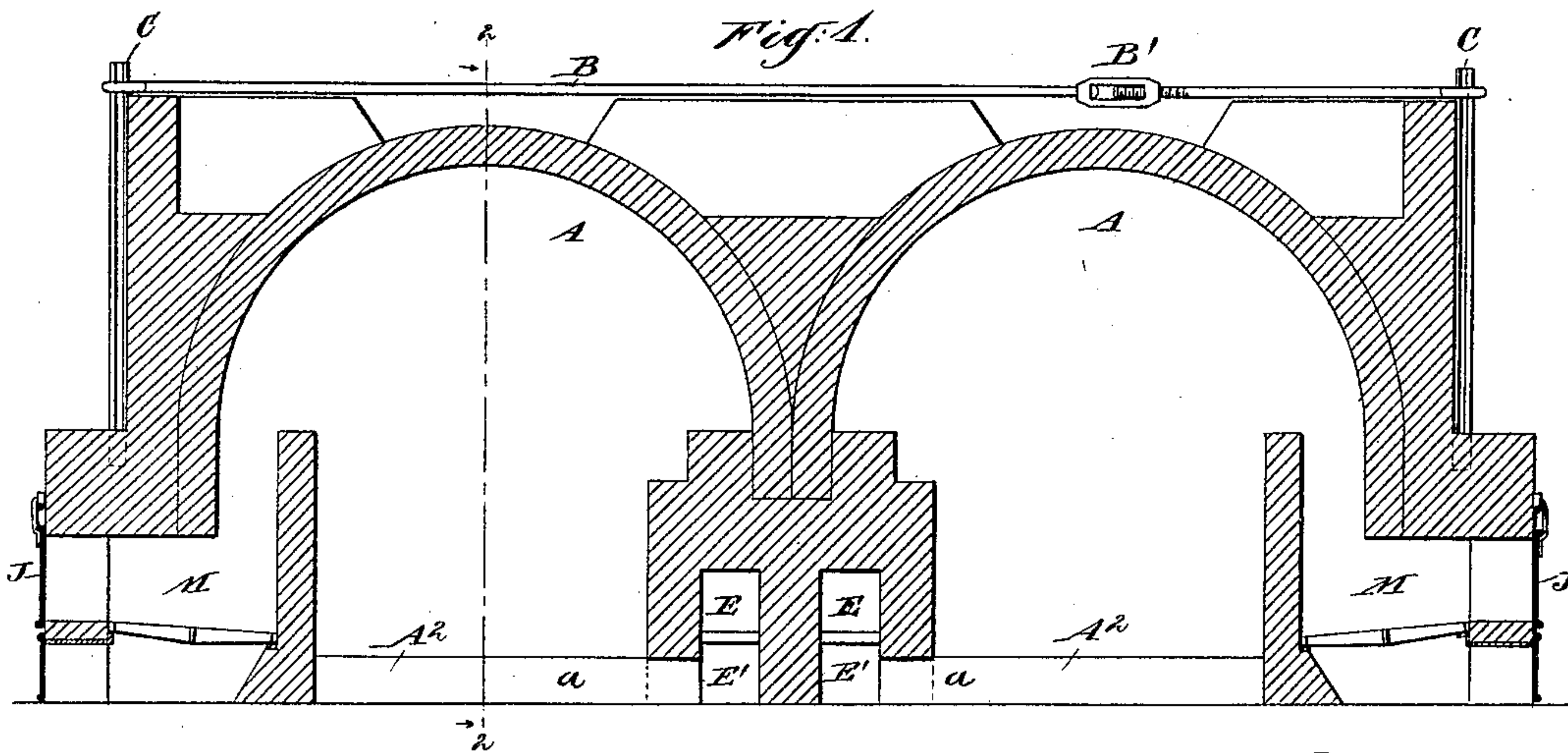
(No Model.)

2 Sheets—Sheet 1.

C. B. COXE.
BRICK KILN.

No. 486,557.

Patented Nov. 22, 1892.



Witnesses:

Charles R. Searle.
Jose L. Fingleton

Inventor:

Charles B. Cox
By his attorney
Thomas, Davis & Stetson

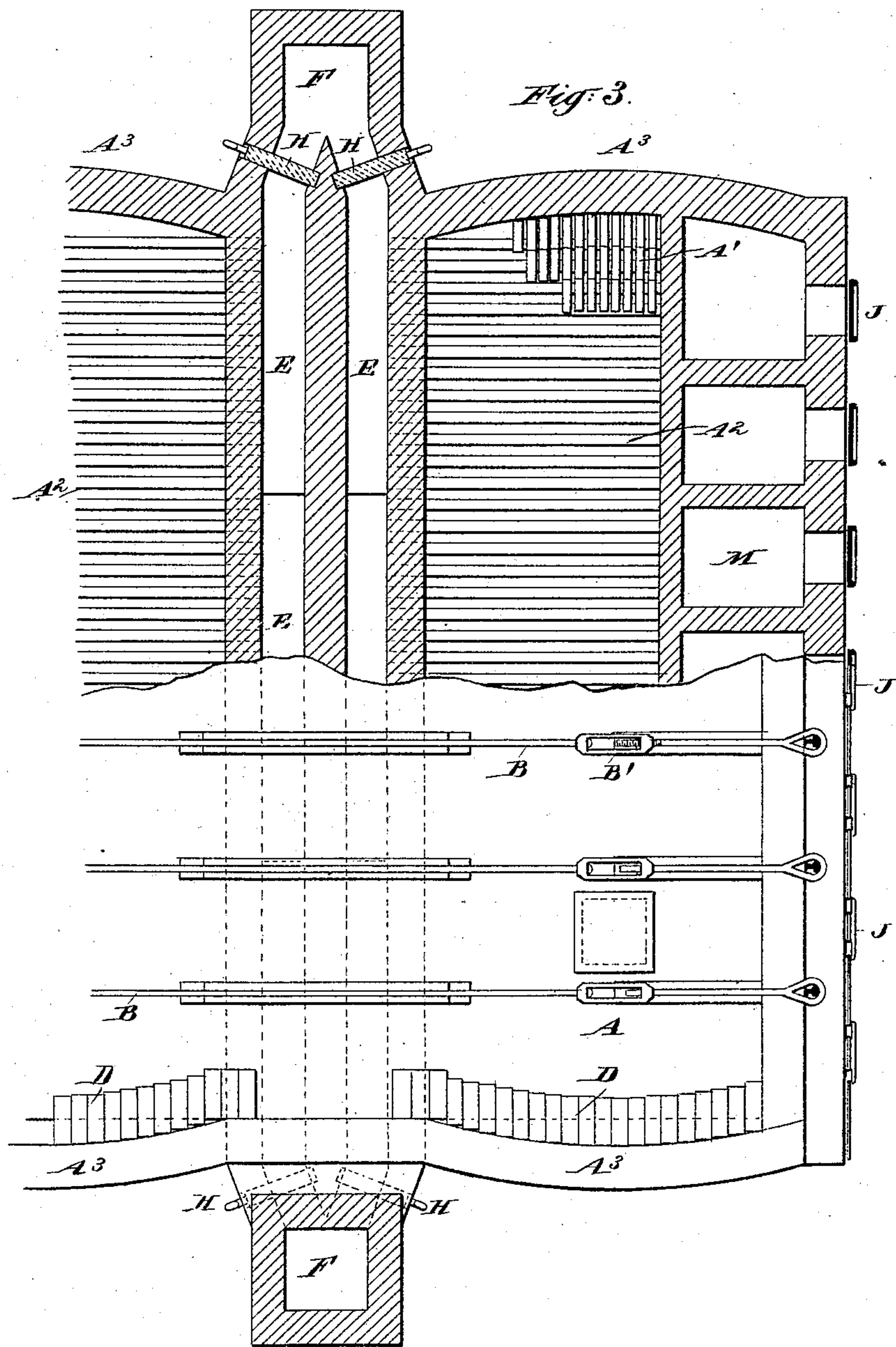
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Inventor:
Charles B. Cox
by his attorney
Thomas Drew Nelson

UNITED STATES PATENT OFFICE.

CHARLES B. COXE, OF BROOKLYN, NEW YORK, ASSIGNOR TO EDWARD B. ESTERBROOK, OF SAME PLACE.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 486,557, dated November 22, 1892.

Application filed March 16, 1892. Serial No. 425,079. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. COXE, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Brick-Kilns, of which the following is a specification.

My improved kiln is adapted for burning any and all kinds of bricks. I have experimented mainly with bricks made from ground slate compressed into form with but a small quantity of moisture, the material and the mold being above the ordinary temperature.

The improvement allows the attaining of a substantially-uniform heat and a practically-equable burning of the bricks filling every part of the kiln.

It consists in features fully set forth herein, and specifically defined in the claims.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a vertical transverse section. Fig. 2 is a vertical longitudinal section on the line 2 2 in Fig. 1, and Fig. 3 is a horizontal section on the offset line in Fig. 2.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is a semicylindrical arch, of fire-brick or other material, of a nature to endure the conditions, and supported against its spreading action by ties B, extending across the top and engaging with uprights C, fitted against the exterior wall forming the main front and rear faces of the kiln.

The furnaces M, arranged at a lower level, are fired and the fires regulated in the ordinary manner. The hot products of combustion from these furnaces are led upward through a space between the top of the bricks (not shown) and the under face of the arch. The products escape to the flue by descending from the interior of the arch through the mass of bricks.

The floor of the kiln is formed of an open-work layer or riddle bottom of brick A', resting on a transversely-channeled bottom A², technically known as "witts." The channels *a* extend horizontally and parallel to each other across the bottom and receive the gases

as they descend through the openly-piled mass of brick to be burned. (Not shown.) The gases discharge from these transverse passages *a* between the witts into a flue E, extending across the back of the bottom of the kiln and communicating at each side with a stack F. Two kilns are shown, one back wall common to both. There are two distinct transverse flues E, one serving for each kiln, but both delivering into the same stack on each side. Each flue is divided near its outer end by a horizontal partition, constituting it there into two parts, the upper retaining the letter E and the lower part being marked E'. The freedom with which the gases discharge from these transverse passages into the stack on each side may be regulated by dampers H H', operating by suitable rods. The passages *a* between the witts, which receive the gases and deliver them into these flues, vary in depth—that is to say, the passages *a* near each end of the kiln may be twelve (12) inches in depth. The corresponding passages near the mid-width of the kiln are deeper, the central one being eighteen (18) inches deep and the others graded less each way. The two parts E E' of each flue may each deliver directly into its connected chimney F, and will do so unless prevented by its damper H H'. The damper H controls the upper part E, and the damper H' controls the lower part E'. When the lower damper H' is closed and the upper damper H is open, the gaseous products of combustion received from all the channels *a* in the corresponding portion of the kiln on being received in the lower part E' of the flue are led away from the stack and toward the mid-length of the flue. They rise through the open space shown into the upper part E of the flue. From thence they flow directly through the upper part E to the stack. This mode of working tends to concentrate the heat in the central portion of the kiln. It can be employed whenever such concentration is necessary.

My kiln is fired, as usual, very mildly at the beginning. After all the water has been expelled at a moderate heat harder firing is commenced, and the mass of bricks is kept white-hot for the proper number of hours or days. The progress of the burning is determined in the ordinary manner by observing

through the ordinary peep-holes how the mass of bricks in the interior settles down at different points. If the bricks at any point are found to be sinking too fast, the dampers are manipulated to give less heat at that point, and more heat is applied at points which are not sinking sufficiently. The furnaces M transmit so much heat through the flash-walls at their rears, that that side of the kiln adjacent to the flash-wall tends from such cause to better retain its heat and to burn the material faster. This tendency about balances the disposition of the hot gases to enter the passages α near their rear ends and enables the operator to attain equable burning throughout the kiln from front to rear. The increased depth of the parallel passages α near the center counteracts the disposition of the gases to descend with greater force near the stacks.

The doors J are run by wheels or sheaves on transverse ways. In active firing only one is opened at a time. The front of the furnace being made as plain as practicable with brickwork, and the inner face of the door being correspondingly plain the doors will, with the draft induced by properly high stacks, match with sufficient tightness. The thin sheet of air drawn in through the very close joint around each door mingles with the gaseous products of combustion. In the descent of the hot products of combustion, through the mass of highly-heated bricks in the kiln, the free oxygen in the air combines with the combustible matter in the gases, and the kilns may burn any kind of fuel without either producing smoke or wasting the fuel by giving an excess of air, except for brief periods at the time of firing. The turnbuckles B' in the tie-rods B allow the uprights C to be adjusted apart or together, as required, to hold the front and rear walls properly in position and sustain the arch.

I provide for greater expansion laterally of the arch than of the front and back walls. The walls A³ at the right and left sides are slightly curved outward, as shown, slightly exaggerated in the plan view, Fig. 3. The arch is made entirely independent thereof and of slightly less width, and the narrow opening or space between the arch A and the side wall A³ on each side is defended by a series of bricks D, which are daubed and laid loosely on the arch, and are capable of being shifted inward upon the arch by contact with the side walls when the arch expands. After the kiln has cooled off and the bricks are removed, the top layer of bricks B is again adjusted in position, projecting across the joint or slight space between the arch and the side walls, and again forming a practically-tight contact with the side walls A³, with the same

provision as before for self-adjustment of position when the intense heat is applied.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. I have shown seven (7) furnaces. The number may be increased or diminished.

I claim as my invention—

1. In a kiln for burning bricks and the like, having provisions for downdraft, the floor A', the base A² thereunder, having parallel channels α of graduated depths, the flue E of corresponding-graduated size extending across the rear and communicating both with the series of channels α and with two stacks F F, one at each end of the flue, all arranged to serve substantially as herein specified.

2. In a kiln for burning bricks and the like, having provisions for downdraft, the floor A', the base A² thereunder, having parallel channels α of graduated depths, the flue E of corresponding-graduated size extending across the rear and communicating both with the series of channels α and with two stacks F F, one at each end of the flue, two kilns and four dampers being combined, so that the same stacks may serve for both, all substantially as herein specified.

3. In a kiln for burning bricks and the like, having provisions for downdraft, the curved side walls A³, the semicylindrical arch A, narrower than the space between the side walls, and the loosely-mounted layer of bricks D, overlapping the sides of said arch and capable of yielding to allow for difference of expansion by heat, in combination with each other and with the base A², channeled deeper in the center than near each side, delivering into a flue E, correspondingly varied in size, and with the stacks F and dampers II, as shown, all arranged for joint operation, substantially as herein specified.

4. In a kiln for burning bricks and the like, having provisions for downdraft, the floor A', the base A² thereunder, having parallel channels α of graduated depths, the flue E of corresponding-graduated size extending across the rear and communicating both with the series of channels α and with two stacks F F, one at each end of the flue, and the loosely-fitted doors J, admitting air in thin streams, and provisions for maintaining a close joint between the arch and the side walls, all arranged for joint operation, substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

CHARLES B. COXE.

Witnesses:

H. A. JOHNSTONE,
J. L. FINGLETON.