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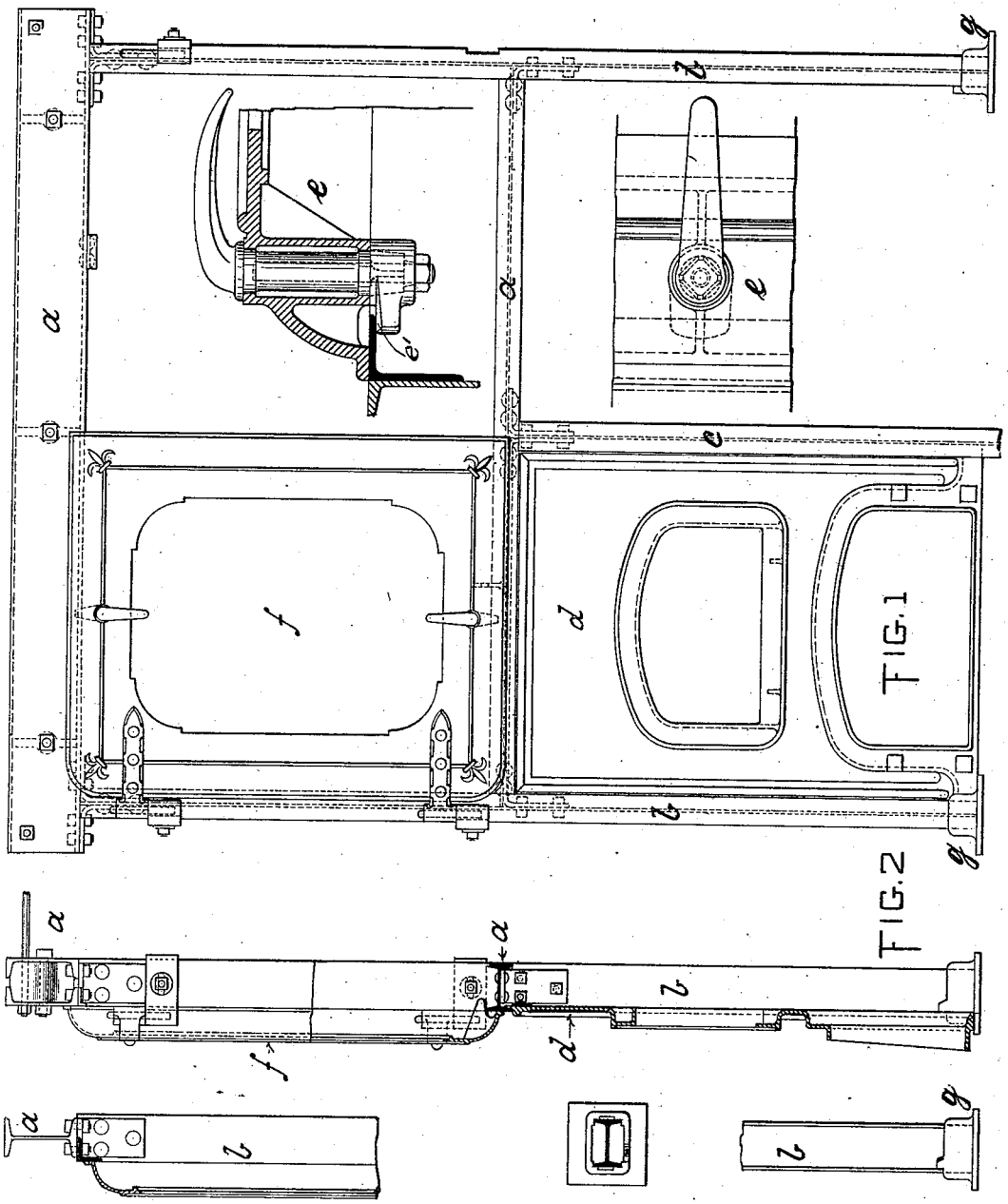
N. W. PRATT.

BOILER FRONT.

No. 306,861. Patented Oct. 21, 1884.



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ATTORNEY

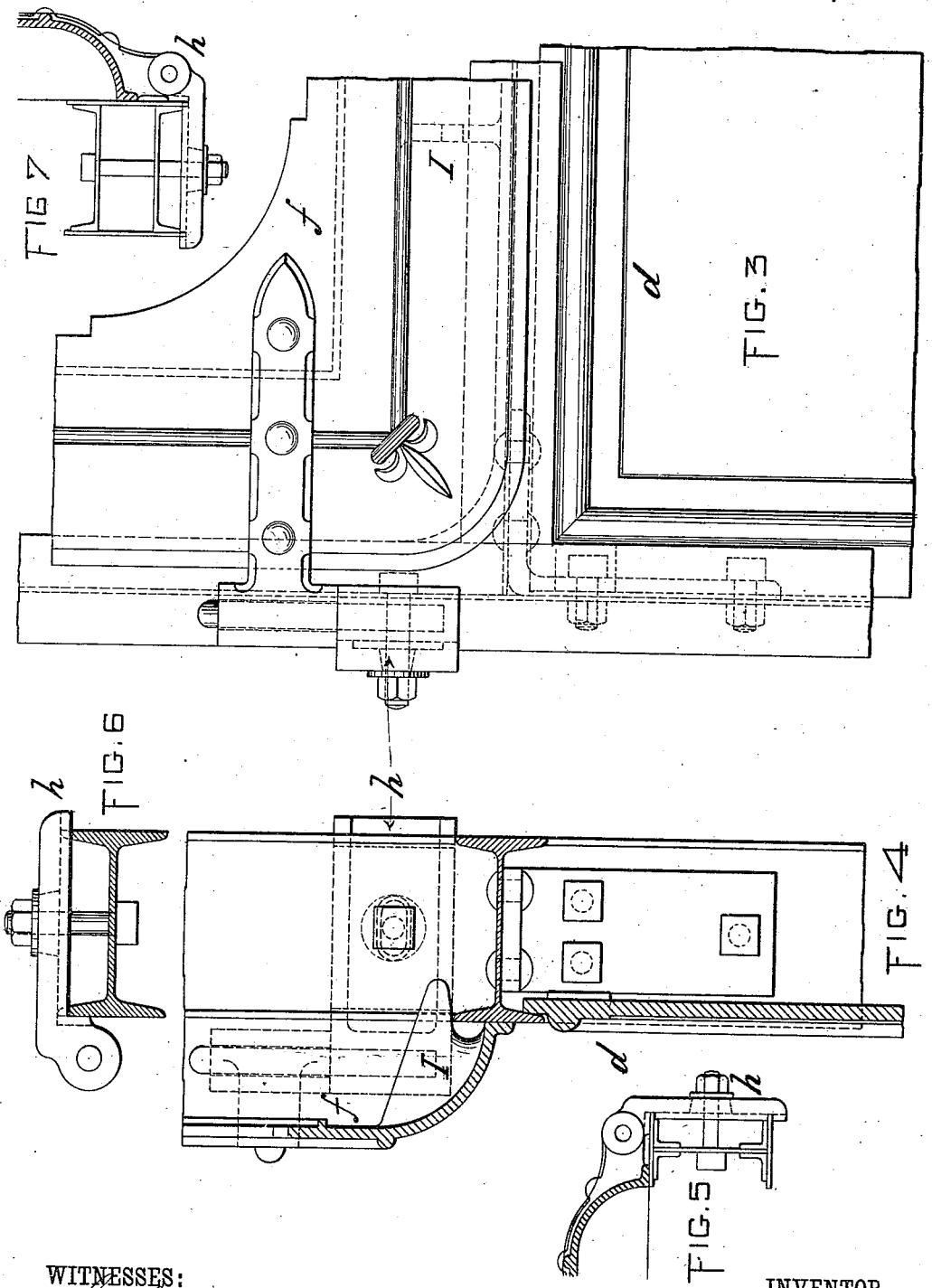
(No Model.)

4 Sheets—Sheet 2.

N. W. PRATT.

BOILER FRONT.

No. 306,861. Patented Oct. 21, 1884.



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(No Model.) 4 Sheets—Sheet 3.

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BOILER FRONT.

No. 306,861. Patented Oct. 21, 1884.

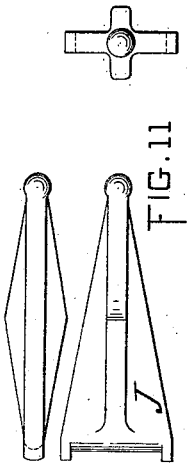

FIG. 11

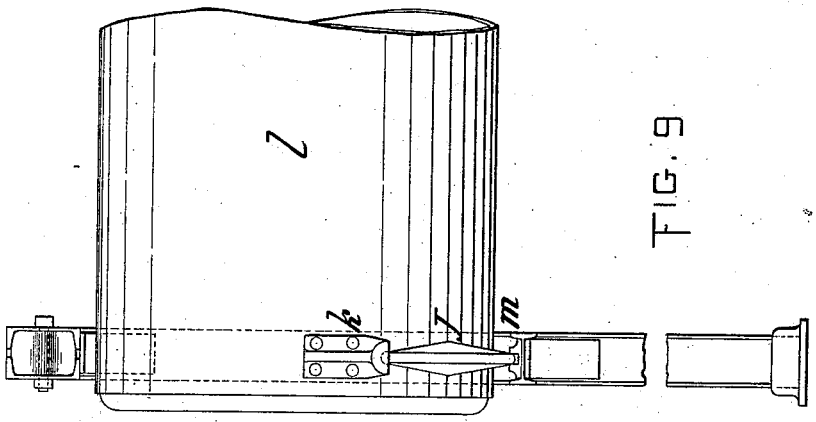

FIG. 9

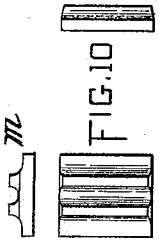

FIG. 10

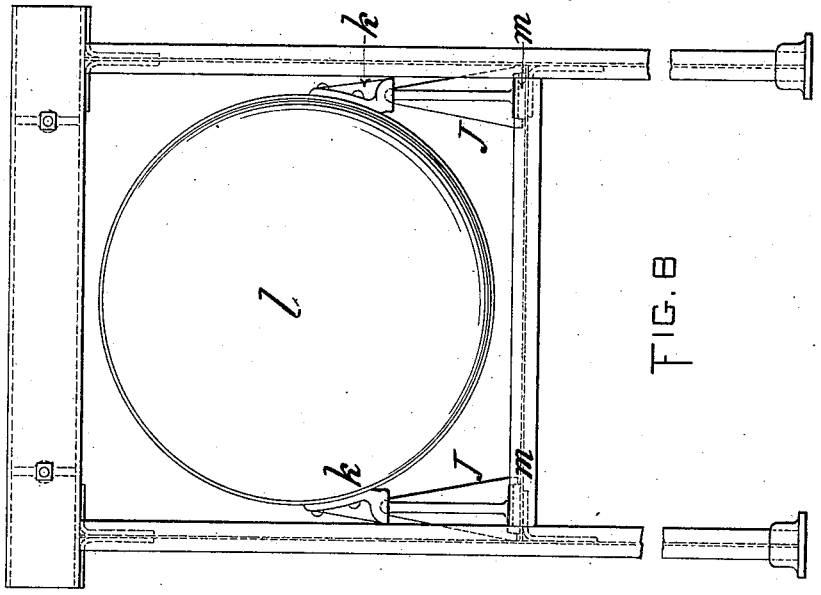

FIG. 8

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(No Model.) 4 Sheets—Sheet 4.

N. W. PRATT.

BOILER FRONT.

No. 306,861. Patented Oct. 21, 1884.

FIG. 12

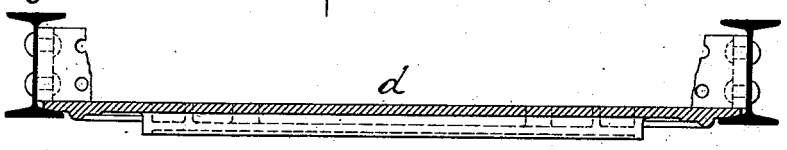


FIG. 13

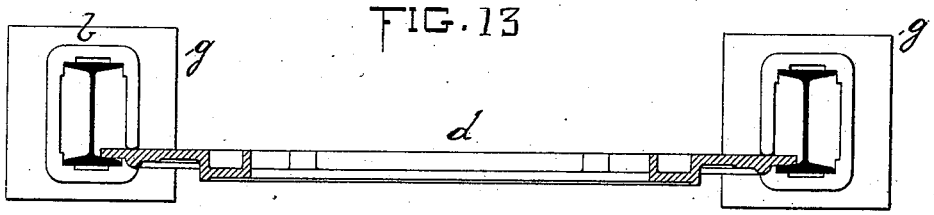
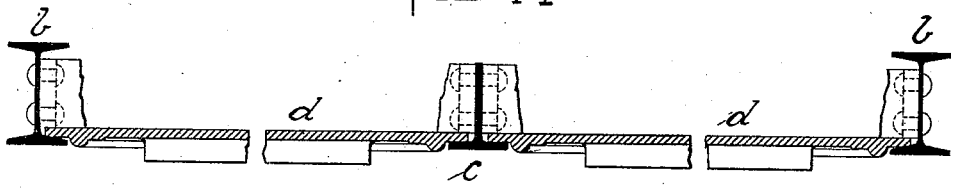


FIG. 14



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by his attorney

Sydney A. Bennett

UNITED STATES PATENT OFFICE.

NATHANIEL W. PRATT, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE BABCOCK & WILCOX COMPANY OF NEW JERSEY.

BOILER-FRONT.

SPECIFICATION forming part of Letters Patent No. 306,861, dated October 21, 1884.

Application filed March 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. PRATT, of the city of Brooklyn, in the county of Kings and State of New York, have made an invention of certain new and useful Improvements in Boiler-Fronts; and I do hereby declare that the following is a full, clear, and exact description and specification of the same.

This invention relates to a new method of constructing boiler-fronts and similar structures wherein the least weight is combined with the greatest attainable strength, in which advantage is taken of the forms and finish possessed by the ordinary shapes of rolled wrought-iron—such as I-beams, channel-beams, angle-iron, T-iron, and plate-iron—to build up a frame-work which shall, without further surface finish, be suitable to hold in position and form tight joints with the panel-work and doors by which the openings in the frame-work are closed. The doors shut against the outside surfaces, while the panels are held in position and made tight against the inside of the flanges of the rolled metal, the combination forming a light and durable structure, requiring a small amount of labor to fit it together, and one not liable to crack or warp out of shape through differences of temperature.

In the drawings, Figure 1 is a front view showing frame-work with part of the doors and panels in position, *a a* being the horizontal and *b b* the vertical members of the frame-work; *c*, the vertical T-iron covering the joint of abutting panels *d*. *e e* are enlarged views of the locking-handles which fasten the doors *f f*. *g g* are the bases into which the vertical members are fitted. Fig. 2 is a sectional elevation of my boiler-front, with details. Figs. 3 and 4 are enlarged details showing the method of securing the panels *d* in place, also the adjustable hinges *h h* and the rider I on the door *f*. Figs. 5, 6, and 7 show the adjustable hinge *h* fitted to different constructions of columns, in all of which the outer flanges of the column are recessed to receive the hinge. Figs. 8 and 9 show the skeleton frame-work with the rockers J in position between the brackets *k* on the boiler *l* and the sole-plates *m m*. Fig. 10 is a detail of the sole-plate, and Fig. 11 a detail of the rocker. Figs. 12, 13, and 14 are horizontal sectional views of my boiler-front.

The frame-work consists of two vertical side pieces or columns resting on suitable bases or foundations, and connected together at their upper ends and at about the center of their height by cross-beams, the whole being held together by suitable angle-plates or brackets riveted or bolted, said columns and cross-beams to be made of the ordinary forms of rolled iron. In small-sized structures each vertical column is made up of a single piece of rolled iron, ordinarily termed a "channel-beam." Where greater strength is required, I-beams are used instead, and where still greater strength is desired built-up columns made of two channel-beams and two plates riveted together to form a box-column can be used, or of three plates riveted together in the shape of an I-beam by means of four angle-irons, substantially as shown in details. It is preferable that the flanges of the column, irrespective of the method in which it is built up, be turned to the outside for the greater convenience of fitting the hinges to them. The cross-beams can also be made up in the same manner, according to sizes, dimensions, &c., the main object in the frame-work being to make use of the smooth straight surfaces of the rolled-iron frame-work against which to fit the doors and panels of the structure, without having to expend any labor beyond that which has already been expended on the raw material. To accomplish this the outside faces of the vertical and horizontal members of the frame-work are brought flush with each other, and form at their upper portion a continuous seat for the door or doors that close the upper opening to shut against. The panels which close the space between the two columns and the lower horizontal beam are held in position by being placed back of the flanges of the before-mentioned beam and columns. Where the width between columns is greater than can be conveniently cast in a single panel, two or more can be used, and their juncture covered by a vertical T-iron fastened to the under side of the lower cross-beam, extending down to and into the floor below. These lower panels, carrying the fire and ash-pit doors, are held in position against the before-mentioned flanges by projections on the base-pieces, into which the columns set, at the bottom, and at the top by the angle-pieces which connect the lower cross-

beam to the columns. This arrangement allows the door-pieces to adjust themselves to the different temperatures to which they are subjected without straining or cracking them. In some cases it is preferable to continue the upper cross-beam beyond the columns, and provide anchor-bolts for securing the ends to the wall, as shown. Anchor-bolts may also be provided at other points, if desirable. In some cases it is desirable to support the weight of the boiler on either the upper or lower cross-beam, in which event it can be made of sufficient strength for that purpose. To avoid throwing any strain on the front by the lateral expansion of the boiler, it can rest on small rollers, or preferably on the device hereinafter described.

The doors which close the upper openings are supported by hinges of peculiar construction, the stationary part of the hinge, that is fastened to the column, being in the form of a plate of sufficient width to reach across and bear against both flanges of the column, the end projecting beyond the seat against which the door shuts being provided with a pintle to fit into the hinge on the door, or else with a socket through which an ordinary hinge-pin can be passed. To secure the stationary half of the hinge in position on the column, a shallow recess is cut into each of the vertical flanges of the column, into which the before-mentioned plate is fitted, being held in position by a single bolt that passes through the plate and the vertical web of the column. The recesses that are cut into the flanges of the column prevent the hinge from being displaced vertically, while by the use of a single bolt passing through an elongated hole in the hinge the position of the hinge-center can be varied to match the distance from the face of the door. When doors are tightly fitted to place when cold, heating them up, as in a boiler-front, throws a heavy strain upon the hinge-pin, and by forcing the door from its seat on the edge opposite the hinges causes serious leaks of air, which cool down the furnace. To avoid this quite a large amount of clearance is provided in the holes in the door-hinges through which the hinge-pins pass, so that when the doors are shut against their seat they can be firmly pressed against it by means of the locking-handles situated at the top and bottom of each door in the center of its width, the vertical position of the door when shut being determined by the lugs on the inside of the door, which ride up on the cross-beam forming the lower seat, and by the hinges upon which the outer edge is supported, while the contact of the door with its seat is wholly determined by the locking-handles, top and bottom. These locking-handles may engage with the flanges of the cross-beams themselves, or with angle-irons riveted in position to serve the same purpose, the face of the latch which engages with the flange being made inclined or wedge-shaped, as at e' in the detail in Fig. 1, so as to force the door tightly against its seat when thrown into position. When the weight of the boiler is carried upon the front, it becomes necessary to use some device which will avoid strains being thrown upon it by the elongation of the boiler through differences in temperature. In ordinary practice small rollers have been generally used for such purposes; but these are very apt to become blocked by any small accumulation of dust, or will not revolve if not perfectly true. To avoid this angle-pieces are riveted on each side of the boiler of sufficient strength to sustain the weight, having a pocket or slight depression formed on their under side. These angle-pieces are preferably riveted on the shell of the boiler at about its center. Directly below them, when the boiler is brought in position, sole-plates having corresponding depressions are laid upon the cross-beam, and between the angle-pieces on the drum and the sole-plates on the beam rockers formed of cast or wrought iron are placed, having rounded ends to fit into the depressions in the angles and plates, said rockers being of sufficient length to keep the bottom of the boiler clear of the upper side of the cross-beam. When any movement of the drum takes place through expansion, these rockers act as rollers upon which the drum can go and come without throwing any strain upon the front itself.

I claim as my invention—

1. In a boiler-front, the combination of two vertical flanged beams and two horizontal beams fastened together by angle-pieces, bolts, and rivets, the flanges of such vertical and horizontal beams being brought together in the same plane, in combination with one or more vertical T-irons, substantially as and for the purpose described.

2. In a boiler-front, the combination of two vertical flanged beams and two horizontal beams fastened together by angle-pieces, bolts, and rivets, the flanges of such vertical and horizontal beams being brought together in the same plane, in combination with the doors and panels adapted, respectively, to close the openings in the upper and lower divisions of said frame-work, substantially as and for the purpose described.

3. The combination of an adjustable hinge, flanged column, recessed to receive said hinge, and retaining-bolt, substantially as and for the purpose described.

4. The sustaining-brackets secured to the boiler, the sole-plates, and the intermediate rockers, substantially as and for the purpose described.

5. In a furnace-door provided with loosely-fitted hinge-pins, the rider and locking-handles at top and bottom, substantially as and for the purpose described.

NAT. W. PRATT.

Witnesses:
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J. W. LAWSON.