(No Model.)

C. METTAM.

Fire Proofing Iron Column.

No. 230,316. **Patented July 20, 1880.**

Fig. 6.

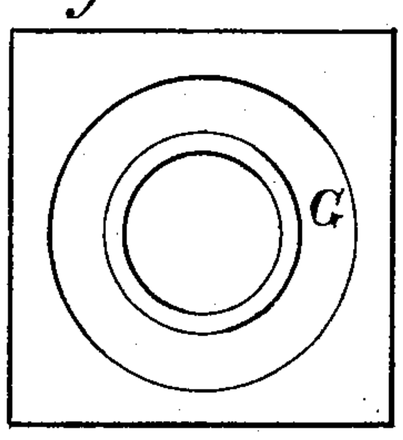

Fig. 7

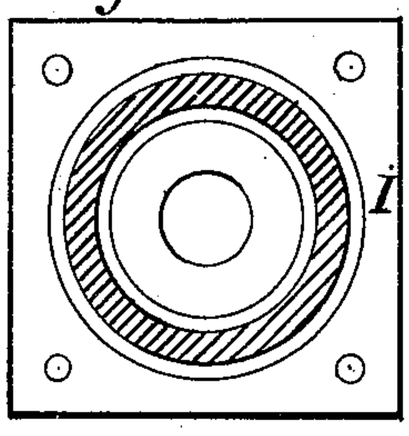

Fig. 1.

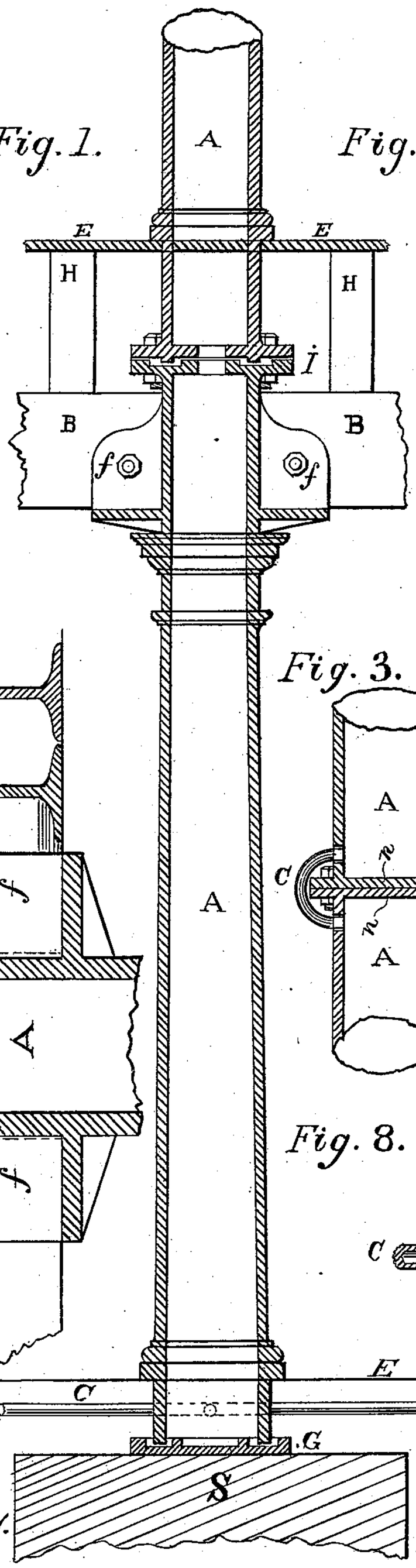

Fig. 2.

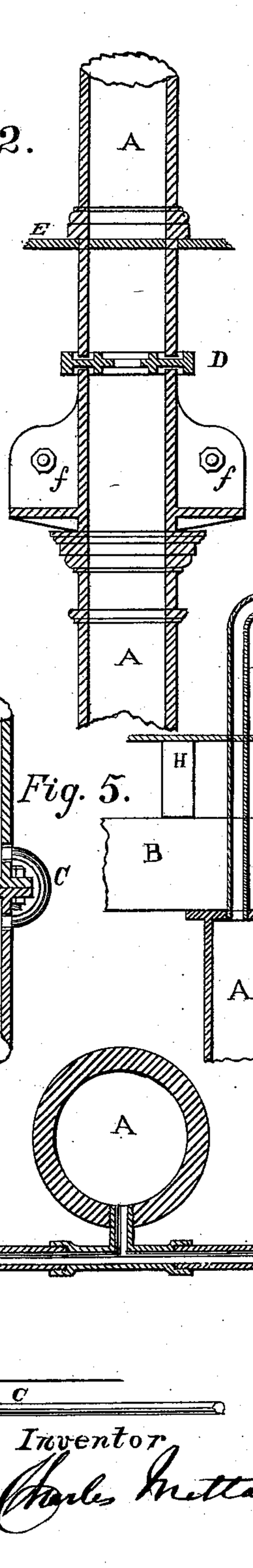

Fig. 4.

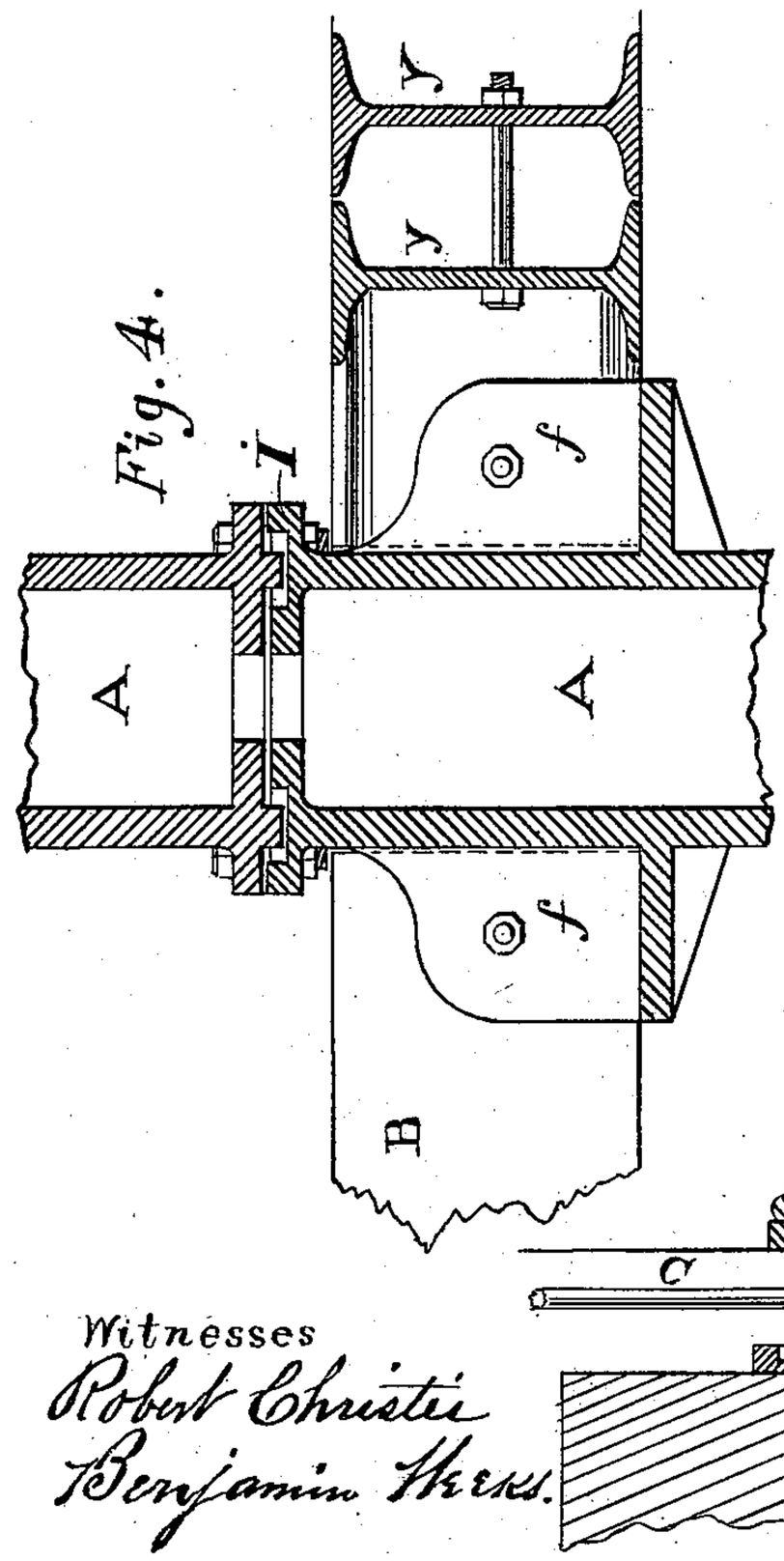

Fig. 3.

Fig. 5.

Fig. 8.

Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES METTAM, OF NEW YORK, N. Y.

FIREPROOFING IRON COLUMNS.

SPECIFICATION forming part of Letters Patent No. 230,316, dated July 20, 1880.

Application filed April 14, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES METTAM, architect, of No. 395 Canal street, in the city of New York, in the county and State of New York, have invented a new and useful Improvement in Fireproofing Iron Columns, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a tier of columns, partly in section. Fig. 2 is a section showing a different mode of connection between the columns. Fig. 3 shows a pipe-connection between the columns. Fig. 4 is an enlarged section of the connections between the columns of Fig. 1, and also illustrates the use of either wooden or iron girders. Fig. 5 shows a vent-pipe extending from the top of a column out through the roof. Fig. 6 is a plan of a bottom plate. Fig. 7 is a plan of a top plate, and Fig. 8 is a cross-section of the column at the base, as shown in Fig. 1.

A A are iron columns. B is a girder. C is a water-pipe. D is a connecting-plate. E is the floor. F is a bracket to support the ends of the girder. G is the bottom plate of the girder. H is a floor-beam. I is the upper portion of the column. R is a vent-pipe. S is a stone pier. Y is an iron girder.

Similar letters of reference indicate corresponding parts.

The object of my invention is to fireproof the ordinary hollow iron columns of a building by filling them with water, so that in case of fire the columns will remain comparatively cool, and therefore perfectly safe from the usual disastrous effects of heat, and at the same time they shall be free from the danger of exploding from the steam arising from the water within when the columns are heated, and also free from the danger of bursting by the water therein becoming frozen.

It is well known that ordinary cast-iron columns, when exposed to fire and water, (as in a burning building,) are very liable to snap and give way without a moment's warning. Firemen are particularly afraid of venturing in a burning building where the floors are supported by iron columns, and insurance companies have done all in their power to discountenance the use of iron columns and get used in their stead wooden columns or brick piers; but on account of their vast sustaining strength and their extreme sightliness, as well as their adaptability for ornamentation, iron columns are, and doubtless will continue to be, with constructers the favorite mode of supporting the girders and floors of warehouses and other buildings.

Various devices have been resorted to in fireproofing columns, such as making columns double, one inside the other, and filling the space between with plaster, also incasing the columns on the outside with scagliola and other cement or burnt-clay veneers. These plans are not only expensive, but they increase the size of the columns and render them undesirably large.

By my system of fireproofing I do not in any way alter the outside appearance of the columns. To the eye they are unchanged. Whatever diameter of column and thickness of metal an architect would require is still adhered to. Take, for example, a modern store or warehouse: On each story a central line of columns supports the girders and floor-beams. The columns stand one on top of the other, an iron plate intervening. The columns in the basement are usually fourteen inches in diameter, those in the first story twelve inches, in the second and third stories ten, in the fourth and fifth stories eight inches in diameter, and all having a usual thickness of one inch of metal.

My drawings illustrate this style of construction—namely, one column standing upon the other, A A, and an intermediate plate, D, as shown in Fig. 2. At the bottom of each of the lower columns I drill and tap a hole and screw in a short piece of wrought-iron pipe. Connecting these branches, I run a supply water pipe, so that when water is supplied to this pipe it will simultaneously pass into the columns.

The connection between the column and the bottom plate I make water-tight with glazier's putty, Portland cement, or by plugging with lead or oakum, &c., the plate itself being made with grooves or with raised projections or ledges, so as to retain the packing in place. Where one column stands on the other I do the same with the intervening plate—that is, I

provide depressions in the plate to receive the columns, or I make use of raised projections or rings to hold the packing in place.

My own personal preference for a suitable packing is to use simply common glazier's putty on account of its durability, its water-tight qualities, its cheapness, and because it can be obtained everywhere and at any time in market.

In the groove of the plate G, I lay in a body of putty, and when the column is lowered to its place on the plate it squashes the putty tightly underneath the column both back and before, so that almost without further care a water-tight joint is secured. Of course I go farther and carefully see on the outside that a good bed of the putty is pressed around the column at the plate.

The same general remarks apply to the under side of the plate in resting on top of the column.

The connecting-plate is provided with one or more holes in the same, so that the water from the supply-pipe will rise from the basement to the first-story columns, and so on upward.

Almost all warehouses are fitted with a water-tank on the top floor. If I carry the supply-pipe C downward from this tank to the bottom columns, the water in the columns will rise to the level of the water in the tank. In other words, the line of columns will be filled with water nearly or quite to their extreme height. On the other hand, if the supply be taken from the city pipes direct, the height of water in the columns will vary with the pressure in the street service-pipes, say at one time of the day rising up to the fourth story and at another time only to the third story.

The advantage of filling columns with water is this: That in case of fire the columns cannot be seriously injured by heat, and therefore the sustaining ability of the columns is assured. In illustration take a common iron pot in which water is being boiled; the under side of the pot in which the water is boiling may be pressed with the hand without fear of burning. Now, when heat and flame reach and surround the column the water inside commences to heat, and as it heats it commences to circulate, so that, like the pot, the column can scarcely be made so hot that the hand cannot touch it. As the water inside the columns heats up it commences to give off steam, and in order that this confined steam may not cause an explosion in the columns I carry a vent-pipe, R, from the top of the upper column out through the roof, and make a return-bend or goose-neck on the same. This pipe also serves another purpose—that in case the water-level rises above the extreme height of the columns it can find an outlet through the pipe and flow away on the roof without doing any damage.

The water in the columns will not evaporate to any extent. Neither is there much danger from freezing, because a building when occupied is warmed, and when not occupied it is usual to draw off all the water, although in my columns water should always be left, at least in the lower columns, so that in case of fire the steam from the water in these would rise and moisten and keep cool the upper columns.

The supply of water to my columns will be controlled by suitable cocks, and, if desired, small size try-cocks may be attached to one or more of the upper columns, so as always to known what height of water is within, or any of the devices to determine this as usually fitted to boilers.

In applying my system of fireproofing columns by means of an inside water-filling to existing buildings where solid intervening plates are already in, I make a connection between the columns through a pipe or pipes, as shown in Fig. 3.

I propose also (but to be the subject of a future patent) to arrange a valve in the columns at the neck or under the cap, and to conduct a branch from the supply-pipe to the front of the building or street, with a stop-cock and coupling, so that firemen can connect their hose to it, and by this means have many streams of water acting in the center of the building during a fire, the valves so arranged as to stand the pressure of the standing water in the columns, and only to open when the fire-engine is connected by hose to the supply-pipe. The outlet on the roof in this case would also have a check-valve, so that when the pressure of the engine is put on it will close and prevent the water from going out on the roof when in use in the other parts of the building in case of fire.

An incidental benefit of my water-filling will be that sound good castings for the columns will invariably be obtained, for the contractor will take unusual care to make them perfect and of proper thickness throughout, knowing that any doctoring of holes or cracks—a too common occurrence—would eventually be discovered, to the cost of his reputation and pocket.

It will be evident to any engineering mind that any constructor of architectural iron-work can vary the shapes of the plates for the columns and the mode of connecting the columns together in a variety of ways, as well as supplying the water to the columns and in passing the water from one column to another. Such variations of details will occur to almost any architect, engineer, or steam-fitter.

Therefore, while I have shown in my drawings some simple and effective connections, I do not wish to confine myself to the precise details shown; but

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. Hollow metallic columns abutting end to end and provided with passages connecting the interior of said columns, in combination with an inside filling of water, substantially as herein described.

2. Hollow water-filled columns having their abutting ends or flanges made with raised ledges or projections and corresponding depressions, combined with the use of glazier's putty, hydraulic cement, or other suitable packing, to make a water-tight joint, substantially as herein set forth.

3. In combination with a hollow water-filled column or series of abutting and communicating columns, a vent or overflow pipe, substantially in the manner and for the purpose shown and described.

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Witnesses:
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BENJAMIN WEEKS.