

C. L. GARFIELD & J. PATTISON.
Fire-Extinguisher.

No. 217,456.

Patented July 15, 1879.

Fig. 1

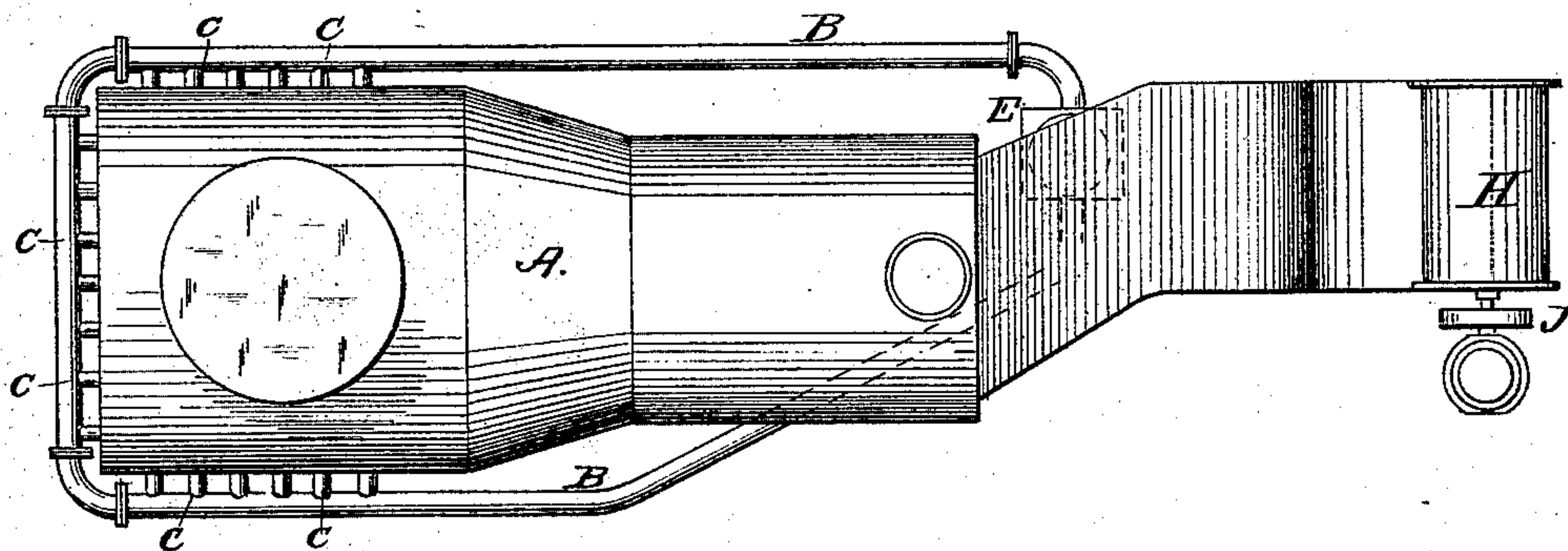
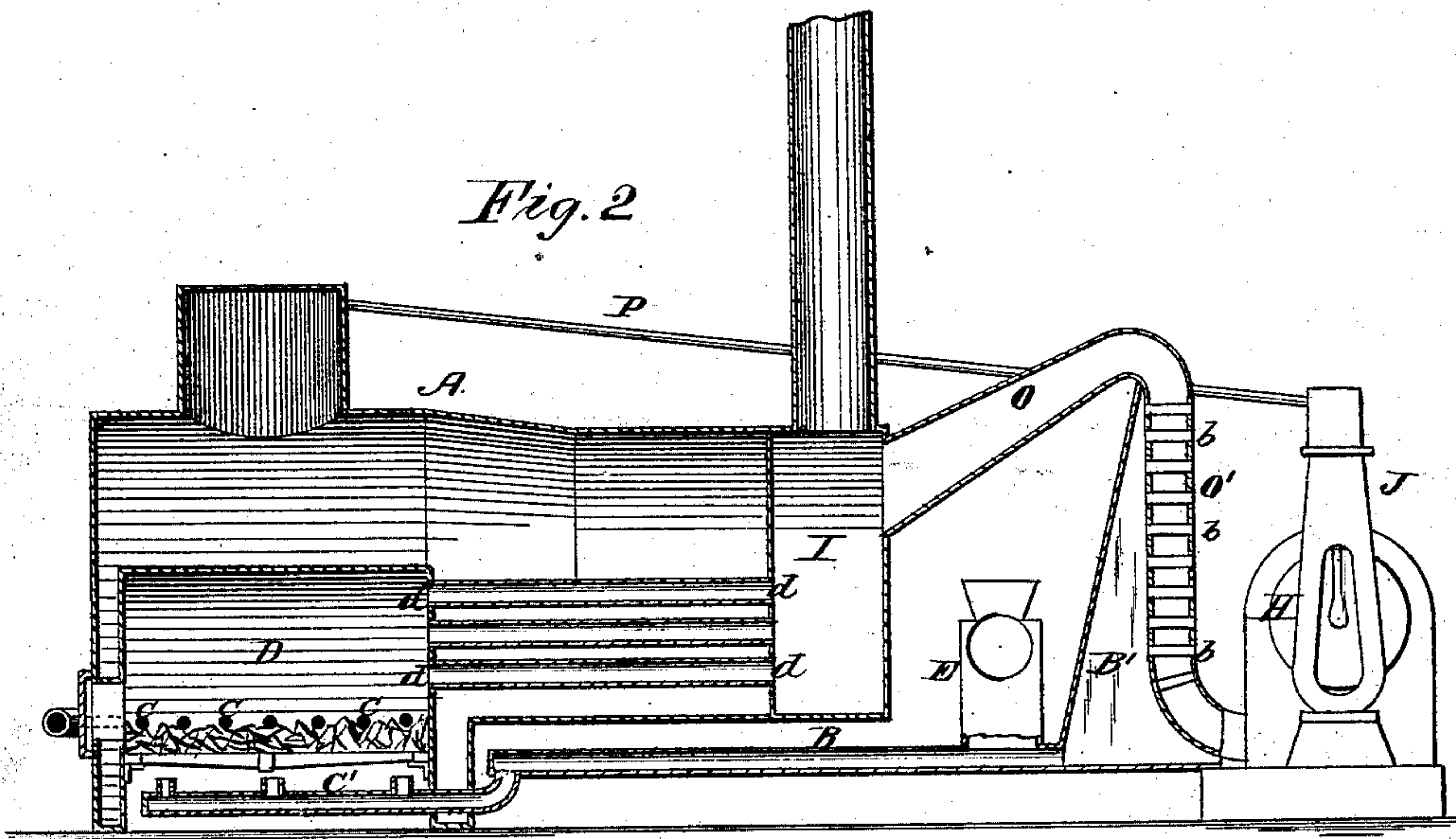


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN FIRE-EXTINGUISHERS.

Specification forming part of Letters Patent No. **217,456**, dated July 15, 1879; application filed June 10, 1878.

To all whom it may concern:

Be it known that we, CHARLES L. GARFIELD and JUAN PATTISON, both of Albany, Albany county, New York, have invented certain new and useful Improvements in Fire-Extinguishers; and we do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top-plan view, and Fig. 2 a longitudinal sectional view, showing the application of our improvements to an ordinary boiler.

Our invention consists, first, in a new process of manufacturing fire-extinguishing gases—namely, by introducing finely-powdered carbonaceous material mixed with atmospheric air in proper proportions into the combustion-chamber of a furnace, through or above, or both through and above, the fire therein, drawing off the gases and other products evolved in said combustion-chamber by means of an exhaust, and forcing the said gases and products so drawn off directly to the fire to be extinguished, or to suitable storing-chambers or tanks for future use; secondly, in the peculiar means and appliances for carrying said process into effect, which will be more fully described hereinafter.

In the drawings, A represents a steam-boiler and furnace of the ordinary construction, such as is used for marine and stationary engines.

B B are pipes or ducts having communication with the open air through a trunk, B', and tubes or flues *b*, and provided with numerous lateral distributing-pipes C C, which pass through the walls of the furnace and boiler and open into the combustion-chamber D above the fire. Said pipes B B are further provided with a branch, C', which extends into the space beneath the grate and admits draft to the fire from below.

E is a grinding or pulverizing mill, of any preferred construction, for reducing the charcoal or other carbonaceous material employed to a fine impalpable powder, and arranged to deliver said carbon in its reduced state directly into the conducting-pipes B B.

H is an exhaust-fan, connected by a suitable

pipe, O, to the smoke-box I of the furnace, and adapted to draw the gases and other products of combustion through the boiler-flues *d*, and thus create a strong draft for the fire. The fan H is driven by an engine, J, preferably supplied with steam from the boiler A through a pipe, P, and the fan in turn drives the mill E by means of a belt or other proper connection.

The application of the foregoing-named parts, it will be observed, does not in the slightest prevent the furnace and boiler from performing their ordinary functions. When fire is discovered, steam is admitted to the engine, and the fan is made to rotate at a high velocity, thus causing a powerful draft through the furnace. At the same time the mill commences operation, and the carbonaceous material, reduced to a fine powder, passes into the pipes B B, and there becoming mixed with the inflowing atmospheric air is carried by the latter through the distributing-pipes C C into the combustion chamber D above the fire, and also by the branch C' into the space beneath the grate, and thence up through the fire.

The sudden introduction of the powdered carbon and atmospheric air greatly augments the volume of gases evolved by the fire, and said gases are rapidly drawn off by the fan and forced by the latter to the point of delivery. As the gases pass down the vertical portion O' of the conducting-pipe O they come in contact with the tubes *b b*, through which the inflowing air is passing on its way to the furnace, and are considerably reduced in temperature thereby.

It will thus be seen that the tubes *b b* effect the double purpose of warming the air before its entrance into the furnace and cooling the gases prior to their delivery for use.

We do not, of course, desire to limit ourselves to this particular arrangement for effecting these results, as any other may be employed without departing from the principle of the invention in this regard.

The invention is applicable to all classes of furnaces, though we have designed it especially for use on shipboard. Where a number of boiler-furnaces are employed each may be provided with pipes for conducting the

combined carbon and air, and all connected with a common grinding-mill and with a common exhaust and forcing fan, so that when it is desired to extinguish a fire one or more of the brightest and hottest fires may be selected in which to manufacture the gases.

The proportion of carbonaceous material mixed with the air to produce the best results we have found to be, approximately, one ounce of carbon to one cubic foot of air, which, from the purity of its constituents, the proportions in which they are mixed, and the intimacy of the admixture, produce instantaneous combustion.

It is evident that other modes than that herein described may be practiced for carbonizing the air to produce the augmented volume of gases in the furnace, as, for example, by atomizing any of the hydrocarbon oils, and intimately commingling said atomized product with the air on its way to the furnace in any suitable manner.

We do not, broadly, claim herein the combination of a deoxygenating-furnace, pipes for supplying air to said furnace, a fan for forcing the deoxygenated air to the point where it is desired to be used, and a steam-boiler and engine for driving the fan and reducing the temperature of the deoxygenated air; nor do we broadly claim a cooler located between the furnace and fan for further lowering the temperature of the deoxygenated air.

We claim as our invention—

1. The process herein described of manufacturing and utilizing fire-extinguishing gases—namely, by introducing finely-powdered carbonaceous material mixed with air in proper proportions into the combustion-chamber of a

furnace, through or above, or both through and above, the fire therein, drawing off the gases and other volatile products evolved in said combustion-chamber by means of an exhaust, and forcing the said gases and products so drawn off directly to the fire to be extinguished, or to a suitable storing-chamber.

2. The combination, with a furnace, of suitable pipes for conducting carbonaceous material mixed with air to the combustion-chamber of said furnace and a fan for drawing off the gases and other volatile products from said combustion-chamber and forcing the same to the place of use.

3. The grinding-mill E, connected with the air-conducting pipes B B, so as to deliver the finely-powdered carbonaceous material directly into the inflowing atmospheric air on its way to the combustion-chamber of the furnace, substantially as described.

4. The combination, with the furnace, of the pipes B B C, grinding-mill E, and fan H, substantially as described, for the purpose specified.

5. The branch-pipe C', for delivering the carbonized air beneath the grate of the furnace, for the purpose specified.

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