

No. 774,121.

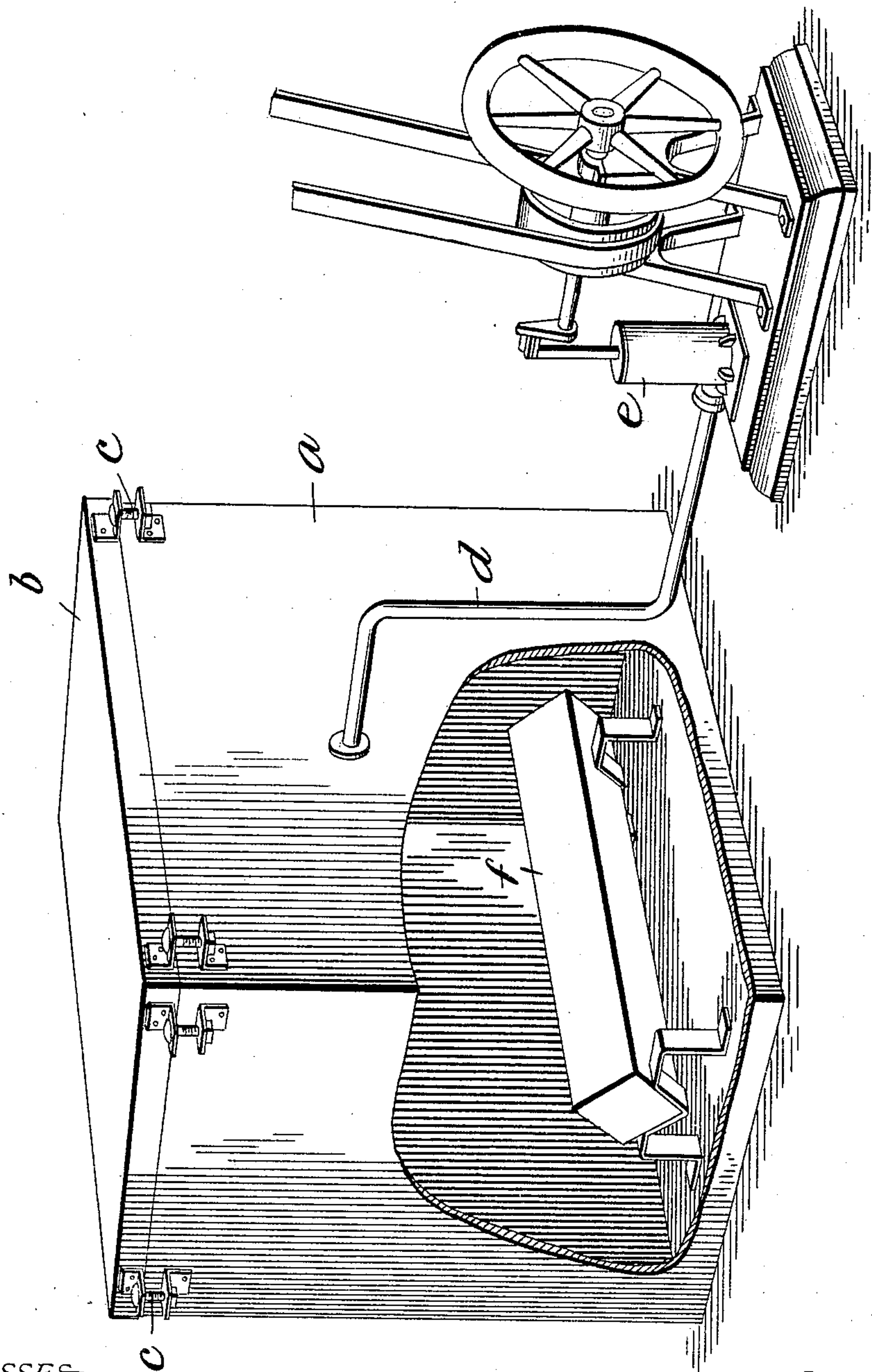
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C. H. WEIGELT.

PROCESS OF POLISHING AND FINISHING LIMESTONE, MARBLE, &c.

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NO MODEL.



WITNESSES.

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PROCESS OF POLISHING AND FINISHING LIMESTONE, MARBLE, &c.

SPECIFICATION forming part of Letters Patent No. 774,121, dated November 1, 1904.

Application filed January 26, 1903. Serial No. 140,655. (No specimens.)

To all whom it may concern:

Be it known that I, CURT HEINRICH WEIGELT, professor, a subject of the German Emperor, residing at 3 Pariserstrasse, Berlin, Germany, have invented new and useful Improvements in Processes of Polishing and Finishing Limestone, Marble, and the Like, of which the following is a specification.

My invention relates to a process for polishing and finishing limestone, marble, and the like in which highly-diluted acids are used.

The polishing of stone is generally intended to give it a smooth bright surface, rendering it better able to resist atmospheric influences and also improving its appearance. The rough surfaces produced by the cutting or sawing of blocks of stone, owing to the unevenness of their surface, offer a great surface for the action of the air. If the uneven rough portions are removed, the surface exposed to the action of the atmosphere becomes smaller and the stone is rendered more durable. Hitherto this has been effected by mechanical grinding or polishing. The surfaces to be polished were sharply rubbed with a piece of stone of the same kind, some of the dust produced during the sawing being interposed between the two surfaces. The larger uneven portions were thus removed, while the smaller ones were removed by means of emery or fine sand, and the surface rendered perfectly smooth by polishing mediums, generally oxid of iron. This treatment of stone required much labor and time.

By means of the present invention the same object is attained in a much shorter time and the polish produced, whatever be the shape of the stone, is much superior to that attained by the ordinary polishing processes. The removal of roughness is effected according to this process in a chemical way. Marble, more particularly certain kinds of carbonate stones the appearance of which is scarcely improved by the ordinary polishing, is rendered by this process so attractive that it may be used for decorative purposes in buildings and for artistic purposes. For instance, Rüders-

dorfer limestones if etched with hydrochloric acid of a strength of 1.5 per one thousand take a very nice appearance.

The main feature of this invention consists in producing on the stone to be polished a perfectly smooth surface without any hand labor. This is a great improvement, especially as it at the same time enables even convex or projecting surfaces to be polished in a uniform manner. An essential condition for the proper carrying out of the polishing process is the continuous removal of the gas-bubbles generated on the polishing-surface. If they are not removed at once, they cover the surface to be polished, and thus prevent any further action of the acids. The surface then becomes covered with pits, spots, or stripes. The removal of the bubbles is effected by keeping the acid in continual movement. The movement of the liquid causes the bubbles generated to be continuously removed. Another method of removing the bubbles would be to carry on the process in a vacuum. Owing to the vacuum, the bubbles grow rapidly and are drawn to the surface of the liquid, the latter then becoming agitated in the same way as water does when boiling.

In the accompanying drawing the figure shows a practical manner of carrying on the process with a vacuum.

In the drawing a vessel *a* is employed which is capable of being closed by a cover *b*, so as to render the same practically air-tight. The edges of the cover are drawn tightly to the walls of the vessel by screws *c* for the purpose of securing such an air-tight joint. The vessel *a* is provided with any suitable supports arranged interiorly thereof for holding the stone *f* therein. In treating a stone the vessel is usually filled about one-half full with diluted acid. From the upper part of the vessel *a* is extended a pipe *d*, which connects the vessel with the cylinder of an air-pump *e*. The pump may be of any usual or desired type and when set into operation continuously draws off the developed gases in the casing, thus tending to maintain a vacuum in the

closure *a*. It will be readily seen that from this means the bubbles collecting upon the stone can be rapidly drawn to the surface of the liquid, causing an agitation thereof and
5 at the same time keeping the surface of the stone comparatively free of such bubbles and subject to an even action of the acid.

The etching or polishing of the stone is effected in the following manner: The stone is
10 put in a bath of acid and left there for a certain time. The stones will be palpably rough or perfectly smooth, according to the length of time of immersion. Care must be taken to keep the bath in a state of continuous move-
15 ment in order that all the surfaces exposed to the action of the acid should become uniformly etched. This movement of the bath can be effected in various ways. If it is desired to have at some points a deep or relief-
20 like appearance or if it is desired to have portions more or less highly polished, then they can be covered during the whole process or

part by any substance which is insoluble in the acid.

Having now particularly described and as- 25
certained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

The process of producing a glazed or finished surface upon carbonate stone, consisting 30
in subjecting the surface to the action of dilute hydrochloric acid and agitating the same to prevent gas-bubbles from continuing on said surface, the operation being carried on in a vacuum for rendering the result of the 35
process more perfect.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CURT HEINRICH WEIGELT.

Witnesses:

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