(No Model.)

G. LIGOWSKY.

POTTERY APPARATUS AND PROCESS FOR WORKING THE SAME.

No. 246,161. Patented Aug. 23, 1881.

FIG. 1.

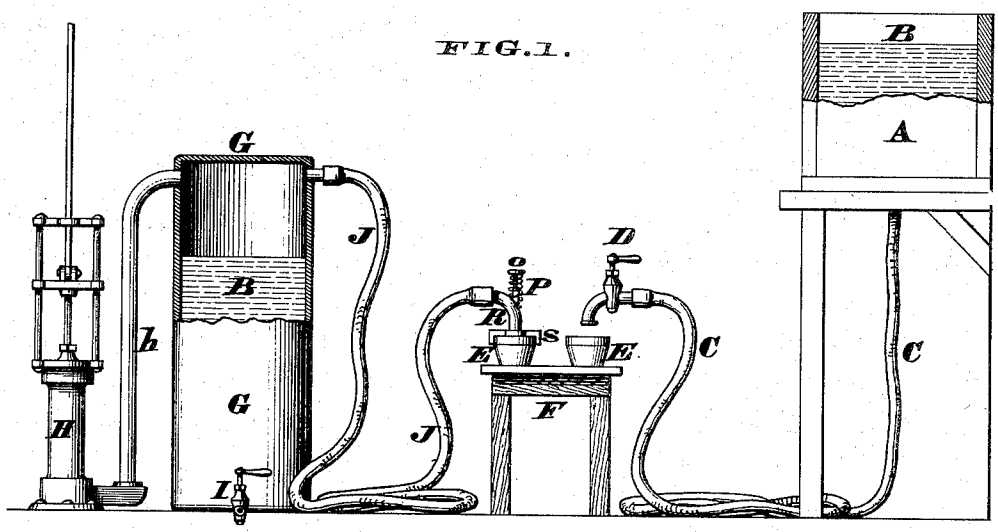

FIG. 2.

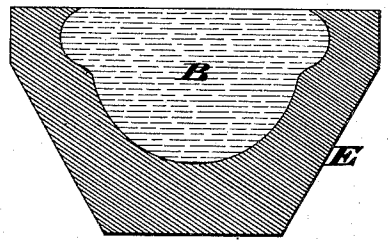

FIG. 3.

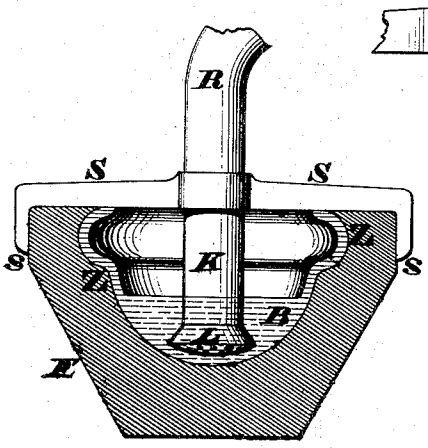

FIG. 4.

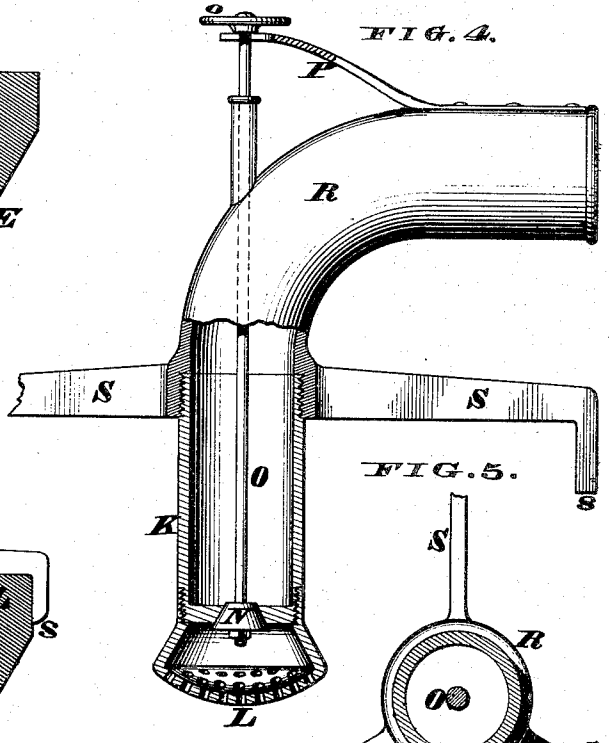

FIG. 5.

Attest:
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UNITED STATES PATENT OFFICE.

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POTTERY APPARATUS AND PROCESS FOR WORKING THE SAME.

SPECIFICATION forming part of Letters Patent No. 246,161, dated August 23, 1881.

Application filed June 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE LIGOWSKY, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Process and Apparatus for the Manufacture of Pottery, of which invention the following is a specification.

The first part of my invention comprises a novel process of removing the superfluous material from those molds which are charged with a semi-fluid commonly known as "slip." This process consists in allowing the slip to remain in the molds or flasks only as long as may be necessary to secure a proper deposit of material therein, and as soon as this result has been accomplished the remaining slip is exhausted by means of a vacuum produced, preferably within a suitable receiver or vessel, by a pump or any other convenient appliance. From this vacuum-vessel a hose or flexible tube having a valve or cock or other cut-off device extends to the bench or table upon which a row of filled molds are set, and as soon as this tube is placed in one of said molds and the cock opened the superfluous slip is instantly drawn out, as hereinafter more fully described.

The second part of my invention comprises certain novel devices for carrying this process into operation, the principal appliance being a peculiarly-constructed suction-tube that enters the mold and draws off the slip, said tube being so arranged as to leave any desired thickness of material at the crown of the article produced. Furthermore, this suction-tube is so arranged as to occupy an exactly central position when inserted in the mold, and is provided with a valve capable of being readily opened at will, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a representation of the general arrangement of my preferred construction of apparatus, the upper portions of the slip-reservoir and vacuum-vessel being sectioned. Fig. 2 is an axial section of a mold filled with slip, or any equivalent semi-fluid material capable of being used for the manufacture of pottery. Fig. 3 is another axial section of said mold, but showing the suction-tube inserted therein and the superfluous slip partially withdrawn. Fig. 4 is an enlarged sectionized elevation of the suction-tube detached from its hose-connection. Fig. 5 is a transverse section of said tube.

A represents a tank or reservoir, into which the slip B may be elevated with a pump or otherwise. Proceeding from this reservoir is a hose or other flexible tubing, C, of such length as to reach all the molds that are to be charged. The free end of this hose has a faucet or valve, or other convenient device, D, wherewith to control the flow of slip into the various molds or flasks, E, which latter are preferably arranged in two or more parallel rows on a long table, bench, or other suitable support, F.

G represents a vacuum-vessel, from which the air is drawn by a pump, H, or other exhauster, said pump being operated either by hand or power, as may be most convenient. This pump has a suction-pipe, *h*, entering near the top of said vacuum-vessel, as shown.

I is a drain-cock for drawing off the slip as soon as it reaches a certain height in the vessel G, which level may be determined with a common glass gage, or otherwise. Attached at or near the top of this vessel is a hose or flexible tubing, J, having a suction-nozzle, K, constructed as shown in Fig. 4. This nozzle or tube K has at its receiving end a perforated strainer or rose, L, which allows the slip to flow in as soon as the valve N is opened, said valve being seated in a head of said tube, and being provided with a stem, O, carrying a button or knob, *o*, at its exposed end. Valve N is maintained in its normal or closed position by a spring, P, which may be a simple leaf or plate, as shown in Fig. 4; or said spring may be coiled around the outer portion of stem O, as represented in Fig. 1, or it may be otherwise arranged.

Suction-tube K can be screwed into or out of an elbow, R, which device is furnished with radial arms S, having downward prolongations or lugs *s*. Of these arms three are preferably used, as indicated in Fig. 5.

My process is carried into operation in the following manner: The tank A being filled with slip B, the molds E arranged on the table F, and a suitable vacuum produced in the exhauster G, the potter then proceeds to fill each of said molds, which act is accomplished by simply opening the faucet D and allowing the proper quantity of slip to flow through the hose C. Owing to the flexible nature of this hose, all of the molds can be reached and readily filled in a few minutes, and as soon as the

material has set and formed a suitable deposit on the interior of the mold the potter then inserts the suction-tube K in the mold, opens the valve N by depressing its stem O *o*, and the superfluous slip is at once drawn through the hose J and discharged into the exhauster G. This stage of the process is clearly illustrated in Fig. 3, a reference to which illustration will show the slip adhering to the upper part of the mold at Z, while the slip in the lower portion thereof is being drawn off. This illustration also shows the arms S resting on the top of the mold and serving as stops that prevent the tube K reaching too near the bottom of the mold, and by simply screwing said tube out of or into the elbow R the rose L can be caused to approach or recede from the bottom of mold E. Consequently the thickness of the crown of the article being made can be regulated with the utmost nicety. Furthermore, this illustration shows that the lugs *s* fit snugly over the sides of the mold, and thus centralize the tube K in the most perfect and expeditious manner. The thickness of deposit in the mold will, of course, depend on the consistency of the slip, the materials of which it is composed, and the porosity of the mold E, which latter may be made of plaster-of-paris, so as to absorb the water in the slip quite rapidly. The slip having been thus exhausted from one mold, the potter then removes the pressure from the button *o* and allows the valve N to reseat itself while the suction-tube K is being removed and inserted in the adjacent mold, and these operations are repeated until all the molds are emptied of their superfluous slip, as above described. The molds, with their adhering contents, are then removed to a drying-room, and subsequently handled in the manner well known to all potters, the contraction incidental to drying causing the articles to be readily liberated from the flask. After the exhauster G has become nearly filled the cock I is opened, the slip drawn off and then returned to tank A, thereby preventing any waste of material. It will thus be seen that the slip does not enter the pump H, and therefore there is no danger of its valves and packing being destroyed by the gritty materials in the fluid; but in some cases the exhauster may be dispensed with and the slip be drawn directly out with a special pump adapted for such service; or the withdrawal of the superfluous slip may be effected with a vacuum produced in any manner whatever, as my invention is not to be limited to any special appliances or devices for effecting the vacuum. Neither is it to be limited to any special kind of slip, or shape, or size of material produced in the molds. Finally, a series of suction-tubes can be attached to one hose, in order that the opening of a single valve will exhaust a number of molds of their superfluous slip at one operation.

I claim as my invention—

1. The within-described process of exhausting superfluous slip from a mold by means of a vacuum, after a suitable deposit of material has formed within said mold, for the purpose stated.

2. An improved pottery apparatus, consisting of an elevated receptacle for containing slip, a hose for conducting said fluid to the molds, a suction-tube and hose for exhausting the superfluous slip therefrom, and a suitable device for producing a vacuum, substantially as described.

3. An improved pottery apparatus, consisting of the elevated receptacle A, valved hose-connection C D, suction-pipe K L N, flexible tubing J, exhauster G, and pump H *h*, or its equivalent, for the purpose herein described.

4. The combination of suction-tube K L, valve N, stem O, and external retractile spring, P, as herein described.

5. The suction-tube K L, adjustable with reference to the elbow R, for the purpose described.

6. The combination of adjustable suction-tube K L and elbow R, which latter is provided with radial arms S, having lugs *s*, for the purpose explained.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE LIGOWSKY.

Witnesses:

JAMES H. LAYMAN,

SAML. S. CARPENTER.