2 Sheets—Sheet 1.

R. H. KENT & J. A. BALDWIN.

Manufacture of Earthenware Vessels.

No. 197,864. **Patented Dec. 4, 1877.**

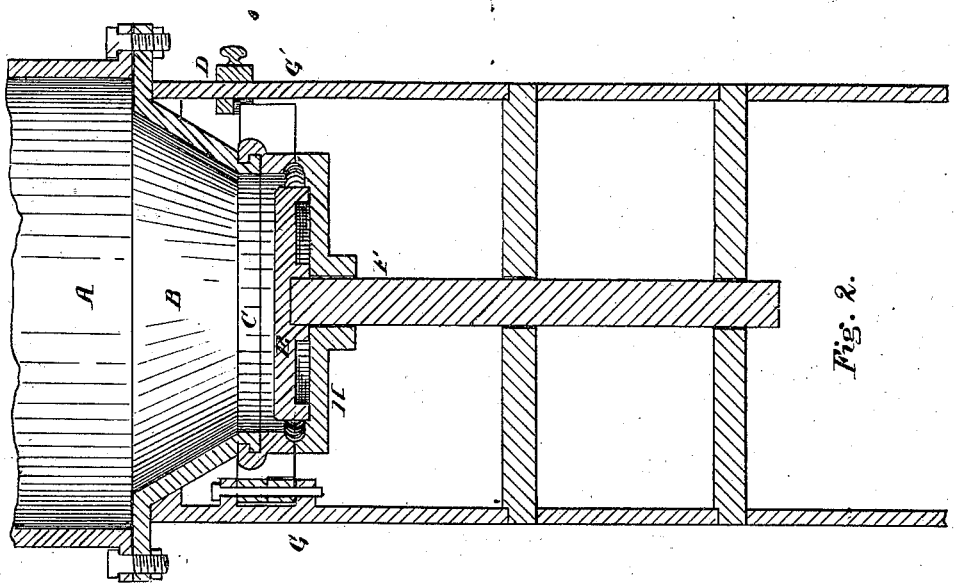

Fig. 2.

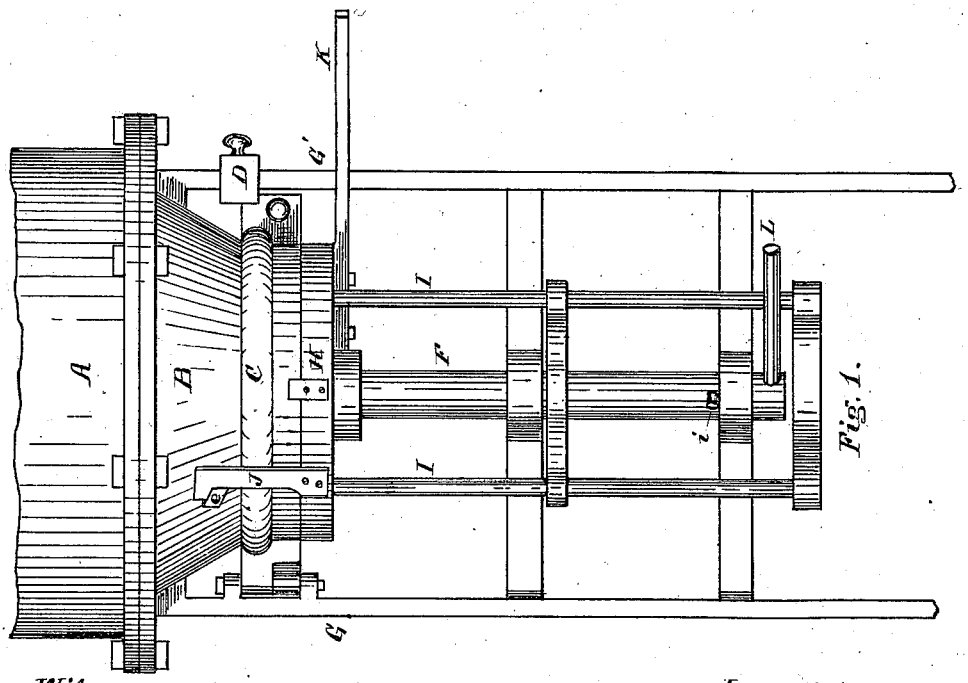

Fig. 1.

Witnesses:

Geo. S. May

James V. Welsh

Inventors:

Russell H. Kent

Joseph A. Baldwin

by Humphrey & Stuart, their Attys.

2 Sheets—Sheet 2.

R. H. KENT & J. A. BALDWIN.

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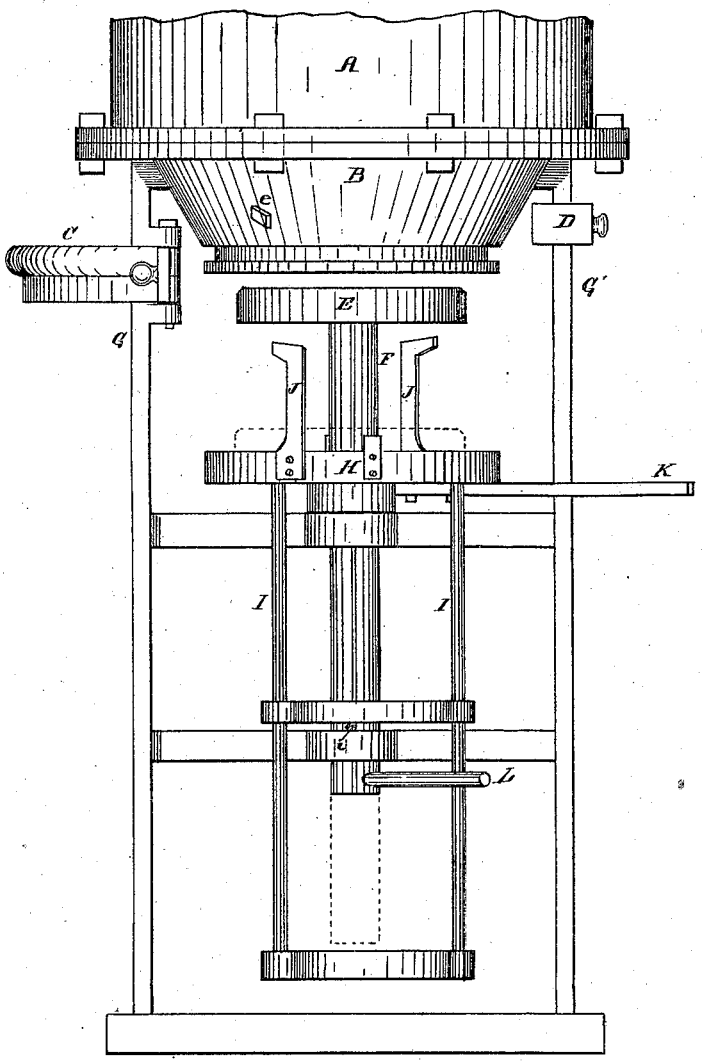

Fig. 3.

Witnesses:

Geo. S. Mack

James V. Welsh

Inventors:

Russell H. Kent

Joseph A. Baldwin, by

Humphrey & Lucas,

their Attys.

UNITED STATES PATENT OFFICE.

RUSSELL H. KENT AND JOSEPH A. BALDWIN, OF AKRON, OHIO, ASSIGNORS TO THE BUCKEYE SEWER PIPE COMPANY, OF SAME PLACE.

IMPROVEMENT IN MANUFACTURE OF EARTHENWARE VESSELS.

Specification forming part of Letters Patent No. **197,864**, dated December 4, 1877; application filed September 1, 1877.

To all whom it may concern:

Be it known that we, RUSSELL H. KENT and JOSEPH A. BALDWIN, of the city of Akron, in the county of Summit and State of Ohio, have invented an Improvement in the Manufacture of Earthenware Vessels, of which the following is a specification:

This invention has relation to that method of manufacturing earthenware vessels having straight sides wherein the bodies are formed of sections of clay tube made by forcing the clay, while in a plastic state, through an annular space formed by suspending within a circular discharge-orifice of the receptacle from which the clay is pressed an inner die or mandrel of proper size and shape to form the interior of the crock-body, upon which bodies bottoms are subsequently placed by a separate process.

The object of our invention is to form the crock entire before removing it from the press; and we accomplish this by supporting the mandrel which forms the interior space of the crock from without the clay-receptacle, instead of from within, as has heretofore been the custom; forming its inner end of the proper shape to afford a die for the interior of the crock-bottom, and, when the body has been forced with the mouth foremost to the desired length, arresting its flow, and, while it is still connected with the mass of clay remaining within the press, cutting across the mass of clay inside of the inner end of the mandrel at such a distance therefrom that a layer of clay of suitable thickness to constitute a bottom for the crock shall remain connected with the body; and by subsequently withdrawing the mandrel to enable the completed crock to be removed.

The machinery by which this operation is accomplished is fully illustrated in the accompanying drawings, Figure 1 thereof representing the press closed for the formation of the crock-rim preparatory to pressing the sides or body; Fig. 2, a section of Fig. 1; and Fig. 3, the same as Fig. 1, but with the under die lowered to permit the body to be formed, and the lower part of the outer die opened to permit the clay to be cut to form a bottom.

In the drawings similar letters refer to like parts.

A is the lower part of a clay-cylinder, such as are in common use for pressing sewer-pipe, supported by two posts, G G′, and to the bottom thereof is attached an outer die, B, the lower interior whereof is of equal diameter with the desired ware. This die is continued by means of a ring, C, in two parts, hinged at the post G, and held together, when desired, by a lock, D, which slides on the post G′, or other equivalent device.

E is the mandrel, sometimes called the "inner die," which forms the interior of the crock-body, of suitable diameter for that purpose, and shaped at its top to the desired form of the interior of the crock-bottom. This mandrel is attached to a shaft, F, by which it can be raised within and lowered from the interior of the ring C, and, while the clay is being forced outward from the main cylinder A, is held rigidly, concentrically within said ring C, by a pin, *i*, in the shaft F, at such a height with relation to the outer die B that the distance between the plane of its top and the plane of the lower end of the die B shall be equal to the desired thickness of the crock-bottom.

H is a lower die, adapted to be raised and lowered from the ring C by rods I I, and can be locked against and form a tight joint with the ring C by the hooks J and lugs *e*, and, when so locked, affords an additional support for the mandrel E. At the joint between the ring C and die H the annular space between the mandrel E and ring C is enlarged by a groove around the outside, constructed partly in the die H and partly in the ring C, forming a mold for the rim upon the top of the crock.

In operation the mandrel E is raised within the ring C, as hereinbefore stated, and fastened in that position by the pin *i*, the ring C closed and locked, and the die H raised and locked against the ring C. Clay is then forced downward from the cylinder A, by a piston or other suitable appliance, through the die B and annular space between the mandrel E and ring C, until the groove between the ring C and die H is entirely filled, and a rim for the crock-top thus formed. The die H is then rotated by the lever K until unlocked, and pressure again applied to the clay in the cylinder A, which flows downward through the annular space between the mandrel E and ring C

in a tube bearing the rim which constitutes the crock-top upon its forward end, which rim, while the clay is being forced downward, rests on the die H, which descends with it, and forms a steadying-support for the crock-body. When the crock has reached the desired length the pressure on the clay is stopped, the die E rotated by means of the lever L, to smooth the inner surface of the crock-bottom and cause it to part more freely from said die, the pin *i* withdrawn, and the die E lowered until it rests upon the die H, as indicated by dotted lines in Fig. 3.

It may be found convenient, for the purpose of facilitating the separation of the mandrel E from the crock-bottom, to provide it with upward-opening air-valves; but as these are common for similar purposes, it has not been deemed necessary to show them.

The ring C is then unlocked and opened, and the mass of clay cut off across the bottom of the die B with a wire or other suitable appliance, thus leaving an entire crock upon the die H, whence it is removed and the operation repeated.

The same process may be practically accomplished by supporting the inner die from above by a shaft, from which it can be disengaged to remove the crock; but in such case an orifice of the same size as the supporting-shaft will remain in the crock-bottom, to be closed by hand.

We do not claim as new the formation of the rim and body of the crock as herein described, as we are aware that that is already the subject of a pending application; but

What we claim, and desire to protect by Letters Patent, is—

1. The process of forming bottoms upon earthenware vessels, the bodies whereof consist of sections of tube forced from a receptacle through an unclosed annular orifice, by cutting across the clay remaining in the receptacle, while the body is connected with it, a suitable distance above the core which forms the inside of the body to leave a bottom thereon, substantially as shown.

2. The opening die C, in combination with the inner die E, substantially as and for the purpose hereinbefore set forth.

3. The opening die C, in combination with the dies E and H, arranged and operating substantially as and for the purpose hereinbefore set forth.

4. The combination of the dies B E H and ring C, all arranged and operating substantially as and for the purpose hereinbefore set forth.

RUSSELL H. KENT.
JOSEPH A. BALDWIN.

In presence of—
C. P. HUMPHREY,
E. W. STUART.