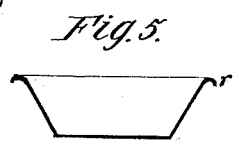
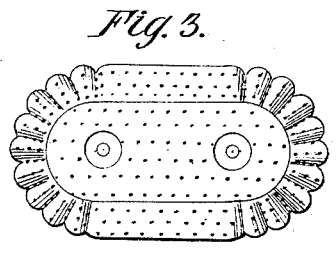
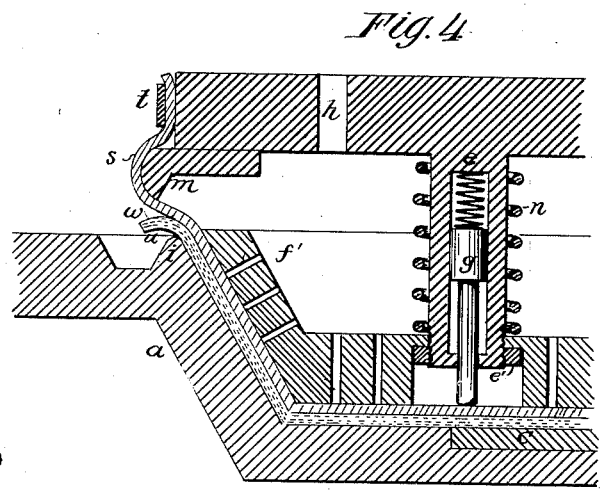
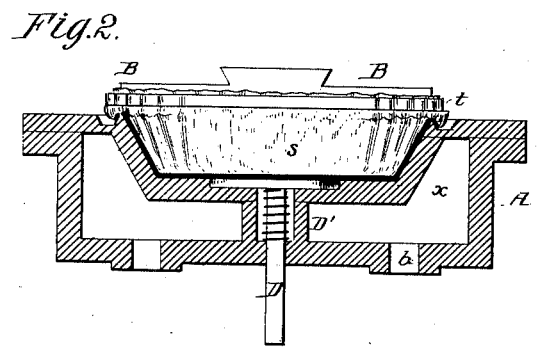
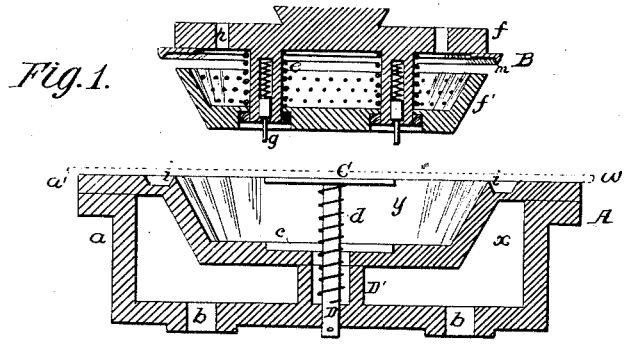


H. A. HOUSE.  
 Apparatus for Molding Dishes from Paper.  
 No. 208,097.                      Patented Sept. 17, 1878.



Attest:  
*Edw. Benjamin*  
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 By his attorney  
*Charles E. Foster*

# UNITED STATES PATENT OFFICE

HENRY A. HOUSE, OF BRIDGEPORT, CONNECTICUT.

## IMPROVEMENT IN APPARATUS FOR MOLDING DISHES FROM PAPER.

Specification forming part of Letters Patent No. 208,097, dated September 17, 1878; application filed May 28, 1878.

To all whom it may concern:

Be it known that I, HENRY A. HOUSE, of Bridgeport, Fairfield county, Connecticut, have invented Improvements in the Manufacture of Paper Dishes, of which the following is a specification:

Heretofore in the manufacture of grocers' dishes from paper they have been molded cold between plain or corrugated dies operating upon sheets of dampened paper, and a subsequent drying operation has always been necessary in order to set the molded dishes in the newly-acquired form.

In order to avoid the loss of time resulting from the drying and the danger of impairing the form of the dishes in removing them wet from the mold, and, further, to produce a dish that will retain its form, I make the same in the manner and by the means which I will now describe.

On reference to the accompanying drawings, which form part of this specification, Figure 1 is a sectional elevation of improved apparatus for carrying out my invention. Fig. 2 is a partial section, showing the parts in a different position. Fig. 3 is an inverted plan view of the upper die. Fig. 4 is a detached sectional view, and Fig. 5 a transverse section of the dish made by dies constructed as shown.

A represents the lower, and B the upper, die, which are suitably secured to the frame and plunger of a press, so that they may be brought together and separated.

The lower die consists of the chest *a* and cap *a'*, bolted thereto, inclosing a chamber, *x*, to which highly-superheated steam is admitted through openings *b*.

The cap *a'* has a recess, *y*, conforming in shape to the external form of the dish to be made, and at the edge of this recess is a lip, *i*, for a purpose described hereinafter.

At the bottom of the recess *y* is a depression, *c*, to receive a plate, C, secured to a rod, D, extending through a hollow standard, D', of the die, a spring, *d*, coiled around the rod D, tending to maintain the rod and plate in the elevated position shown in Fig. 1.

The die B consists of two sections, *f* *f'*, the under section, *f'*, being a shell coinciding externally with the form of the recess *y*, and slid-

ing on hollow studs *e*, projecting from the section *f* through openings in the shell, and having enlargements *e'* at the lower ends, to limit the downward movement of the shell, which is recessed to receive said enlargements.

In each stud *e* slides a spring-pin, *g*, the end of which projects downward below the shell, and a spring, *n*, coiled round the stud tends to maintain the shell at the limit of its downward motion.

The section *f* is provided with an edge flange, *m*, which, when the die B is brought into the die A, overlaps the lip *i*. The shell *f'* is perforated throughout its entire extent, and in the section *f* are openings *h*.

The face and edges of the die B are covered by a sheet, *s*, of felt or other material, which is secured by a continuous band, *t*, clamping the edges against the edge of the section *f*.

The dies being in a position shown in Fig. 1, superheated steam at a temperature of about 600° Fahrenheit is admitted to the chamber *x*, the felt is applied to the die B, and a sheet, *w*, of moistened paper is placed upon the lower die when the dies are brought together.

The dies are preferably formed with corrugations, which take up the excess of material as the paper is folded up at the edges to form the sides of the dish, as described in the application of C. Ingersoll, filed March 14, 1878, this folding operation being performed without distending or overlapping the paper as the shell *f* sinks into the recess *y*.

When the shell has reached the limit of its downward movement, the edge *u* of the paper will extend above the lip *i*, Fig. 4, so that as the plunger descends, carrying farther down the section *f*, the flange *m* will fold the edge *u* over the lip *i* and form a flange, *r*, at the edge of the dish, for the purpose set forth in my application for a grocer's dish, filed May 23, 1878.

The heat of the die A almost instantaneously vaporizes the moisture in the paper as the latter is compressed to its new form, the steam escaping freely through the perforations in the shell and through the openings *h*, and the felt absorbing any moisture that may remain, so that the paper is instantly dried, and the dish is set in its form the instant it is molded.

The result of these operations is not only to expedite the manufacture of the dish, but to give it a form which can only be changed by destructive pressure, for it has been found that when so molded, as above described, the dish is rendered stiff, yet elastic, so that it will, by its own elasticity, recover its form when any but destructive pressure is applied—a quality not possessed by dishes molded cold, in the ordinary manner.

It is most important that the body of the dish be clamped between the molds before the section or follower *f* begins to turn down the flange *u*, as otherwise there is danger of clamping the flange before the body is formed and tearing the paper.

As the plunger rises the springs *n* maintain the shell in its place until the follower rises from the flange *u* and the heads *e'* strike the bottom of the shell, when the latter will also be elevated, the dish being kept in contact therewith by the follower-plate *C*, which is forced upward by the spring *d*. When the plate *C* reaches the limit of its movement the spring-pins *q* will detach the dish from the upper die and leave it upon the plate, from which it may be removed prior to the molding of another dish from another sheet in like manner.

The covering *s* is an important adjunct in this process, as it not only helps to dry the paper and prevents the same from being stained by the upper die, which is rusted by the moisture, but it further prevents the edges of the die from cutting the paper, especially in folding over the flange *u*, and imparts a neat and smooth finish to the inside of the dish.

The form of the dies, of course, depends upon the shape of the dish to be made, and

will vary with the character thereof, the lower or upper die in some instances being made in several sections, operating successively or alternately.

Other means may be employed for heating the dies, and for imparting the desired movements to the shell and the followers, and the die *B* may be heated and the perforations may be made in the die *A*.

Without, therefore, limiting myself to the precise construction and arrangement of parts described,

I claim—

1. The improvement in the manufacture of grocers' dishes from paper, consisting in subjecting a sheet of moistened paper to pressure and heat simultaneously between dies, which impart the required shape, as set forth.

2. The combination, in a machine for molding paper dishes, of dies *A B*, one of which is heated and the other perforated, substantially as and for the purpose set forth.

3. The covering *s*, combined with heated paper-molding dies, substantially as and for the purpose set forth.

4. The flanged follower *f*, having a movement independent of the section *f'*, in combination with the die *A* and its lip *i*, substantially as set forth.

5. The follower *C*, combined with the die *A*, substantially as and for the purpose set forth.

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

HENRY A. HOUSE.

Witnesses:

GEORGE C. BISHOP,  
HORATIO N. SQUIRE.