

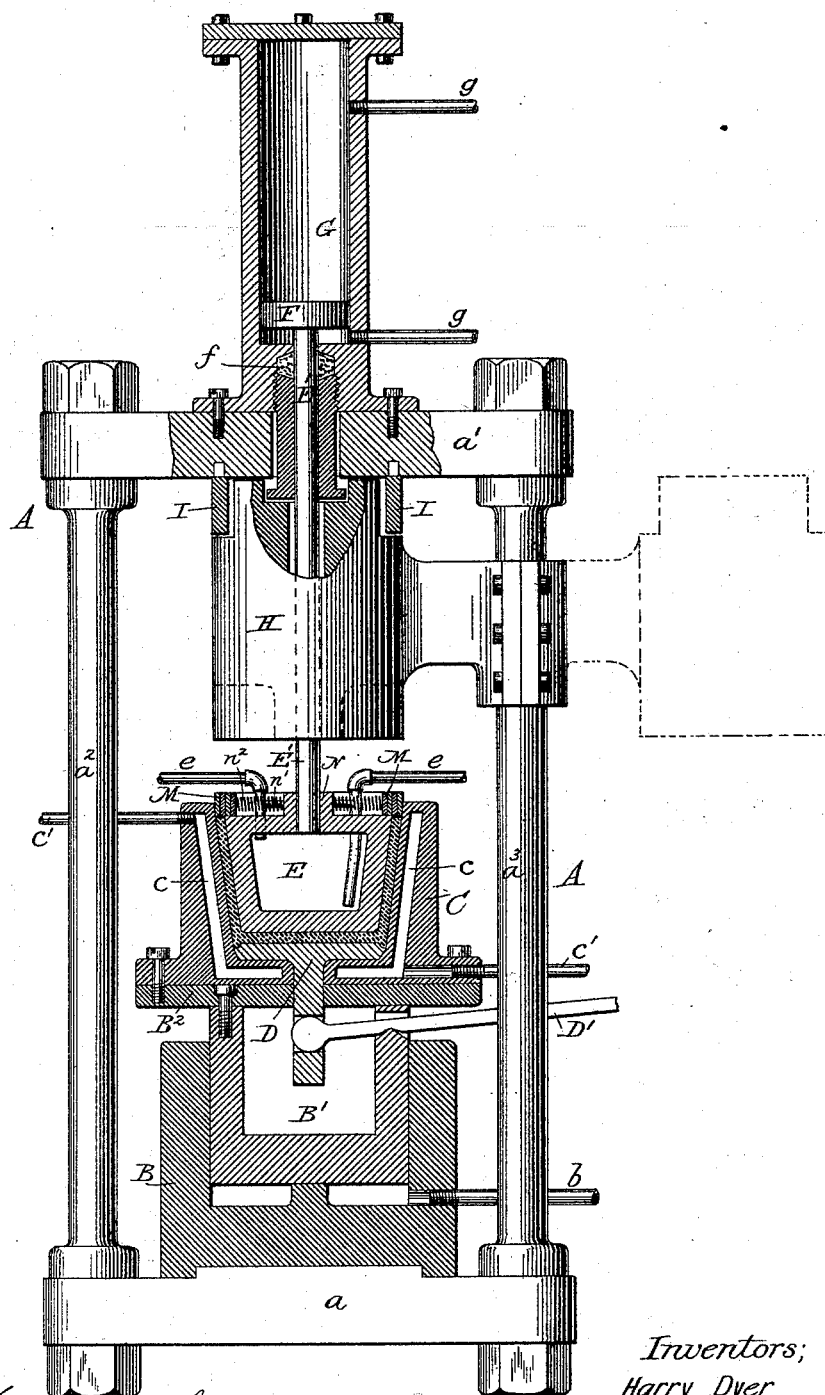
(No Model.)

2 Sheets—Sheet 1.

H. DYER & W. H. BINGHAM.  
MACHINE FOR MAKING HOLLOW WARE.

No. 526,693.

Fig. 1. Patented Oct. 2, 1894.



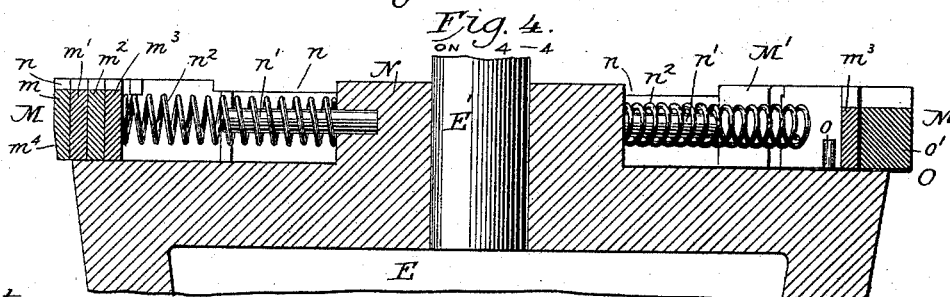
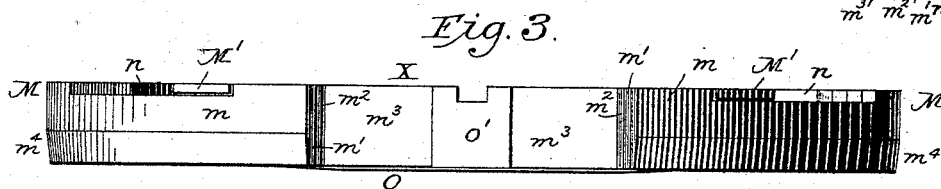
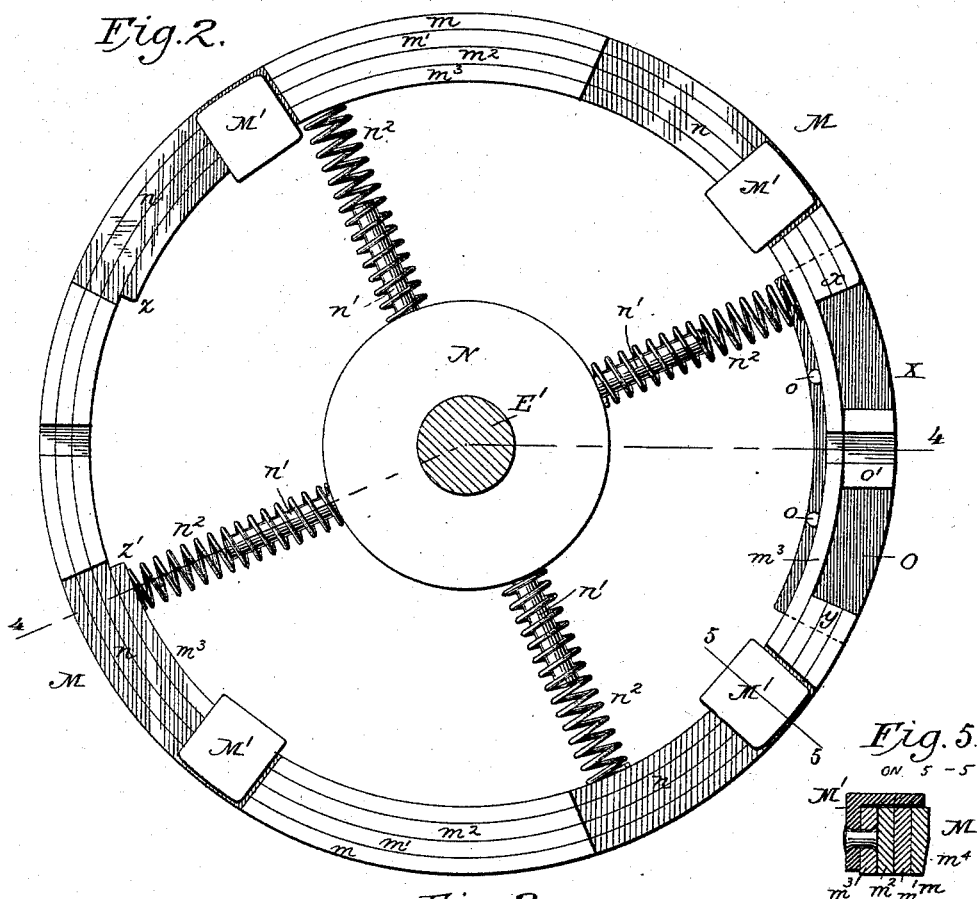
Witnesses,  
*Sidney P. Hollingsworth*  
*B. Washington Miller.*

Inventors;  
Harry Dyer  
William H. Bingham.  
by their attorneys,  
*Baldwin, Davidson & Wright.*

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# UNITED STATES PATENT OFFICE.

HARRY DYER AND WILLIAM H. BINGHAM, OF ST. CLOUD, MINNESOTA,  
ASSIGNORS TO THE ST. CLOUD VULCANIZED FIBREWARE COMPANY,  
OF SAME PLACE.

## MACHINE FOR MAKING HOLLOW WARE.

SPECIFICATION forming part of Letters Patent No. 526,693, dated October 2, 1894.

Application filed October 26, 1892. Serial No. 450,034. (No model.)

*To all whom it may concern:*

Be it known that we, HARRY DYER and WILLIAM H. BINGHAM, citizens of the United States, residing at St. Cloud, in the county of Stearns and State of Minnesota, have invented certain new and useful Improvements in Machines for Making Hollow Ware, of which the following is a specification.

Our present invention is designed to improve machinery adapted for the manufacture of hollow ware, such as pails of paper pulp or similar fibrous material.

One of the most approved ways of forming articles such as pails or similar hollow ware, is to employ a mixture of fibrous material and resin, or asphalt, and to form it into shape in a heated die. To make a pail in this way, a die or mold composed of two members is employed, the female member being adapted to receive the material, and the male member being adapted to enter the female member and to form the material into shape. In order that the material may be prevented from escaping at the upper end of the mold or around the top of the male member, when pressure is applied, and in order that the rim may be properly formed, we employ a rim former or gate of improved form, the details of which will be hereinafter fully described.

In the accompanying drawings,—Figure 1 is a view partly in elevation and partly in section, showing a press for forming a pail and embodying our improvements. Fig. 2 is a view on an enlarged scale of the top of the rim former, employed. Fig. 3 is a side elevation. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a section on the line 5—5 of Fig. 2.

The main frame A, of the press, may be of any suitable construction, comprising a base piece *a*, a top cross head *a'*, and uprights or columns *a<sup>2</sup>*, *a<sup>3</sup>*. The hydraulic cylinder B, has a supply pipe *b*, and a piston B' is adapted to be raised and lowered in the cylinder. To the piston B', is secured a top plate B<sup>2</sup>, and on this is mounted the outer or female member C, of the die or mold. This is channeled, as shown at *c*, and is provided with steam entrance and exit pipes *c'* *c'*. An expeller D, of well known construction may be operated

by a lever D'. The male member of the mold E, is channeled or hollow, and provided with steam entrance and exit pipes *e*. A rod E', is connected with a piston F, working in a cylinder G, having entrance and exit pipes *g*. The rod E', may work in suitable packing *f*. A swinging block H, is interposed between the mold and the cross head *a'*, and a stripper I, is secured to the cross head. The swinging block forms a support or abutment for the mold, when the piston B' is elevated.

The apparatus so far as has been described, is not our invention. We have illustrated and described such an apparatus to show how our improvements are applied. It will be understood that the male member E, is first elevated and the material is placed in the member C, of the mold. Preferably it is put in in the form of a blank partially compressed, and of approximately the shape of the article to be formed. The piston B', is then raised and the member E, of the mold lowered to compress the material between the two mold members.

Heretofore there has been difficulty in the manufacture of articles in this way, owing to the fact that the material finds its way out at the top of the mold, and the rim is not properly formed. It is necessary to provide some kind of a gate to prevent this escape of the material. Gates at this point have been heretofore employed, but as the walls of the dies are tapered for effective work, the gate should be arranged to close the opening between the mold members at the top, not only when the male member has descended to its full extent and fully compressed the material, but also when it first commences the compression. We, therefore, employ a combined gate and rim former which is contractible and expansible. When the male member first commences the compression of the material, the gate is expanded to its full extent. As the male member proceeds, the gate is contracted or made smaller in diameter to accommodate the decrease in diameter of the female member of the mold.

The best way of carrying out our invention is illustrated in Figs. 2 to 5 of the drawings, in which we have shown an annular gate

adapted to expand and contract for the purposes above described. A series (four being shown) of curved or circular divided spring metal hoops or leaves  $m, m', m^2, m^3$ , are placed concentrically side by side. In Fig. 2, the gate M is shown expanded to its full extent, and the ends  $x, y$ , of the hoops  $m, m', m^2$ , are separated and the ends  $z, z'$ , of the inner hoop  $m^3$ , are likewise separated. The lower, outer edge  $m^4$ , of the hoop  $m$ , is beveled, as shown in Figs. 3 and 4, in order to more readily enter the outer member of the mold. A series of clips  $M'$ , (four being shown) are secured to the inner hoop  $m^3$ , and extend over the tops of the remaining hoops, and are seated in recesses  $n$ , in these hoops. By this arrangement, the hoops are held in place and the recesses  $n$  being elongated, the hoops are free to expand and contract. The boss or hub N, of the male member E, is provided with pins  $n'$ , on which are arranged springs  $n^2$ , which bear against or are secured to the hoop  $m^3$ . These serve to center the annular gate, so that it will always be in position to properly enter the mold. They may also assist in expanding the hoops. When the gate is expanded, as shown in Fig. 2, there is a considerable space X, between the ends  $x$  and  $y$ , of the hoops. In order to fill or cover this space, we employ a supplemental piece or segment O, which is provided with pins  $o$ , and a block  $o'$ , fitting the inner hoop  $m^3$ . This segment is made of thin metal, preferably steel, and is sufficiently strong to compress the material when pressure is first applied. When the full pressure is applied, the ends  $x$  and  $y$ , are in close proximity abutting against the block  $o'$ , so that all the strain is taken by the hoops  $m, m', m^2, m^3$ . It is obvious that while the material is being compressed, the gate automatically contracts as it enters the female member of the die, and it automatically expands while leaving the die.

We claim as our invention—

1. The combination of an outer mold member, an inner mold member, a normally expanded split spring ring forming a contractible gate to close the space between the inner

mold member and the outer mold member at the open end of the mold, and means for operating the mold members.

2. The combination of an outer mold member, an inner mold member, a spring metal, annular, automatically expansible and contractible gate adapted to close the opening between the male and female members at the open end of the female member, and means for operating the mold members.

3. The combination of the outer mold member, the inner mold member, a combined gate and rim former, comprising a series of spring hoops connected together and adapted to expand and contract, means for holding the gate in proper position, and means for operating the mold members.

4. The combination of the mold members, and a combined gate and rim former comprising a series of divided spring hoops, devices for holding them together, and means for holding them in proper position.

5. The combination of the mold members, a gate or rim former comprising a series of spring hoops, devices for holding them together, and the centering springs for holding the gate in proper position.

6. The combination of the two mold members, and the combined gate and rim former comprising a series of expansible and contractible divided hoops, and a supplemental plate or segment between the ends of the hoops, for the purpose specified.

7. The combination of the two mold members, and a combined gate and rim former comprising a series of spring metal divided hoops, clips for securing them together, which are secured to one of the hoops, and which enter recesses in the other hoops, and a supplemental plate or segment between the ends of the hoops.

In testimony whereof we have hereunto subscribed our names.

HARRY DYER.

WILLIAM H. BINGHAM.

Witnesses:

F. J. BACH,

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