(No Model.) 2 Sheets—Sheet 1.

F. E. KEYES.

MACHINE FOR MOLDING PULP.

No. 549,200. Patented Nov. 5, 1895.

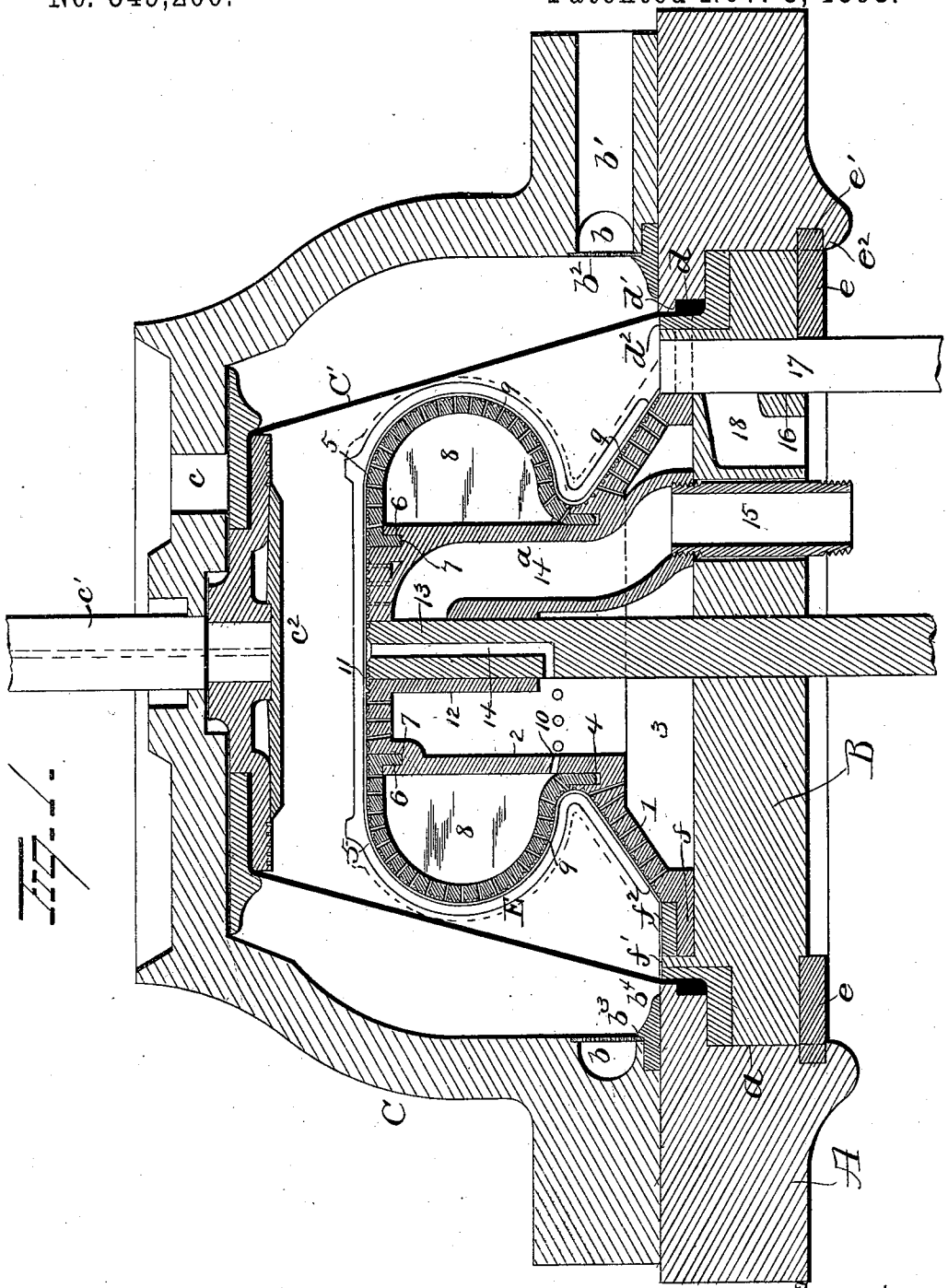

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

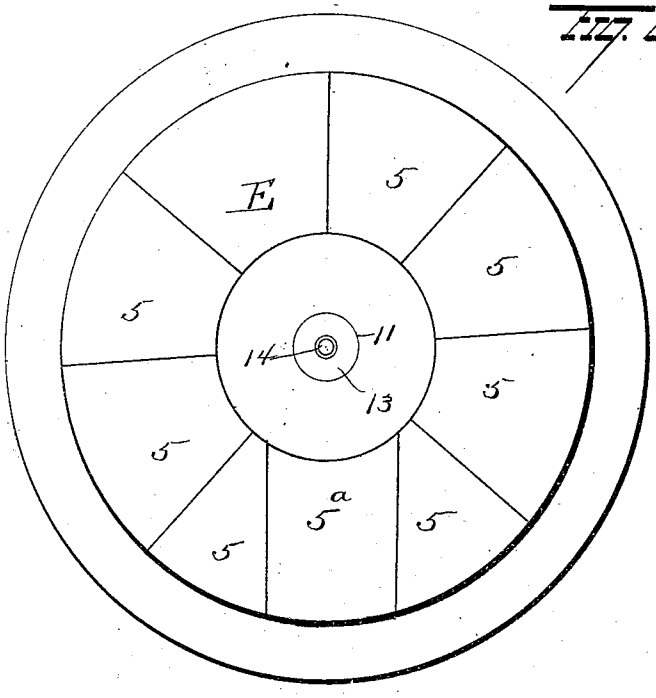
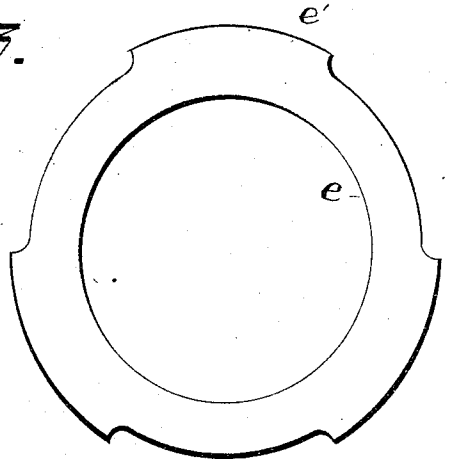


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK EUGENE KEYES, OF LOCKPORT, NEW YORK.

MACHINE FOR MOLDING PULP.

SPECIFICATION forming part of Letters Patent No. 549,200, dated November 5, 1895.

Application filed April 14, 1894. Serial No. 507,586. (No model.)

To all whom it may concern:

Be it known that I, FRANK EUGENE KEYES, a resident of Lockport, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Machines for Molding Pulp; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in machines for molding pulp; and it consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional view of the apparatus. Fig. 2 is a plan view of the former. Fig. 3 is a view of ring *e*.

A represents a suitable base having an opening *a* for the accommodation of a former, base B, and on said base A a dome C is located. In the inner wall of said dome, in proximity to the base thereof, a channel *b* is made and adapted to communicate with an outlet-duct *b'*. A perforated ring b^2 is located in front of said channel *b* and so disposed as to align with the inner wall of the dome, said ring being retained in place by means of a shoulder b^3, projecting from a ring b^4, a portion of said ring b^4 being located in a recess in the bottom of the dome. The top of the dome is made with an inlet *c* for water or other fluid under pressure, and with an opening for the accommodation of a plunger-rod *c'*, said plunger-rod having a plunger c^2 secured to its lower end within the dome. The plunger c^2 is made in sections, and between said sections one end of a bag C', of rubber or other suitable material, is secured, the other end of said rubber bag being made with an enlargement *d*, adapted to enter a recess *d'* made in the wall of the opening *a*, in which it is retained by means of a ring d^2, the former-base B being also recessed for the accommodation of said ring d^2. The former-base B is adapted to be removed, as hereinafter explained, and when the apparatus is in operation said base B is retained in place by means of a ring *e*, having lugs *e'* to rest on similar lugs e^2, projecting from the base A.

On the base B my improved former E is located, said former being made at its base with a flange *f*, which, when in position on the base B, abuts against an annular flange *f'*, projecting upwardly from said base B, and on said flange *f* a ring f^2 is placed.

Projecting upwardly from the base 1 of the former E is a cylindrical body portion 2, and between said body portion and the base B a chamber 3 is left for the reception of water pressed out of the pulp under treatment. At the junction of the base 1 of the former and the body portion 2 thereof a recess 4 is made for the reception of the lower ends of sections 5 of the former, the upper ends of said sections being made with depending flanges 6, adapted to enter an annular groove or recess 7 in the upper end of the cylindrical body portion 2. All the sections 5 of the former are made segmental in form, with the exception of one, (5^a,) which is made with parallel sides and adapted to serve as a key to retain the sections in their proper positions, and each section is provided centrally with a web 8. The various sections, as well as the base 1 of the former, are made with perforations 9 for the passage of water pressed from the pulp under treatment, the water passing through the perforations in the base 1 of the former entering the chamber 3 and the water passing through the perforations in the sections 5 finding its means of escape through perforations 10 in the wall of the cylindrical body portion 2 of the former and finally into said chamber 3.

The upper end of the cylindrical body portion 2 of the former is made with an opening 11, with which a pipe or tube 12 communicates, said pipe or tube being made to depend into said cylinder 2 and intended for the accommodation of a valve 13, having a drain-passage 14 in it. With the pipe or tube 12 a pipe or tube 14^a communicates, the other end of said pipe or tube communicating with a pulp-inlet pipe 15, passing through the base B on which the former is located. Another opening 16 is made in the base B and flange *f* of the former for the accommodation of a valve 17, and with said opening 16 another inlet-pipe 18 communicates.

My improved apparatus is intended particularly for the manufacture of articles having

a bulge—such as cuspidors, pitchers, chambers, milk-cans, carboys, boats, caskets, &c.—but, for convenience of illustration, I have shown it as applicable for the manufacture of cuspidors.

The former having been properly assembled and placed in the dome C, as shown in the drawings, the valve 13 is pulled down so as to bring the pipes or tubes 12 and 14^a into communication with each other. The pulp is then forced through these pipes or tubes until the rubber bag C′ shall have been forced against the walls of the dome C. This manner alone may be employed for introducing the pulp into the apparatus; but in the manufacture of small articles I prefer to force pulp through the inlet 18 at the periphery of the former also. The pulp having been forced into the apparatus between the former and the rubber bag, water or other fluid under pressure is admitted through the inlet *c*. The plunger c^2 will thus be forced down and the rubber bag attached thereto will be forced toward the former, causing the pulp to take the shape of the latter. When the pulp shall have become properly set to the former, the fluid-pressure will be closed or shut off and the water between the bag and the dome will be permitted to escape through the outlet-duct *b*′, as will be readily understood. The base B will then be lowered, carrying with it the former E and the article of pulp formed thereon. The base 1 and integral body portion 2 of the former will then be removed, leaving the sectional portion of the former intact. The small section or key 5^a will then be removed, thus freeing the other sections, which can then be readily removed and replaced in position on the portion 1 2 of the former, ready for another operation. After the article is formed in the press there is still left about fifty per cent. of water in the pulp, which has to be dried out. Then the article is turned to give it the proper external shape, after which it is sandpapered to make it smooth before it its waterproofed. In Fig. 1 the dotted lines indicate the general exterior shape of the article when first molded and before it is turned. When the pulp is in a liquid form and is pumped in under pressure of about fifty pounds to the square inch, this forces the diaphragm or bag out until it reaches the dome. Then the water-pressure is allowed to enter outside of the bag, thus pressing the pulp against the form, the water escaping through the form.

My improved former is very simple in construction, is applicable for use in the manufacture of various articles having a bulge, and is effectual in every respect in the performance of its functions.

Slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details of construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for the manufacture of bulged articles from pulp, the combination with a dome, and an elastic bag, or diaphragm, of a sectional former comprising a central body portion and outside sections arranged around the body portion, said outside sections connected with the body portion at their upper and lower ends, substantially as set forth.

2. In a former for pulp molding apparatus, the combination with a base and a body portion, said body portion having a groove or recess at both ends, of a series of removable sections constructed and adapted to enter said grooves, substantially as set forth.

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

FRANK EUGENE KEYES.

Witnesses:
JAMES ATWATER,
S. S. DICKERSON.