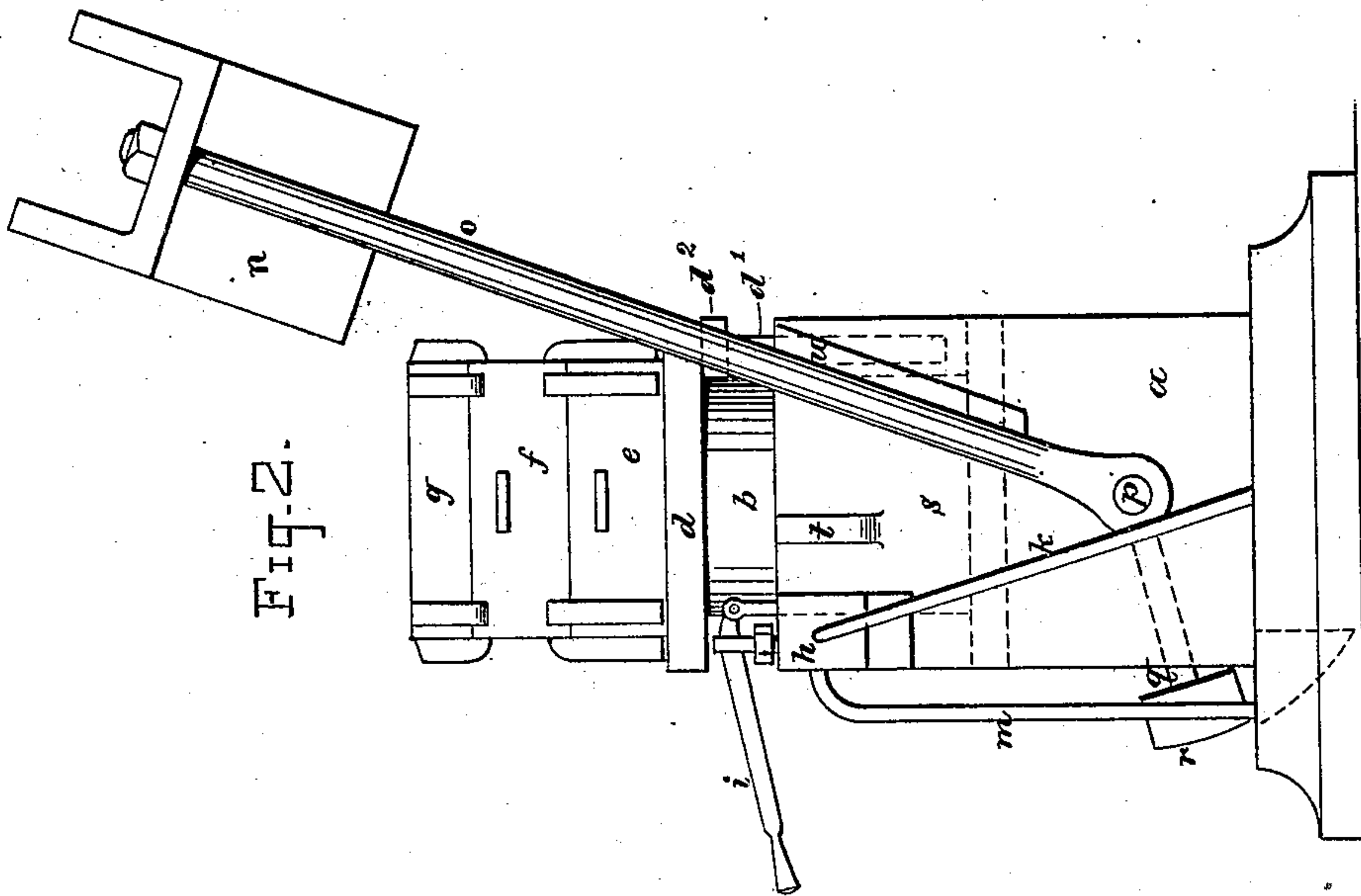


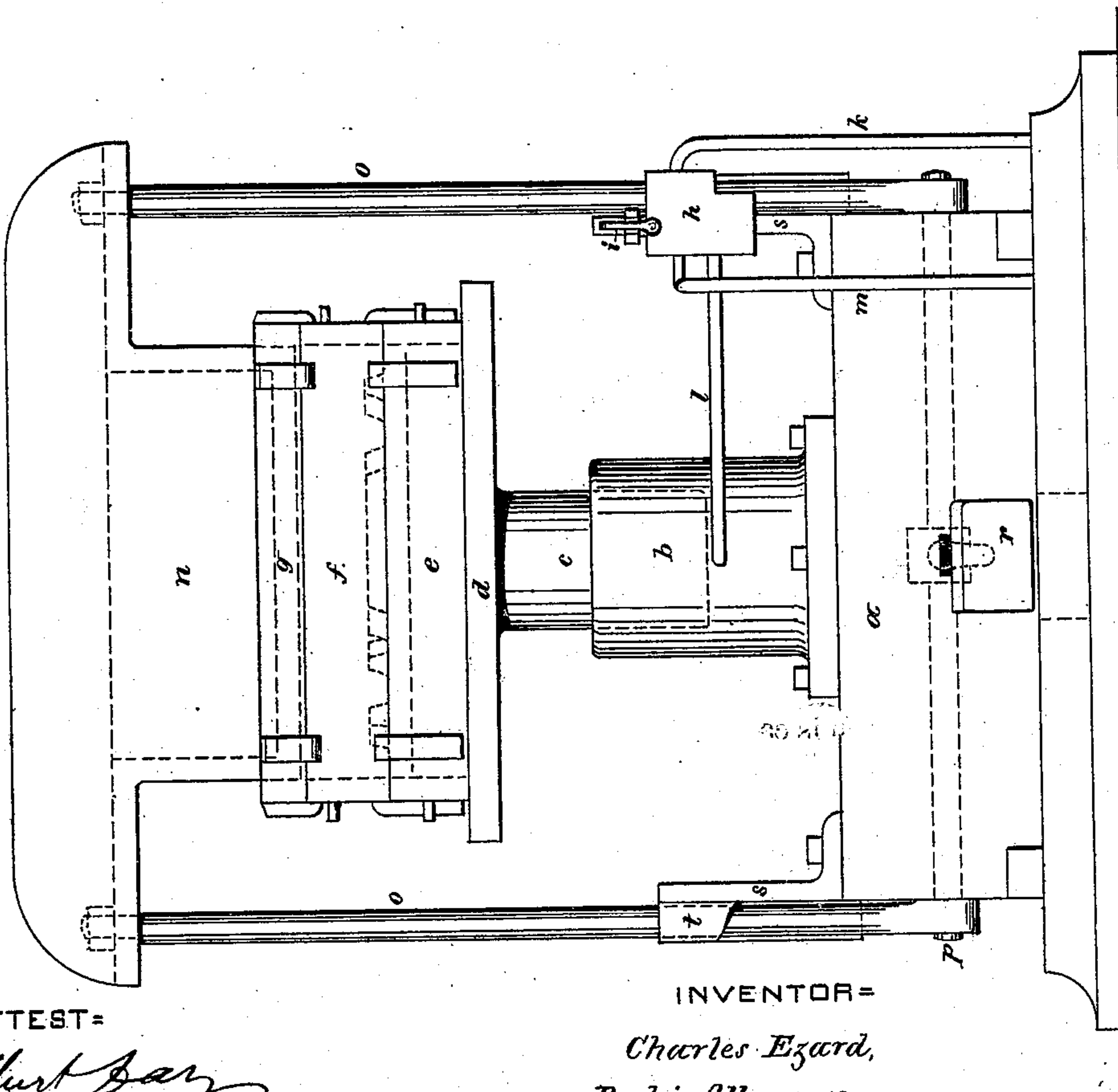
C. EZARD.  
Molding-Machine.

**No. 226,655.**

**Patented April 20, 1880.**



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ATTEST=

Albert Day  
Chas. Eben Brown

INVENTOR=

Charles Elzard,  
By his Attorneys,  
Curke, Fraser & Connell.

# UNITED STATES PATENT OFFICE.

CHARLES EZARD, OF MANCHESTER, ENGLAND.

## MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 226,655, dated April 20, 1880.

Application filed December 17, 1879. Patented in England December 24, 1878.

*To all whom it may concern:*

Be it known that I, CHARLES EZARD, of Manchester, England, have invented certain Improvements in Molding-Machines, for making and ramming molds for castings, of which the following is a specification.

My invention relates to molding-machines wherein the flask and pattern are placed upon a table or platen which rises and carries them up against a stationary head, which head, when the platen is down, may be swung back out of the way; and my invention consists in certain means for operating the said head, as will be fully hereinafter set forth.

In the drawings, Figure 1 is a front elevation of my machine with the platen raised in the act of ramming, and Fig. 2 is an end elevation of the same with the platen lowered and the head tilted back.

Let *a* designate the foundation or base plate of the machine; *b*, a hydraulic cylinder; *c*, the plunger of the same; *d*, the platen or table, sustained by the plunger; *e*, a box containing the pattern or follow-board and placed on the platen; *f*, the flask or molding-box containing the sand and placed upon the platen-box *e*, and *g* a box or frame containing surplus sand and placed on the flask.

The admission and discharge of water to the hydraulic cylinder are controlled by a valve, *h*, which may be operated by a handle, *i*, and with which connect the supply-pipe *k*, cylinder-pipe *l*, and outlet-pipe *m*.

*n* is the press-head, which is carried by arms *o o* at each end of the machine, which arms extend downward and are pivoted to the fixed frame of the machine, whereby the head is permitted to occupy a position directly over the platen, or to be tilted back out of the way, as shown in Fig. 2. To limit the movement of the head I provide two fixed stops—one (lettered *t*) to keep it from moving too far forward, and the other (lettered *u*) to keep it from falling too far back.

The parts thus far described are common in machines of this character, and form no part of my present invention.

The arms *o o*, which carry the head *n*, are fixed to a horizontal shaft, *p*, having bearings in the fixed base or frame of the machine near

the floor, and from this shaft projects a lever or arm, *q*, bearing a weighted treadle, *r*, arranged at a convenient point where the person who is operating the machine can place his foot upon it to manipulate the head. This treadle has, preferably, sufficient weight to counterbalance the weight of the head when the latter is about midway of its play between the stops *t* and *u*, so that when the head is back against the rear stop its own weight holds it in that position, and when it is forward against the stop *t* the weight of the treadle holds it in place. When the head is tilted back it can be brought forward by a slight pressure of the foot upon the treadle, and when forward it can be tilted back by a slight push with the hand. In case, however, the weight of the treadle is not sufficient of itself to accomplish these results, the operator may dispose his own weight upon the treadle in such a way as to serve the same end, standing upon it when down to hold the head steadily in its forward position, and still pressing upon it in tilting the head back, that the latter may fall back gently.

The operation is as follows: The head being tilted back and the platen lowered down, the pattern or follow-board is placed on the platen, preferably in the box *e*, the flask *f* is placed upon that, and the frame *g* upon the flask, and sand is filled into the flask and frame. The head is then brought forward, its lower portion standing directly over the frame and flask, and the platen is forced upward, the head entering the frame and forcing the sand therein down into the flask and ramming it tightly against the pattern. The platen is then lowered, the head tilted back, and the flask removed, when the same operation may be repeated with another flask.

I have shown the platen arranged to be lifted by hydraulic power; but this is not essential to my invention, as other mechanical means might be substituted.

I make no claim to the employment of a counter-weight to balance the weight of the head in a molding-machine; nor do I claim the use of a treadle to depress the head vertically without reference to its tilting movement, as these features I know to be old; but



What I do claim is—

1. A molding-machine which consists of the combination of a vertically-moving platen, means for forcing the same upward, a press-  
5 head carried on a tilting frame which is pivoted at the lower part of the machine, that the head may fall back out of the way when not in use, and a treadle connected with the frame carrying the head, whereby the depression of  
10 the treadle will bring the head forward into position for ramming, substantially as set forth.

2. The combination of the head *n*, arms *o o*, shaft *p*, arm *q*, and weighted treadle *r* with

the platen *d*, and with the fixed frame of the machine, bearing stops *t* and *u*, arranged to 15 operate substantially as set forth.

In witness whereof I, the said CHARLES EZARD, have hereunto set my hand this 25th day of November, 1879.

CHARLES EZARD.

Witnesses:

WM. H. S. WATTS,  
*Solicitor, Manchester.*

ALBERT S. YATES,  
*His clerk.*