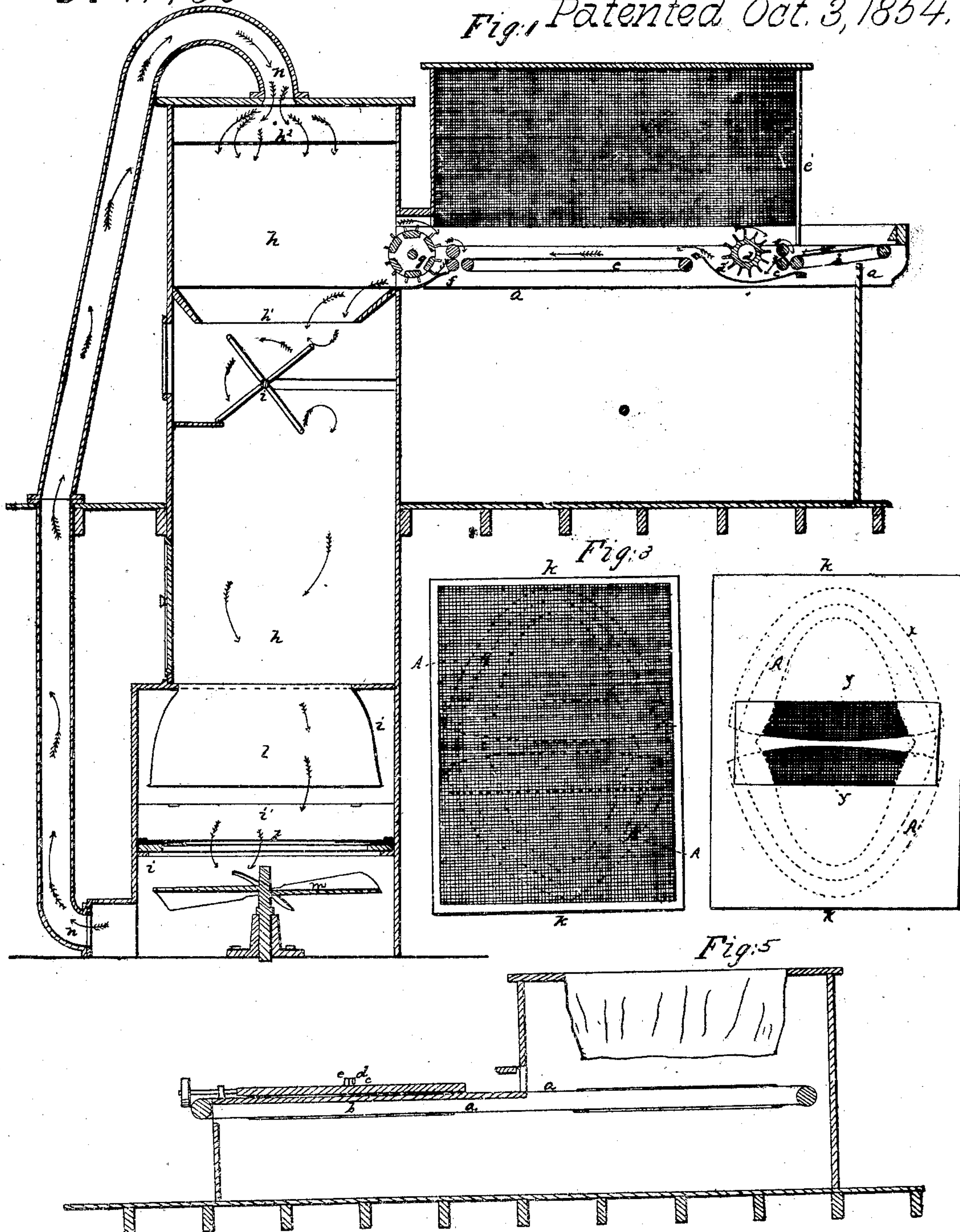


A. Rankin.

Forming Bats.

N<sup>o</sup> 11756

Fig. 1 Patented Oct. 3, 1854.



A. Rankin.

Forming Bats.

N<sup>o</sup> 11756

Patented Oct. 3, 1854.

Fig. 4<sup>2</sup>

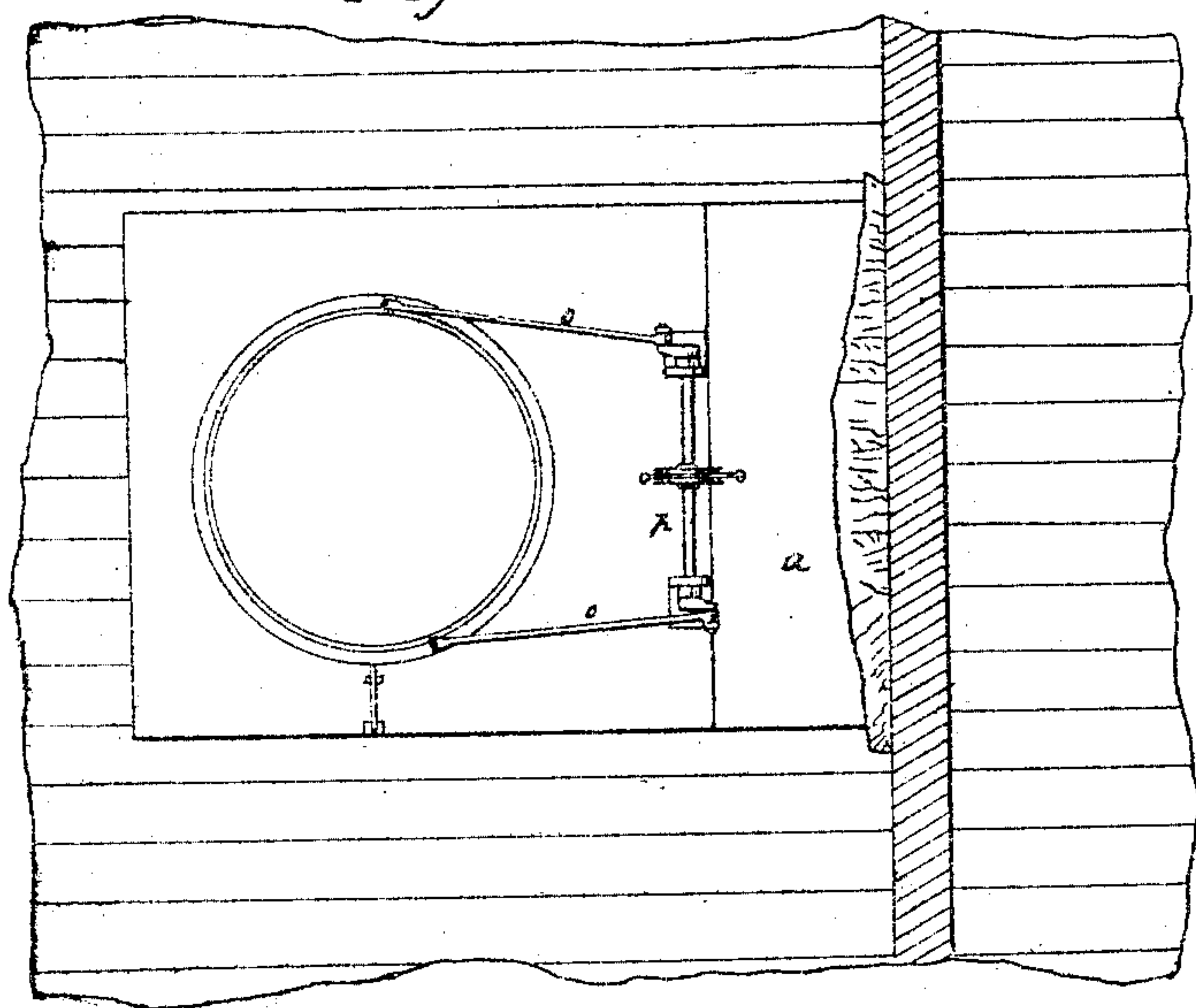


Fig. 2

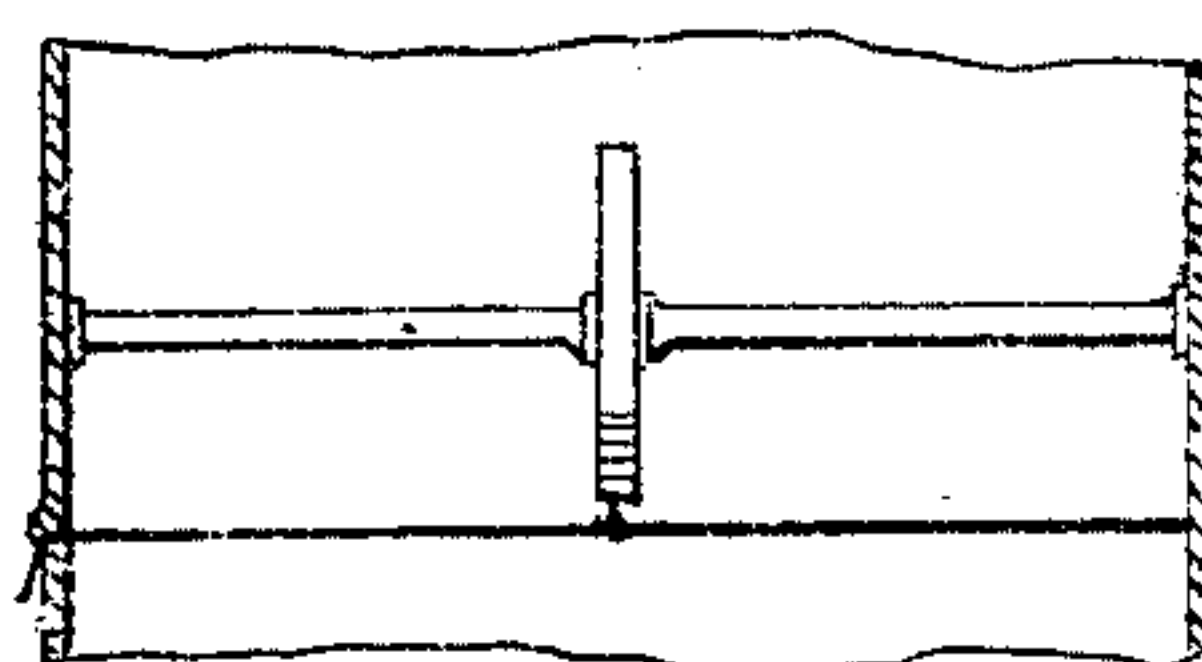
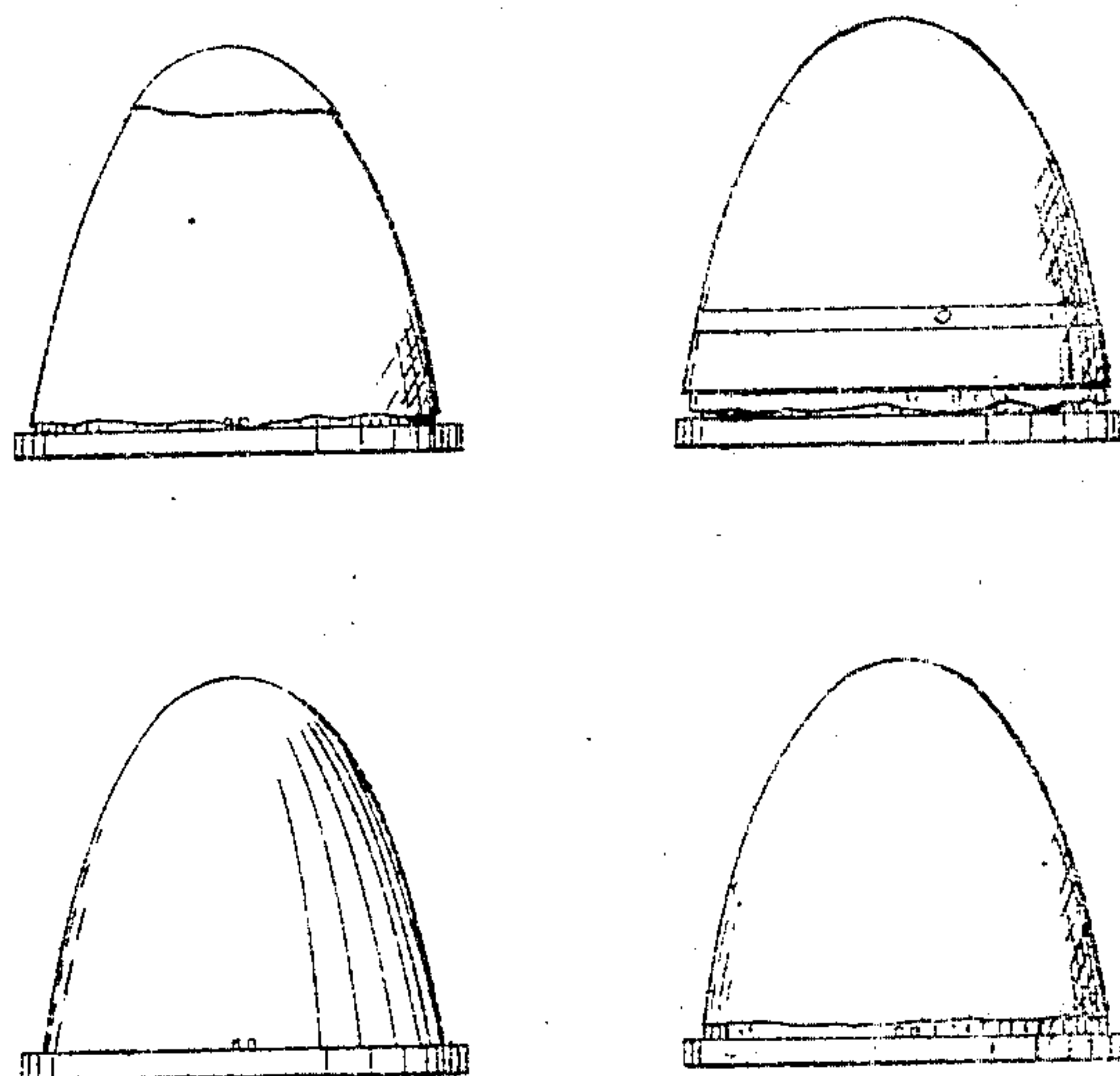
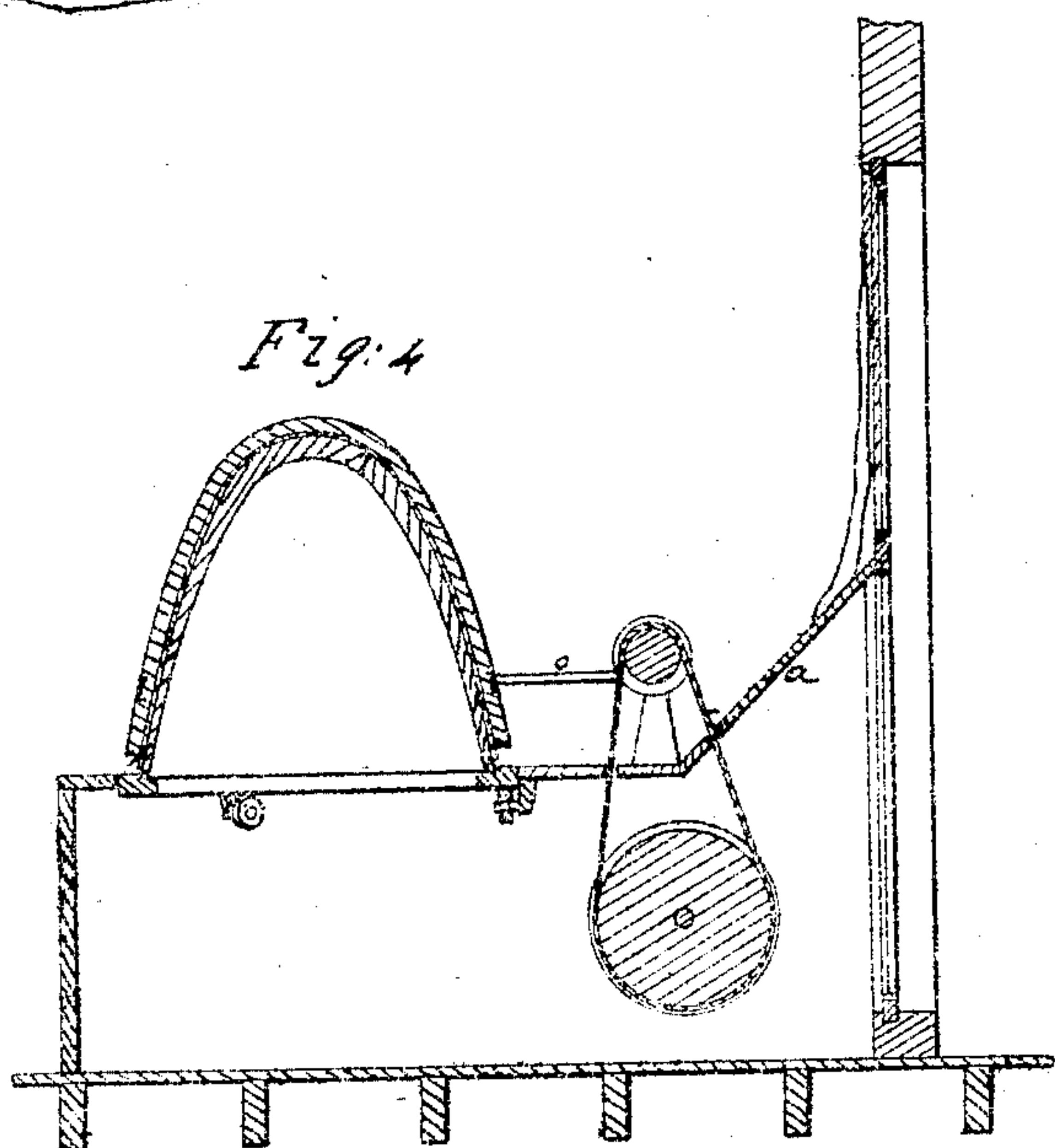


Fig. 4





A. Rankin.  
Forming Bats.

N<sup>o</sup> 11756

Fig. 1<sup>st</sup>

Patented Oct. 3, 1854.

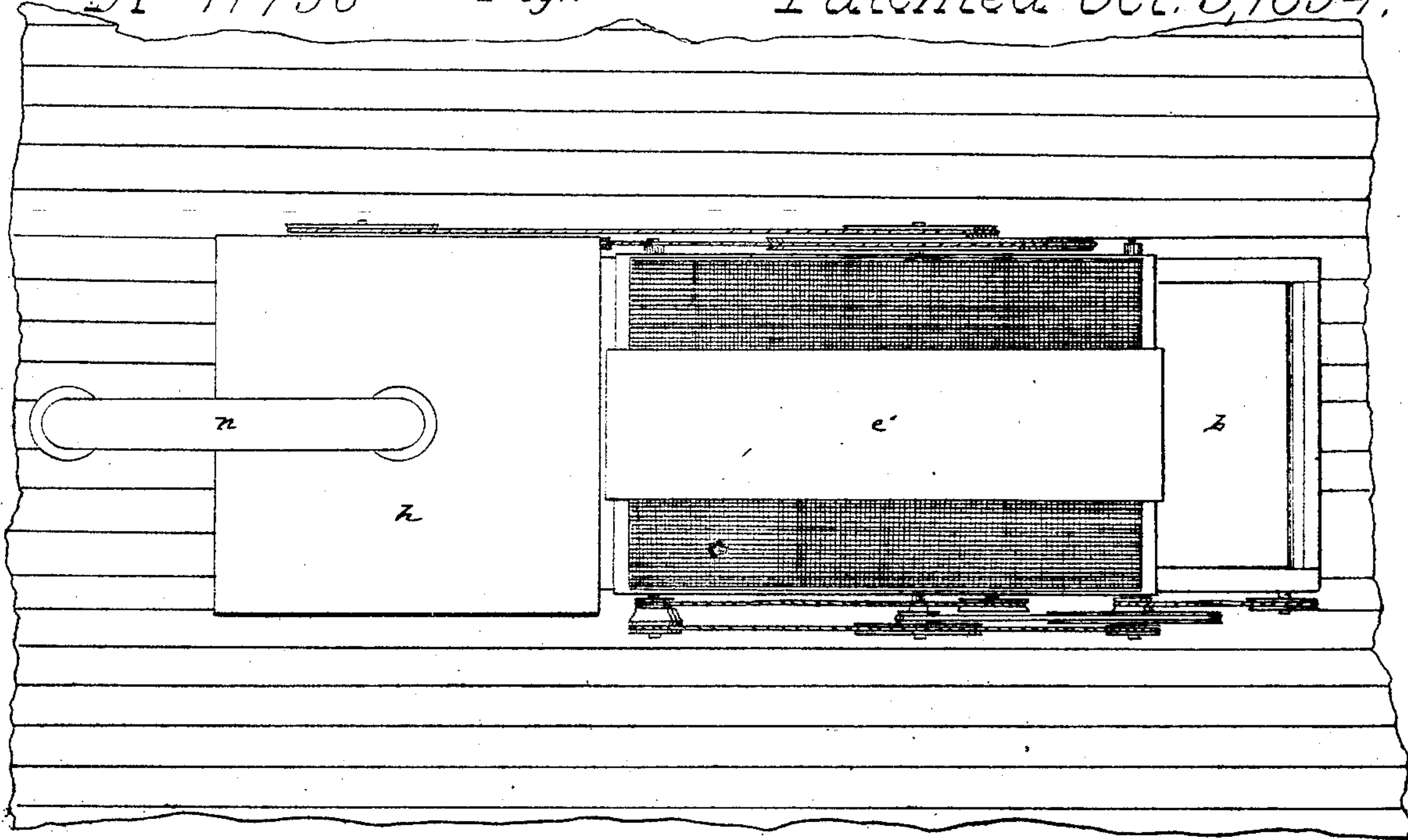
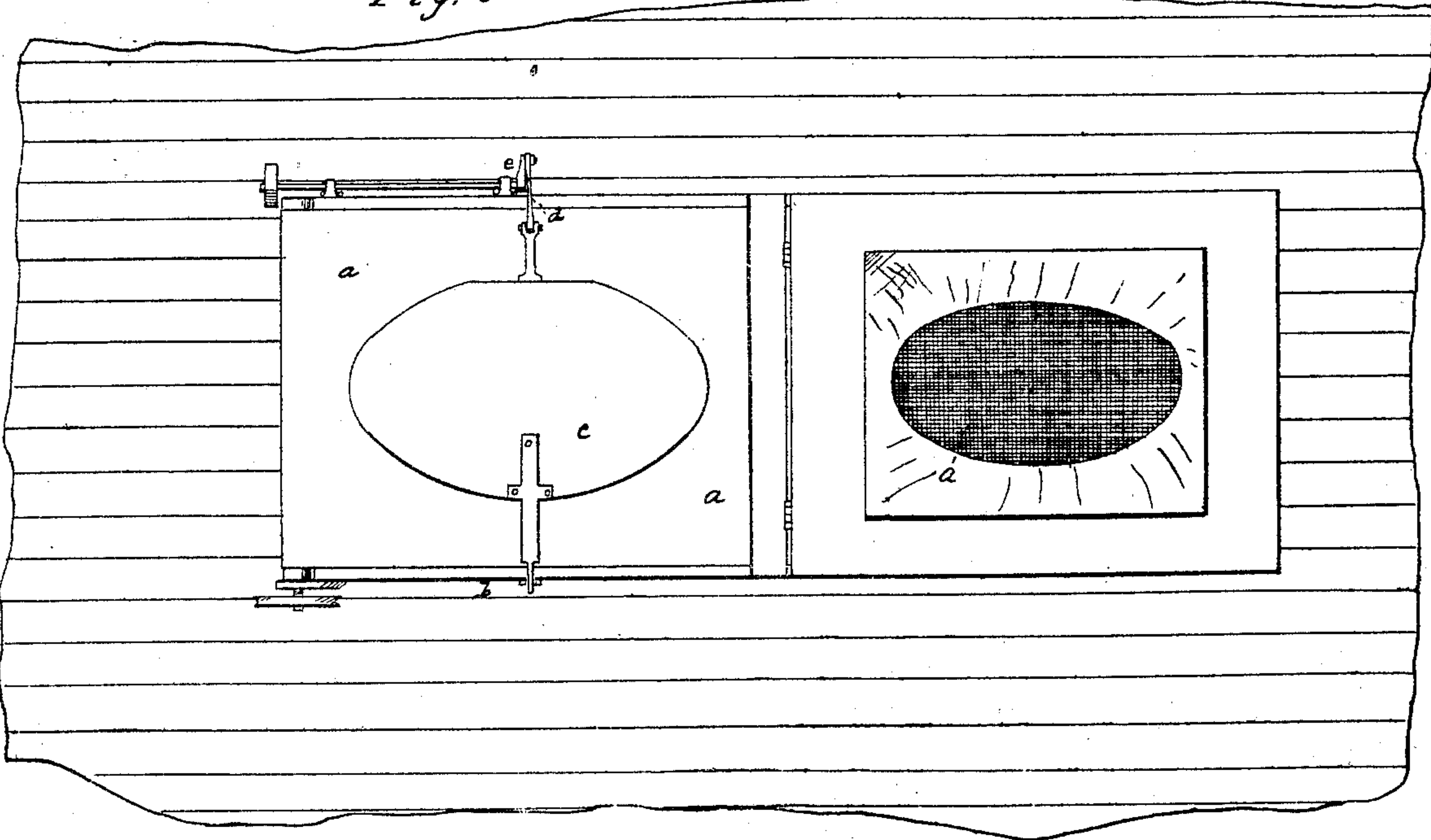


Fig. 5<sup>th</sup>





# UNITED STATES PATENT OFFICE.

ANDREW RANKIN, OF NEWARK, NEW JERSEY.

## MAKING HAT-BODIES.

Specification of Letters Patent No. 11,756, dated October 3, 1854.

*To all whom it may concern:*

Be it known that I, ANDREW RANKIN, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in the Manufacture of Hat Bodies, Naps, &c., and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known, and of the usual manner of making, modifying, and using the same.

My method of forming hat bodies is, by first making the hats, and then setting them up, as is practised in hand making; in fact I follow all the processes of hand work in making hats; but I employ machinery therefor, so that a girl or boy can perform more labor than a journeyman, and do the work better.

My apparatus is constructed as follows: Figure 1, showing a vertical section through the machine. In a proper frame (*a*,) I place a suitable endless feeding apron (*b*,) such as is used for similar purposes upon fur-blowing machines; on this apron is placed a proper quantity of fur by weight, for a hat, which by the revolution of the apron is fed forward, and passes between two small rollers (*c*), and then is it opened up and picked by a rapidly revolving cylinder, (*d*,) just in front of said rollers; this cylinder is armed with rows of straight small wire teeth, and it differs from other similar picker cylinders, in having deep flutes cut in it between the rows of teeth, which causes it to act more effectually upon the fur at this point; beneath, and at a little distance from this cylinder, there is a wire gauze or grating (*d'*), through which the dust and coarse hairs are driven, and separated from the fur, they fall below; the fur is thrown from the cylinder (*d*,) forward upon a second endless apron (*e*,) over which there is a cover of wire gauze (*e'*), to prevent the fur from blowing away; it passes forward between a second pair of feeding rollers (*f*,) and is brought in contact with another rapidly revolving picking cylinder (*g*,); this cylinder is still different from the first, being hollow, with staves extending from end to end, a little distance apart, so as to afford a greater current of air outward than the first, and it is armed with teeth in a similar manner; this opens up the fur, throwing into conductors, (*h*,) through which it descends into the next

story of the building in which it is situated; about half way the conductor there is a bowing apparatus, which may consist of a shaft (*i*,) with arms projecting from it near either end; there are strings stretched from the arms at one end to those at the other, as many in number as there are arms (in the drawing four), these form the bow strings, reaching from side to side of the conductor; as the shaft is turned, these strings revolve around it, and each in succession strikes a pin, performing upon the falling fur the same operation as the hand bow; the fur is guided to the center of the conductor by a hopper, (*h'*,) placed above the bow so as to cause it to be struck by the string at the point of greatest vibration; from thence the fur descends to the former below. A modification of this bowing apparatus, is to place a row of strings across, from side to side of the conductor attaching them thereto, and passing their ends through the sides of the conductor, so as to strain them tight; these strings are struck by a pin on a revolving wheel, as shown in Fig. 2. The conductor rests with its lower end on a chest (*i*,) which is a chamber of sufficient size for the purpose intended; there is a door (*i'*,) in this chest on each side and opposite to each other; these doors are for the purpose of admitting a succession of hurdles (*k*,) to slide into the chest horizontally, the hurdles being for the purpose of forming the bats upon; it is constructed as follows: a piece of wire gauze is stretched upon a frame (*k*,) see Fig. 3, and over this is stretched a piece of paper, large enough to cover it; upon this paper I draw two lines, at right angles to each other, and crossing in the center, from this guide, I cut out the paper to form curves, shown by black lines (*x*), in Fig. 3, which is the proper shape for two bats, such as are made by hand, and enough for one hat body. It is necessary to make these bats thicker in the part to form the rim than elsewhere, and the edges must gradually diminish in thickness for purposes hereafter seen; to effect these modifications of thickness, I resort to the following means: I put all around the edge of the paper, at (*x*) a thin strip of silk, shown by red lines (see A, Fig. 3,) extending inward from the paper about half an inch; over this I put another wider piece, that reaches further inward; and again a third, fourth, or more layers, each piece be-



ing carried further inward so as to make a regular gradation of thicknesses; the effect of which is, the more layers of silk there are, the less proportionally will be the quantity of fur deposited upon the parts covered; over all these I put a piece of silk, covering the whole space, except that part (*y*) which is to form the rim of the hat, over all this should be another wire gauze, and the hurdle is ready for use; when slipped into place, it is surrounded by a paper guide (*l*,) affixed to the upper edges of the chest, and the lower edges brought into the form of the bats; this arrangement admits of any variety of form of bats, being made in the same machine; below the hurdle there is an exhaust fan at (*m*,) and a pipe (*n*,) leads from it up to the top of the conductor (*h*), where it enters over a partition (*h*<sup>2</sup>); and being pierced with a great number of small holes, diffuses the current of air produced by the pipe, which descends down the conductor, carrying the fur with it for deposit, as above stated.

It will be perceived, from the above description, that there can be no waste of material as the fur is entirely inclosed, which is not the case with any other known machine for making hats; the bats, when withdrawn from the chest upon a table, where they are pricked down with the hatter's basket, and covered with a damp cloth which adheres to the bats that are thus taken up and removed to a hardening table; as one hurdle is taken out of the machine, another is put in, so as to continue the operation; at the hardening table, six bats, more or less, are hardened at a time by a friction board, and then the bats are taken through the process of setting up, for which my apparatus is constructed as follows: I form a chest, or close table shown at Fig. 4; this table has an elevation (*a*,) at its rear end, which extends up, covering a portion of a window, as shown in the drawing; on the front and level part of the table there is a transparent cone, made of glass or other suitable material, this transparent cone is placed over an opening through the table top, and can be revolved by the operative at will, moving on friction rollers; the interior surface of the table is colored white, for the better reflection of light; a dark curtain hangs at the window above, that can be raised or lowered, so as to darken the room as required. The operative takes one of the bats after it has been formed as above described, and trimmed, and first dampening the glass cone with a wet sponge, puts the bat around, covering somewhat more than half of the cone, and bringing it smoothly down into place, the cone is then turned around, and the other bat put on and united down to it; the dark curtain is then dropped and the light only admitted from below

through the glass cone, which at once discovers to the workman the thin places, which are stopping off by putting small pieces of fur upon them; and after the body is made equal in thickness and perfect, a damp cloth is put around it, and a small piece on the top, then a stout felt cone is dropped down upon it; two studs project, one from either side of this cone; and to them two arms or pitmans (*o*,) are attached, which extend back to a crank shaft (*p*,), on which the two cranks are opposite to each other, so that by its revolution it causes the conical felt to make a short vibratory revolution on the axis of the cone, and by the friction thus produced, the body is sufficiently hardened; the advantages of this mode of procedure are obvious, and highly important to a person thoroughly acquainted with the manufacture, either of hand or machinery, as heretofore conducted; the ordinary and only mode of setting up a body with two bats, is to lay a piece of paper, cut to the proper shape, upon one bat, and then fold over carefully the edges of the bat; another bat is then laid upon them and worked down a little; they are then turned over, and the edges of the other bat is folded over, and the whole united; then it is carefully raised, and by looking through it from the interior, the thin places are stopped off, a work of some care and difficulty that is obviated by my glass cone. And again, in machine made hats that are formed on a wire gauze cone, they have to be submerged in water before they can be removed; this materially injures the stock, for the reason that it washes out the chemical preparation with which it is prepared before felting, and renders it comparatively unfit for felting; but in my process I wet no further than is done by the damp cloth, in which it is hardened sufficient to be taken off uninjured.

The naps are formed in a manner similar to the bodies, the whole apparatus being the same, except the hurdle, for which an endless belt is substituted, as shown in Fig. 5; this endless belt or apron (*a*,) is perforated, at proper intervals, with oval or circular holes, each of sufficient size for two or four, more or less plates, which perforations are covered with mire gauze; when one of these spaces is brought under the conductor and receives its quantum of fur for a flake of nap, it is run out, and another brought under in its place, the first passing out over a table at (*b*,), when a friction board (*e*,) is brought down upon it; this friction board is moved back and forth in short quick vibrations till the flake is sufficiently hardened, by means of a pitman (*d*,) connecting it with a short crank (*e*,), turned with any convenient power.

Having thus fully described my new apparatus for making hat bodies and naps,



what I claim therein as new and for which I desire to secure Letters Patent, is—

1. The combination of the bowing apparatus constructed substantially as herein described with the picking cylinders in the manner and for the purposes herein set forth.

2. I also claim the hurdle, formed substantially in the manner set forth, having 10 layers of silk or other material between the

upper and lower perforated material around the edges as described.

3. I also claim the employment of the transparent cone for setting up and stopping off hat bodies, as herein specified.

ANDREW RANKIN.

Witnesses:

HENRY D. HEDDEN,  
WM. N. CARR.