Gill v. Brown,
Forming Bats.

No. 16426. Patented Jan 13 1857.

Fig. 1.

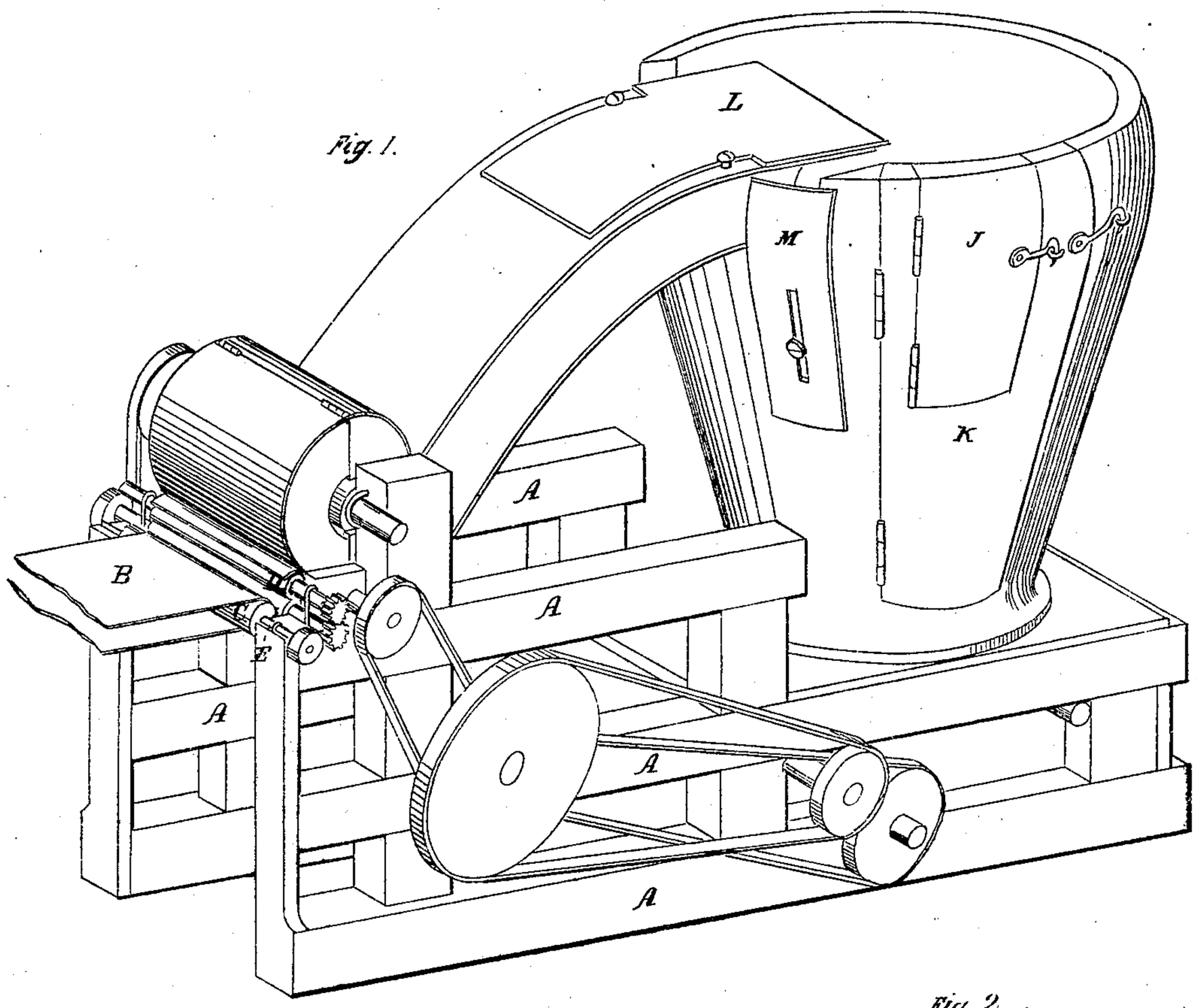


Fig. 4.

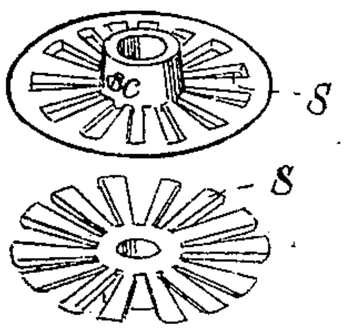


Fig. 3.

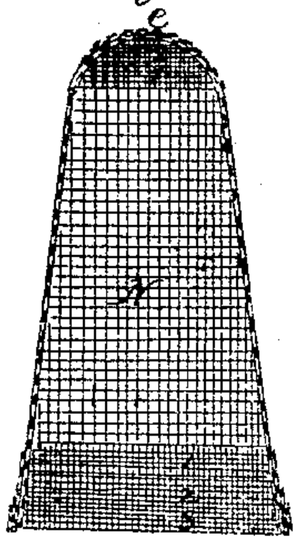
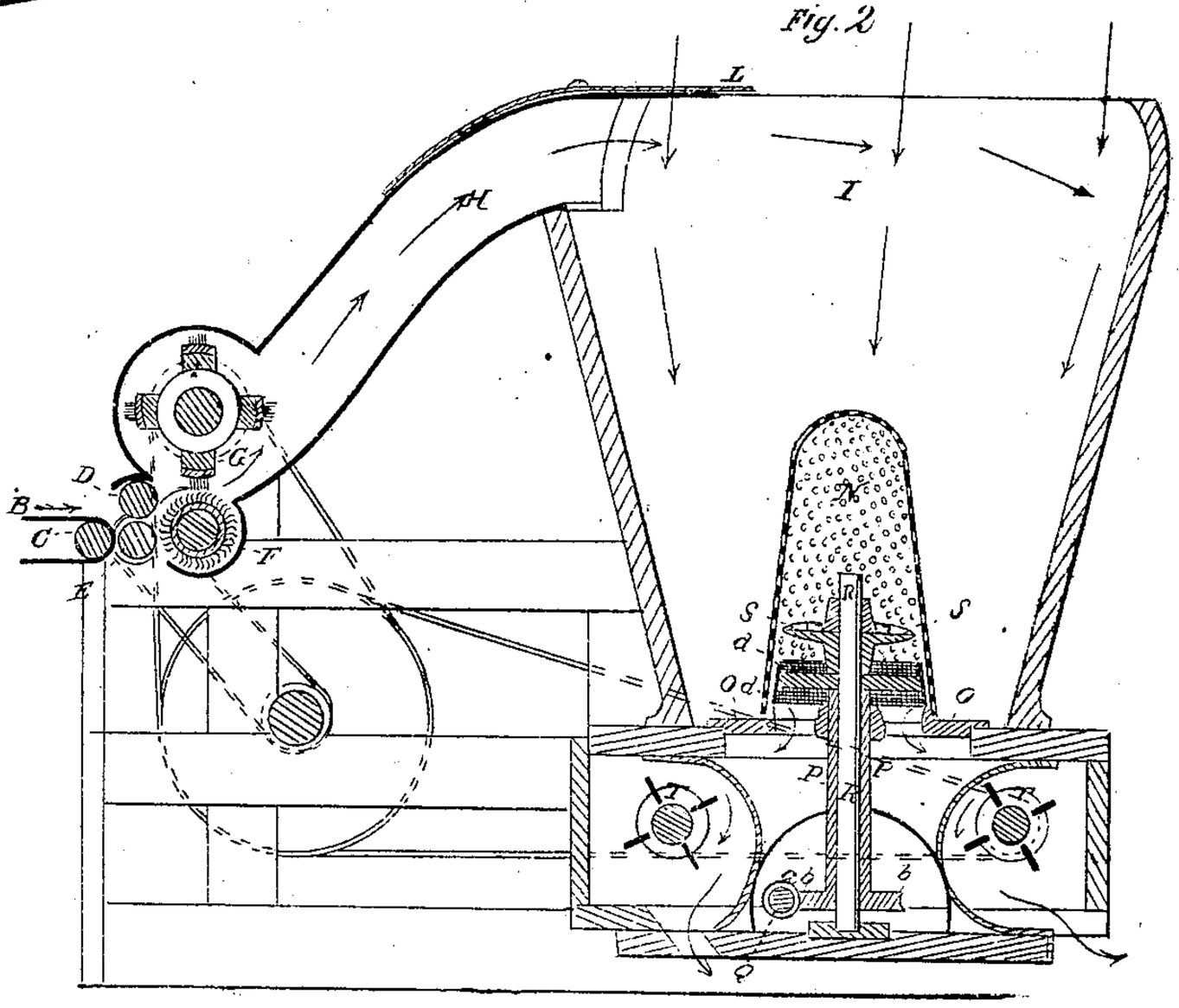


Fig. 2



UNITED STATES PATENT OFFICE.

IRA GILL, OF WALPOLE, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND ELBRIDGE BROWN, OF SAME PLACE.

IMPROVEMENT IN MACHINERY FOR FORMING HAT-BODIES.

Specification forming part of Letters Patent No. **16,426**, dated January 13, 1857.

To all whom it may concern:

Be it known that I, IRA GILL, of Walpole, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in the Manner of Manufacturing Hat-Bodies by Machinery; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part thereof, in which—

Figure 1 represents a perspective view of the machine which I use. Fig. 2 represents a central longitudinal and vertical section through the same, and Figs. 3 and 4 represent detached portions of the machine to better illustrate their particular function in the general operation.

Where similar letters and figures of reference occur in the several drawings, they denote like parts of the machine in all.

The nature of my invention relates more especially to the case or box in which the body of the hat is formed and incidental thereto the manner in which I regulate the thickness of the fur or other material upon the cone, so as to make it thicker or thinner thereon at various points, as may be desired.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents a substantial frame, upon which the machinery employed is mounted, and which machinery may be geared and driven in any of the usual well-known ways.

B is an endless apron passing over rollers C, and is designed for bringing up the fur or other material to be used in the manufacture of the hat-bodies to the feed-rollers D E, which take and convey it to another revolving cylinder F, covered with clothing or bristles, which raises up said material within reach of an open revolving brush-cylinder G, that has sufficient motion to disengage the material from the cylinder F and carry it up through and out of the trunk or conductor H into the top of a case or box I, where it is caught by another separate and independent current of air and carried to the cone.

So much of the machine as is above described may be varied in many particulars, it being simply an arrangement of machinery for preparing and transmitting the fur or other material to or near the place where it is to be taken up and carried to the cone, and I have shown and described it as one of the many arrangements that may be devised or used for the purpose.

The case or box I, I prefer to make round, as such a form presents fewer surfaces for causing counter or reacting currents of air therein, or dead-spaces or eddies, it being of the utmost importance that all these objectionable contingencies should be, as far as possible, prevented; but a three, four, or many sided box may be used and I have experimented with such. The case or box I is open at its top and closed at the bottom, except immediately under the inside of the cone, and the area of the top of the box should be larger than the area of the bottom thereof for the purpose of concentrating the current or currents of air drawn into it at the top toward the cone, which is placed on or a little above the bottom of said case or box. The diminution of the area of the case or box from top to bottom may be regular; but I prefer the form shown in the drawings—viz., slightly contracted at the top; or it may have a series of curves or waves from top to bottom, the general lines of which, however, must approach each other at or toward the bottom. By this means I produce, as it were, a vortex, into and through which the fibers fall like snow flakes, uncontrolled by any reacting currents, and settling with the greatest regularity upon the cone, on which they are held by the current drawn through it by the fans below.

I have said that the cone may be placed on or a little above the bottom of the case or box I. If the fur or other material to be used were entirely divested of all the "dags," then the cone might be placed on the bottom of the box or case; but as this is almost an impossibility, and it is important that these dags should not touch the cone, because they cannot easily be removed without disturbing other portions of the deposit, I propose to raise the cone up a short distance above the bottom of the box. This I am aware will produce a

dead-space at the bottom of the box, which will fill up with the fur that falls into and remains in it; but it also forms a dead-space into which the dags by their greater specific gravity will fall and remain without touching the cone, which is important.

The box I is or may be provided with double doors J K, the smaller one J being made in the larger one K. The door J is for placing or removing the cone, and the one K for gaining access to the bottom of the box for removing the dags or for any other purpose. When a clot or dag is driven through the trunk H, it being heavier than the fiber is driven farther than it, even so far as to strike against the opposite side of the case or box I, which so deadens its velocity that it falls down along said side into the bottom of the box, where there is no current tending toward the cone, and I believe that I am the first to contrive any means whereby the dags are kept from the cone, and consequently I produce a better hat-body by my process than by any other of which I have knowledge.

I am aware that hat-bodies have been made in a box or case; but not in a box or case in which a vortex is created and maintained and which floats the fiber up to the cone, as in my machine. I do not pretend that exact uniformity of deposit takes place in all parts of the box. This would be impossible, unless some means of blowing the fur into the box could be devised that would not counteract the vortex which I deem so essential for the perfect conveyance of the fur. In my own machine I have found the difficulty alluded to and which I was obliged to obviate as far as possible.

It will be seen that the trunk H is so arranged that its top is just flush with the top of the box I, and that it is further provided with a sliding top L to increase or diminish said top. The trunk has also considerable width, as seen in Fig. 1. It is obvious, therefore, that this trunk must, and does to a certain extent, mar the perfect action of the vortex, and the consequence is that there is about one-third greater deposit on that side of the box opposite to the mouth of the trunk than there is on the side next to said trunk; but as the cone is constantly revolving this is immaterial, for all of its sides or parts are brought opposite the greater as well as the lesser deposits, and they thus become uniform; for what the trunk H takes off in height from the box or case I provision must also be made, and I do this by making at each side of the trunk an opening, covered by a slide M, so that a regulated quantity of air may be admitted to supply that otherwise kept out by the trunk. As a point of difference in form between my case or box and the cone, it will be seen by reference to Fig. 2 that as the cone increases in diameter the box or case diminishes in diameter, and that where the cone is largest there the box is smallest. I am thus particular in pointing out the shape of my case or box and the action of the current through it, because it is of the greatest importance in making a perfect hat-body, and if I am mistaken in the *rationale* of the process I am not mistaken in the product, for I can and do make a better hat-body than can be produced by any of the present known machines.

N represents the cone, which is placed on a frame O, that is attached to and revolves with the shaft P, said shaft being revolved by a worm-gear *a* on a shaft Q, which worm-gear *a* takes into a worm-wheel *b* on said shaft P. The shaft P is hollow, and through it passes another shaft R, which is stationary. This shaft R extends up into the cone N, and upon it is arranged a register S, composed of two plates, as seen separately in Fig. 4, which can be adjusted on said shaft both vertically or horizontally by means of the set-screws *c* therein. The object of this register S is to regulate or adjust the amount of fur to be deposited on the upper and lower part of the cone, which is done by closing or opening said register and by raising or lowering it on its shaft. In addition to this adjustment to regulate the upper and lower parts of the hat-body, I make further provision for regulating to tip, square, and brim of the hat, thickening or thinning these parts at pleasure, which is desirable in hat-making, and is done as follows:

In Fig. 2, *d* represents an inside gauze opposite that part of the cone upon which the brim is formed. This additional gauze of course obstructs the current of air, and consequently diminishes the deposit at that point; but it may be desirable to gradually thin out that portion to an edge, as it were, so that in finishing the hat the brim may be more readily turned up. To do this, a second and third gauze is introduced, as shown at 1 2 3 in Fig. 3, each of less height than the other, which gradually obstructs the current through them and as gradually diminishes the deposit of fur. So, also, on the tip *e* one, two, three, or more pieces of gauze may be laid on, which will leave the tip very thin at the center and thicker at the square.

T T are a pair of fan-wheels for exhausting and drawing by suitable openings a current of air through the case or box I and the cone N. A grass or other cloth may in the usual manner be laid over the cone and the hat-body formed on and removed with said cloth.

Having thus fully described the nature and object of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The forming of a hat-body within an inclosed chamber, in which a vortex is produced by means substantially such as described

said chamber diminishing in area from its open to its closed end to regulate the draft through it and to avoid counter-currents, eddies, or dead-space, as set forth.

2. In combination with the cone on which the hat-body is formed, a register or draft-regulator within it, so as to regulate the quantity of fur or other material that is to be gathered upon its upper and lower portions, as set forth.

IRA GILL.

Witnesses:
A. B. STOUGHTON,
THOS. H. UPPERMAN.