

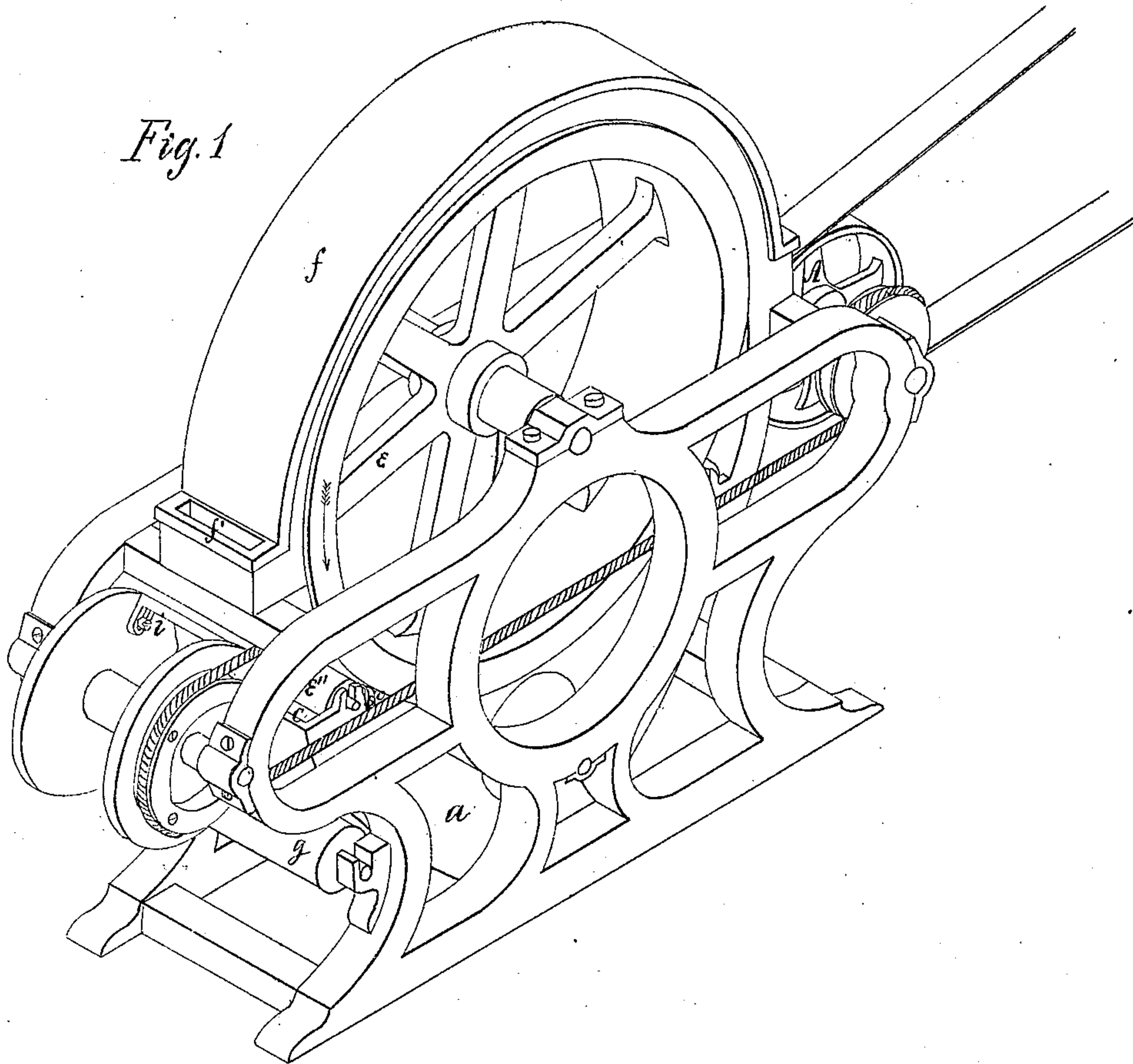
*C.D. Jones.*

*Paper Mach.*

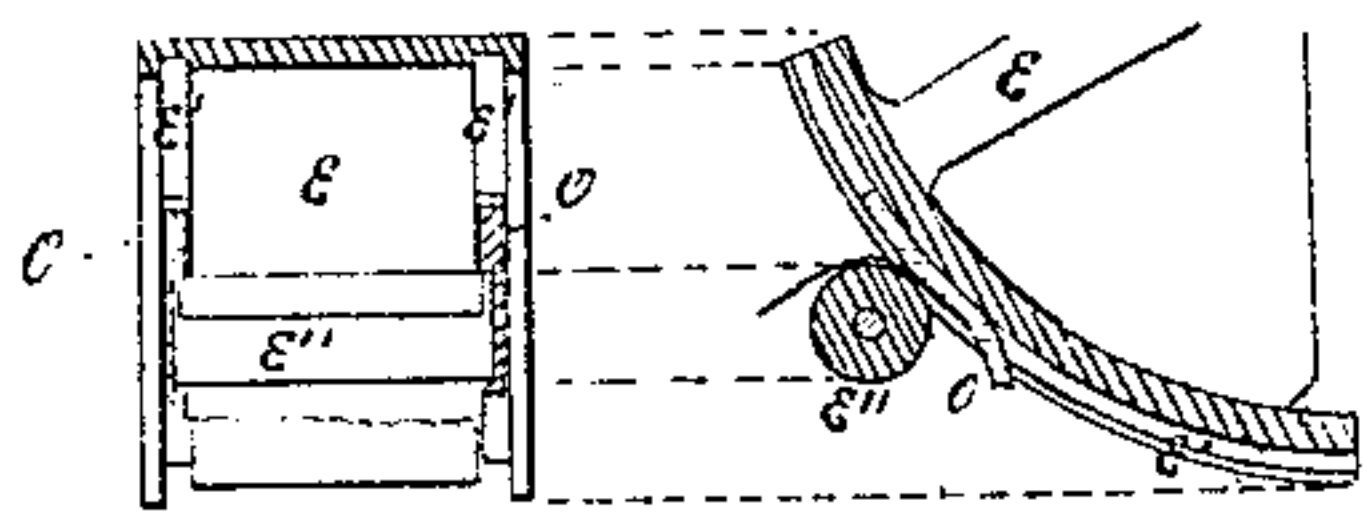
*Nº 13,913.*

*Patented Dec. 11, 1855.*

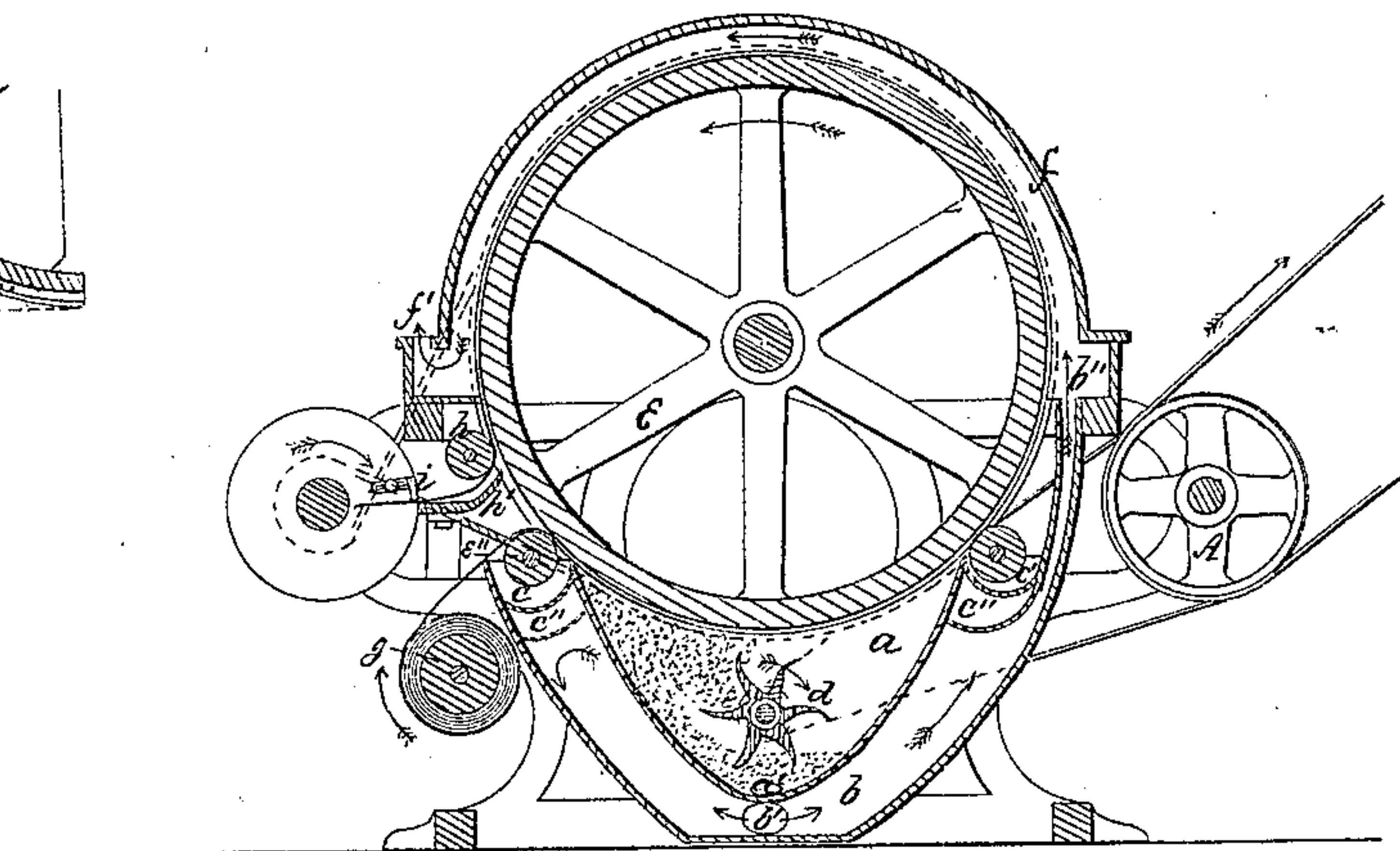
*Fig. 1*



*Fig. 3*



*Fig. 2.*





# UNITED STATES PATENT OFFICE.

GILBERT D. JONES, OF JERSEY CITY, NEW JERSEY.

## SANDPAPER-MAKING MACHINE.

Specification of Letters Patent No. 13,913, dated December 11, 1855.

*To all whom it may concern:*

Be it known that I, GILBERT D. JONES, of Jersey City, county of Hudson, and State of New Jersey, have made certain new and  
5 useful Improvements in Machinery for Manufacturing Sandpaper; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawings, mak-  
10 ing a part of this specification, in which—

Figure I is a perspective view of my improved machine. Fig. II is a longitudinal vertical section thereof. Fig. III is a part in detail, and similar letters refer to similar  
15 parts throughout.

The object of my improvement is to reduce the time, labor, and space or room heretofore required in making sand-paper, while at the same time the quality thereof is fully  
20 maintained, and in some respects it is rendered superior, especially in regard to the tenacity or holding property of the grit to the paper. The performance is such that the paper is passed in at one point of the  
25 machine, and in a few moments after is delivered again completely finished and ready for use without the intervention of any manual performance by an attendant.

The most important features of my invention consist, firstly, in the preparation or condition of the sand at the moment it is to be applied. Secondly, in the method of applying it, and thirdly, in the sizing of the paper. To these are added, as minor  
30 points, the drying, feeding, delivery and cutting into sheets.

The machine consists principally of a sand-reservoir and its mechanism for applying the same, glue-vats and their rollers, a carrying wheel to convey the paper while going through the various stages of the process, hot air channels for drying the paper, &c.

The important feature respecting the  
45 preparation of the sand consists in heating it and applying it at a high temperature. The object of this is to effect the immediate setting of the glue by driving off the moisture by contact with the hot sand or grit,  
50 whereby the latter becomes almost instantly affixed to the paper.

The second feature is the mode of applying the sand, viz: by throwing it upward and against the glued surface of the paper,  
55 in contradistinction to the old modes whereby the sand is sifted and falls by gravity

upon the paper. The superiority of my mode lies in the fact that the sand may thus be projected with force in to the glue regardless of the quantity dashed upon it, 60 since the excess will fall off. This insures the complete covering of all the paper evenly, whereas in the old modes any excess produces a cloudy or ridgy paper, and besides the grit will not adhere with any 65 strength, but is easily rubbed off, and is liable to injure the work.

The other improvements will be shown during the description of constructing and working the machine, which is as follows: 70 At (a) is a deep dish forming the sand-box, and is placed at the bottom of the machine; the ends and bottom are formed double so as to leave an air space, as shown at (b). Upon each top edge and in the 75 thickness or space between the inside and outside are formed two glue-vats (c c'); these have also double bottoms (c'') for holding hot water, steam, or hot air, to keep the glue liquid. At (a') is an opening 80 leading to a conveniently placed reservoir containing the main supply of sand, which pours in as wanted, and at (b') is a like opening in (b) through which hot air enters; (b'') being the discharge place for 85 the same. At (d) is the dashing wheel for applying the sand. The arms have a little of the scooping form, and its manner of performance is clearly indicated in the drawings. 90

A large drum-wheel (e) is supported on the frame immediately over the sand-box, and sinking into it so far as to leave only clearance at both ends. This wheel therefore covers the opening, and the office of it 95 is to convey the paper while undergoing the process of being glued, sanded and dried, and then to deliver it finished to the cutter, or, if not to be cut into sheets, to the take-off roller. On the face of (e) a narrow 100 groove (e') Fig. III is cut near each edge. These are for receiving a stationary piece (o) (o) at each end of the gluing roller, as will be hereinafter described, and they also serve to admit the sides of the sand-box (a) 105 making thereby a better joint, as well as to receive the arched side pieces of a semi-circular box or cover (f) which is for the purpose of forming a continuation of the channel (b'') delivering the hot air from 110 (b), there being a final discharge at (f').

The paper to be sanded is in the form of



a roll or extended sheet, said roll being placed on an axis convenient to the machine, as at (*g*); from this it passes over the gluing roller placed in the vat (*c*), which roller is so situated as to press the paper between it and the drum (*e*). Thence the paper is carried around said drum nearly its whole circumference, and is led off just above the place of entrance by being taken under a roller (*h*) whence it passes over a curved plate (*h'*), the outer edge of which forms half of the shear for cutting into sheets. The other part of the shear is a movable blade (*i*) revolving in front, as shown, and is so timed in its movements with regard to the delivery of the paper as to cut that off into uniform sheets.

In Fig. III is a view of a small but important part of the machine, the object of which is to prevent any glue from running over the edge of the paper upon the face of the drum. The letters (*e'*) represent the grooves upon the drum, the space on the face between (measuring from the inner sides of the grooves) is to be a little less than the width of the paper, so that the latter will slightly overlap. The length of the gluing roller (*e''*) is also such as to be a little greater than the width of the paper. Now as this roller presses the paper against the drum, the extreme edges would not receive glue properly by reason of their sinking into the grooves; each groove is therefore filled up for a short distance by a curved piece (*o*) but attached to the side framing as seen in Fig. I, so that the surface of (*e*) becomes by that means widened out. These pieces of course remain stationary, there being play enough to allow the drum to revolve freely. The edges of the paper are therefore kept up while receiving glue, any excess running over on to the pieces (*o*) and dripping back into the glue-vat, thus keeping the surface (*e*) always clean while yet the paper can be sized and sanded to its extreme edge, which could not otherwise be the case. The various parts are put in motion by well-known contrivances of belts and pulleys, cog-gearing, &c.

The operation is as follows: And first, as to maintaining a supply of hot sand. This may be done by means of a reservoir placed near the machine, and at an elevation so that a spout leading to the opening (*a'*) will keep up the feed. The sand in the reservoir must be heated either by means of a hot blast, steam pipes or direct fire as may be found most convenient, to accomplish which no particular art is necessary. A continuous blast of hot air is then to be kept passing through (*b*) under the cover (*f*) and discharging at (*f'*). The current is represented as being sent in at (*b'*) but the reverse of this may be the case, (*f'*) being then the place of entrance and (*b'*) the exit.

This latter direction will afford some advantages in dripping since the paper will move in a course opposite to that of the current of air. The vats (*c* and *c'*) are to be supplied with the appropriate sizing, of which glue is to be preferred, and its liquidity is to be maintained by means of steam, hot water, or hot air in (*c''*). All the parts are to be so coupled or geared as to move together with the relative speeds required for the different parts, the power being applied as shown at A. The machine being started, the velocity of the drum (*e*) is such, as to give the required time for the sizing coat from (*c'*) to dry during its passage from that vat to the place of discharge at (*h*). A high velocity is imparted to the sand-wheel (*d*). The paper must in the first instance, be passed through the machine so as to cover the drum all around except the short space between (*h*) and (*e''*); the process will now be as follows: As the paper is drawn from the roll (*g*) it passes first over the roller (*e''*) and then receives its coat of glue; the drum (*e*), moving steadily on, carries this over the top of the sand-box; the operation of the wheel (*d*) is such as to project the hot sand upward with considerable force against the glued surface, thus burying the grit well into the glue. In consequence of the high temperature the glue almost immediately sets, and the water is drawn off in vapor. The whole surface is completely covered with sand, and with great equality, for although the sand is constantly thrown upon it in great excess, no more than can cover the surface will be able to lodge, by reason of the sudden setting of the glue, and the excess therefore falls back in to the box. The drying is so rapid that the finishing coat of size may be at once applied which is accordingly done as the paper presses upon the roller in (*c'*) and the final drying being accomplished during the remainder of the revolution of (*e*) from (*b''*) to (*f'*). It is then either rolled upon a take-up roller, or cut into sheets, as may be, if the latter, the cutter is placed as shown at (*i*) there being nothing peculiar here.

In order to continuous working it is very necessary to keep the surface of the drum always free from glue, and inasmuch as the glue must be applied to the paper in excess so as to insure the perfect covering of it that excess must escape somewhere. This is at the end of the rollers, where it pours back again into the vat, and there would consequently be constant danger of the glue getting under the edge of the paper, and out to the drum, were not provision made to prevent it. This is the purpose of the part shown in the detached Fig. III. As the excess of glue is pushed up or rather before the roller at the point of contact with the paper, it gradually works out toward the



ends, and there falling upon the curved surface of the plates (o) trickles down and falls back into the vat, while such as may have worked under the edges of the paper while passing over the plates (o) overhangs in the grooves of the drum and does not therefore touch anything.

The machine may be modified in several particulars, one of which is that instead of the forming of a hot-air channel over the drum by the cover (f), the paper may be led off after passing the sizing roller, to a drying-room, or through a channel lying horizontally, vertically, or in any other position through which the hot air may pass, and the paper be delivered into the packing room, at a distance from the machine if so preferred.

I claim as of my invention,

1. Applying sand or grit in a heated state to the glued surface of the paper, for the purpose set forth. 20

2. The method of depositing the sand upon the glued surface, that is to say, by projecting it forcibly against said surface while in such reversed position that the excess shall fall off by gravity, as described. 25

3. The combination of the stationary pieces (o) or their equivalent, with the moving drum, the paper, and the gluing roller, for the purpose set forth. 30

GILBERT D. JONES.

Witnesses:

J. P. PIRSSON,  
S. H. MAYNARD.