

J. Franck,
Glass Furnace.

2 Sheets, Sheet 1.

N^o 3,081.

Patented May 12, 1843.

Fig. 1.

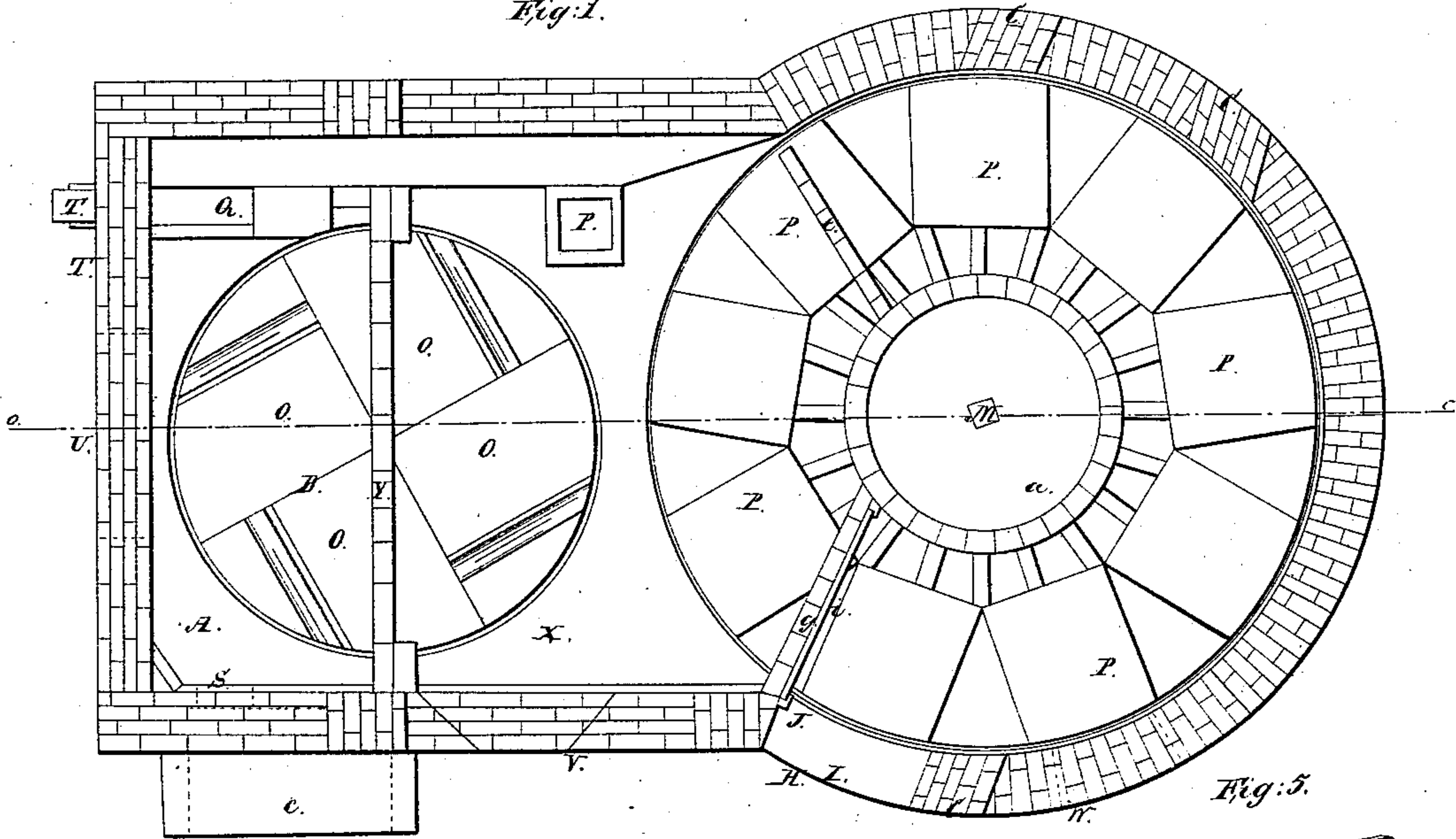


Fig. 5.

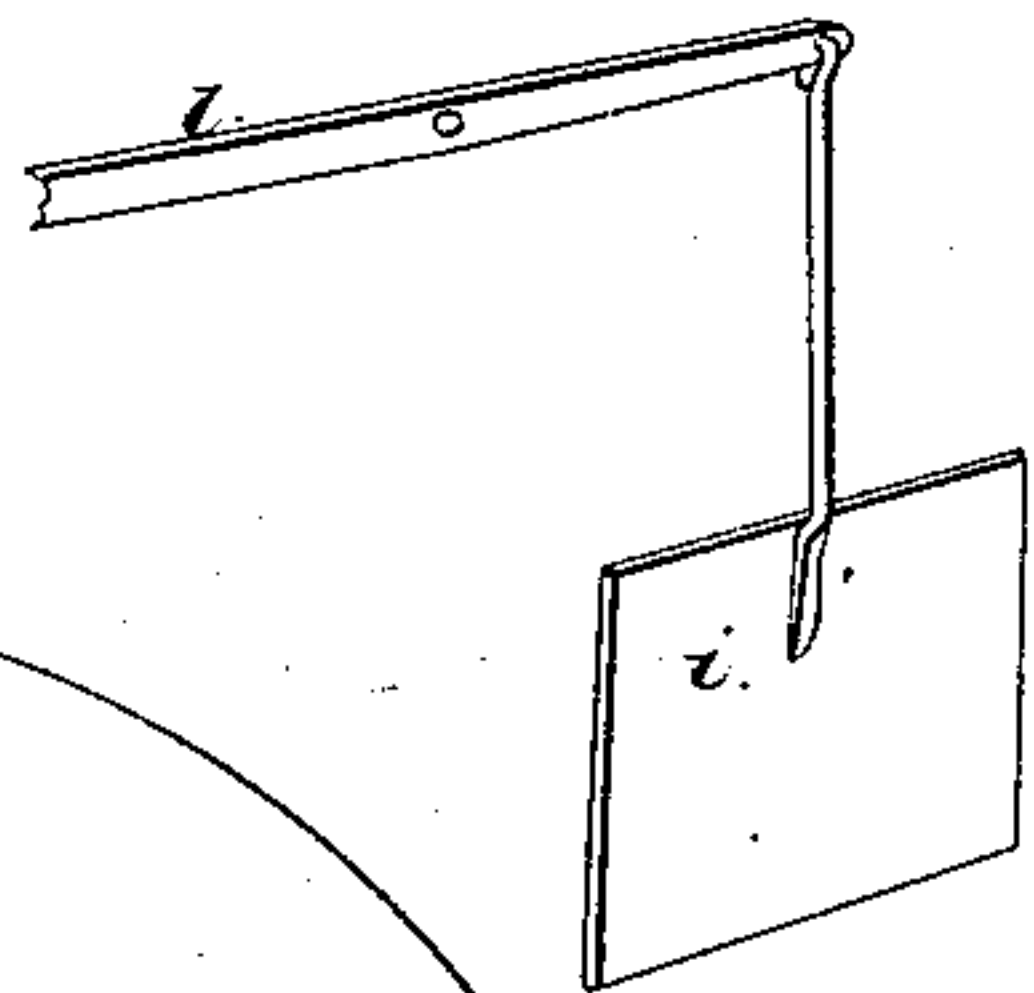
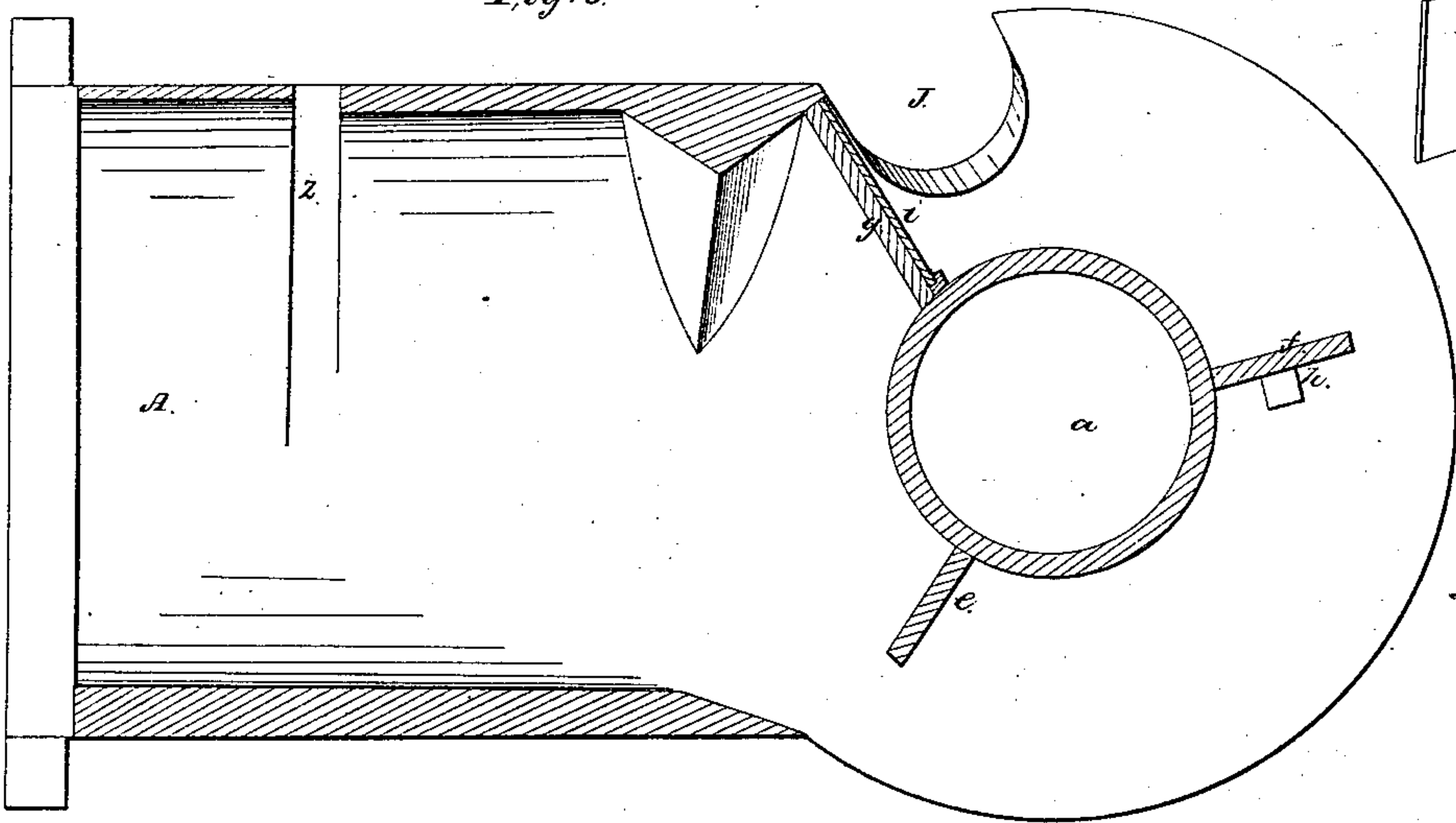


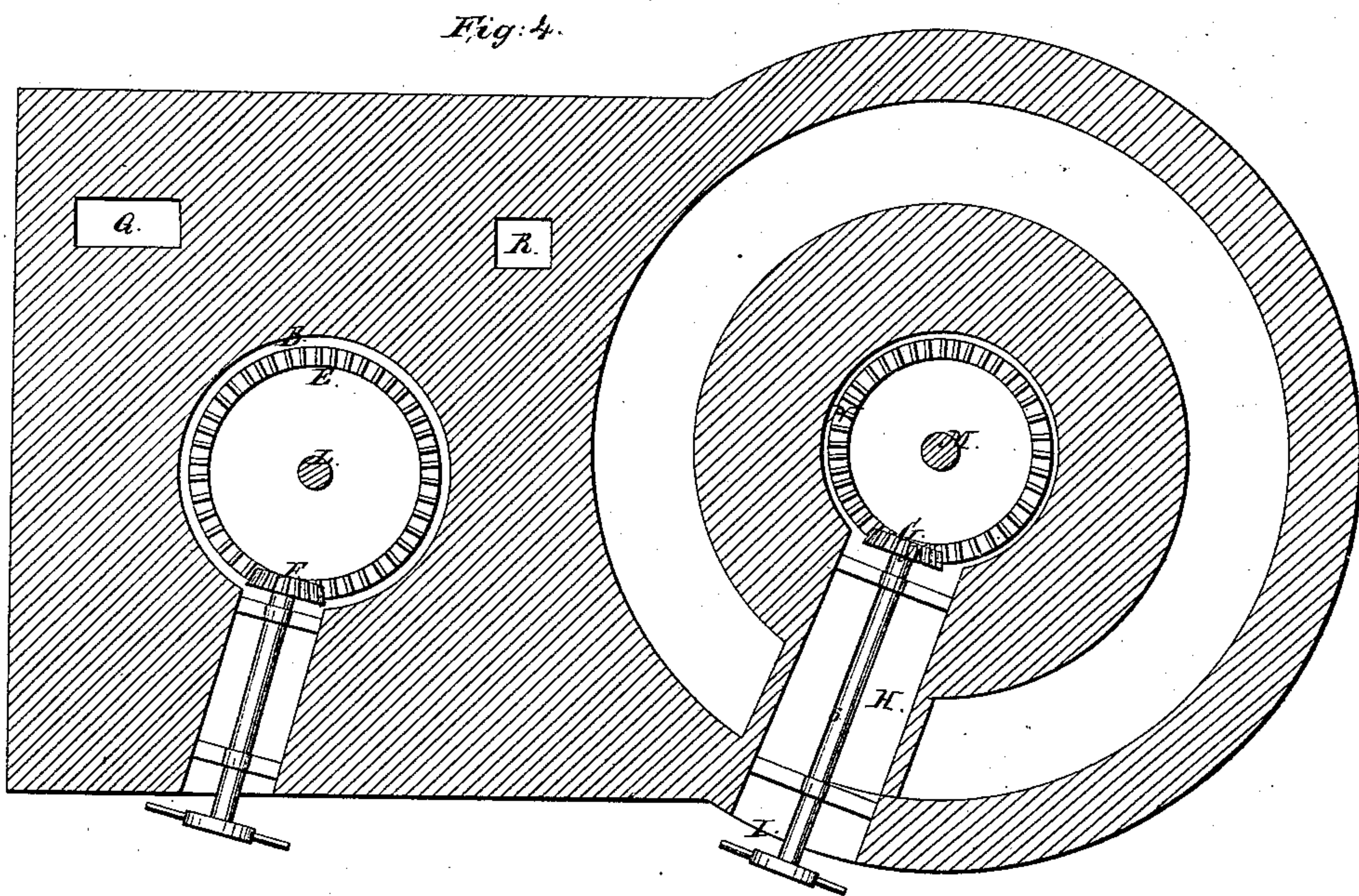
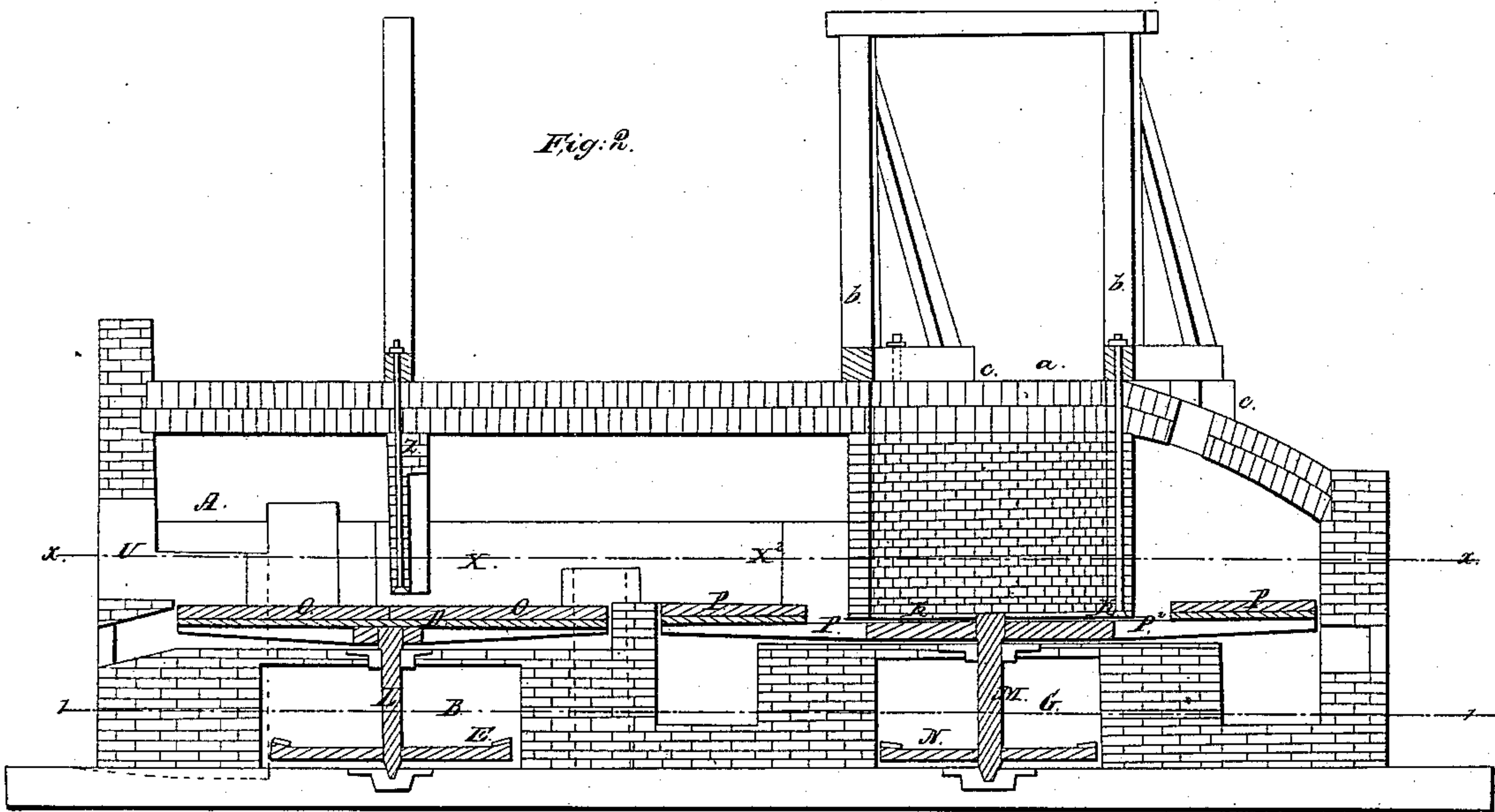
Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN FRANCK, OF MILLVILLE, NEW JERSEY.

OVEN FOR COOLING AND ANNEALING GLASS.

Specification of Letters Patent No. 3,081, dated May 12, 1843.

To all whom it may concern:

Be it known that I, JOHN FRANCK, of Millville, in the county of Cumberland and State of New Jersey, have invented a new and Improved Oven for Annealing Window-Glass and All Kinds of Glassware; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings of the same, making part of this specification, of which—

Figure 1 is a horizontal section at the dotted line *x x* of Fig. 2. Fig. 2 is a vertical longitudinal section at line *o o* of Fig. 1. Fig. 3 is a view of the underside of the top, inverted, showing the mantles. Fig. 4 is a horizontal section at the dotted line 1 1 of Fig. 2. Fig. 5 the lever and damper.

Similar letters in the several figures refer to corresponding parts.

The nature of my invention consists in laying the glass on clay stone called cooling stone, the stone being placed on a pivot wheel, and the oven being constructed in such manner and divided by mantles, the mantles being suspended over the wheel by means of bolts and king post; the object of the mantles is to give the oven an even heat, and cool the glass very gradual, by being revolved around on the pivot wheel from that part of the oven where the fire is kept until it comes entirely out of the ovens which takes about four hours when the glass is cool and ready to be taken off the stone.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

To give a full description of my oven, I must at the same time give that of the flattening oven attached thereto, as they are used together. The flattening oven A is 13 feet 3 inches wide in front outside, the whole length of flattening and cooling oven is 24 feet 6 inches, the ovens are 13 feet 3 inches wide from front for 12 feet where it intersects the cooling oven, which is a circle 16 feet 2 inches diameter; the hearth of each oven is 3 feet 3 inches above ground work of ovens. The flattening oven cog wheel arch B the center of which is 5 feet 5 inches from front of flattening oven and 7 feet 3 inches from side at stick hole C and is 4 feet 4 inches in diameter and 10 inches high with 10 inches circle cap, which has a hole in top at center 4 inches diameter to let the pivot of flattening oven wheel D in; the

pivot passes down through this hole, the lower end of which stands in the pan in the center of bottom of this arch; the large pan is laid in stone and the small one is laid in the large one; the pivot stands perpendicular; in this arch is a large and small cog wheel, the large wheel E is a horizontal and the small one F is perpendicular; to small wheel is attached a shaft; at the outer end of it is affixed a cross by which the wheels are turned; from the cog wheel arch leads the shaft arch which is 2 feet wide, 2 feet high, 5 feet long, 6 inch circle, with 12 inch wall, the mouth of which is directly under stick-hole; the bottom of these arches is 6 inches below ground work of ovens, in this arch is put two pieces of timber 4 inches by 4 inches thick, 2 feet long for the shaft to run on; they are placed 3 feet apart 12 inches above bottom of arch.

The cooling oven cog wheel arch G is the same as flattening oven cog wheel arch, the center of which is center of cooling oven; from this arch leads the shaft arch H which is 6 feet long 2 feet wide, 2 feet high, 6 inch circle, and 9 inch wall. The mouth I of this arch is directly under the take off mouth, J. The bottom of these arches is 6 inches below ground work of ovens; the wheels in this arch are the same as those in flattening oven cog wheel arch, and work in the same manner; the shaft in this arch also runs, and is fixed the same as the one in flattening oven arch.

The flattening oven circle where the flattening wheel D plays in is 8 feet 1 inch in diameter. The bottom of it is 12 inches below the hearth of oven; in the bottom of this circle the cross is fastened which stays the pivot L on which the flattening wheel sets; this makes this circle 12 inches deep; the center of it is 5 feet 2 inches from front of flattening oven and 5 feet 7 inches from side at cooling oven.

The cooling oven circle is 13 feet 2 inches in diameter; in this circle the cooling wheel P² plays; the center of it is 16 feet 5 inches from front of flattening oven, and 8 feet 1 inch from either side of cooling oven; this circle is the same depth of flattening oven circle, and is on a level with the same; in the bottom of this is a cross which stays the pivot M of cooling wheel; these crosses have a hole in center, through which the pivot passes. The pivot has a head on which the cooling wheel sets, and then the pivot passes

down to large cog wheel N; the pivot 6 inches from lower end is square; this part is fastened in hub of large cog wheel, through which it passes; the lower end of it stands in the pan in cog wheel arch; the whole is then set in motion from the action of the small cog wheel N² on the large one; the small wheel is turned by the shaft S attached to it; the flattening and cooling wheels are horizontal; on the flattening wheel are four stones O, and on the cooling wheel nine stones P. The flattening stone is 31 inches wide, 42 inches long on one side, and 37 inches long on the other and 5 inches thick; the cooling stones are 36 inches long, 29 inches wide, and 3 inches thick; the stones are made of materials used by glass manufacturers.

The shear Q to heat the flattening oven is 2 feet from left hand corner of flattening oven and is 43 inches deep, 17 inches wide, and 15 inches high, with 7 inch circle. This makes the shear 22 inches high in center and in the oven 4 feet 2 inches high, where there is a wall between the shear and circle of flattening wheel 11 inches high, 6 inches thick. This makes the wall back side of flattening oven to where it intersects cooling oven 2 feet thick, and from this to cooling oven circle 30 inches thick, and in front of flattening oven 13 inches thick; all other outside wall is 18 inches thick, except stick hole C which is 9 inches thick. The coal hole T of flattening oven is 5 feet deep, 14 inches wide, 12 inches high, and extended in front of oven 2 feet.

The shear R to heat the cooling oven is 8 feet 3 inches from front of flattening oven, is 3 feet 7 inches deep, 17 inches wide, 15 inches high, 7 inch circle. This makes the shear 22 inches high outside, and runs up in this cooling oven with a flue 14 inches square between the circles of the two wheels.

The stick hole C is 37 inches wide, 14 inches high, with 9 inch circle, which makes it 23 inches high in center. The stick hole wall is extended by the main wall at right hand of flattening oven 22 inches and is 14 inches from front of oven; and is divided from flattening oven by 4 inch wall and ring; the ring has a hole S 11 inches diameter to put the cylinders into flattening oven; the ring is 26 inches from front of flattening oven and 37 inches from mouth of stick hole. The flattening oven mouth U is 5 feet 6 inches from corner at left hand of flattening oven; is 38 inches wide, 11 inches high, with 12 inch circle.

The cooling oven V is 7 feet 3 inches from front of flattening oven, is 2 feet wide, 13 inches high, with 6 inch circle. The take-off mouth J is 12 feet from front of flattening oven, is 41 inches wide; at this mouth there is no cap over the oven, where it is entirely out for 3 feet 6 inches up in the cap.

The cooler mouth W is 2 feet to right of take-off mouth, is 28 inches wide, 7 inches high, with 6 inch circle. The bottom of these mouths is at hearth of oven.

The flattening oven A is 10 feet wide 4 feet long inside and is separated from cooling oven X by mantle Y and mantle arch Z. The arch is 4 feet from front of oven on the inside and has a screw-back for foot of mantle to set on 8 inches long; the arch has a spring of 2 feet and is 8 feet 1 inch across; this arch is over the center of flattening wheel, and is 9 inch wall, with mantle 4 inches thick to fill up under the arch. Through the center of this mantle passes a $\frac{3}{4}$ inch bolt with a stop at lower end for mantle to rest on; the upper end of this bolt passes up through mantle arch, and screwed into king post on top of arch; the king post is to hold up mantle. The mantle arch has its foot on hearth of oven; the bottom of mantle is 2 inches above hearth of oven; the flattening oven is 17 inches high from hearth of oven, with cap 18 inches spring; this makes the oven 35 inches high in center.

The cooling oven X is 9 feet wide inside to where it intersects the circular part X² which has a diameter of 13 feet 2 inches inside, and is 16 inches high from hearth, with a spring of cap 22 inches which makes this oven 38 inches high in center; in center of the cap of 13 feet 2 inches diameter. There is a hole *a* in the cap 5 feet 6 inches in diameter; this hole is secured by two iron hoops being let into the same; the hoops are $\frac{1}{2}$ inch thick, 2 inches wide; these keep the cap from pressing in this hole which I call the mantle hole, is to swing the round mantle in, which mantle is supported by 6 bolts each 1 inch in diameter; at lower end of these bolts there is an iron rim or wheel K $\frac{1}{2}$ inch thick, 2 inches wide; the bolts are fastened through this and are supported at top of oven by king posts *b* by passing through sill of posts, and are screwed on top of sill; the bolts are 5 feet long and have a screw on the upper end; these bolts are 30 inches apart around the inside of mantle; the mantle is 4 inches thick and of brick; the brick are built on the iron rim; and up to the top of cap of oven; the bottom of this mantle is 2 inches above the cooling wheel so as to let the wheel play under the mantle; between this mantle and the inside of circle is the space in which the cooling stones are laid on the wheel and the stones P are raised 2 inches above the bottom of mantle, so as to let no heat pass under the mantle. The stone revolves around this mantle; the king posts to hold up this mantle are placed directly over the hole in cap of cooling oven 4 feet apart, the sills of which rest on pillars *c* built on the outside walls for them to rest on; the pillars are run up so as to let the timber clear the top of cap; the one end of sills of

king posts are one on each side of take-off mouth and the other ends directly opposite at back of oven.

At back of cooling oven inside where it intersects the circle, there is a short mantle *e*; it rests on the round mantle 16 inches from its bottom and runs up to center of cap, that is center of cap between the round mantle and out wall; there is another hole *h* in this cap in the center of the space between round mantle and out wall 6 inches square 7 feet 6 inches from take off mouth at this hole; there is a mantle *f* on the side of hole next to take off mouth, this mantle rests on round mantle 16 inches from its bottom and runs up to hole in cap in center of the space between round mantle and out wall; there is one mantle *g* at left hand side of take off mouth; it reaches across from outside wall to round mantle; one end of it rests on round mantle the other on the out wall of oven; the bottom of this mantle is 10 inches above hearth of oven, the stones pass under this mantle as they are turned into the oven to receive the glass, which opening is closed by a damper *i* made of clay which is hoisted and lowered by a lever *l* attached thereto; the lever is hung to king post; the damper is 4 feet long, 12 inches wide, 2 inches thick. See Fig. 5.

There is 6 ventilators each 9 inches high 12 inches wide; the bottom of each is bottom of wheel circles; one is front of flattening oven 4 feet 6 inches from corner at stick hole, one under cooling oven mouth 9 inches from stick hole, one 15 inches from right hand side of cooling oven shear. These lead to flattening wheel circle, one 6 inches to left of take off mouth, one 14 feet to right of this at back of oven; the other 7 feet to left of cooling oven shear; these lead to cooling wheel circle.

The small cog wheels one each for flattening and cooling oven is 12 inches at one side and 9 inches diameter at the other side 4 inches thick. In center of this wheel is a 2 inch square hole for shaft to fasten into; the shaft for flattening oven is 6 feet 4 inches long 2 inches square; the shaft of cooling oven is 7 feet 4 inches long, 2 inches square; the flattening wheel has a hub 10 inches diameter 4 inches thick, in center of which is a hole $3\frac{1}{4}$ inches square to let the head of pivot in; the arms of this wheel is 3 feet 4 inches long and 4 inches by 2 inches thick at hub and 2 inches by $1\frac{1}{2}$ inches thick at end of arm; there is six arms to this wheel; the arms and hub are cast together; the large cog wheels one each for flattening and cooling oven are 4 feet diameter; the outer work is a rim 4 inches broad on which is the cogs, and with the cogs is 3 inches thick; the center is a hub 12 inches in diameter at upper side and 8 inches diameter at lower side, with hole for pivot to go in $3\frac{1}{4}$

inches square; there is four arms to this wheel each 14 inches long 3 inches by 1 inch thick; this wheel the hub arms and rim are cast together; there are two pivots one each for flattening and cooling ovens; they are 39 inches long, 3 inches diameter, and round only at the head for 4 inches length; they are square 3 inches, and they are 3 inches square for 4 inches 6 inches from lower end which is pointed to run in pan; the pan is 6 inches square 2 inches thick, the bore in pan is 1 inch diameter $\frac{1}{2}$ inch deep; there is one each for flattening and cooling oven; there is two other larger pans one for each oven for small pan to set in, they are 9 inches by 12 inches wide 2 inches thick with bore 6 inches square in center $\frac{1}{2}$ inch deep, the hub of the cross is 11 inches diameter $1\frac{1}{2}$ inch thick, in the center of it is a hole $4\frac{1}{2}$ inches diameter for the pivot to work in; the arms to the cross are four each 2 feet long $1\frac{1}{2}$ inch thick 3 inches broad; these hubs and arms are cast in one; there is two crosses one each for flattening and cooling oven, there is two half boxes to each hub $\frac{1}{2}$ inch thick 1 inch wide, each half forms half circle to fill up the hole in hub of cross to fit to pivot. The cogs to all the wheels is $\frac{1}{2}$ inch thick and $1\frac{1}{2}$ inch deep. There is 2 cog wheels 1 pivot 2 pans 1 cross and 1 shaft to each oven.

The large cooling wheel has a hub 5 feet diameter 4 inches thick with hole in center $3\frac{1}{4}$ inches square to set on head of pivot, then there is 20 arms each 5 feet long $1\frac{1}{2}$ inches square; they are let into the hub 15 inches and secured at foot by strap of $\frac{1}{2}$ inch iron being screwed in their end to hub; there is six holes in hub for these screws at an equal distance around the hub at foot of arms; the screws are 1 inch thick; this leaves the arms 22 inches apart at the outer end, and the arms extend over the hub 3 feet 9 inches, and makes the wheel 12 feet 6 inches in diameter; the arms of this wheel is wrought, and the hub cast iron, all the wheels above are cast, the shafts are wrought iron.

The king posts of cooling oven is 8 feet long the sill is 15 feet 2 inches long the braces is 9 feet 3 inches long, there is two king posts for cooling oven, and one king post to flattening oven it is 6 feet 6 inches long, the sill is 12 feet 6 inches long, the braces is 6 feet 8 inches long, the timber for posts and sills is 7 inches square and for braces 5 inches by 6 inches square. The king posts are to hold up the mantles in the ovens, and the cooling oven cannot be put up without them, as there is no other way to hang the mantles required in the oven.

What I claim as my invention, and desire to secure by Letters Patent is—

The annealing and cooling glass in the

same oven, by laying the glass on flat stone,
the stone being laid for the purpose on a
pivot wheel, and the oven being constructed
in such manner, and divided by mantles,
5 the mantles being suspended through the
oven by means of bolts and king posts, the
object of the mantles is to give the oven,
an even heat, and cool the glass very gradual
by being revolved around and under these
10 mantles by the pivot wheel, these mantles

form chambers in the oven, which gives
different degrees of heat until the glass
comes to take off the mouth entirely cool,
and the oven at the same time kept in full
operation, all as described.

Millville Sept. 21st 1842.

JOHN FRANCK.

Witnesses:

WM. G. LEAKE,
LEWIS MULFORD.