

STARBUCK & GILMAN.

Smut Machine.

No. 23,405.

Patented March 29, 1859.

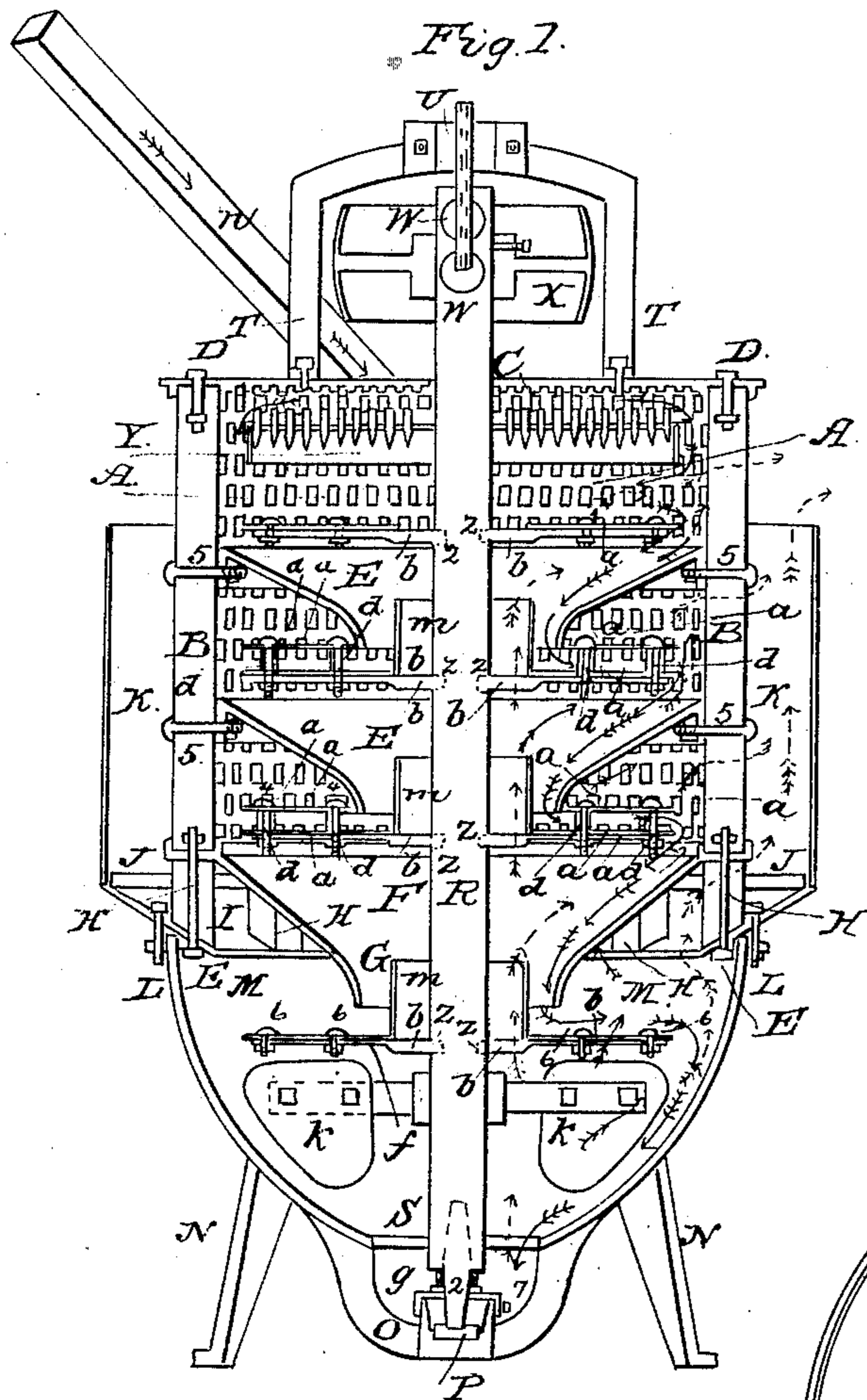


Fig. 2.

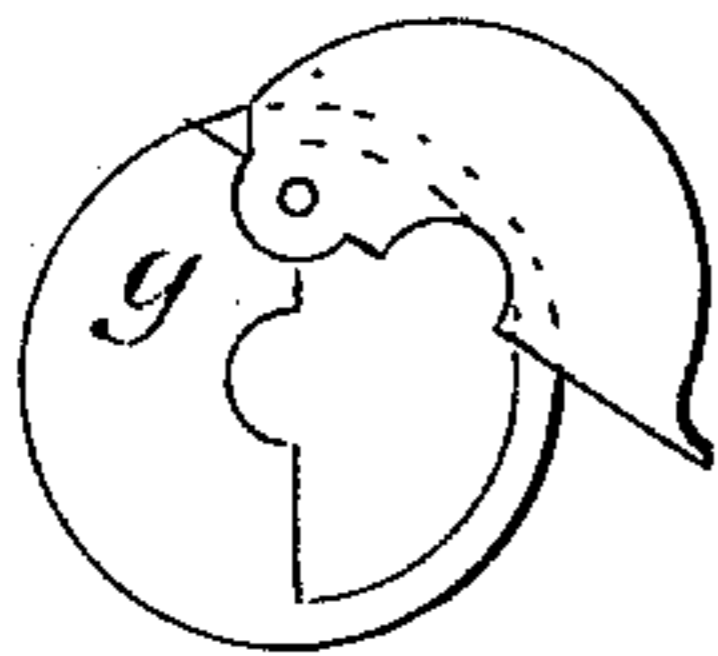


Fig. 3.

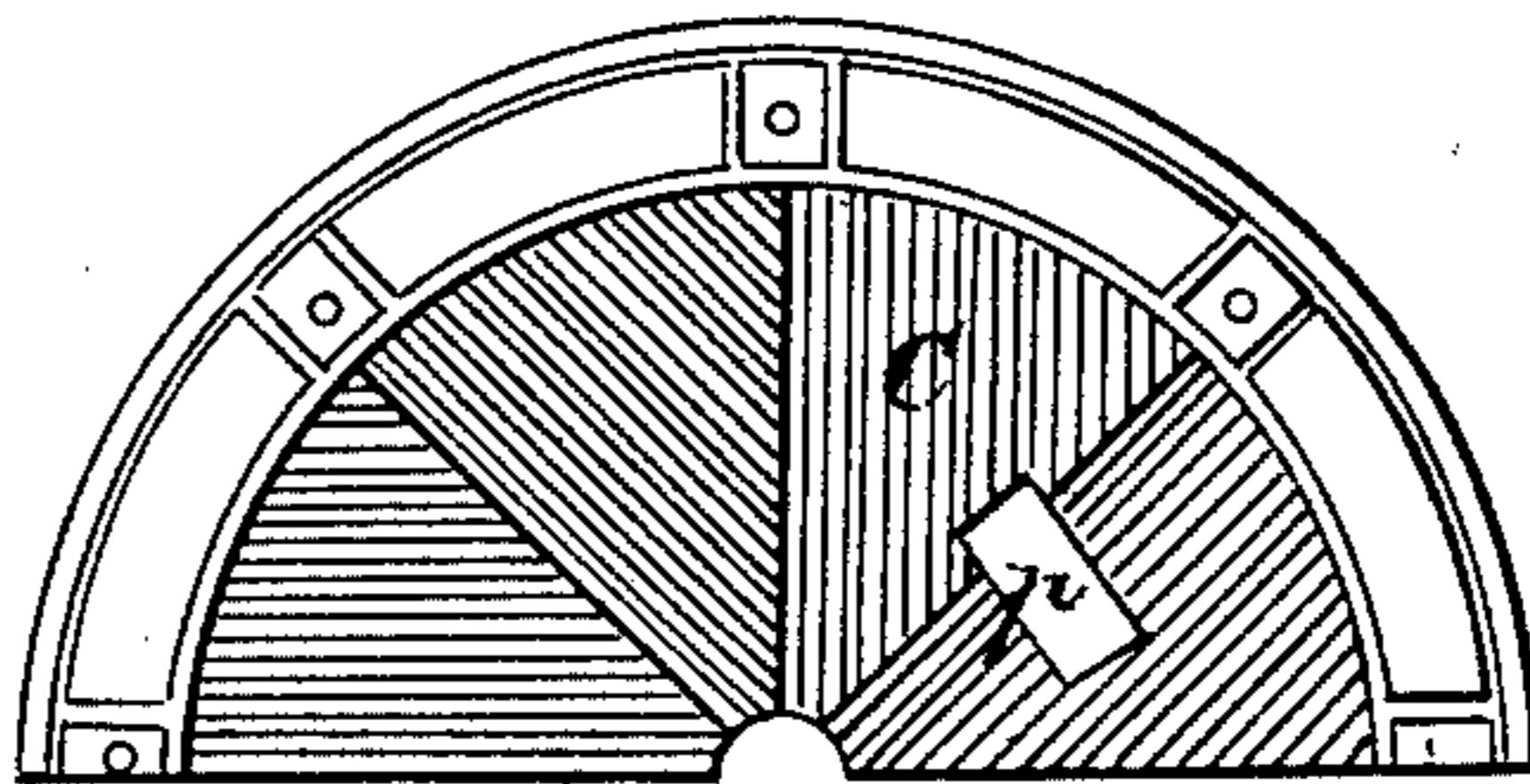


Fig. 4.

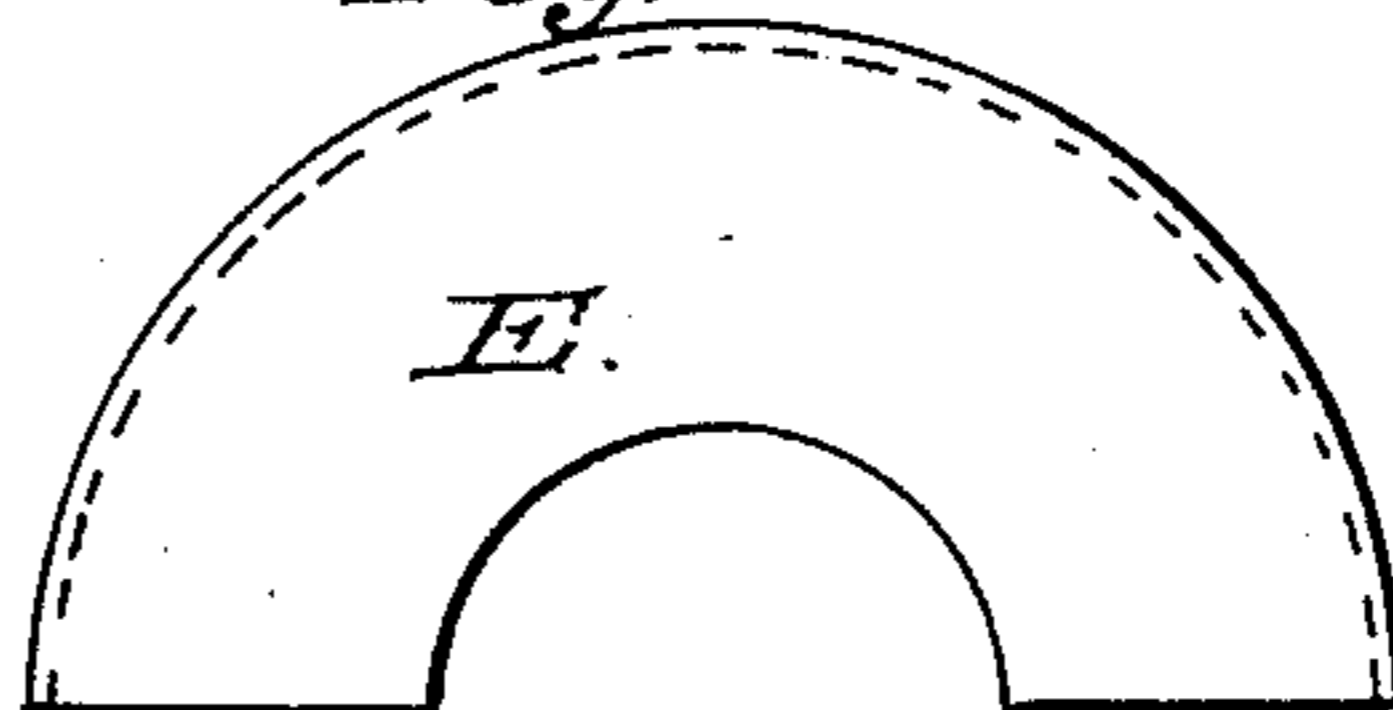


Fig. 5.

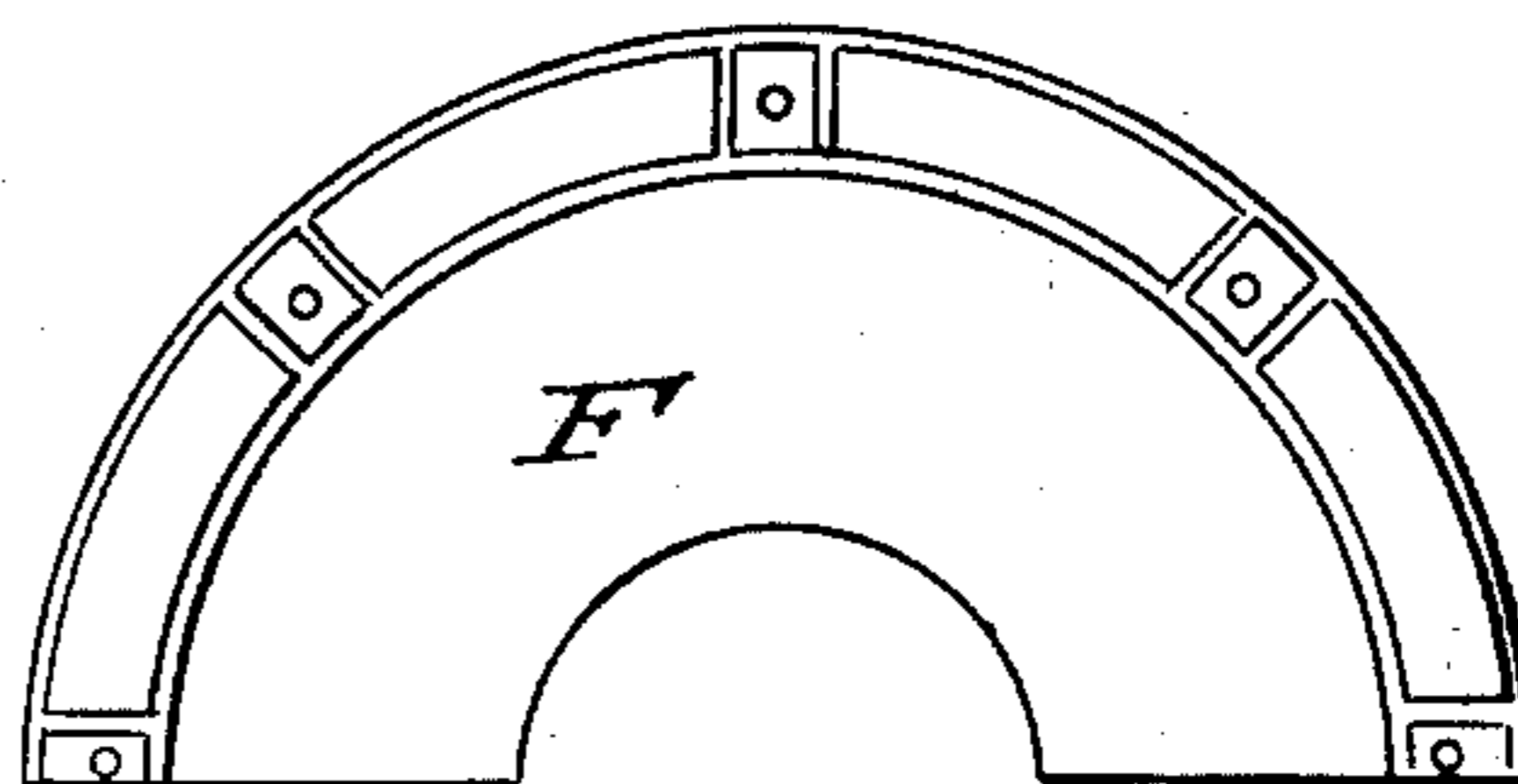


Fig. 6.

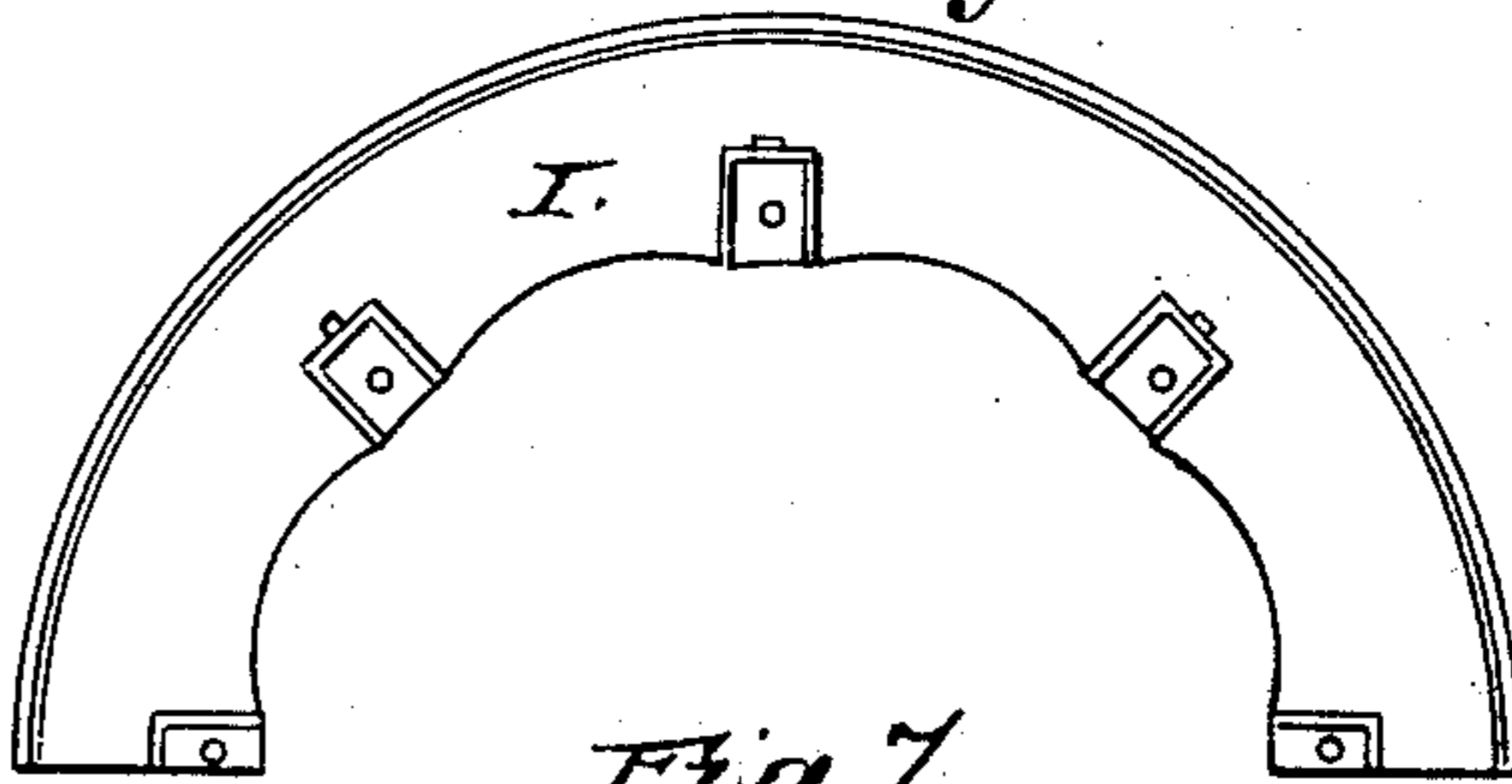
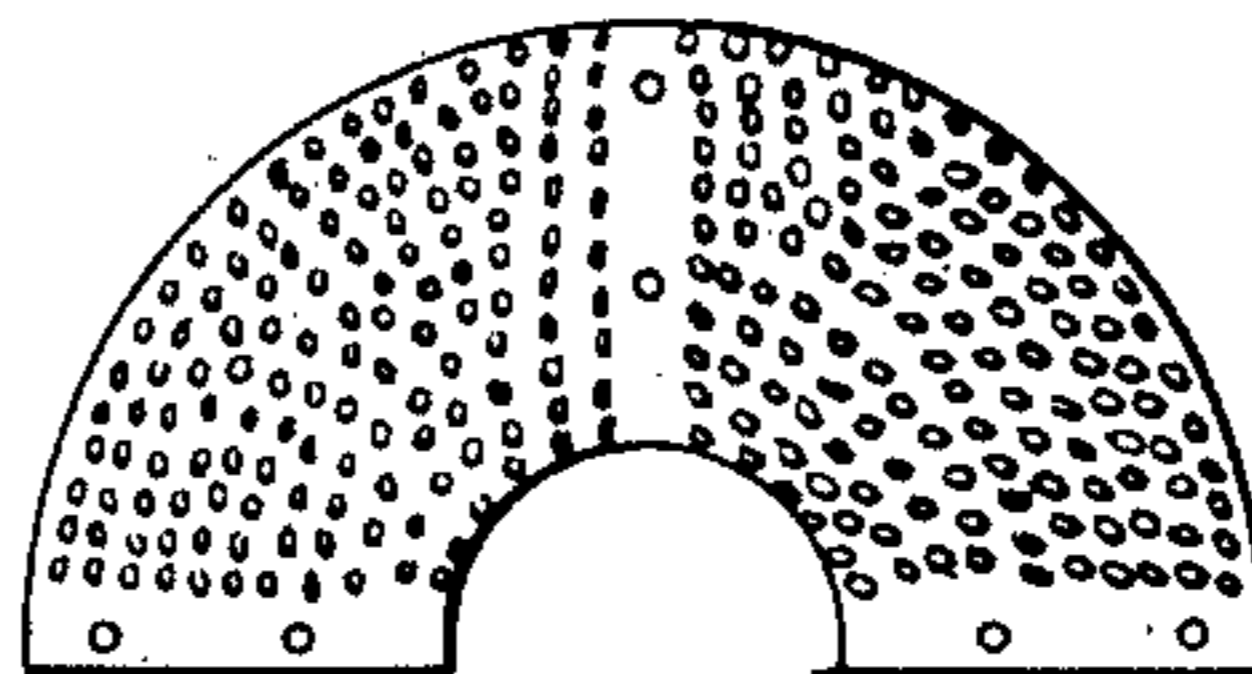


Fig. 7.



UNITED STATES PATENT OFFICE.

G. H. STARBUCK AND L. D. GILMAN, OF TROY, NEW YORK.

SMUT-MILL.

Specification of Letters Patent No. 23,405, dated March 29, 1859.

To all whom it may concern:

Be it known that we, GEORGE H. STARBUCK and L. D. GILMAN, of the city of Troy, county of Rensselaer, State of New York, have invented a new and Improved Smut-Mill for Cleaning Grain; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a vertical section taken through the center of the whole machine; Fig. 2, an enlarged top view of the hinged cover to the bridge pot; Fig. 3, a view of one half of the top plate taken from the under side; Fig. 4, a top view of one half of the funneling plate; Fig. 5, a top view of one half of the bottom plate of the scouring machine; Fig. 6, a top view of the sloping plate placed on top of the semi-spherical bottom; Fig. 7, a top view of one half the punched sheet iron scouring plates.

The same letters indicate like parts in all the figures.

The following is a description of our improvement in smut mills, reference being had to the accompanying drawing and to the letters of reference marked thereon.

A represents a cylindrical case or shell of sheet iron punched from the outside, leaving a lip projecting inwardly so as to form a roughened surface and having a large number of openings for the escape of smut and dirt as it may become separated from the grain. The sheet iron casing A is fastened to the upright posts B which form a framing for its support outside of the shell, said posts being attached at the upper end to the cast iron head C by the joint bolts D which pass through the head and screw into the nuts which are let into the posts for that purpose. The under side of the head C is furrowed or corrugated by projections cast on the plate and projecting downward in any proper form. The posts are fastened at the lower end by bolts E and nuts to the bottom plate F of the machine which is formed by a cast iron plate of conical or funnel shaped form leaving a circular opening G of about ten inches diameter for the discharge of the grain.

Underneath the bottom plate of the smut machine at a distance of about three inches and separated from it by the posts H is attached a sloping or funneling shaped plate

i which is fastened to the upper shell or case by the joint bolts E passing through the lower posts H and screwing into the nuts let into the lower part of the upper posts B for that purpose which firmly attach said plate to the bottom of the machine. The plate i projects outwardly to a distance of some three inches beyond the outer edge of the posts and has a flange or collar J cast upon it to receive an outside casing or shell K of sheet iron forming a trunk or channel way and allows a continuous passage from the fan chamber, interrupted only by the posts H, for the escape of smut, filth, and white caps, which are separated from the grain by the screen f and fans k. In the fan chamber the plate i projects inwardly to a sufficient distance to receive the posts H.

Underneath the plate i and to which said plate is fastened by the bolts and nuts L is placed a fan chamber M of semispherical form, said chamber being made of cast iron with the legs N attached for its support and bridge tree O for receiving the plate P, in which the steel point Q attached to the vertical shaft R is stepped. At the bottom of the fan chamber at S a circular opening is made for the discharge of the grain, said opening being about eight inches in diameter.

R represents a vertical cast iron shaft passing through the fan chamber M and through the center of the case A or shell.

Q is a steel point let into the bottom end of the shaft and running in the bronze step P which is let into the bridge tree O.

Attached to the upper head and bolted to it as shown at T is a cross brace of cast iron with a cap U bolted to the brace, which cap clasps and holds stationary the steel point V which projects down in the shaft and forms the upper bearing for the shaft to revolve upon.

There is an oil hole drilled lengthwise in the upper steel point for the introduction of oil to the spherical chambers W which are formed in the shaft when cast, making a reservoir for receiving and holding the oil and preventing its waste.

Underneath the cross brace is fastened the pulley X by a set screw for belting to give motion to the shaft. Attached to the shaft inside the case or shell is a head Y of wood, about twenty one inches in diameter and two inches thick, which is firmly attached

to the shaft R. Said head is covered on its upper side and outer edge with sheet iron, through which and driven in the wood are a number of wrought spikes *f* forming a roughened surface. The head is placed upon the shaft so as to leave about three quarters ($\frac{3}{4}$) of an inch between the ends of the spikes and the furrows on the under side of the cast head. At the points Z on the shaft holes are drilled to receive the wrought iron arms *b*, to which are attached the circular sheet iron scourers *a* with an opening in the center larger than the shaft. The scourers are made by punching the sheet iron *a* full of holes with a sharp punch, leaving a rough surface. The upper scourer is so formed, the bur side being placed upward and bolted to the arms *b*, which holds it firmly to its place. The other scourers are made by using a circular plate of sheet iron laid on the wrought iron arms as above described with the bur side upward, and at a distance of about one inch from the under scourer. Another sheet iron scourer *a*, *a* with the bur downward, so as to bring the two roughened surfaces toward each other, is placed and held in its position by the pipes or washers *d*, through which and the scouring plates *a aa* and wrought iron arms *b* the bolts 4 pass and bolt the whole firmly together, forming a double revolving scourer.

E represents conical plates or funnels, said plates being fastened to the inner side of the case or shell by the bolts 5 passing through the posts B and flange of plate and fastened by the nuts.

f represents a screen fastened by bolts 6 to the wrought iron arms *b* and revolving with the shaft R underneath the screen *f*, and also attached to and revolving with the shaft are the fans *k* for producing a blast.

M represents iron or metallic pipes which are placed upon the scourers *a* as represented for the purpose of preventing the grain as it passes down the conical or funneling plates E on its passage to the scourers from passing in the circular opening between the scourers and shaft. One is also represented attached to the screen *f*, which prevents the grain as it is discharged through the bottom plate F of the scouring machine upon the screen *f* in the fan chamber from passing in the circular opening between the screen and shaft. The pipes M have a flange projecting under the scourers *a* and is fastened to the wrought iron arms *b* by the bolts 4, which pass through and attach the scourers to the arms. The one upon the screen *f* is fastened in a similar manner by the bolts 6; by which the screen is attached to the arm *b*.

g is a metallic cover to the bridge pot which is fastened to it and held to its place by the set screw 7. The cover has a hinged

part of its top as shown in the enlarged drawing Fig. 2, allowing the introduction of oil or of getting at it for cleaning. The top of the cover has a circular opening of sufficient size to admit the steel point 2 passing freely through it. Lying on the cover is a washer of leather or rubber held to its place by the spiral spring which prevents any dirt or dust passing through the opening left in the cover for the passage of the steel point.

N is the spout by which the grain is introduced into the machine through the opening in the cast head C at *p*.

b represents the wrought iron arms which are made by flattening a piece of round iron for a sufficient distance to receive and support the scourers. Holes are drilled or punched in the arms for receiving the bolts which fasten the scourers to them. The ends are turned and firmly driven in the shaft at Z, where the holes are drilled to receive them.

The operation is as follows: The shaft is rotated by a belt being attached to the pulley X, when the grain to be cleaned is introduced at the opening *p* by the spout *n* and falling upon the spiked rubber head Y is thrown or carried by centrifugal force against the outer case or shell A. The rebound of the grain from the case will carry it a short distance upon the scourer *a*, whence it is again thrown to the case and falling upon the conical or funneling plate E it is carried to the center of the double screen *a aa*, whence it is again thrown to the case, being scorued at the same time by coming in contact with the rough surfaces of the scourer above and below and is carried by the funneling plate E to the scourer below, where the same process is repeated. After leaving the lower scourer it falls upon the conical bottom F of the machine, by which it is conveyed to the revolving screen *f* in the fan chamber M (whence it is distributed in a thin sheet over the surface of the screen for the action of the blast upon it, from thence falling downward in the fan chamber M is discharged at the opening S. The blast generated by the fans *k* passes through the opening in the screen *f* and through the grain as it is spread in a thin layer on the screen, as well as through the grain after leaving the screen *f* between the outer edge of screen and fan chamber M, floating off the filth, smut and white caps through the vertical cylindrical opening formed between the bottom of the machine F and sloping plate *i* into the trunk or channel way K and upward out at the top of the trunk. The blast is also forced through the opening G and distributed through the interior of the machine, finding egress through the openings punched in the case or shell and taking out such smut

and fine dirt as may become separated from the grain before it passes into the fan chamber. The black arrows show the direction of the grain, the red arrows of the blast.

5 Having thus described our machine what we claim as new and wish to secure by Letters Patent is—

1. The combination of the two scouring plates *a*, *aa* placed one above the other with
10 their roughened or burred surfaces toward each other in combination with the funneling plates *E* for depositing the grain at the center of the scourers between which it is
15 and revolving with the shaft *R* operated in

the manner and for the purpose set forth we do not confine ourselves to any number of scourers for a machine.

2. The vertical cylindrical opening as shown at *I* in combination with the outer 20 case *K* screen *f* and fans *k* for the purpose of giving free discharge to all light impurities and foreign matter and preventing the discharge of grain.

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L. D. GILMAN.

Witnesses:

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P. H. VAN AKEN.