

No. 627,080.

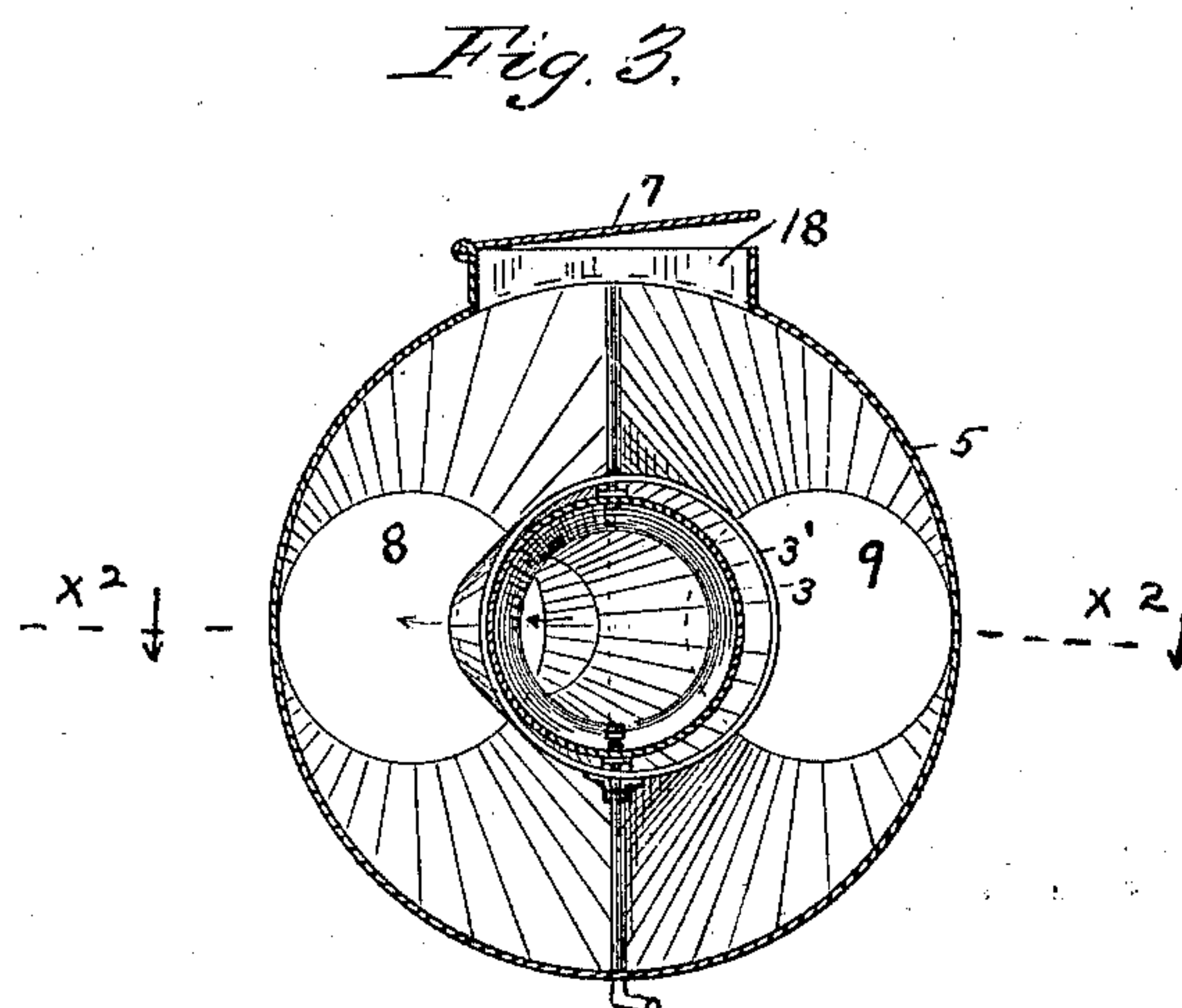
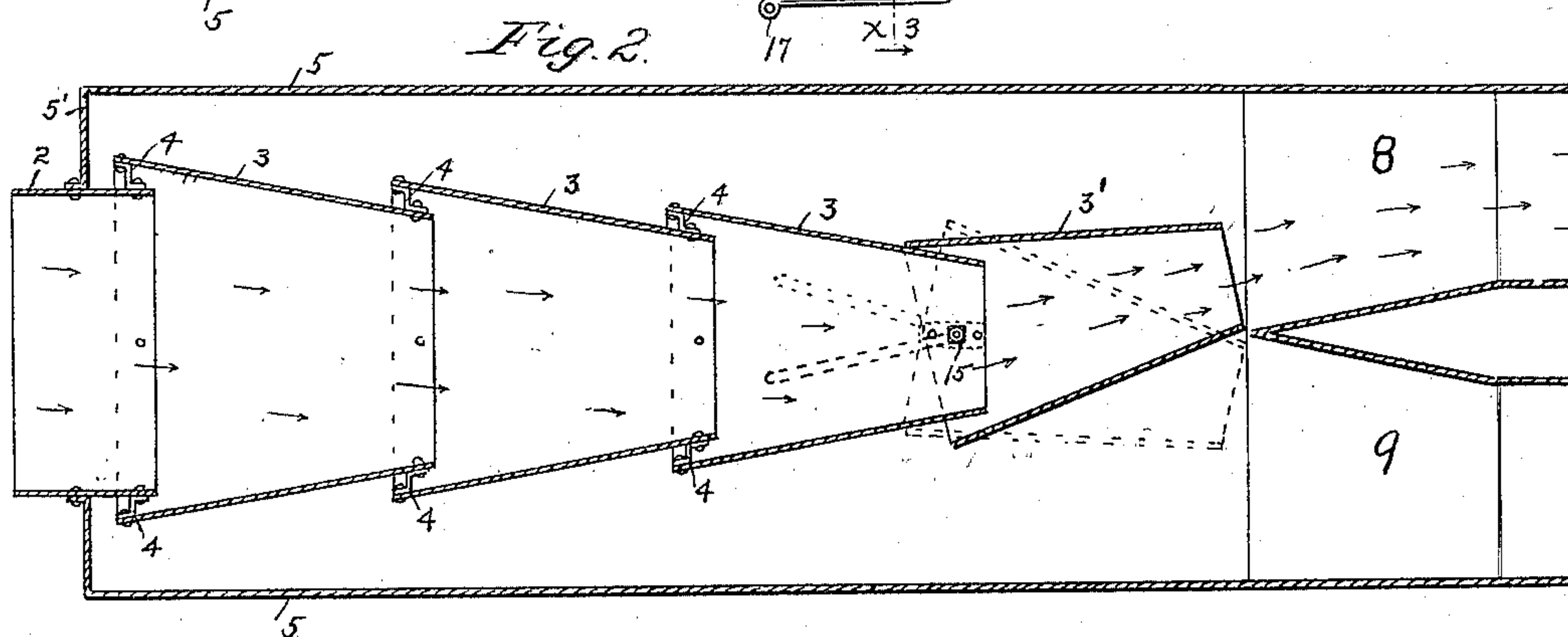
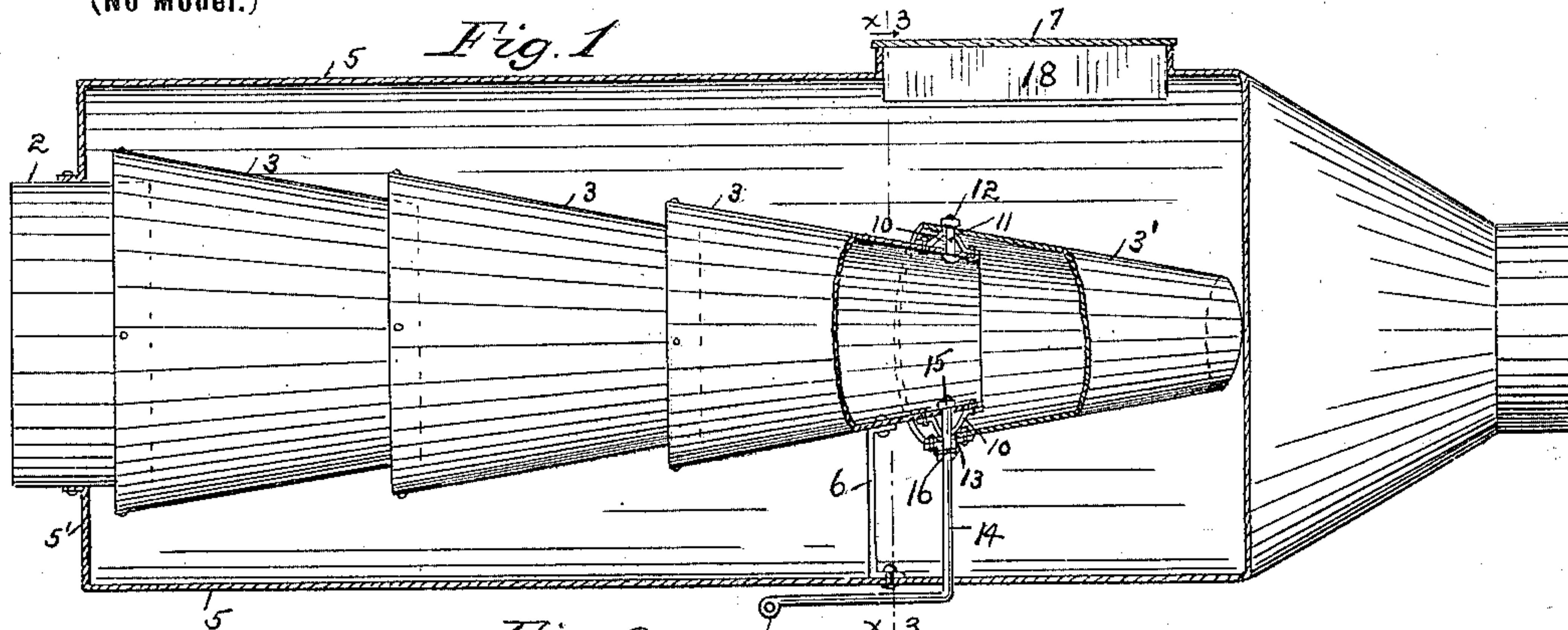
Patented June 13, 1899.

J. K. MILLER & O. NILANDER.

PNEUMATIC CONVEYER ATTACHMENT FOR BLAST OR SUCTION PIPES.

(Application filed Mar. 24, 1899.)

(No Model.)



Witnesses

C. F. Kiegon  
J. N. Madfey.

Inventors

John K. Miller and Otto Nilander  
By their Attorney

Fredrick J. Kiegon



# UNITED STATES PATENT OFFICE.

JOHN K. MILLER AND OTTO NILANDER, OF MINNEAPOLIS, MINNESOTA;  
SAID NILANDER ASSIGNOR TO SAID MILLER.

PNEUMATIC CONVEYER ATTACHMENT FOR BLAST OR SUCTION PIPES.

SPECIFICATION forming part of Letters Patent No. 627,080, dated June 13, 1899.

Application filed March 24, 1899. Serial No. 710,301. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN K. MILLER and OTTO NILANDER, citizens of the United States of America, residing in the city of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Pneumatic Conveyer Attachments for Blast or Suction Pipes, of which the following is a specification.

Our invention relates to relief and switch boxes for use in connection with suction or blast pipes provided for conveying sawdust, shavings, dust, &c., from machines in saw-mills, woodworking-shops, elevators, factories, &c., to the furnace or storage rooms or to suitable receptacles provided for such material; and the objects we have in view are to provide suitable means whereby the heavy material carried through such pipes may be concentrated into the smallest possible volume and a substantial portion of the air with which such material is intermingled withdrawn or permitted to escape without carrying with it any of the dust or heavier material, thus effecting a substantial reduction of the volume of air and material carried by said pipes, permitting the use of much smaller pipes, and greatly reducing the power required to carry such material to the desired place and at the same time to distribute the dust and heavy material to the pipes leading to the furnace or store room to which it is desired to deliver the same.

With these objects in view our invention consists in providing a conveyer having the form of a truncated cone, in connection with the blast or suction pipe surrounding the conveyer, with a pipe of larger diameter and provided with a closed end through which the blast-pipe extends into the conveyer, the conveyer provided with air-escapes through which a portion of the air delivered to said conveyer by the blast-pipe may escape therefrom as the air and material are carried along in said conveyer, two or more outlets provided at the other end of said surrounding pipe, said conveyer adapted to be moved to deliver the air and material passing there-through to the desired outlet, and a relief

valve or outlet provided in said surrounding pipe through which a predetermined portion of the air escaping from said conveyer is discharged.

Our invention consists, further, in the devices, combinations of elements, and parts hereinafter described, and particularly pointed out in the claims, and will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a longitudinal-sectional view of a device embodying our invention, a portion of the conveyer being broken away to more clearly show the manner of pivoting the movable portion thereof. Fig. 2 is a sectional view on the line  $X^2 X^2$  of Fig. 3, looking in the direction of the arrow. Fig. 3 is a cross-section on the line  $X^3 X^3$  of Fig. 1.

As shown in the drawings, 2 represents the blast or suction pipe. This extends into the large end of the conical conveyer, which is made up of a number of tapering joints 3. There may be any desired number of joints 3, each succeeding joint being smaller than the one before it, but its larger end being of slightly greater diameter than the diameter of the small end of the preceding joint, and the respective joints being so placed that the small ends of the respective joints extend a slight distance within the large ends of the succeeding joints, so that air-escapes are provided between the several joints. The largest joint is supported on the blast-pipe 2 by suitable brackets 4, of which there may be any desired number. These brackets are riveted to the pipe 2 and joint 3, as shown. Similar brackets 4 connect respective joints 3, as shown, except that the end joint 3' is movably connected, as hereinafter described, with the next preceding joint. A pipe 5, of somewhat larger diameter than the greatest diameter of the largest joint 3, encircles the conical conveyer, and through the air-tight head 5' thereof the blast-pipe 2 passes into said conveyer. A bracket 6 is riveted to the inner side of the pipe 5 and to one of the joints 3 and serves as an additional support therefor. The pipe 5 is provided



with an outlet 18 and a pivoted cover 7, which is suitably weighted. Two or more outlets 8 9 are provided in the other head of the pipe 5, as shown. With these respectively are connected the pipes leading to the dust-collector, furnace-room, &c. The end joint 3' is swiveled to the preceding joint. A bracket 10 is riveted to the outside of the stationary joint. A bolt 11 passes up through this joint through a bearing in said bracket and thence through the movable joint. A nut 12 holds the bolt in place. On the under side a similar bracket 10 is riveted to the stationary joint. A collar 13 is riveted to the outside of the movable joint. A rod 14 passes through a bearing in the collar 13, through the movable joint, and through the bearing in this bracket 10 and may extend up through the stationary joint, as shown, and a nut 15, provided thereon, or only extend through the bearing in the bracket 10 and be held in place by a suitable nut. The rod 14 extends out through the bottom of the pipe 5 and is thence bent at right angles to form an operating-lever. A pin 16 extends through the collar 13 and rod 14, as shown. It is thus seen that by moving the rod 14 the movable joint is swung therewith. A loop or eye 17 is provided in the end of the rod 14, and from this a wire extends to within the reach of the operator.

The operation of our combined relief and switch box is as follows: The volume of air mixed with shavings, dust, &c., is forced through the pipe from the fan and is delivered from the pipe 2 into the first joint 3 of the conveyer. As the stream or current of air and material passes along in the conveyer it is brought into a more compact body and the heavier material condensed. A considerable quantity of the air is permitted to escape from the conveyer through the air-escapes provided between the several ends of the overlapping joints. The material and air carried through the conveyer are directed by the movable joint thereof to the desired outlet 8 9, leading either to the dust-collector, furnace-room, or other receptacle or storage-room. A portion of the air escaping from the conveyer through the air-escapes formed between the overlapping ends of the joints is permitted to again mix with the material and air in the conveyer as it passes into the respective outlet 8 9, thus insuring a sufficient pressure to positively carry the heavy material along. Another portion of this free air is permitted to pass through the other outlet to the dust-collector or other desired receptacle, and the air-pressure in the outlets and in the pipe 5 and conveyer is reduced and kept at a constant pressure by the escape of air through the relief valve or outlet 18. By this means we are able to greatly reduce the power required to operate the fans and to effect a material saving in the cost of maintenance of the system.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, in a device of the class described, with a blast or suction pipe, of a tapering or conical conveyer provided with one or more air-escapes, a pipe encircling said conveyer and of larger diameter than said conveyer, said blast-pipe extending through a closed end of said pipe and communicating into said conveyer, said pipe provided with outlets, and said conveyer adapted to be moved to deliver the heavy material to either of said outlets as desired, substantially as described.

2. The combination, in a device of the class described, with a blast or suction pipe, of a tapering or conical conveyer provided with one or more air-escapes, a pipe encircling said conveyer, said blast-pipe extending through the closed end of said pipe and communicating into said conveyer, a relief-outlet provided in said pipe, and means for closing the same, said pipe provided with outlets, and said conveyer adapted to be moved to deliver the heavy material to either of said outlets as desired, substantially as described.

3. The combination, with a blast or suction pipe, of means whereinto the stream or current of material and air from said pipe is delivered and wherein the area or volume of said stream or current is reduced, means whereby a portion of the air freed from said material is permitted to escape from said main current or stream, a relief-outlet through which a portion of said air escaping from said main stream may be discharged, conductor-pipes adapted to receive said main current or stream of air and material, means whereby said main stream or current of air and material may be directed to the desired conductor-pipe and a portion of said freed air permitted to again mingle therewith as said main stream passes into said conductor-pipe, substantially as described.

4. The combination, with a blast or suction pipe, of a conveyer formed of a series of tapering joints, air-escapes formed between the overlapping ends of said joints, a pipe surrounding said conveyer provided with a head through which said blast-pipe communicates to said conveyer, a relief-outlet provided in said pipe, means for regulating or controlling the escape of air therethrough, said pipe provided with outlets at its other end to which the conducting-pipes are attached, one of said tapering joints adapted to be moved to direct the material delivered to said conveyer to the desired outlet, and means for operating said movable joint, substantially as described.

5. The combination, with a blast or suction pipe, of a conveyer formed of a series of tapering joints and being air-escapes between the overlapping ends of said joints, a pipe surrounding said conveyer provided with a



head through which said blast-pipe communi-  
cates to said conveyer, said pipe provided  
with outlets at its other end to which the con-  
ducting-pipes are attached, one of said taper-  
5 ing joints adapted to be moved to direct the  
material delivered to said conveyer to the  
desired outlet, and means for operating said  
movable joint, substantially as described.

In testimony whereof we have hereunto set  
our hands, at Minneapolis, Minnesota, U. S. 10  
A., this 17th day of March, A. D. 1899.

JOHN K. MILLER.  
OTTO NILANDER.

In presence of—  
FREDERICK S. LYON,  
J. R. GODFREY.