

F. H. DAY.
FLOOR SWEEP.
APPLICATION FILED DEC. 7, 1908.

969,157.

Patented Sept. 6, 1910.
2 SHEETS—SHEET 1.

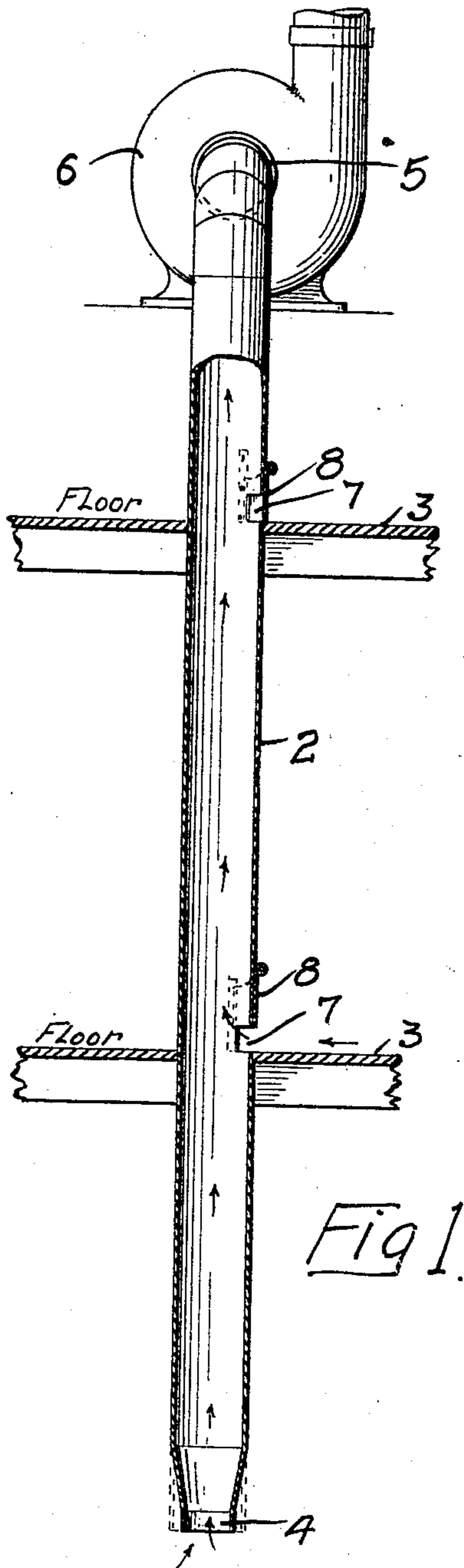


Fig 1.

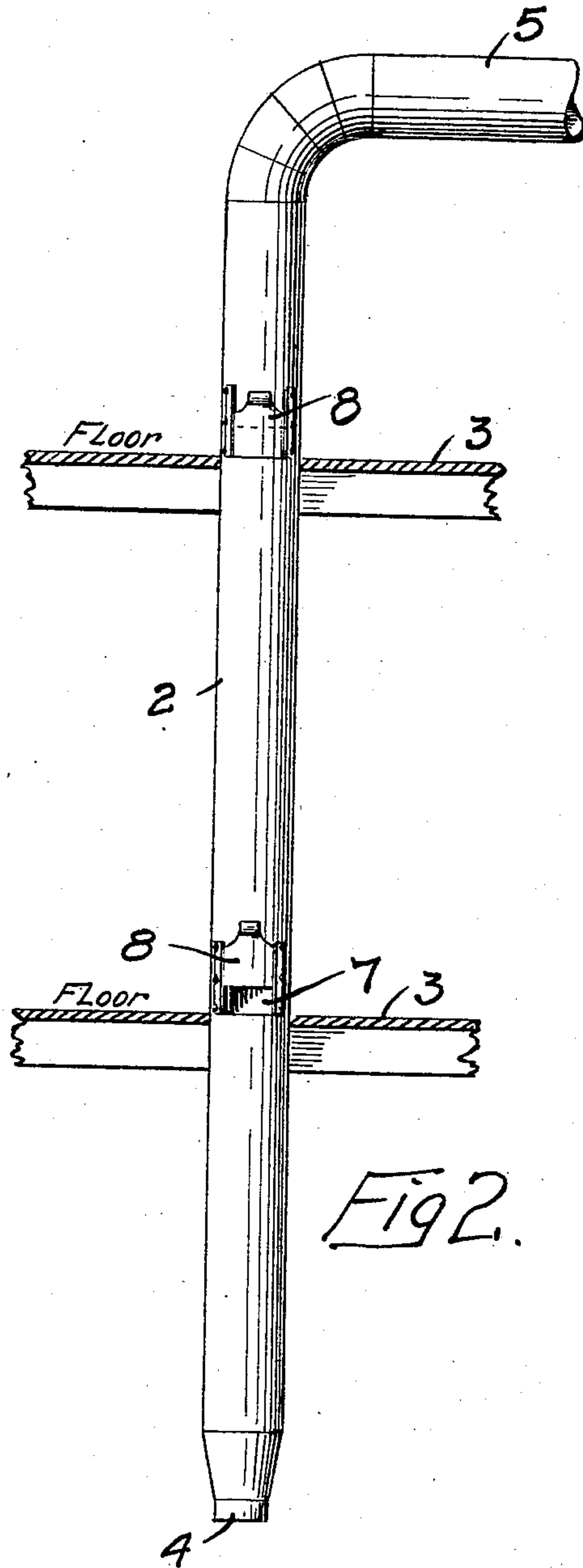


Fig 2.

WITNESSES
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E. J. Hanson

INVENTOR
FRANCIS H. DAY
BY *Paul & Paul*
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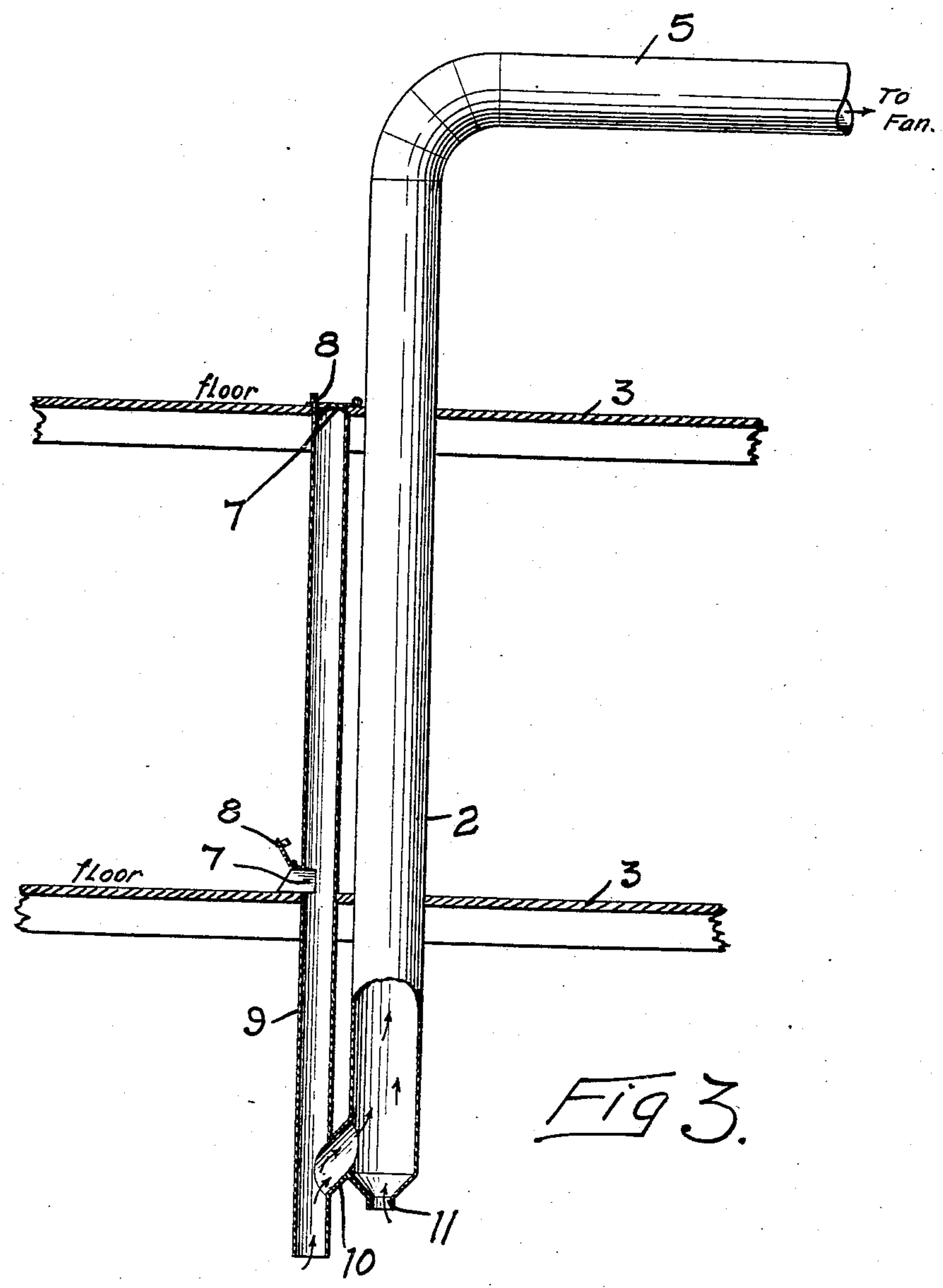


Fig 3.

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UNITED STATES PATENT OFFICE.

FRANCIS H. DAY, OF MINNEAPOLIS, MINNESOTA.

FLOOR-SWEEP.

969,157.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed December 7, 1908. Serial No. 466,298.

To all whom it may concern:

Be it known that I, FRANCIS H. DAY, of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and
5 useful Improvements in Floor-Sweeps, of which the following is a specification.

This invention relates to improvements in devices designed for use in grain storage elevators, grain cleaning houses, and other
10 structures, for the purpose of separating the dust and grain from the floor sweepings and causing the dust to be taken up and delivered to a suitable dust collecting system.

The object of the invention is to provide
15 a device of this kind into which the grain, dust and like mixed material may be swept from the floor of the elevator, cleaning house, or other structure, and in which this mixed material will encounter a current of
20 air having sufficient force to lift and carry along the dust and light material, while permitting the grain and heavier material to be at once separated from the dust or light material and to pass by gravity into
25 a suitable bin, or to any other place of deposit.

The invention consists further in the constructions and combinations hereinafter described and particularly pointed out in the
30 claims.

In the accompanying drawings, forming part of this specification; Figure 1 is a vertical section of a dust and grain separator embodying my invention. Fig. 2 is a side
35 elevation of the same. Fig. 3 shows a modified structure.

In all of the drawings, 2 represents the main suction pipe or conductor, which is arranged, preferably, in an upright position,
40 and which, preferably, extends through or past several of the floors 3 of the grain elevator, cleaning house, or other structure in which the device is to be used, and which has its open lower end 4 arranged a short
45 distance above the lower floor of said elevator or house, or above an open bin, or other place of deposit, for the separated grain. The lower end of the conductor 2 may be contracted, as shown by full lines in Fig.
50 1 of the drawings, or it may be of the full size of the conductor, as indicated by dotted lines in the same figure. The upper end of the conductor 2 is connected by a suitable pipe or conduit 5 to a suction fan 6, by
55 which a current of air is created upward through the main conductor and from which

fan the dust, light material and air are discharged into a suitable dust collecting device, which permits or secures a separation
60 of the dust or light material from the air.

The main conductor 2 is provided at a level with each floor, through or by which the conductor extends, with an opening 7 in its wall adapted to be closed by a suitable
65 door 8. I have shown a vertically sliding door, but any other suitable form of door, such as a hinged door, might be employed instead of a sliding door. These openings are preferably arranged on a level with each
70 of the floors so that sweepings from said floors, consisting of dust and loose kernels of grain, or other light and heavy materials, may be swept directly through said openings into said conductor. As the sweep-
75 ings enter said conductor, the dust and light material will be taken up by the current of air, which is caused by said fan to travel upward in said conductor and will be carried by said current of air to said fan, from
80 which it will be discharged into any other suitable dust-collecting device. The loose kernels of grain, or heavy material, will drop down through the open lower end of the conductor and fall onto the floor below,
85 or into the bin, or be deposited in any other place provided for the reception thereof. The current of air passing upward through the conductor will not be sufficiently strong to carry the grain and like heavy material
90 upward with the dust and light material. I am thus enabled to operate the device with a small amount of power on the fan whereby only a light current upward through the conductor is created. Both the upper and
95 the lower ends of the main conductor may be contracted, thereby causing the air to expand in the main part of the conductor, which acts, in fact, as an expansion chamber and permits the heavier material to drop at once through the conductor and fall out at
100 its lower end.

It will be understood, of course, that the main conductor, instead of being in a vertical position, may be set at any inclination, which will not interfere with the passage of
105 the grain and heavy material by gravity through the conductor and out at its lower end.

In Fig. 3 of the drawings, I have illustrated a modified construction. As here
110 shown, an auxiliary pipe 9 is provided having openings 7 into which the grain and

mixed material may be swept. These openings are covered by doors 8. One of these openings may be the open upper end of the auxiliary pipe. The pipe 9 has an open lower end and is connected with the main conductor 2 by a branch pipe 10. The main pipe, or conductor, is preferably contracted at its lower end and is provided with a small opening 11. The branch pipe 10, and the lower end of the auxiliary pipe 9, practically form a continuation of the main pipe or conductor 2. The operation is practically the same as with the structure shown in Figs. 1 and 2. The mixed grain and dust, or other like material, is swept into the auxiliary pipe 9 through any one of the openings. The mixed material falls into the air current passing upward through the lower end of the auxiliary pipe 9 and through the branch pipe 10 into the main pipe or conductor 2. The grain or heavier material falls through the open lower end of the pipe 9, while the dust or light material is taken up by the air current and carried through the branch pipe 10 into the main conductor 2. The admission of some air at the lower end of the conductor 2 prevents any further expansion of the air after it passes into said main conductor, so that all of the dust and light material taken up by the air current will be carried to the fan and delivered by it to a suitable dust-collector.

I do not limit myself to the details of construction as the same may be varied in many particulars without departing from my invention.

I claim as my invention:

1. The combination, with an upright pipe extending through the floor of a building and having an open lower end for the discharge of relatively heavy material and having an opening in its wall opposite said floor, through which mixed grain, dust and light material may be swept from said floor through said opening into said pipe, of means for creating an upward current of air through said pipe in the opposite direction to the flow of relatively heavy material therethrough to carry off light material separated from the heavy material, substantially as described.

2. The combination, with an upright pipe extending through one or more floors of a building and having an open lower end for the discharge of relatively heavy material and having an opening in its wall opposite each of said floors, through which mixed

grain, dust and light material may be swept from any floor through the corresponding opening into said pipe, of means for creating an upward current of air through said pipe in the opposite direction to the flow of the relatively heavy material, and means for closing each of said openings, substantially as described.

3. The combination, with an upright pipe extending through one or more floors of a building and having an open lower end for the discharge of relatively heavy material and means for introducing mixed material, such as grain and dust, into said pipe, of means for creating an upward current of air through said pipe in the opposite direction to the flow of the relatively heavy material, whereby the grain or heavier material falls through the open lower end of the pipe while the dust and light material is removed in the opposite direction by the upward current of air, substantially as described.

4. The combination, with an upright pipe extending through several floors of a building, and having an open lower end for the discharge of relatively heavy material, and means located opposite each floor for sweeping into said pipe mixed material, such as grain and dust, of means for creating an upward current of air through said pipe in the opposite direction to the flow of the relatively heavy material, whereby the grain or heavier material will drop through the open lower end of the pipe while the dust or light material is carried away in the opposite direction by the upward current of air, substantially as described.

5. The combination, with an upright pipe having an open lower end for the discharge of relatively heavy material, and having an opening in its wall for sweeping into said pipe, mixed material, such as grain and dust, of means for creating an upward current of air through said pipe in the opposite direction to the flow of the relatively heavy material whereby the grain or heavier material will drop through the open lower end of the pipe, while the dust and light material is carried away by the upward current of air, substantially as described.

In witness whereof, I have hereunto set my hand this 2nd day of November 1908.

FRANCIS H. DAY.

Witnesses:

C. G. HANSON,
J. A. BYINGTON.