

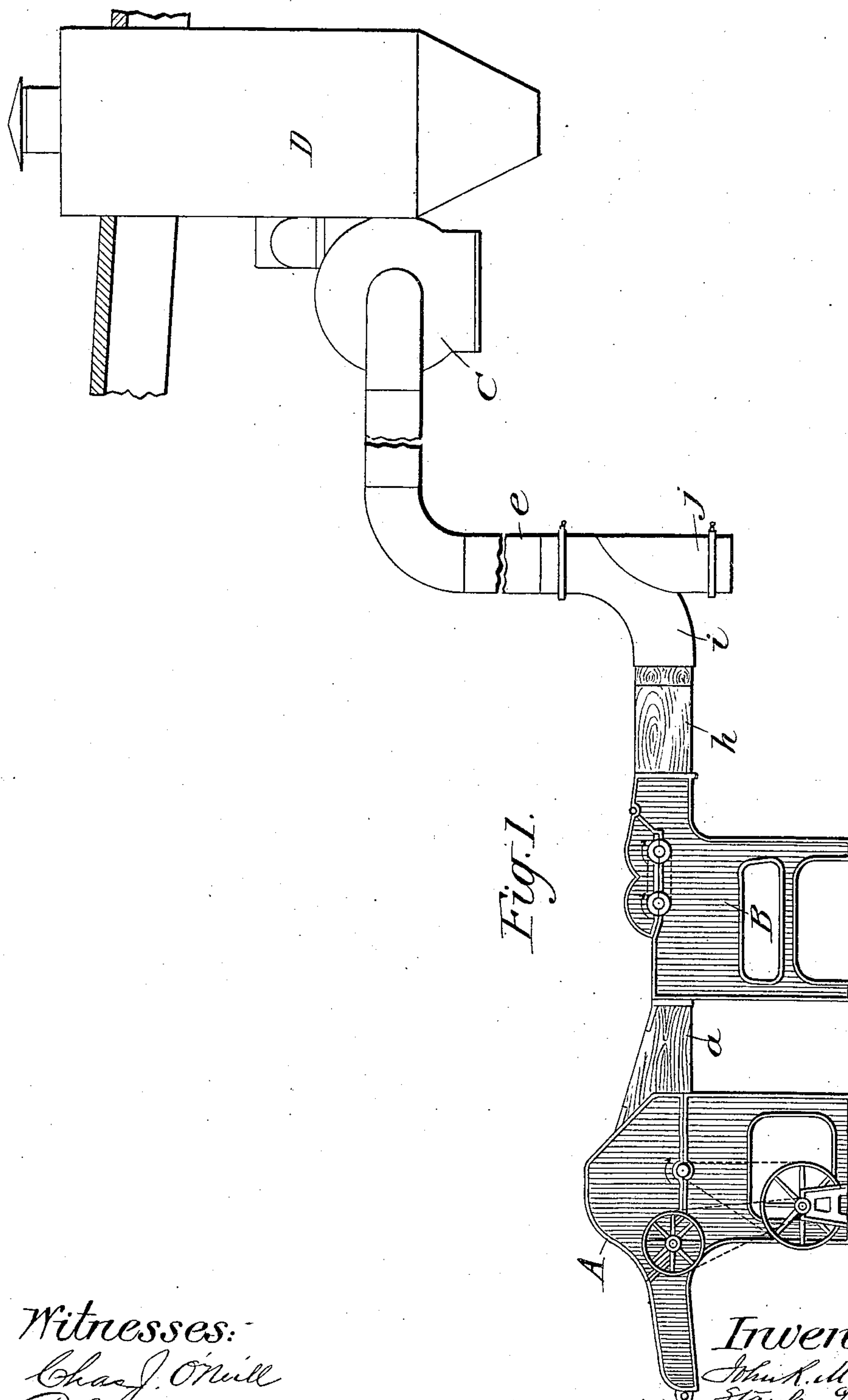
No. 876,576.

PATENTED JAN. 14, 1908.

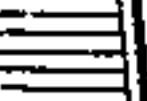
J. R. McDONALD & S. G. MILLER.
APPARATUS FOR CLEANING WASTE.

APPLICATION FILED APR. 11, 1905.

3 SHEETS—SHEET 1.



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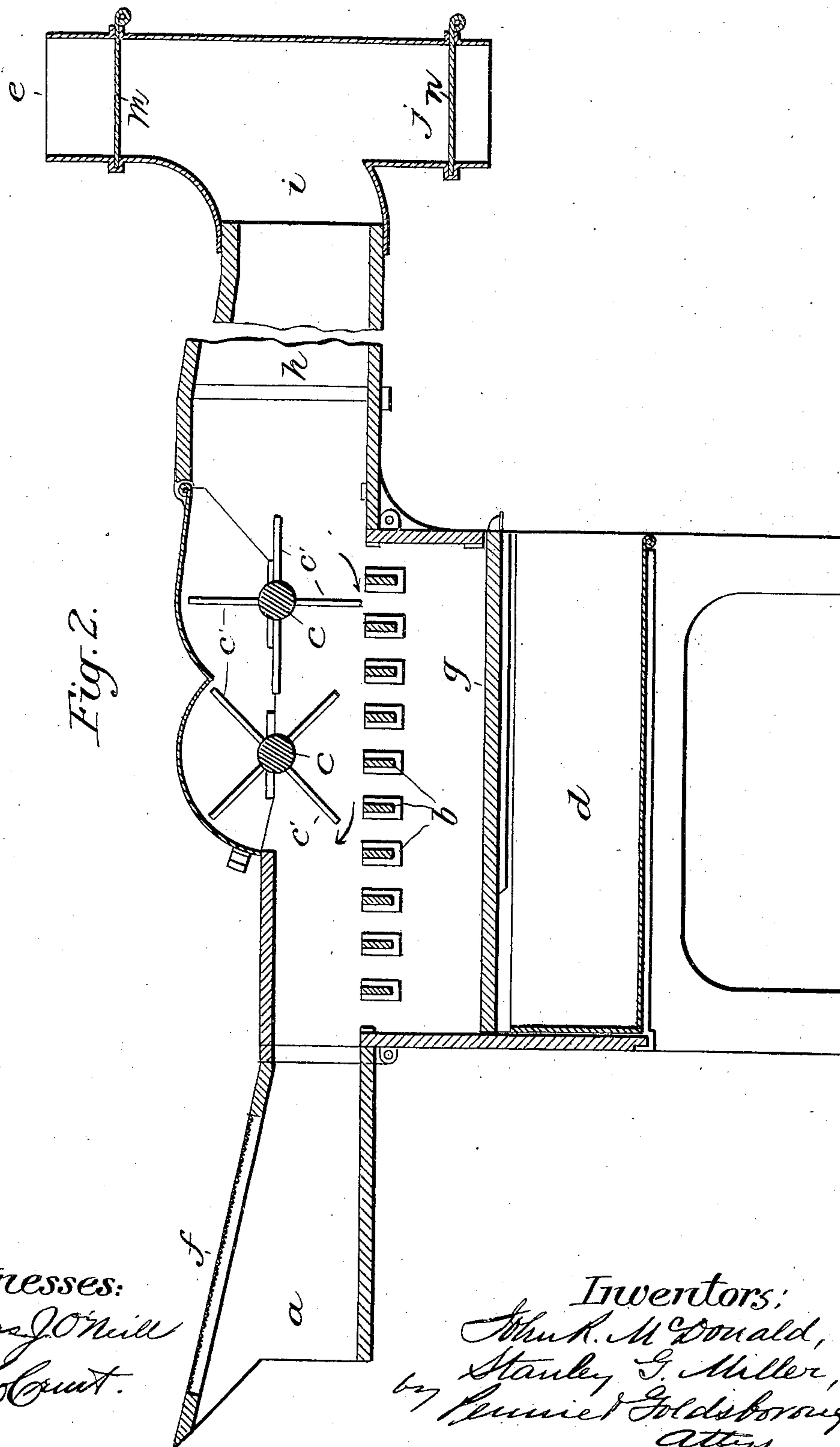
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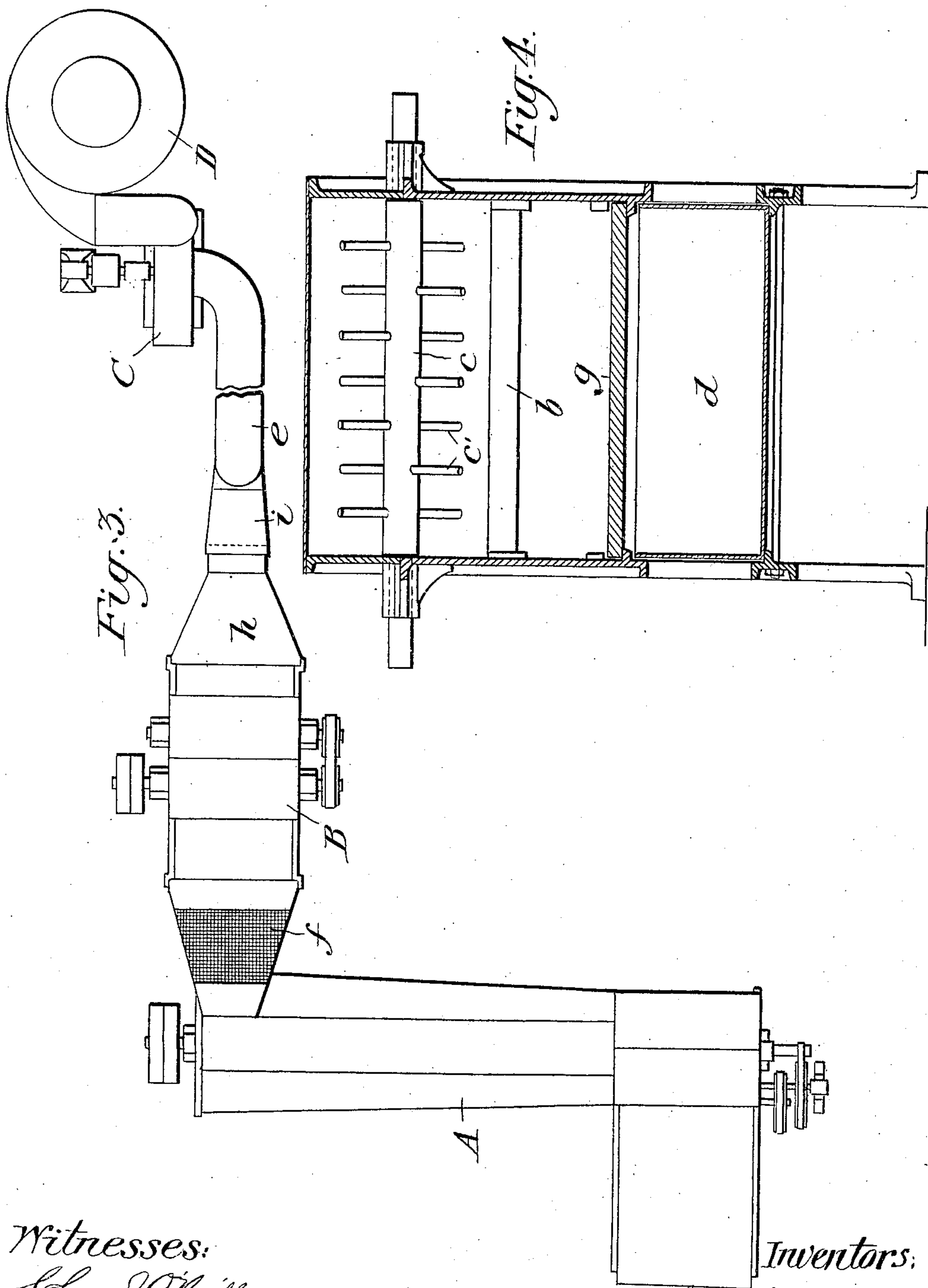
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN R. McDONALD, OF CHARLOTTE, NORTH CAROLINA, AND STANLEY G. MILLER, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR CLEANING WASTE.

No. 876,576.

Specification of Letters Patent.

Patented Jan. 14, 1908

Application filed April 11, 1905. Serial No. 255,043.

To all whom it may concern:

Be it known that we, JOHN R. McDONALD of Charlotte, Mecklenburg county, North Carolina, and STANLEY G. MILLER, of Philadelphia, Philadelphia county, Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Apparatus for Cleaning Waste; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to apparatus for cleaning and extracting foreign material from mill sweeps, waste and the like and comprises an opener to which the mill sweeps, waste, wool, motes, linters and like materials are fed, and which serves to preliminarily open or loosen the material sufficiently to shake out a portion of the sand and similar foreign material that has not become firmly entangled or incased in the masses or bunches of the stock; and a separator, to which the stock is fed from the opener, after being preliminarily loosened, for the purpose of cleaning and extracting all foreign materials such as iron, sticks and the like, which have been firmly entangled in the stock, and delivering the latter in a thoroughly cleaned and divided condition into a bin or other receptacle. Said separator comprises a casing having an inlet in communication with the discharge of the opener, a grid disposed in said casing, means for inducing a current of air through the casing to draw the stock over the grid, beating mechanism for operating upon the stock in its passage through the casing and serving to knock said stock backward in position to the influence of the air current and to carry the same over the top of said mechanism in the direction or movement of the air current, and a regulable air inlet below the grid to admit air in sufficient quantities to support the lighter materials of the stock and permit the heavier foreign material therein to drop through the grid. In addition to the elements above enumerated, the system may also include a dust collector, condenser or suitable device which removes the dust or other foreign material that is lighter than the stock and allows the cleaned stock to drop into a bin or other receptacle.

In the accompanying drawings, Figure 1 is a side elevation of a complete system em-

bodying my invention. Fig. 2 is a vertical longitudinal section of my improved cleaner or extractor. Fig. 3 is a plan view of the system shown in Fig. 1. Fig. 4 is a vertical transverse section through the cleaner or extractor.

Referring to the drawings, A in Figs. 1 and 3 indicates an opener, which may be of any of the well known forms, and which serves to operate upon the stock to loosen up the same and separate therefrom any foreign material, such as sand and the like, which is not firmly enmeshed in the fibers of the stock. The discharge opening of the opener A is in communication with the inlet trunk *a* of my improved cleaner or extractor B, which latter consists of an inclosing casing, supported upon suitable standards, having a grid *b*, preferably formed of transverse bars disposed in horizontal relation in said casing. Below the grid the casing is provided with a drawer *d* to receive the material which falls through the grid. It is to be noted, however, that this drawer may be replaced by a hopper conveyer or other suitable receptacle for holding or removing the foreign material.

Mounted upon two transverse horizontal shafts, *c, c*, supported in the casing above the grid, is a rotary beating mechanism, preferably consisting of a series of radial arms or pins *c'* mounted in the rotary shafts, the said shafts being driven by suitable belting or gearing to cause the arms or pins to move over the grid in a direction contrary to the movement of the stock through the casing, that is to say, said arms in the lower half of their rotatory movement sweep over the grid toward the inlet trunk *a* of the cleaner or separator.

The stock is drawn through the casing of the separator by means of a draft of air, preferably induced by a suction fan, as C, located in the discharge flue *e*, which in turn is connected to the eduction trunk *h* of the separator by means of a suitable elbow or coupling *i*. The major portion of the supply of air, which is drawn through the casing by the exhaust fan is admitted to the casing through a screened opening *f* in the top of the trunk *a*. Beyond the suction fan C, the discharge flue connects with a dust collector, condenser or other suitable device D which serves to separate the material that is lighter than the stock and allows the cleaned stock to drop into a bin or other suitable receptacle. Be-

low the coupling *i* in the flue *e* there is provided a trap *j*, which serves to catch and retain any pieces of sticks, bale ties or other foreign material that are either too long or too large to pass between the bars of the grid *b*. The flue *e* and the trap *j* are provided with cut-offs *m* and *n* respectively, the former to be closed and the latter to be opened in order to discharge any foreign matter caught in the trap *j*. In the ordinary operation of the apparatus, cut-off *m* will be open and, correspondingly, cut-off *n* will be closed. It is, of course, desirable that any of the lighter fibrous materials of the stock be prevented from passing through the grid with the foreign matter and, in order to effect this, a draft of air is admitted below the grid, of sufficient strength to support such lighter fibrous material and prevent the same dropping through the spaces between the bars of the grid. This draft of air, which is induced by the suction fan, is admitted to the casing at some point below the grid, preferably through the drawer *d* or in the neighborhood thereof, and the volume of the air thus admitted is regulated by an adjustable slide *g* located in the casing below the grid, and serving, as it is moved in or out, to admit air in greater or lesser quantities, as may be found necessary to support the fibrous material in its passage through the casing.

The apparatus as above described operates substantially as follows. The stock consisting of mill sweeps, waste, wool, motes, linters and like materials is fed to the opener *A*, which, as before indicated, opens or partially separates the stock and shakes out the sand and such other materials as may be lightly held in said stock. The stock is then drawn by the current of air, induced by the suction fan *C*, through the inlet trunk *a* of the cleaner or extractor *B* and thence over the grid *b*. The stock in passing over the grid comes in contact with the rapidly revolving arms of the beaters *c'*, which knock the stock back toward the point of entry, loosening up any bunches or masses that may have been caused by the fibers of the stock becoming entangled or incased. This loosening or agitation releases any pieces or particles of foreign materials that may have become entangled or incased in these masses or bunches of stock and permit such foreign material to fall through the grid into the lower part of the casing and ultimately into the drawer *d* or other receptacle for receiving the foreign matter. Owing to the fact that the lower part of the beaters revolve in the opposite direction from that in which the stock moves under the influence of the draft of air, the stock is forced back and none of it passes under the beaters, but is lifted over the top of the same, thereby giving the iron, sand or other foreign material better oppor-

tunity to be freed from the masses of the stock and fall through the grid. Any tendency of the fibrous material of the stock to pass through the grid is counteracted by the upward current of air, admitted by the slide *g*, below the grid, and this slide may be so adjusted that just enough air is admitted to support the fibrous material above the grid without, however, preventing the heavier bodies such as sand, iron or other foreign materials from falling by gravity through the grid. After leaving the beaters the stock passes through the trunk *h* into the flue *e* where any pieces of sticks or other foreign material that are too long or too large to pass through the bars of the grid *b* are caught and retained by the trap *j*, from which they may be removed by opening a suitable slide provided for that purpose. From the flue *e*, the stock passes into the dust collector or condenser *D* which removes the dust or other foreign material that is lighter than the stock and permits the thoroughly cleaned stock to fall into a bin or other receptacle provided therefor.

What we claim is:

1. Apparatus for cleaning and extracting foreign material from waste, mill sweeps and the like, comprising a casing, a grid in said casing, means for inducing a current of air through said casing to draw the stock above said grid, beating mechanism above the grid operating upon the stock, and a regulable air inlet below the grid serving to admit air in sufficient quantities to support only the light material of the stock and prevent the same falling through the grid.

2. Apparatus for cleaning and extracting foreign material from waste, mill sweeps and the like, comprising a casing, a grid in said casing, means for inducing a current of air through said casing to draw the stock above said grid, rotary beating mechanism above the grid operating upon the stock, and a regulable air inlet below the grid serving to admit air in sufficient quantities to support only the light material of the stock and prevent the same falling through the grid.

3. Apparatus for cleaning and extracting foreign material from waste, mill sweeps and the like, comprising a casing, transverse bars forming a grid in said casing, means for inducing a current of air through the casing to draw the stock above the grid, rotary shafts having radial arms above the grid, the movement of said arms adjacent to the grid being in opposition to the movement of the air current, and means for admitting air below the grid in regulable quantities sufficient to support only the lighter material in the stock.

4. Apparatus for cleaning and extracting foreign material from waste, mill sweeps and the like, comprising an opener for preliminarily loosening the stock, a casing receiving the stock from the opener, a grid in

said casing, means connected with the discharge end of the casing for inducing a current of air through the casing to draw the stock above the grid, rotary beating mechanism above the grid operating upon the stock on the grid in opposition to air current, and a regulable air inlet below the grid to admit air to support the light material of the stock.

5 5. Apparatus for cleaning and extracting
10 foreign material from waste, mill sweeps and the like, comprising an opener for preliminarily loosening the stock, a casing receiving the stock from the opener, a grid in the cas-

ing, a receptacle for heavy material below the grid, rotary beating mechanism in the casing above the grid, a discharge flue connected with said casing, an exhaust fan for communicating with said flue, and a dust collector into which said flue discharges. 15

In testimony whereof we affix our signatures, in presence of two witnesses. 20

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STANLEY G. MILLER.

Witnesses:

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