

(No Model.)

2 Sheets—Sheet 1.

A. H. KIRK.

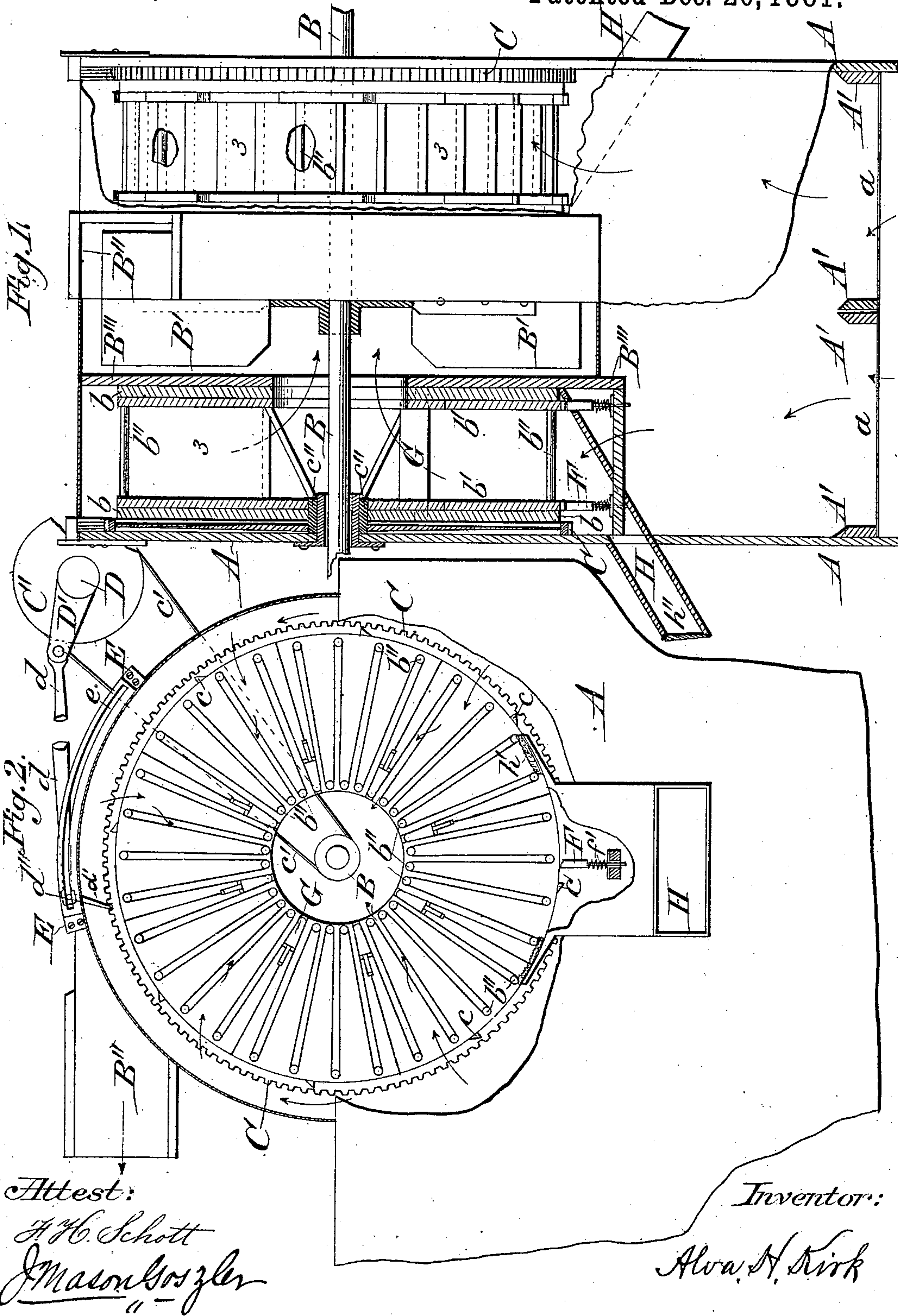
DUST COLLECTOR FOR MIDLINGS PURIFIERS, &c.

No. 251,121.

Patented Dec. 20, 1881.

Fig. 1.

Fig. 2.



Attest:

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Mason & Co.

Inventor:

Alva H. Kirk

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Fig. 3

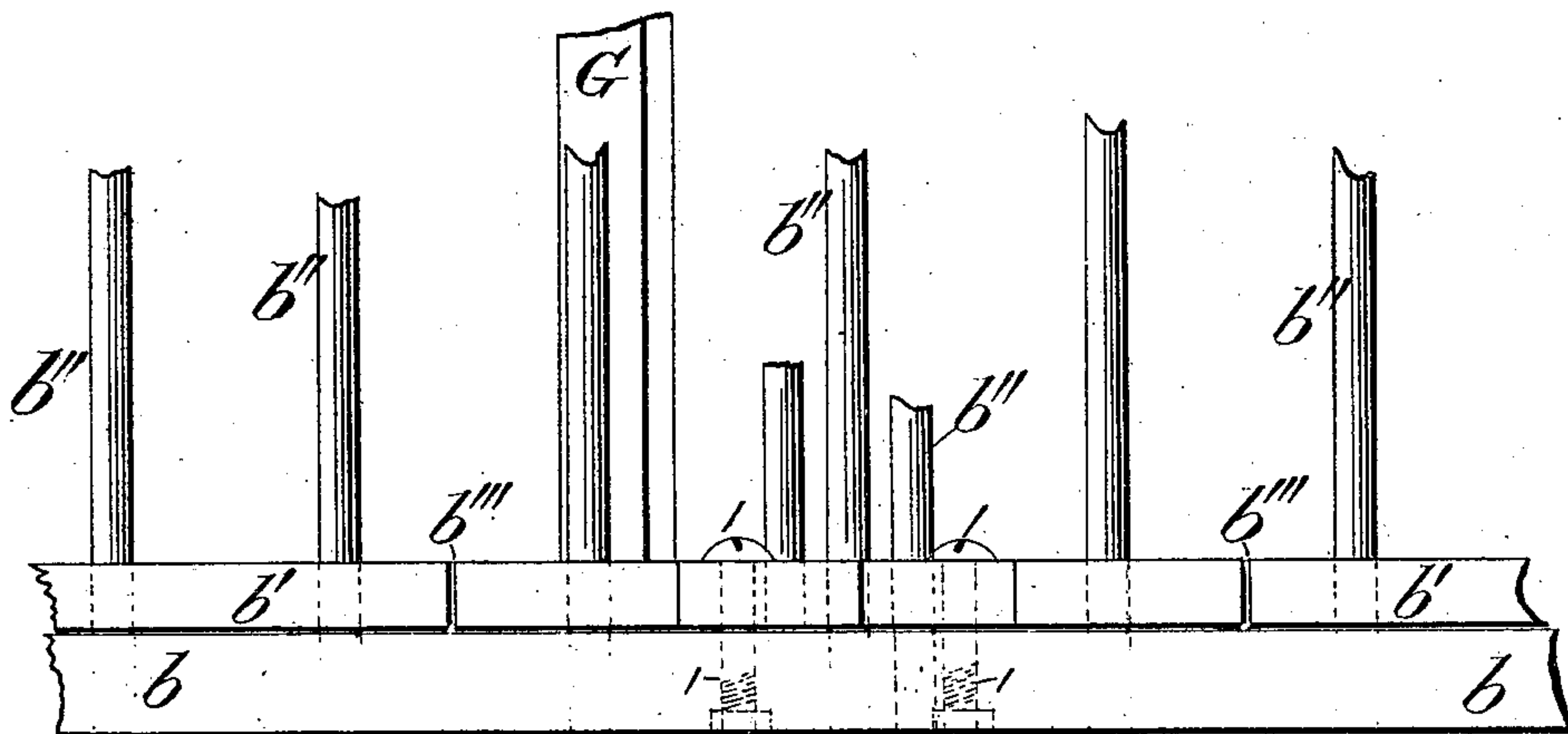
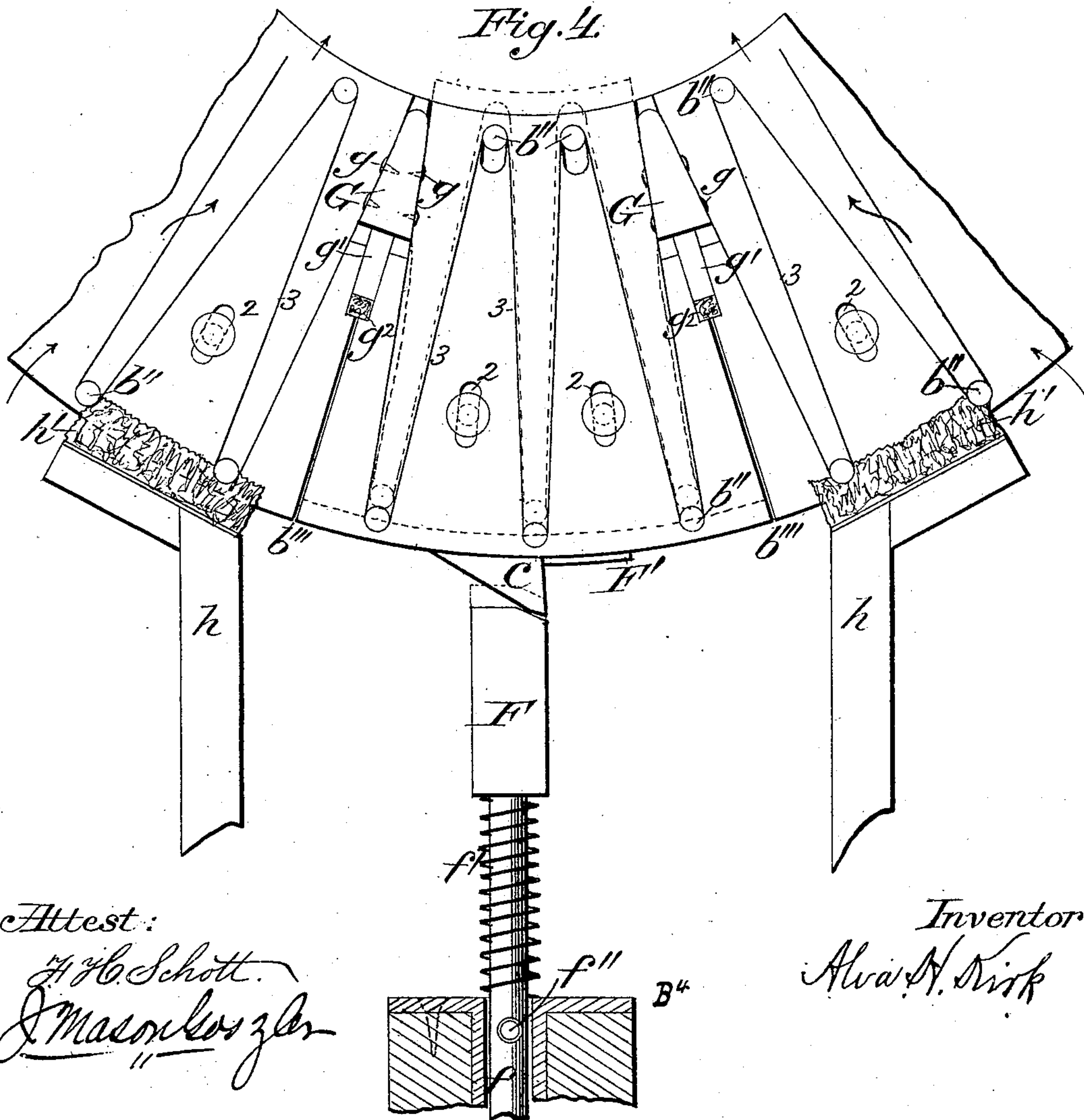


Fig. 4



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UNITED STATES PATENT OFFICE.

ALVA H. KIRK, OF MINNEAPOLIS, MINNESOTA.

DUST-COLLECTOR FOR MIDLINGS-PURIFIERS, &c.

SPECIFICATION forming part of Letters Patent No. 251,121, dated December 20, 1881.

Application filed February 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALVA H. KIRK, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful improvements in machines for collecting and saving the fine dust floating in the air in and around middlings-purifiers and analogous machines in flouring-mills; and I 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

In the drawings, Figure 1 represents an upright side view, partly in section, of my improvement as placed over the shaker of a middlings-purifier. Fig. 2 represents an end view of same. Fig. 3 shows some of the details of construction seen in Fig. 1 enlarged, and Fig. 4 shows parts of Fig. 2 enlarged.

A represents the frame of the purifier, and also forms the case in which my improvement is placed.

A' A' represent the sides of the shaker-frame of the purifier, which in this instance shows two distinct shakers side by side and the bolt-cloth *a* secured to the bottom edges thereof.

B is a horizontal fan-shaft in proper bearings on opposite sides of the frame A. To shaft B is secured fan B', and with said shaft the fan is revolved by any convenient means or device.

C C are ratchet or toothed wheels attached to hubs *c''* around shaft B, and are also firmly secured to heads *b* by any means, to secure their revolution with the ratchet-wheels as they revolve.

b' *b'* are movable or yielding sections inside of heads *b*, of the same diameter, and each section extends from *b'''* to *b'''*, as shown in Figs. 3 and 4. These sections *b'* have rods *b''* between them and secured thereto, except the two center ones, which go through slots in sections *b'* and are fast to the heads *b*. These sections *b'* are held in contact with heads *b* by the screws 1 1, that pass through slots 2 2 in sections *b'*, and thence into the

heads *b*, which construction will allow the sections *b'* to yield or slide inward toward the center of the device.

3 represents cloth, either flannel or cotton, placed around the rods *b''* in a zigzag manner, as seen in Fig. 4. This cloth is of such texture as will prevent any of the dust from the purifier from passing through it, while the air that carried the dust against the cloth will pass through the cloth freed from all the comminuted particles or dust and be forced out of the device through air-exit B'' by the fan B', that is placed in a central chamber between two heads and over the purifier, and separated from the dust-collectors on either side of it by partitions B'''.

C' is a band-pulley on transverse shaft D, and is put in revolution by the band *c'*, that goes around a pulley on shaft B.

D' D' are crank-arms fast to hubs on shaft D, and revolve with said shaft and pulley C', and have arms *d* pivoted to their outer ends, to which are secured pawls *d'*, so that as the crank-arms D' revolve the pawls *d'* will engage with the teeth on wheels C. At each revolution of the cranks the arms *d*, with the pawls *d'*, will reciprocate far enough to turn the ratchet-wheels C one-eighth of a revolution, or the distance that one of the sections *b'* occupies. The pawls *d'* are attached to cross-heads *d''*, the horns of which are in curved slots *e* in curved plates E, secured to the top of the case in which the device is, as seen in Fig. 2.

c c are projecting wipers placed at or near the center of the periphery of each section *b'*, having their forward sides inclined and their opposite sides at or nearly at right angles to the periphery of sections *b'*.

F is a yielding hammer, having a portion of its outer or upper end inclined or angular, and the remainder a plane, as seen in Fig. 4, and has a reduced round stem part, *f*, extending down into a thimble on the bottom B⁴ of the chamber in which the device operates, as seen in Fig. 1.

f' is a spiral spring around stem *f*, its upper end bearing against the shoulder of the hammer, and the lower end against a thimble in B⁴.

F' is a plate or bumper on the periphery of each section *b'*, to receive the blow of the ham-

mer as it passes off of the wiper *c* in the intermitting rotation of the sections as they each, in turn, pass in contact with the hammer.

f'' is a holding-screw, to hold the hammer in a fixed or unyielding position when desired, and when the hammer is so fixed the forward movement of the sections *b'* causes the projecting wipers *c* to pass over the hammer and force the entire section toward the center, as shown in dotted lines in Fig. 4.

G G are blocks firmly secured to heads *b*, and in openings between the yielding sections *b'*, and to which the ends of the cloth 3 are secured by tacks *g*, as seen in Fig. 4.

g' g' are tongues that project outward from blocks *G*, between the sections *b'*, in openings to receive them, made of equal size in each adjacent section, the outer ends of which are provided with yielding cushions to act as springs.

g² g² are yielding cushions, which may be of soft rubber or other equally yielding material, placed between the outer ends of the tongues *g'* and the shoulders of the openings occupied by the tongues *g'* between two adjacent sections, which, as a section is forced inward, yields or gives way, and as the cause that forced the section inward is removed the cushion acts as a spring and forces the section back to its normal position.

H H are spouts and still-air chamber at the bottom of the case and underneath each section *b'* when the jarring-hammer strikes it, to receive and retain the dust, and through which the dust is discharged from the device, to be conducted by other means to any place desired.

h h are the sides of the spouts, which are far enough apart to more than include one of sections *b'*, and at their upper ends is attached sheep-skin *h'*, with the wool on; or other equally yielding and flexible fibrous substance may be used to bear against the cloth 3, which, being placed around the rods *b''*, as the sections *b'* rotate, comes in contact with and bears upon the pads *h'*, forming an air and dust cut-off, so that all the dust as it is jarred off the cloth will be prevented from passing into any other part of the device, except to fall into the spouts underneath the sections.

h'' h'' are flap-valves at the exit of the spouts *H*, hinged at their top edges to the spouts, so that they will be closed by the pressure of the atmosphere, which valve, with the pad *h'*, will form a still-air chamber in the spout underneath the section, and as the dust is jarred off the cloth it readily falls into the spouts. The middlings being separated in the machine below, the dust-laden air passes upward from the shaker *A'*, goes in the direction shown by the arrows into the dust-catching device, where it is forced against cloth 3, which prevents the dust from passing through it, and will retain it on the side of the cloth it strikes against. One of the sections *b'* being moved forward by the pawls acting against the teeth on the

ratchet-wheels, the wiper projecting from its periphery strikes the hammer, forcing it back and contracting the spring, and, as the wiper passes on, the hammer, by the power of the spring, strikes against the bumper-plate on the periphery of the moving section, which jars off all the adhering dust on the cloth over the still-air chambers in the spouts; or if the hammer is fixed and unyielding, then the section will be forced inward or centrally as the wiper passes over the hammer, which will shorten the folds of the cloth and cause it to bag between the rods, and as the wiper goes off the hammer the section will assume its normal position, causing the cloth to flap suddenly, and thus throw off all the dust that adheres thereto. The air thus cleaned of its dust is now forced out of the device by the fan through the air-exit at the outer end of the air-trunk.

Having thus described my invention, what I claim, and wish to secure by Letters Patent, is—

1. In a machine for collecting and separating the dust from the air in the art of manufacturing flour, the combination of the case *A*, the rotating heads *b*, having separate and yielding sections *b'* attached thereto, with cloth 3, and air-fan *B'*, all constructed and arranged to operate substantially as described.

2. In a machine for separating dust from the air in manufacturing flour, the combination, with case *A*, of the yielding sections *b'*, having mechanism for giving an intermitting rotary motion with the jarring-hammer *F*, as and for the purposes described.

3. In a machine such as above described, the combination of a case, *A*, sections *b'*, having cloth 3, and mechanism for giving an intermitting rotary motion thereto, jarring-hammer *F*, and plate *F'*, with the still-air chamber *H* underneath the sections when jarred, as and for the purposes set forth.

4. In a machine as above described, the rotating heads *b*, having blocks *G*, to which cloth 3 is secured, in combination with the yielding sections *b'*, and mechanism for giving an intermitting rotary motion thereto, and jarring-hammer *F*, as and for the purposes set forth.

5. In a machine as above described, the rotating and yielding sections *b'*, having cloth 3, in combination with the jarring-hammer *F*, fibrous pads *h'*, and spout or still-air chamber *H*, substantially as described.

6. In a machine such as above described, the combination of intermitting rotary and yielding sections, a dust-catching cloth, means for forcing a current of dust-laden air against the cloth, and a jarring device to jar the sections and clear the cloth of adhering dust, as described.

7. In a machine such as above described, the combination of intermitting rotary sections, a dust catching cloth, mechanism for forcing a current of dust-laden air against the cloth, a yielding jarring-hammer to clear the cloth from

adhering dust, and a stillair chamber into which the dust will fall, substantially as and for the purpose described.

5 8. In a machine such as above described, the combination of rotary sections b' , the zigzag dust-cloth 3, the stationary blocks G, and india-rubber block-springs g^2 , as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

ALVA H. KIRK.

Witnesses:

J. W. HAMILTON JOHNSON,
J. MASON GOSZLER.