

(No Model.)

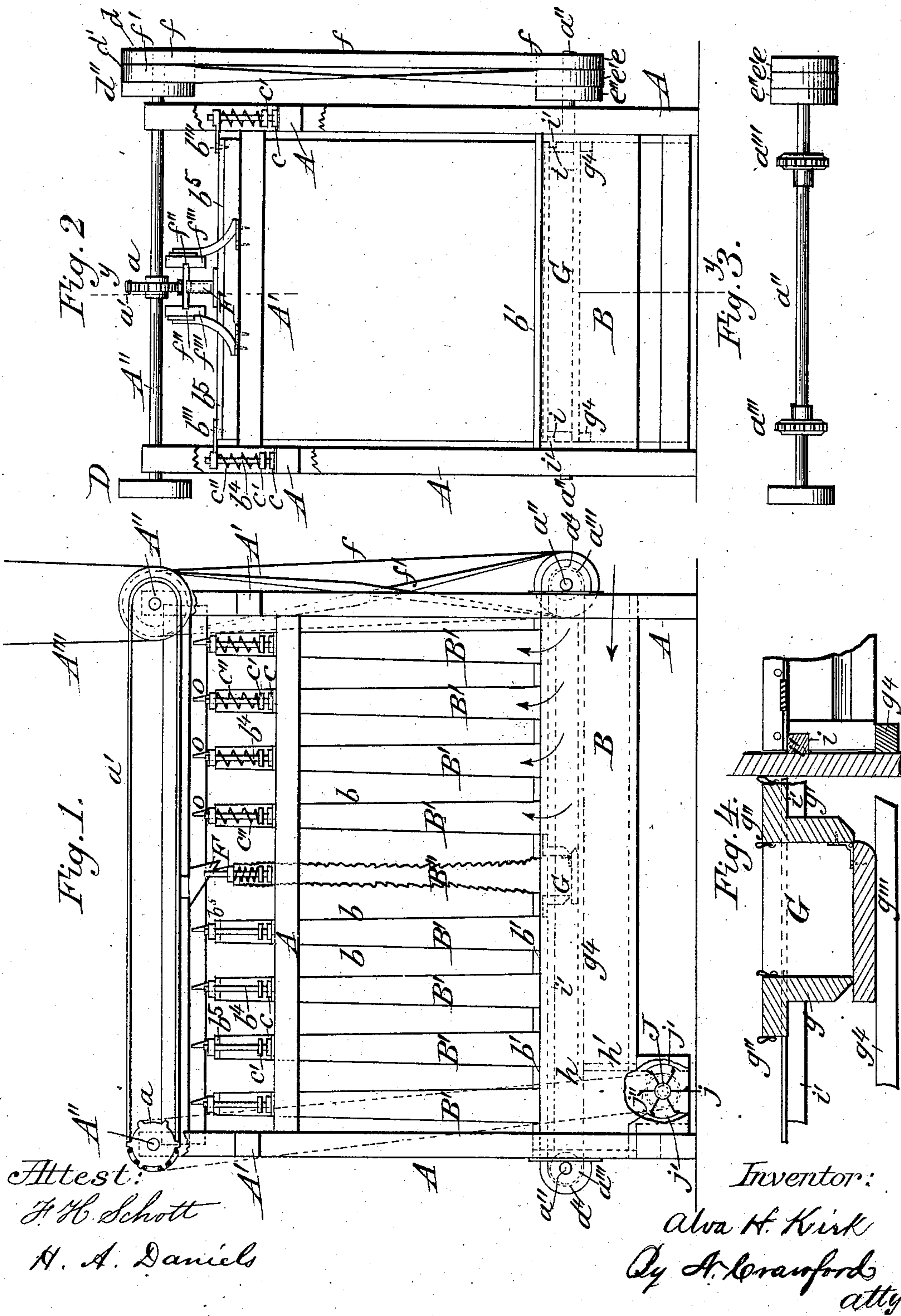
2 Sheets—Sheet 1.

A. H. KIRK.

MACHINE FOR COLLECTING DUST.

No. 259,872.

Patented June 20, 1882.



(No Model.)

2 Sheets—Sheet 2.

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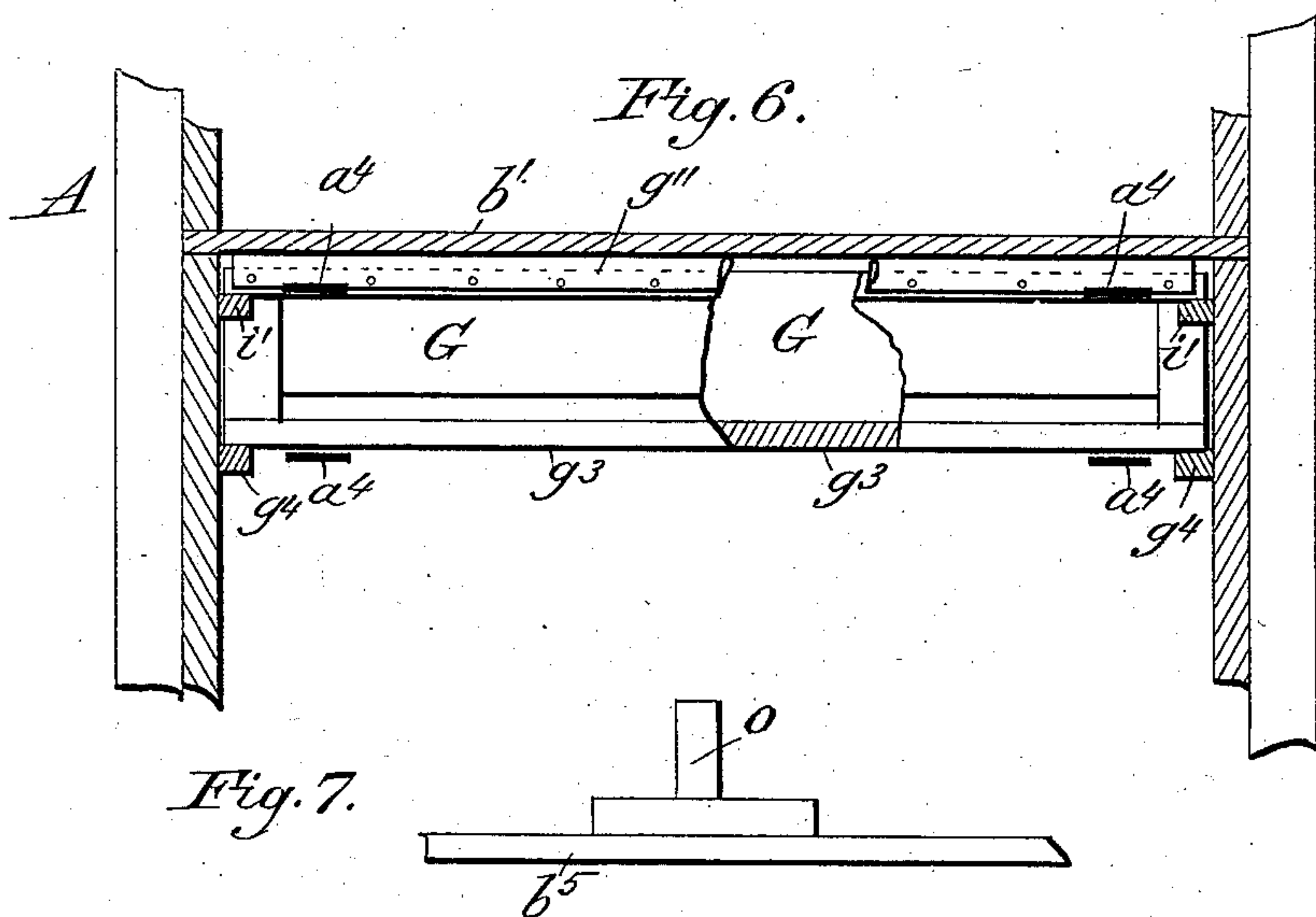
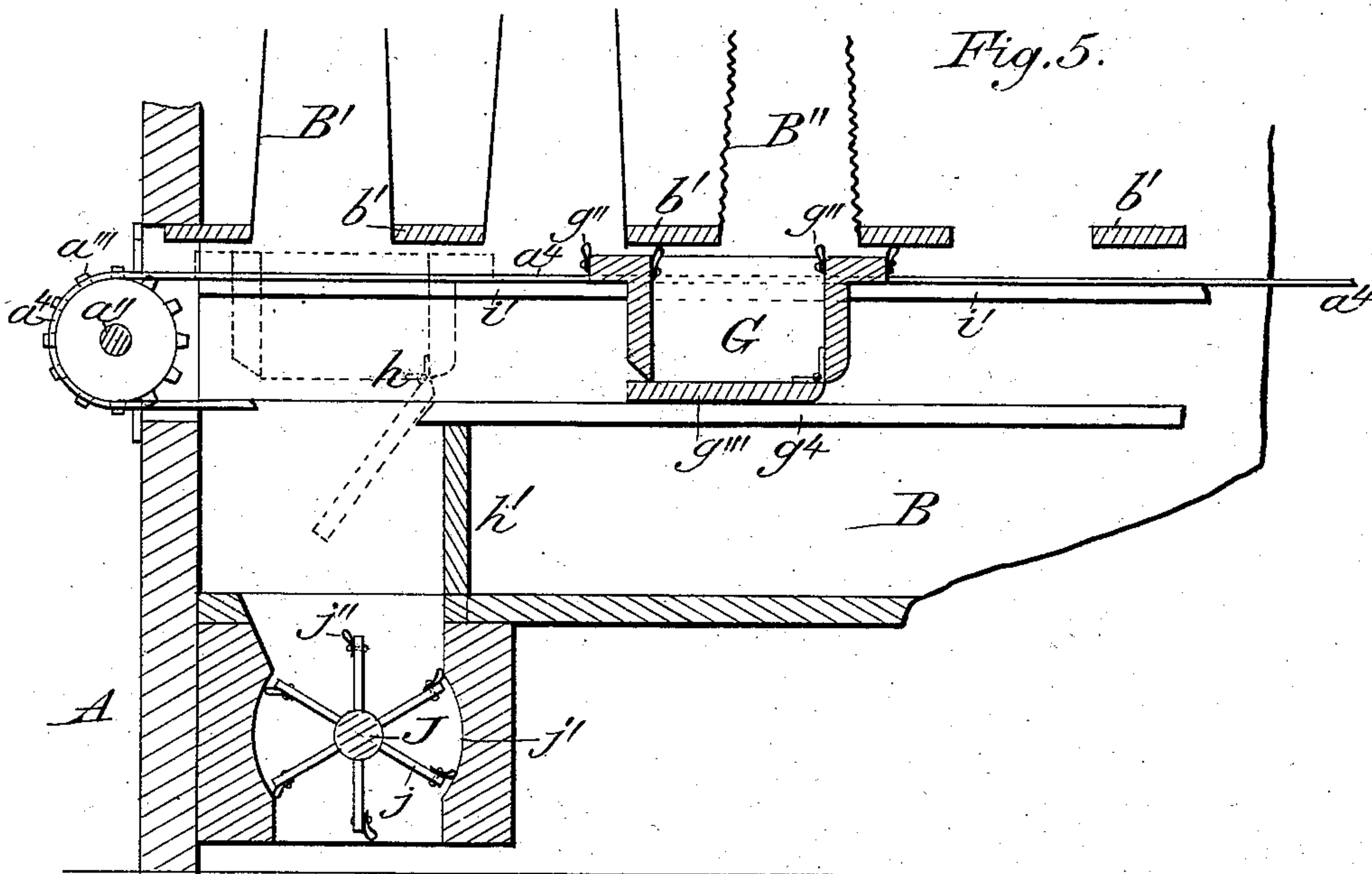
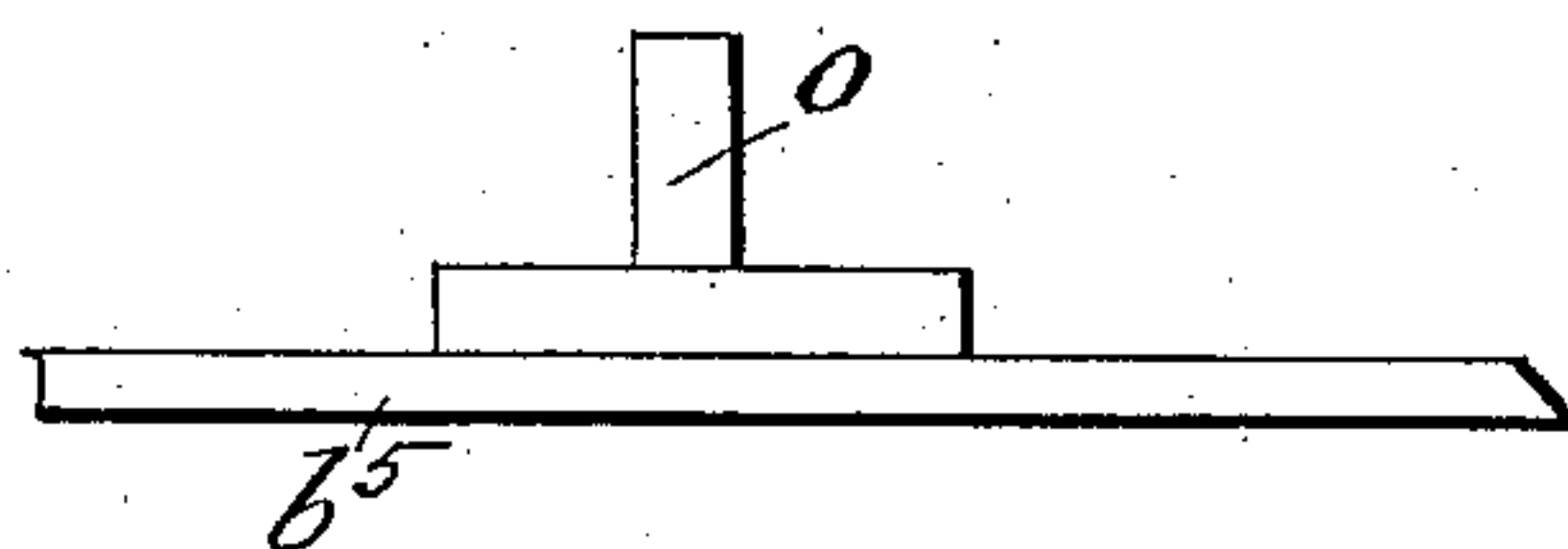


Fig. 7.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR COLLECTING DUST.

SPECIFICATION forming part of Letters Patent No. 259,872, dated June 20, 1882.

Application filed January 31, 1882. (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 Dust; 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.

The object of this invention is to improve the machines in use for catching and separating the dust that is present, in machines where flour is manufactured, from the air that is in and surrounds such machines, and especially such machines as are described and claimed in patents numbered 251,120 and 251,121, and dated December 20, 1881; and the invention consists in the construction of the machine, as will be fully hereinafter described.

In the drawings, Figure 1 represents an upright side view of the machine, with a portion of the machine-casing to the frame removed to show interior parts. Fig. 2 is an end view of the machine. Fig. 3 represents the lower transverse shaft, and Fig. 4 represents details of construction of parts. Fig. 5 represents a part longitudinal sectional view of the machine, a sectional end view of the dust-box, and the devices for operating the dust-box. Fig. 6 is a transverse sectional view of the dust-box, and Fig. 7 represents enlarged details of construction of parts in Figs. 1 and 2.

A represents the frame of the machine, and A' A' represent cross-girts.

A'' A'' represent two transverse shafts, from the revolution of either of which the machine is put into operation by any known and convenient power, as seen by belt A''' over a pulley, which may be secured to either end of the shafts A'', as is most convenient.

a a are sprocket-wheels, which are secured firmly upon shafts A'' and revolve with them. These shafts are situated above and at each end of the machine.

a' is a chain-belt around the sprocket or star

wheels, which give it a continuous motion in one direction when the machine is in motion. There may be on each shaft A'' two sprocket-wheels a in large machines, as shown in Fig. 3, or, in smaller machines, but one on each shaft, as seen in Fig. 2.

a'' a'' are two other transverse shafts, situated near the bottom of the machine and at each end thereof, and have pulleys a''' thereon, upon which pulleys is a belt, a⁴.

B is a chamber to receive the dust-laden air which enters into the machine in the direction of the arrow, and is forced therein by any known device, such as by a force or suction fan that may be located at the most convenient place to effect its work.

B' B' are a series of standing dust-catching bags or chambers, the outsides b of which are cloth, open at their bottom ends to receive the forced dust-laden air from chamber B underneath, as indicated by arrows in Fig. 1. These bags are wider at their bottom or open ends, over chamber B, than at their top ends. The cloth at their bottoms is secured to cleats or supports b' between them, the cloth being of such texture as will stop the dust from passing through it, but will allow the air to freely pass through cleaned of the dust, and thence go out of the machine in any known way or by any known means. The upper ends of bags B' are closed by boards b⁵ of proper width between the cloth that composes the sides and ends of the bags. On the top of these boards b⁵ are secured cast-metal plates b''', which project over the ends of the boards far enough to be over the center of the frame A, and through the end of each plate so projecting is a hole large enough to admit a bolt, b⁴, to slide freely therein, which bolt is fastened in a casting, c, secured to girts forming a part of frame A.

c' c' are nuts fast on the bolts b⁴, upon which rest the lower ends of coil-springs c'' c'', that are coiled around the bolts b⁴, their upper ends bearing against the under side of castings b''', giving to the springs their proper tension.

Upon the shaft A'', at one end, are three pulleys, d d' d'', all of which are fast to the shaft and revolve with it, and at the outer end of shaft a'', and underneath shaft A'', are three pulleys, e e' e'', two of which, e and e'', are fast

to shaft a'' and turn with it, while the middle pulley, e' , is a loose or idle pulley and revolves freely upon shaft a'' .

f is an open belt, or a belt that simply goes around pulleys d and e , causing the pulleys to revolve in the same direction, they being fast upon their shafts.

f' is a cross-belt passing around live-pulley d' on shaft A'' and around loose or idle pulley e' on shaft a'' .

F is a projecting wiper or cam, secured to the chain-belt a' , and travels with it when the machine is in motion.

$f'' f''$ are projections on the wiper F , that slide in grooves in the raised guideways $f''' f'''$, that are supported on cross-girts A' , which construction prevents the yielding of the wiper F in performing its function.

G is a traveling dust-box or cut-off, in length the width of the dust-bags B' , and of dimensions greater than the open bottom or mouth of each bag over the dust and air chamber B . An end sectional view and a front view of the construction of this dust-box are seen in Figs. 4 and 6, respectively. The two sides $g g'$ have rubber or other yielding packing g'' to make it air-tight in its chamber. The bottom g''' is hinged to side g' , and is not attached to the forward side, g , but is held in close contact therewith by the guideways g^4 underneath it, which guideways are secured to the sides of frame A . This dust-box is secured to chain-belts a^4 , that work over sprocket-wheels a''' on shaft a'' , Figs. 3 and 5, and is so arranged as to always be directly under the wiper F when that is underneath the chain-belt a' . The guideways g^4 do not extend the entire length of the frame, but round off at their extreme ends at h , and are there supported by a partition, h' , that ends chamber B underneath, the guideways g^4 leaving an opening beyond the partition. The ends of the box G have grooves i therein, which receive projecting guides i' , that are secured to the inside of the case to the machine, and thus hold and guide the box in its reciprocations independent of the guides g^4 , that keep the bottom of the box close in contact with its sides. (See Figs. 4 and 6.)

J is a transverse shaft underneath the opening at the ends of the guideways g^4 , and is made to revolve by a belt (seen in dotted lines in Fig. 1) or by any other known means. Upon this shaft, and extending the width of the inside of the machine, are wings $j j$, that revolve within two concaves, j' , on opposite sides of the shaft. These wings j have at their outer extremities rubbers j'' , Fig. 5, or other flexible cushions to bear against the concaves and prevent air from passing by the wings. Underneath this shaft and its wings is a still-air chamber (in common use) that receives the dust from the dust-box. No means is shown or described in this for forcing the dust-laden air into this machine for separating the dust from the air, as any of the well-known means for forcing the air and dust may be used for that purpose with this machine.

The machine being constructed as above described, and belts arranged as seen in Fig. 2, the air laden with dust is forced into chamber B , thence into bags B' . The shafts A'' and a'' being in motion, the wiper F moves from right to the left, striking on its inclined side against a projecting pin, o , on support b^5 , forcing the pin and its support down against and contracting the coil-springs over the bag, and causing the bag to wrinkle, as seen in Fig. 1. As the wiper leaves the depressing-pin the springs assume their function and suddenly force the support and the bag upward with a snap that throws or causes all the dust that adheres to the inside of the bag to fall into the dust-box underneath the bag acted upon, as the dust-box moves coincident with the wiper and is always under the bag when the wiper advances and releases the springs. This operation is continued until the wiper has passed the last of the bags at the left, and is to be carried over the sprocket-wheel on its return movement, and the dust-box has advanced to the opening under the last left-hand bag and the bottom of the box has swung down, emptying its contents of dust upon the revolving wings j' of shaft J , to be by that device automatically and surely delivered into a still-air chamber underneath. At this point of the operation an automatic belt-shipper of any known construction (not shown in drawings) is applied to and throws belts f and f' toward the machine, so that cross-belt f' , which has been revolving on a loose or idle pulley, e' , on shaft a'' will be shifted onto fast pulley e'' and open belt f onto the loose pulley e' , which will reverse the revolution of shaft a'' , and thereby through the chain-belts, to which the dust-box G is attached, the dust-box will be reversed in its reciprocation and brought back to be underneath the right-hand dust-catching bag, B' , before the wiper F has passed over the first depressing-pin o , and so as to catch the dust, when the coiled springs c'' suddenly flap the dust-bag to its upright position and shake or jar the adhering dust off the bag into the traveling dust-box.

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

1. In a machine for collecting and separating dust from the air, the combination of the traveling wiper F , coiled springs c'' , the standing dust-catching bags B' , and suitable supports for said springs and bags, whereby the dust-catching cloth b of the bags is wrinkled, and the springs, released from depression, act to throw off or clear the dust from said cloth, substantially as described.

2. The combination, in a machine for collecting and separating dust from the air, of the revolving shaft J , having dust-carrying wings j and india-rubber cushions j'' at their extremities, and the concaves j' , against which, at opposite sides, the cushions bear, as and for the purposes described.

3. In a machine for collecting and separat-

ing dust from the air, the combination of a traveling wiper, standing and compressible dust-catching bags, and a traveling dust-catching box, operating substantially as described.

5 4. In a machine for collecting and separating dust from the air, the dust-catching box G, having a hinged bottom, g''' , in combination with the cut-off guideways g^4 , as and for the purposes described.

10 5. The combination, in a machine for catching and separating dust from air, of standing and compressible dust-bags, a traveling and compressing wiper, suitable mechanism for

operating it, springs to return the bags to their normal condition after being compressed, 15 a reciprocating dust-catching box, mechanism for causing it to travel back and forth, and an automatic revolving dust-discharging device, substantially as and for the purposes described.

In testimony whereof I affix my signature 20 in presence of two witnesses.

ALVA H. KIRK.

Witnesses:

J. GUILFORD,

A. W. HASTINGS.