

(No Model.)

2 Sheets—Sheet 1.

S. L. BEAN.

Balloon for Collecting Flour Dust in Mills.
No. 235,197.

Patented Dec. 7, 1880.

Fig. 1.

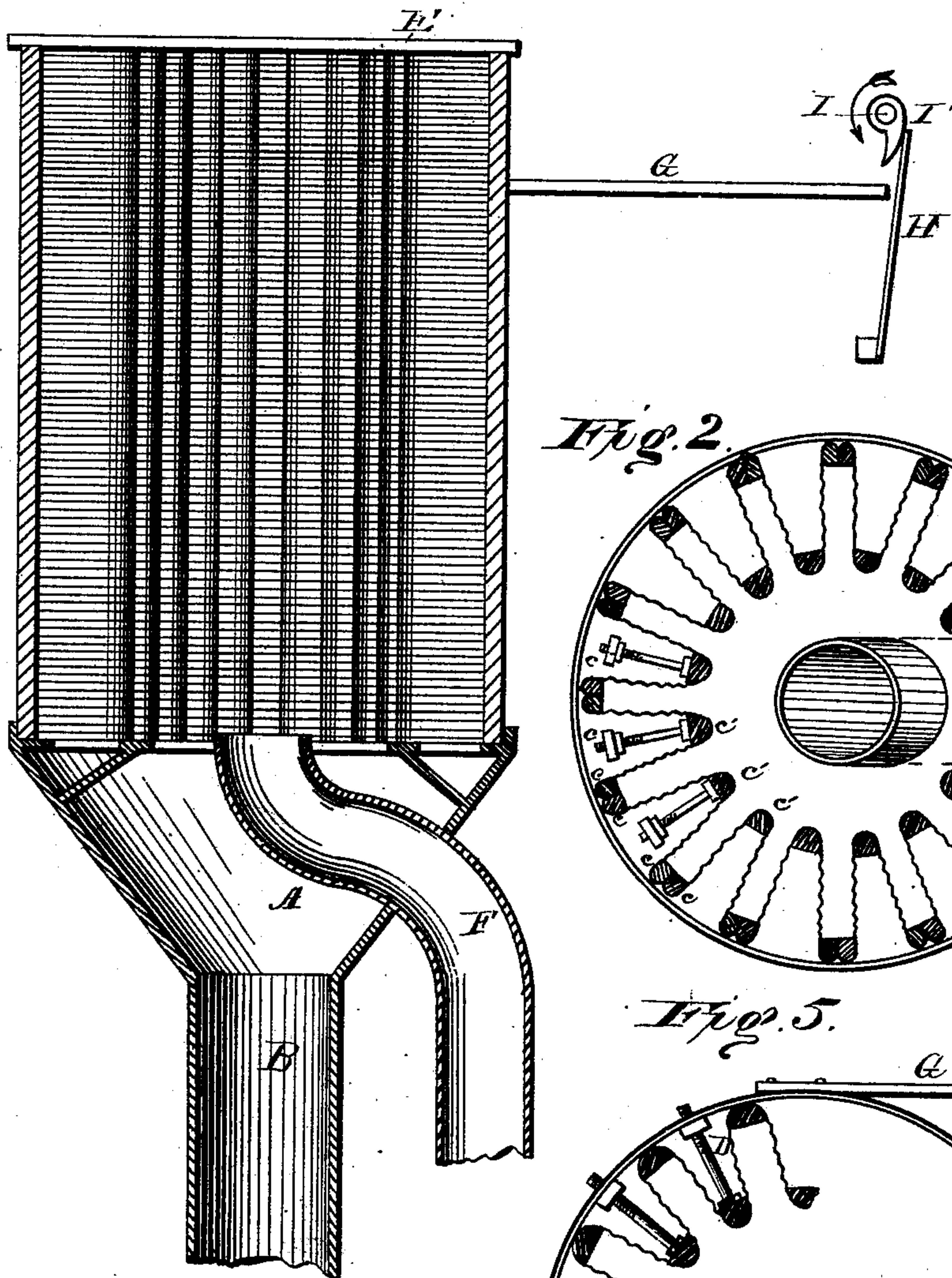


Fig. 2.

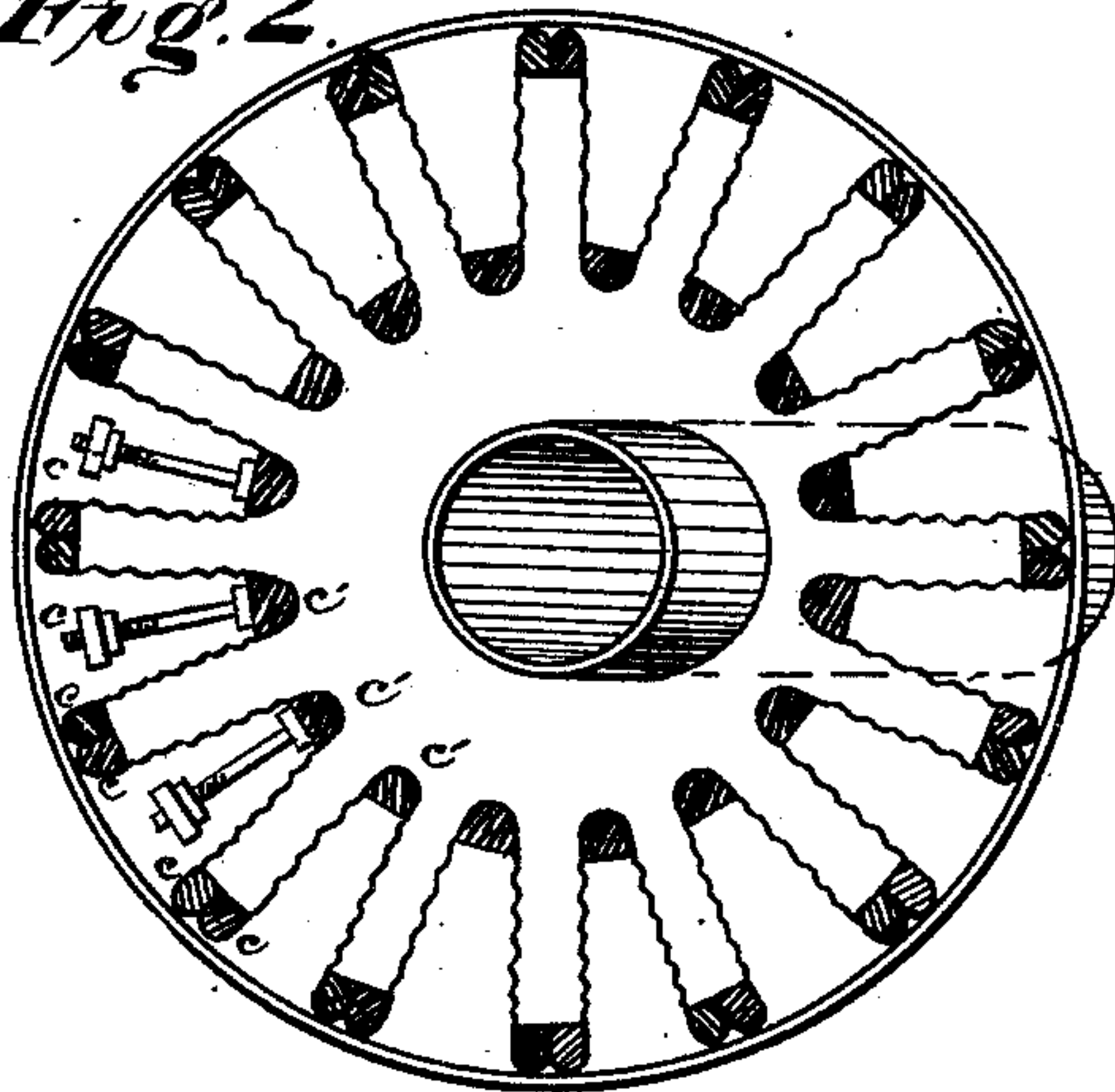


Fig. 5.

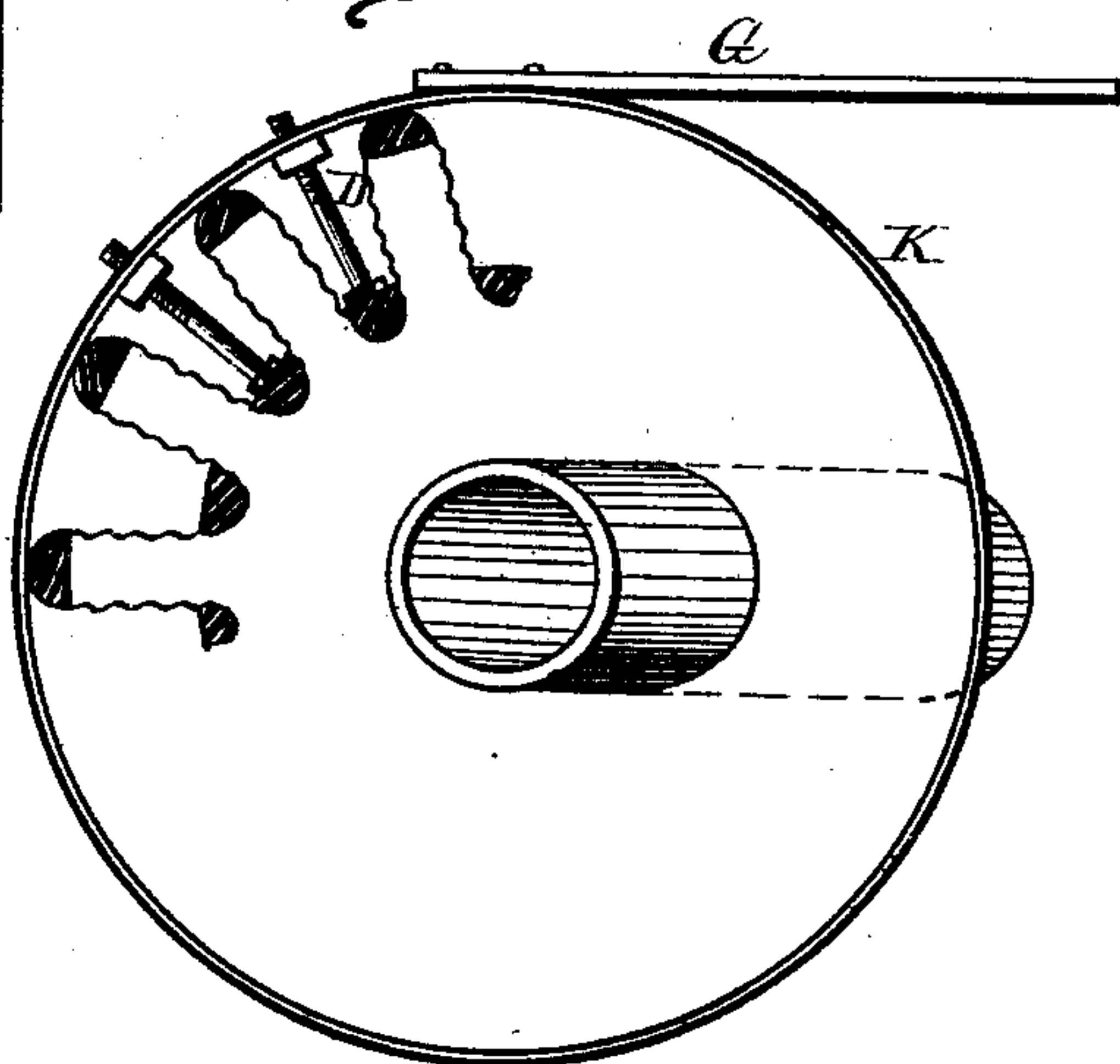
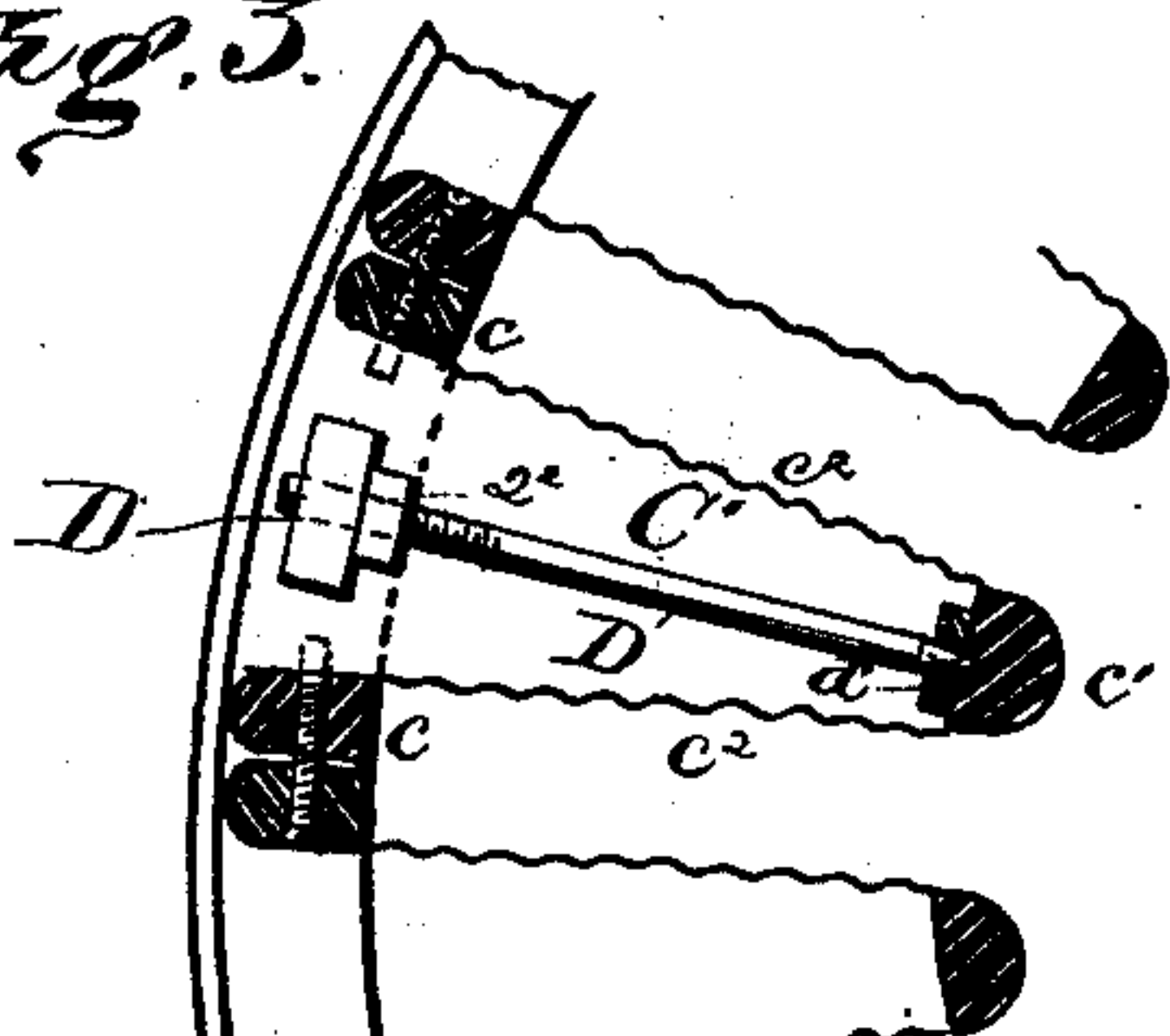


Fig. 3.



Witnesses.
Frank L. Ourand.
L. S. Keane

Inventor:
Samuel L. Bean
by his attorneys
Elliott & Doolittle

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2 Sheets—Sheet 2.

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Fig. 4.

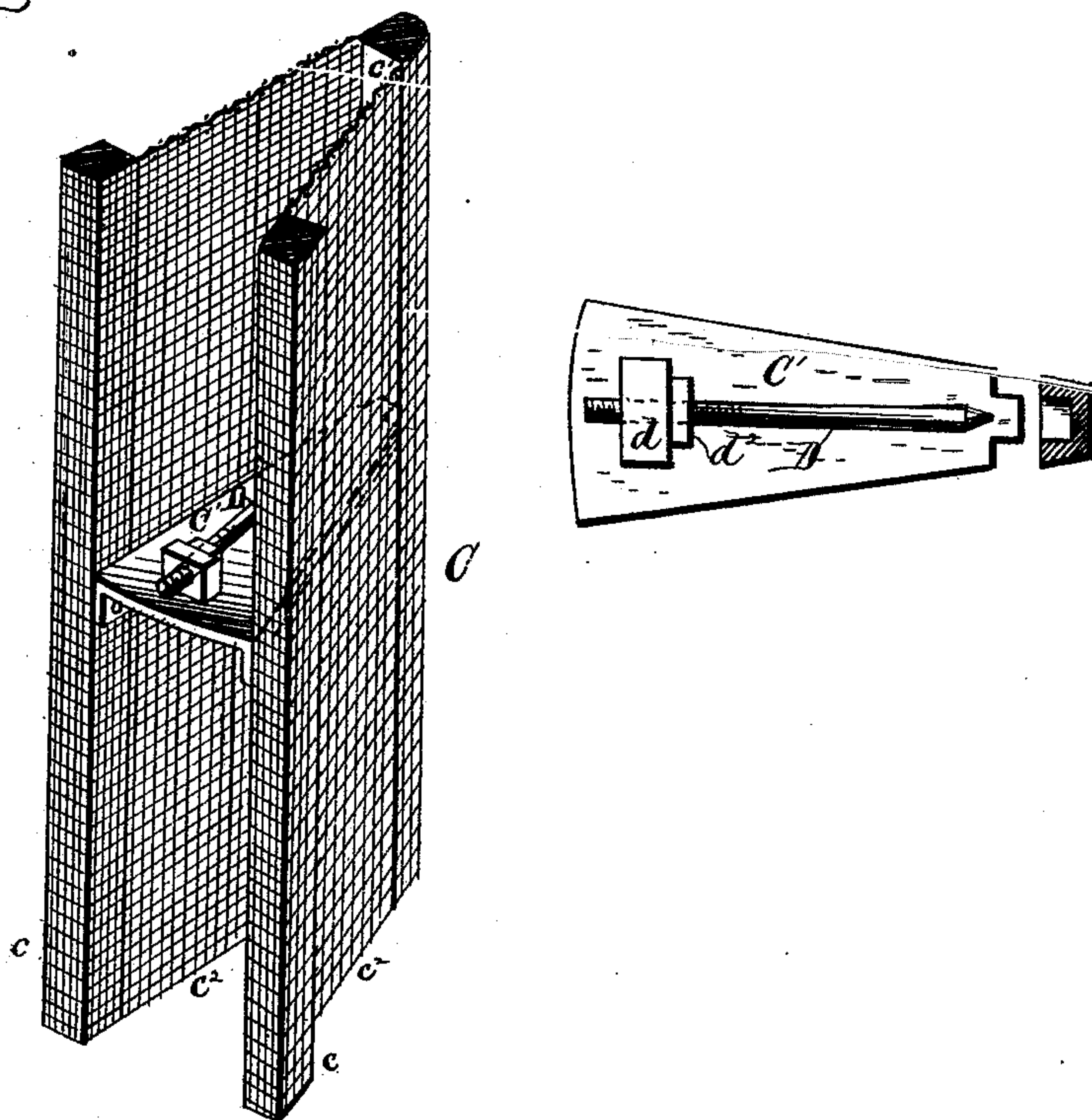
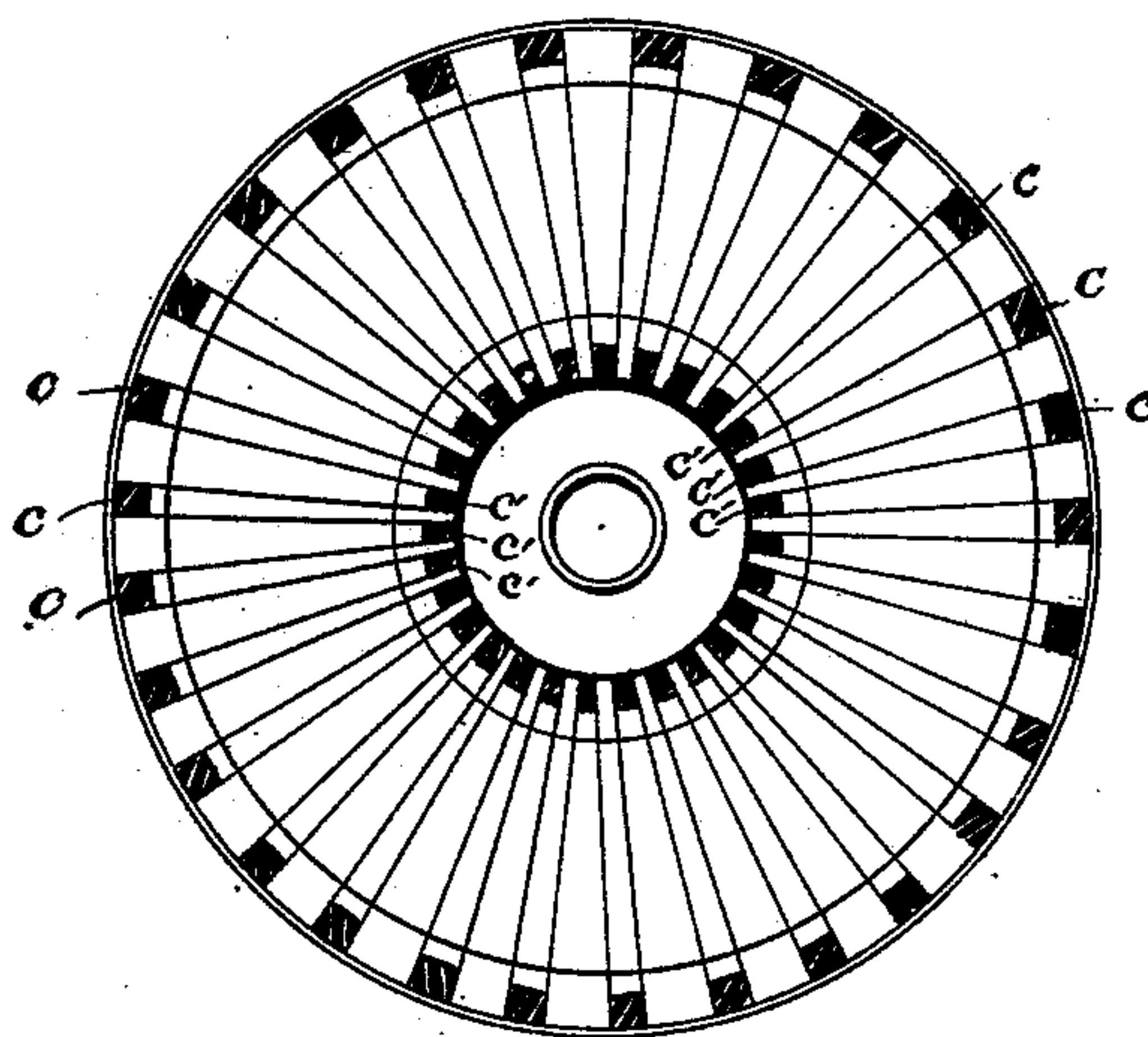


Fig. 6.



Witnesses.
F. L. Curand
[Signature]

Inventor,
Samuel L. Bean
by his attorneys
E. B. & Doolittle

UNITED STATES PATENT OFFICE.

SAMUEL L. BEAN, OF WASHINGTON, DISTRICT OF COLUMBIA.

BALLOON FOR COLLECTING FLOUR-DUST IN MILLS.

SPECIFICATION forming part of Letters Patent No. 235,197, dated December 7, 1880.

Application filed October 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. BEAN, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Balloons for Collecting Flour-Dust in 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.

15 This invention relates to balloons covered with reticulated cloth for straining flour-dust from air-currents drawn by a fan-blower from milling machinery in a flour-mill and blown into such a balloon, through the reticulated cloth of which the air escapes, while the flour-dust is retained, collected, and returned for subsequent utilization.

25 The object of my invention is to so modify the construction of a dust-catching balloon, as described in my United States Letters Patent No. 207,585, that the folds of the cloth will be arranged in such manner as to obviate, or, at least, greatly diminish, the obstructive packing of the flour-dust against said folds by the air.

35 To this end the invention consists of the following novel feature: The plies of each fold or furrow of cloth inclosing a part of the interior space of the balloon are arranged substantially parallel.

40 In order that my invention may be clearly understood, I have illustrated in the annexed drawings, and will proceed to describe, the best form thereof at present known to me, with a modification showing that some parts of my invention may be used or embodied in dust-catching balloons lacking other parts of my invention.

45 Figure 1 is an axial section of my improved dust-catching balloon. Fig. 2 is a horizontal cross-section of the same. Figs. 3 and 4 are detail views. Fig. 5 is a horizontal cross-section of a dust-catching balloon lacking the sectional feature of construction, and modified somewhat as regards the devices for stretching the cloth. Fig. 6 is a horizontal section

of a balloon in which the interior furrows or separating-chambers of the balloon are constructed with outwardly-diverging sides.

The same letters of reference are used in all the figures in the designation of identical parts.

55 The dust-catching balloon is constructed with a hopper-shaped bottom, A, from which a spout, B, may lead to any machine or receptacle for further operating upon or storing the dust strained out of the dust-laden air blown into the balloon.

60 The vertical cloth-covered portion of the balloon is, according to one part of my invention, constructed of V-shaped sections C, one of which is illustrated in Fig. 4, and which are united together in erecting the balloon in the mill by bolting the outer bars or ribs, *c c*, of each section to similar bars or ribs of the two adjacent sections, as shown in Figs. 1 and 2. About midway of its length a brace, C', is introduced in the fork of the section, bolted to the bars *c c*, and preferably tenoned to the bar *c'*, so as to hold the bars *c c c'* apart and the cloth upon them stretched. The reticulated cloth, nailed or tacked to the outer side of one of the bars *c*, is passed around the bar *c'* to the outer side of the other bar *c*, where it is again nailed or tacked. Thus a ply of cloth, *c²*, extends from each bar *c* to the bar *c'*. The bars *c c c'* are preferably made of wood.

65 The building of the cloth-covered portion of these balloons in sections is desirable, not only because it affords better facilities for transporting them and for placing them in mills, but the cloth can be far better applied in such sectional manner than in a continuous piece around the complete skeleton of a balloon, as has been heretofore customary. While the cloth thus applied in sections may ordinarily be held at sufficient tautness by the center brace, C', still it is deemed expedient, in most cases, to add a means for further stretching the cloth at any time. To this end an eye, *d*, is formed on or secured to the brace C', to support one end of a stretching-rod, D, the other end of which bears against the inner bar, *c'*, of the V-shaped section.

70 The inner end of the rod may be pointed to enter the bar *c'* slightly, a washer, *d'*, being provided to limit the penetration of the rod. The outer end of the rod is screw-threaded and

carries a nut, d^2 , bearing against the inner side of eye, d , so that by turning the nut the rod D may be caused to push the bar c' away from the bars c , more or less, and thus to stretch the cloth to the proper tautness.

The balloon has a tight top plate, E, to which the bars $c c'$ of the cloth-covered portion are suitably secured. At its lower end the cloth-covered portion of the balloon is connected to Λ -shaped tongues entering the exterior angles of the balloon, closing them, while the interior furrows or separating-chambers formed by the cloth plies c^2 are open at the bottom, so as to allow the dust to fall from these plies of cloth into the hopper-bottom.

The plies of the cloth are so arranged that where a balloon is completed of these sections, each two plies inclosing an intervening furrow of the balloon will be substantially parallel to each other, as shown clearly in Fig. 2, and should rather diverge than converge in an outward direction, as shown in Fig. 6, so that the dust-laden air entering said furrows from the center of the balloon will not blow directly against the plies, but escape through the meshes thereof by lateral expansion. The practical effect of this substantial parallelism of the plies is that the air does not pack the flour-dust on the cloth to such an extent as in the case where the air blows with more or less direct force against the cloth. The tendency to such packing is also lessened by the reaction of the escaping air-currents consequent upon their meeting in the exterior furrows of the balloon. The packing of the flour-dust on the cloth being thus obviated in a great measure, the meshes of the cloth can be much more easily kept open.

The dust-laden air is conducted, by the air trunk or pipe F, through the side of the hopper-bottom into the center of the balloon, where said air trunk or pipe terminates with a vertical nozzle, the upper end of which lies in a plane with the lower end of the cloth-covering of the balloon, or thereabout. In consequence of this construction, the air enters at the center of the balloon and is discharged in a substantially vertical direction, so that it will be pretty evenly distributed to the cloth-covered interior furrows or separating-chambers thereof, and will not materially interfere with the descent of the dust into the hopper-bottom.

The balloon is fixed in position, preferably, by its hopper-bottom. In order that it may be knocked at intervals to clean the meshes of the cloth from dust, it is provided with a tangential rod, G, secured to it at one end, while the other end of said rod abuts against the

free end of a plate-spring, H. The free end of the spring preferably projects a little distance above the rod, so that it can be operated upon by a cam or arm, I' , on a revolving shaft, I, to bend it back and then allow it to strike the end of the knocker-rod.

The lower end of the spring may be secured to any fixture in any convenient way.

In balloons which do not possess the sectional feature hereinbefore described, and where a single long piece of cloth is stretched over a skeleton frame-work, as shown in Fig. 5, I secure a hoop, K, around the center of the cloth-covered portion of the balloon, and apply the cloth-stretching rods in such a manner that their adjusting-nuts will operate against said hoop, as clearly shown.

The hoop may be a split one, in order that the knocker devices may be able to operate more effectively on the balloon.

I prefer to construct the balloon of separate V-shaped sections, as heretofore explained; but instead of that it may be constructed of sections, each of which includes several furrows of cloth, the division and connection of such sections being made as described with reference to the separate V-shaped sections. The sectional construction may also be attained by dividing the bars c' longitudinally instead of the bars c , in which case the sections would be of U shape. In some cases, where it is impracticable to use a funnel-shaped hopper-bottom, the bottom of the balloon may be made flat, and a rotating scraper or sweeper used to sweep the dust from the flat bottom into a suitable discharge-opening therein.

In a rectangular balloon the sections would all be U-shaped, as, also, most of them at least in an oval balloon.

I disclaim the cloth-stretching features described herein, since they are claimed in my application for Letters Patent filed May 24, 1880, from which the invention set forth in the claim at the close of this specification was withdrawn.

Having thus described my invention, what I claim is as follows:

A dust-catching balloon, the cloth-covered portion of which is formed with interior furrows or separating-chambers having parallel or outwardly-diverging sides, substantially as before set forth.

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

SAMUEL LORENZO BEAN.

Witnesses:

I. DE WITT CARTER,
FRANK WEEKS.