

S. BURGER.
Grain-Cleaning Machines.

No. 149,435.

Patented April 7, 1874.

Fig. 1.

Fig. 2.

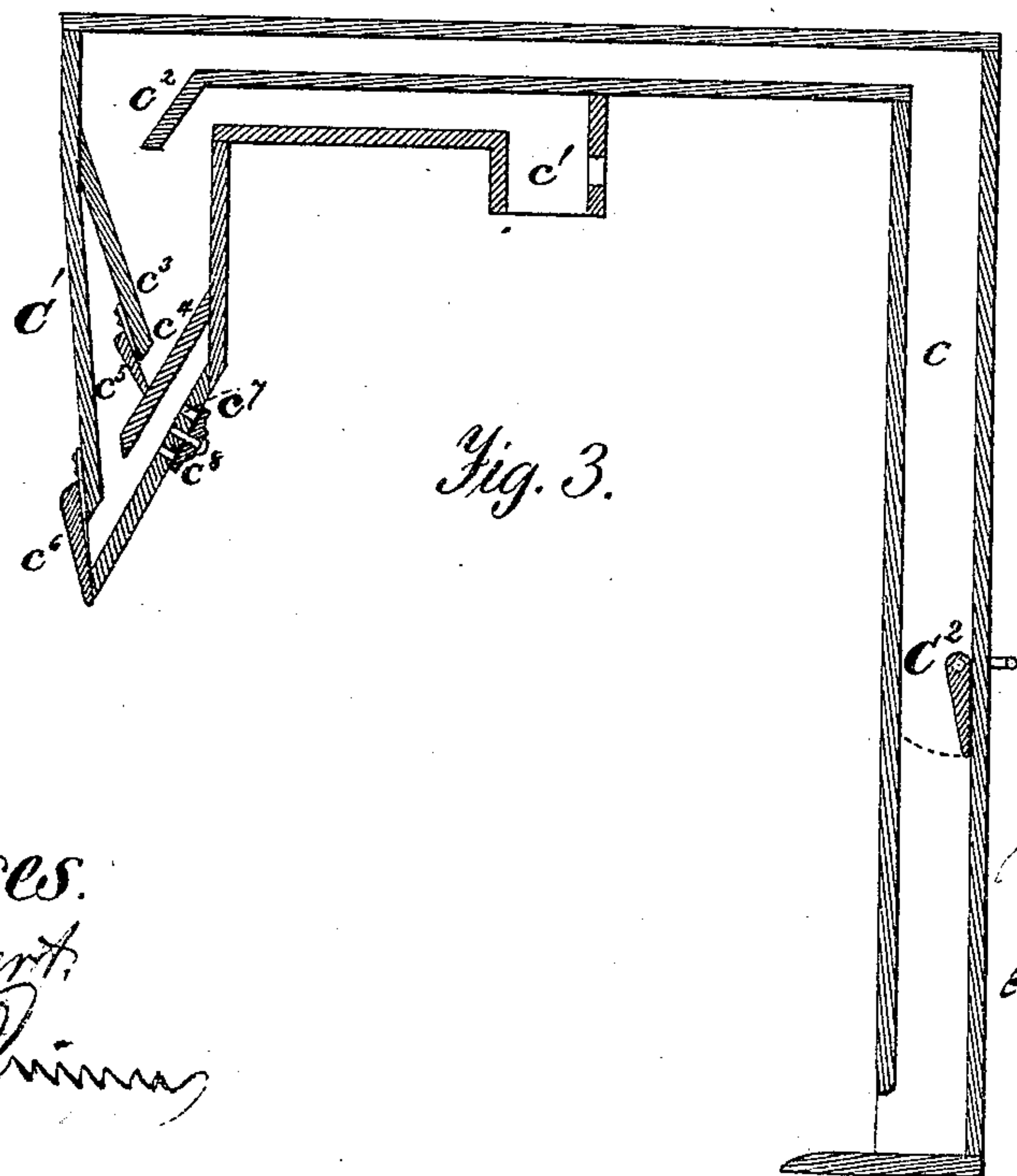
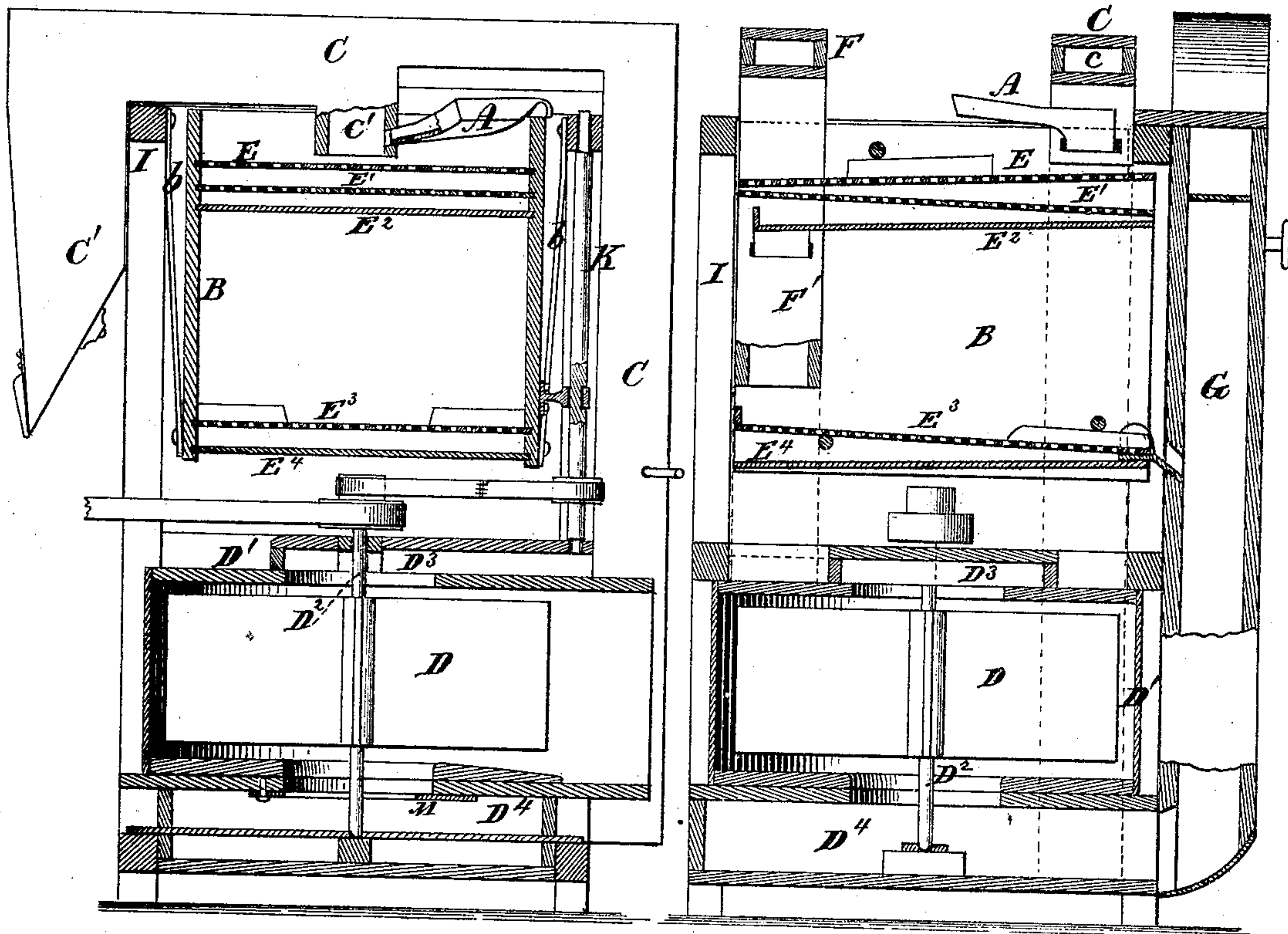


Fig. 3.

Witnesses.
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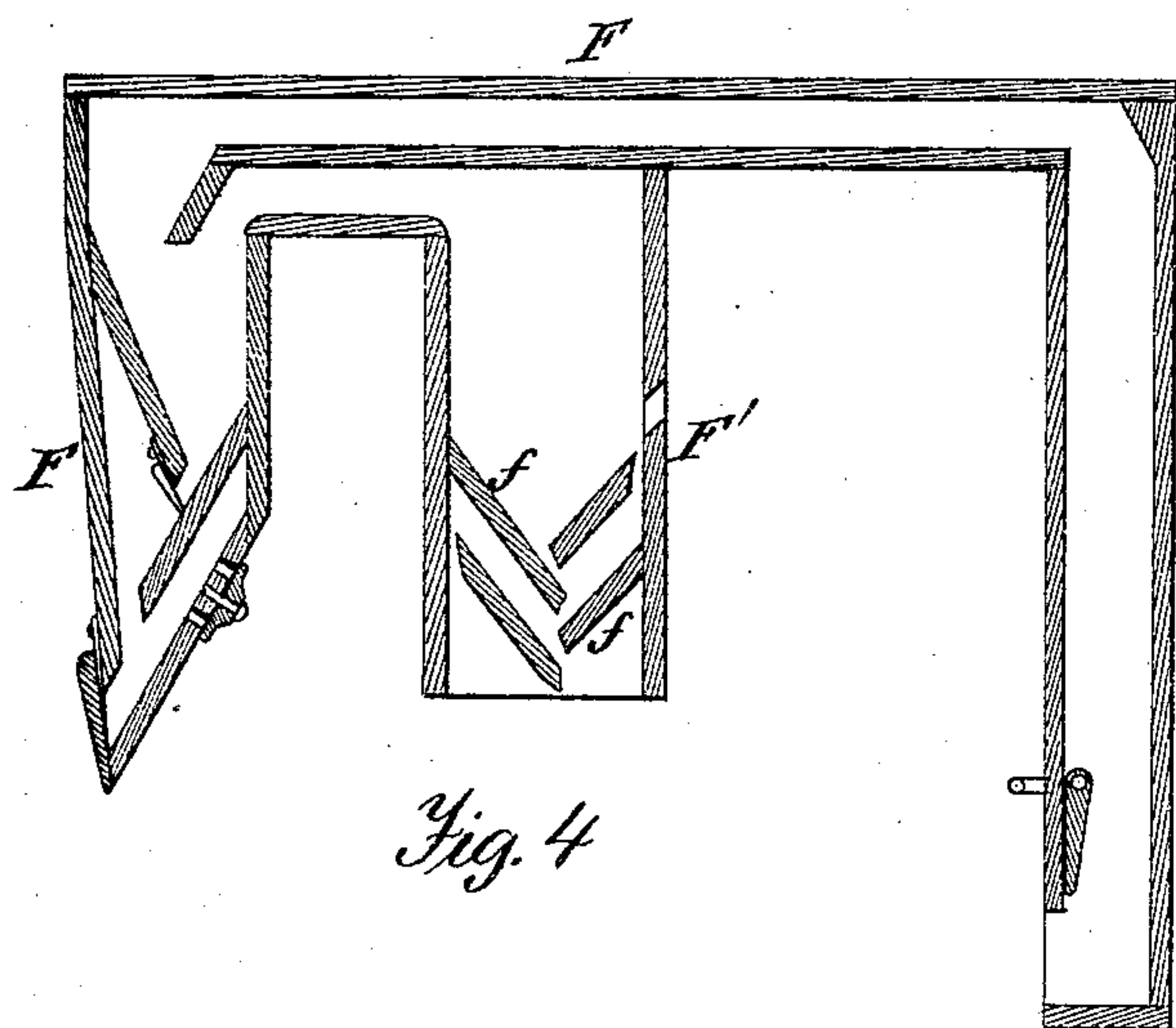


Fig. 4

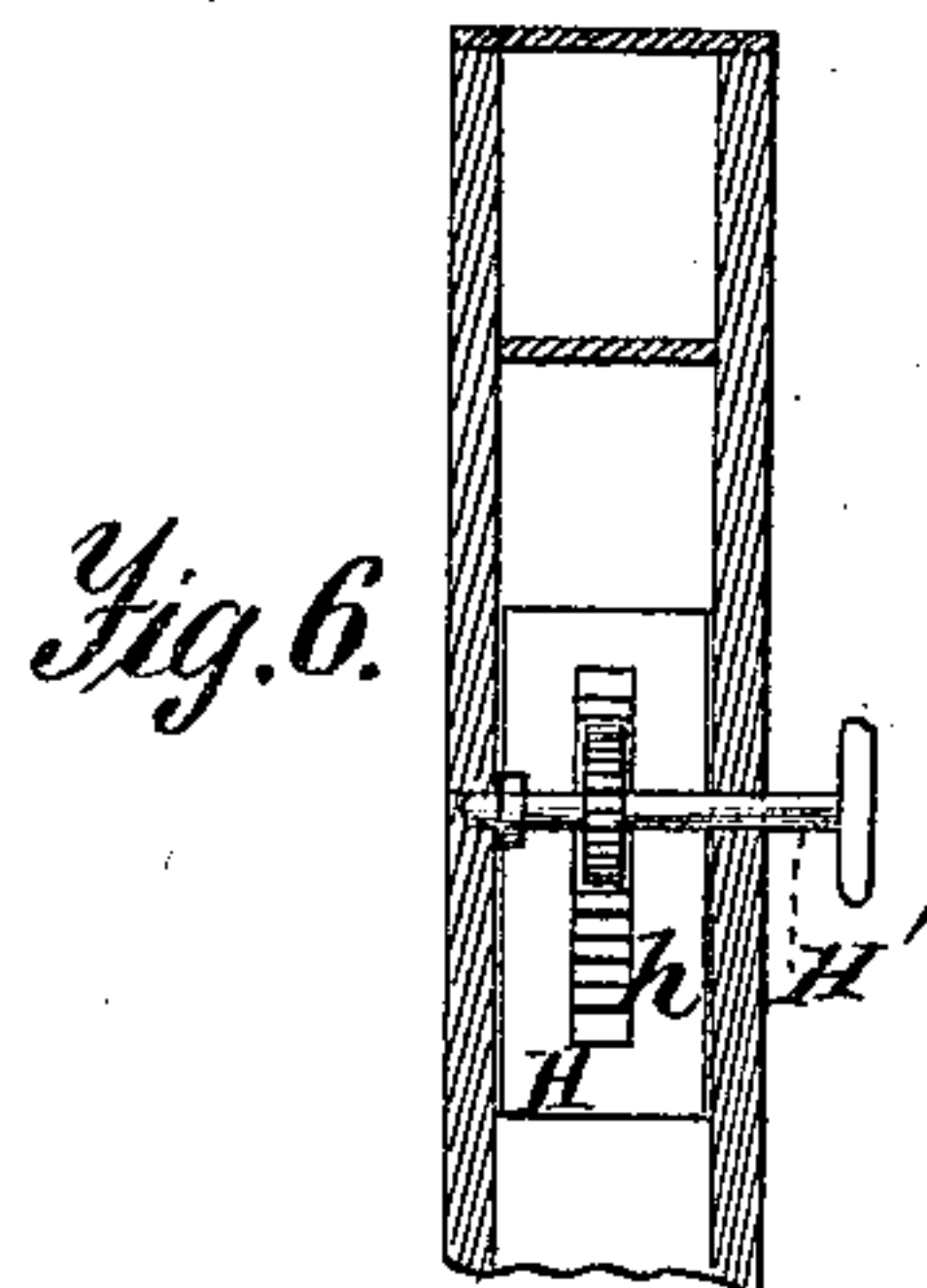


Fig. 6.

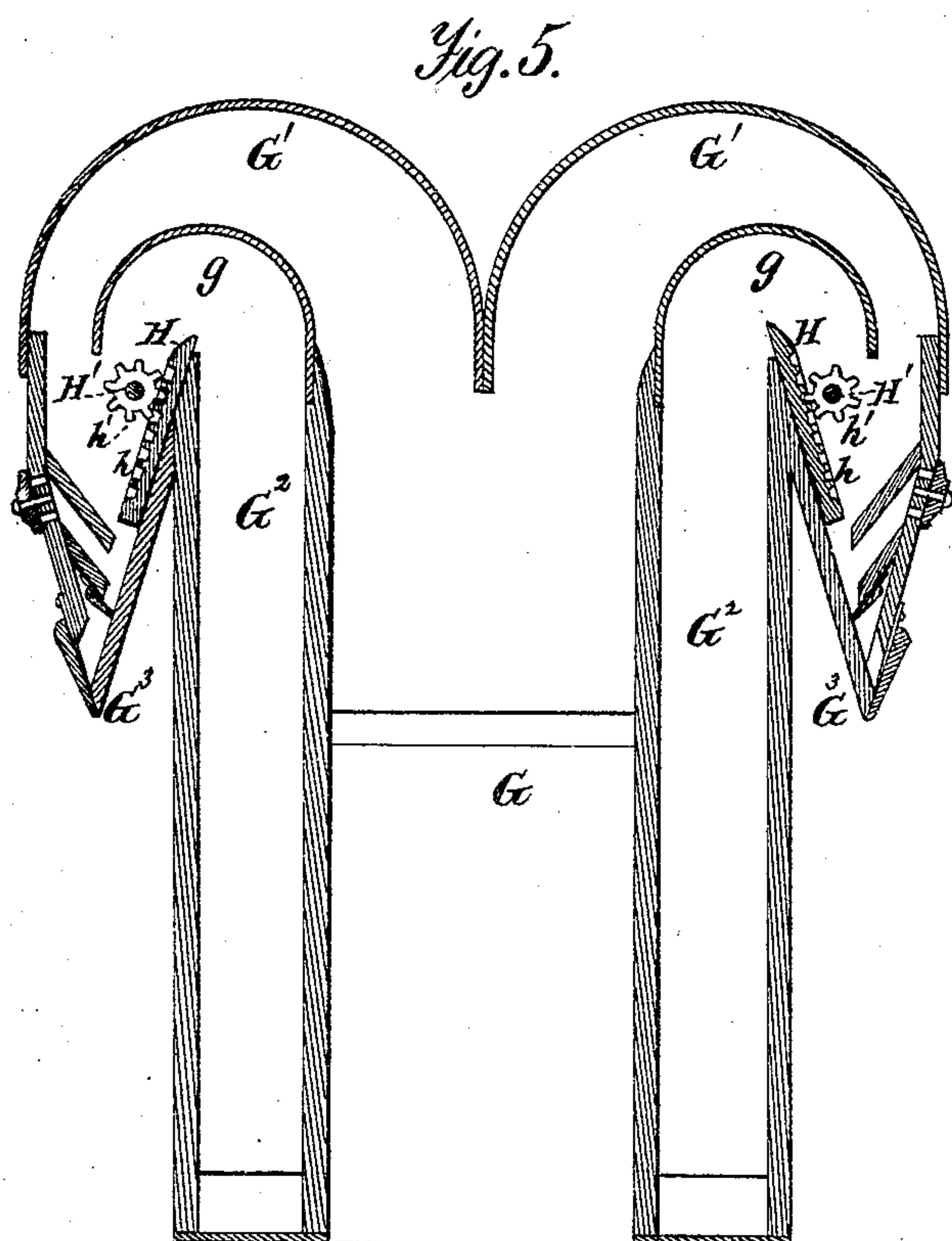


Fig. 5.

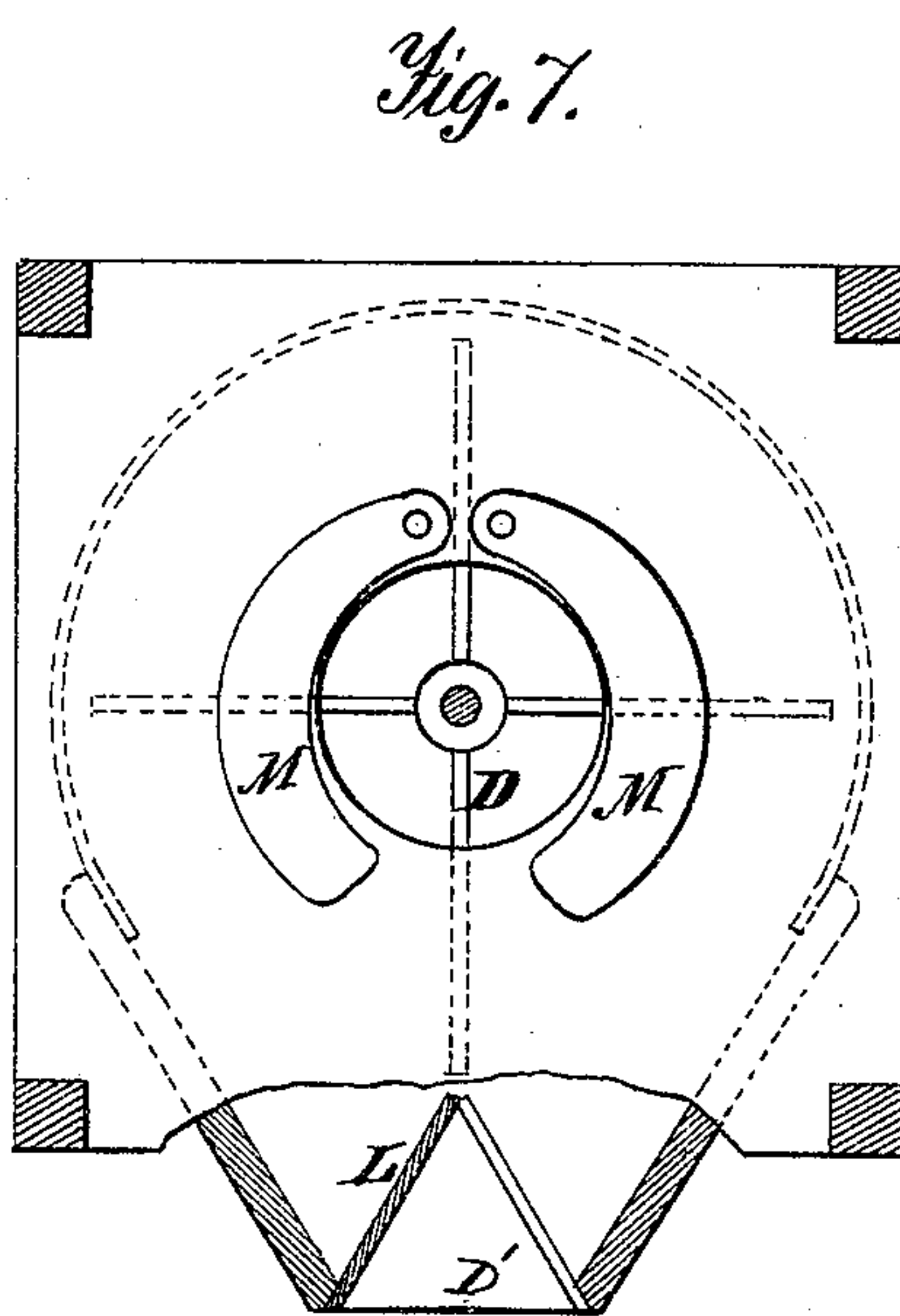


Fig. 7.

Witnesses.
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UNITED STATES PATENT OFFICE.

SAMUEL BURGER, OF YORK, PENNSYLVANIA.

IMPROVEMENT IN GRAIN-CLEANING MACHINES.

Specification forming part of Letters Patent No. **149,435**, dated April 7, 1874; application filed February 3, 1874.

To all whom it may concern:

Be it known that I, SAMUEL BURGER, of York, in the county of York and State of Pennsylvania, have invented certain Improvements in Grain-Cleaning Machines, of which the following is a specification:

This invention relates to that class of machines which, being employed for cleaning the grain previous to its passage to the smut or decorticating machine, remove therefrom loose foreign matters by means of screens and atmospheric currents acting consecutively on the grain during its transit, and which at the same time separate the refuse materials into appropriate groups. My improvement consists of certain peculiarities in the construction of the wind-trunks or air-ducts and their adjuncts, and in their arrangement with reference to the vibrating screens, all fully explained in the ensuing description and specifically pointed out in the claims.

In the annexed drawings, Figure 1 is a vertical section of my improved grain-cleaning machine. Fig. 2 is also a vertical section in a plane at right angles to the section represented in Fig. 1. Figs. 3 to 7 are detail views, hereinafter more specifically referred to.

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

The grain is received upon the shoe A, permanently secured to the top of the screen or riddle frame B, and arranged to overhang the uppermost series of riddles on their most elevated side. The overhung end of the shoe passes through an aperture in the side of the induction-spout c^1 of the primary air-duct C, so as to discharge the grain, when it at once, before reaching the first screen or riddle, is subjected to a strong upward draft, which carries a considerable portion of the lighter foreign matters into this air-duct, the construction of which is clearly illustrated in Fig. 3. The induction passage or spout c^1 and the main air-passage c of this duct open into and are connected by the downwardly-projecting discharge-spout C^1 , into which the heavier portions of the materials drawn into the duct are thrown, partly by the action of the deflector c^2 , and partly by the eddies formed at the top of this spout. The portions thus directed down-

ward are deposited upon the converging partitions c^3 and c^4 , the space between which is covered by a valve, c^5 . The opening in the extreme end of this spout is covered by another valve, c^6 . These valves are operated automatically by the material seeking its discharge and the draft of air, in such a manner that, one being opened by the former, the other is at once closed by the latter, and thus the proper inhalation of air through the induction-passage c^1 is not interfered with. To modify the draft in this discharge-spout, I form a series of air-holes, c^7 , in the slanting side of its lower end beneath the partition c^4 , and cover such holes by a register, c^8 , by means of which the amount of air admitted through them can be regulated. The light stuff is carried along by the draft through the main passage c , and drawn from the lower end thereof into the fan-case D^1 , out of which it is blown by the fan D. A valve, C^2 , is arranged in the main passage of this air-duct, by means of which the draft can be readily governed.

The grain falls from the shoe onto the first screen, E, of coarse mesh, which simply separates straw, sticks, and larger articles, while the grain and finer refuse pass through onto the second screen, E^1 , where another separation takes place. The grain and finer foreign matters, still passing through the second screen, are received upon a board or plate, E^2 , and directed by a chute into the secondary air-duct F. These screens and bottom plate are inclined in the manner shown, the former discharging, respectively, upon opposite sides of the machine whatever does not pass through them.

To provide for a more effectual withdrawal of the light foreign matters mixed with the grain thus screened, the vertical end of the induction passage or spout F^1 of this secondary air-duct has a series of inclined shelves, f , which retard the downward passage of the grain and present it at several points, in thin streams, to the action of the upward currents of air. A space is also left between the upper end of each alternate shelf and the side of the spout, as best seen in Fig. 4, to afford an unobstructed passage for the rising light stuff. Aside from this addition the secondary air-duct is in every respect similar in construction to the primary

one, having the depending spout F^2 for the deposition and discharge of the more weighty particles with the same appendages described in connection with the spout C^1 .

The grain is received from the spout F^1 upon the riddle E^3 , in passing over which the fine seeds, and other fine foreign matters mixed with it, sift through the screen, and, falling upon the board or plate E^4 , are discharged at the side of the machine. The grain is directed from the end of the screen into the tertiary and last air-duct, clearly illustrated in Fig. 5, falling into the wide central shaft G , through the open lower end of which it is discharged. The main or induction shaft G of the duct separates into two arched branches, $G^1 G^1$, which are respectively connected to the side or eduction shafts $G^2 G^2$ by the downwardly-projecting discharge-spouts $G^3 G^3$, which are constructed and act like the spouts C^1 and F^2 . The size of the passages g , connecting the discharge-spouts G^3 and side shafts G^2 , can be regulated by the sliding valves H , which are provided with racks h , and are operated by pinions h' on shafts H' , as best seen in Fig. 6.

The construction of the tertiary air-duct with central and side shafts is of very great importance, as it enables the machine to effect at the last stages of its operation a very complete separation of the nearly-clean grain and the lighter particles still mixed with it by means of a quite strong draft, which, being divided on top, divides the refuse materials, that they may again be separated in quantities best suited to the purpose. All the screens and conducting-plates are secured to the screen-frame B , which is hung by links or straps b from the main frame I of the machine, and receives its vibrating motion from cranks or eccentrics on the counter-shaft K , through suitable connecting-rods. The shaft K is driven, by belt and pulleys, from the fan-shaft D^2 ,

which is stepped in a bearing at its lower end and supported near its upper end in a bearing on a cross-bar of the frame. The air is drawn by the fan D through the openings in the top and bottom of the fan-case, which openings are covered, respectively, by the flat chambers D^3 and D^4 , with which the several air-ducts communicate. The discharge-opening of the fan-case is provided with a slide, L , by shifting which from one side to the other the proper tangential direction can be given to the air, whether the fan turns from right to left, or vice versa, the sides of the fan-case contiguous to the discharge-opening being arranged convergently tangential, all as clearly shown in Fig. 7. The opening in the lower side of the fan-case can be increased or diminished in size, according to the necessities, by means of a valve, M .

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the vibrating screens and the fan, of the simple primary and secondary air-ducts and separators, and the compound tertiary air-duct and separator, arranged relatively substantially as and for the purposes specified.

2. The overlapping inclined shelves f in the induction-spout F^1 of the secondary air-duct F , arranged and operating substantially as specified.

3. The fan-case D^1 , the discharge opening of which is bounded by convergently-tangential sides, in combination with the shiftable slide L , substantially as specified.

In testimony whereof I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

SAMUEL BURGER.

Witnesses:

PETER AHL,
T. C. STROMAN.