

(No Model.)

2 Sheets—Sheet 1.

O. M. MORSE.  
GRAIN CLEANER.

No. 414,431.

Patented Nov. 5, 1889.

Fig. 1.

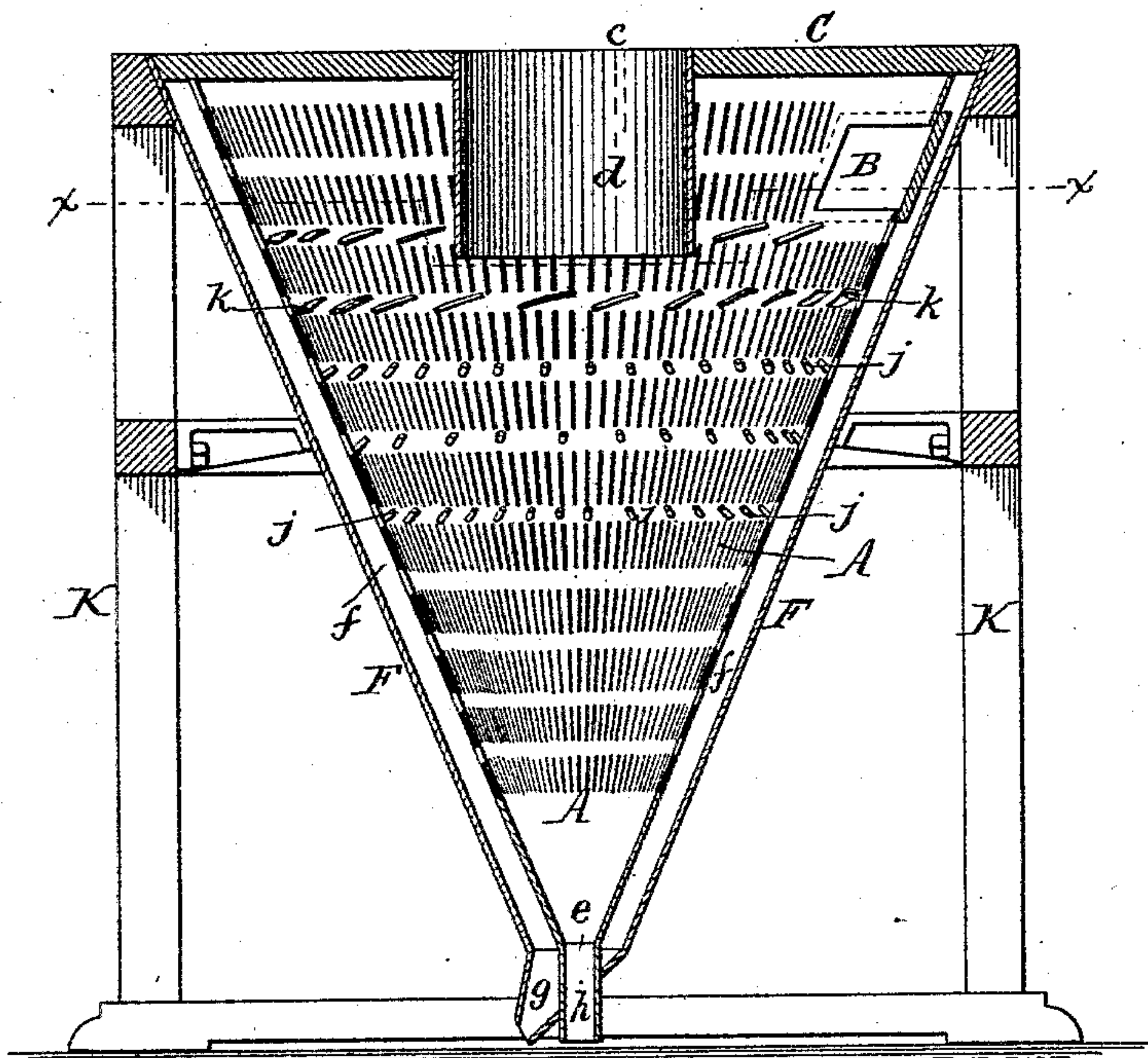


Fig. 2.

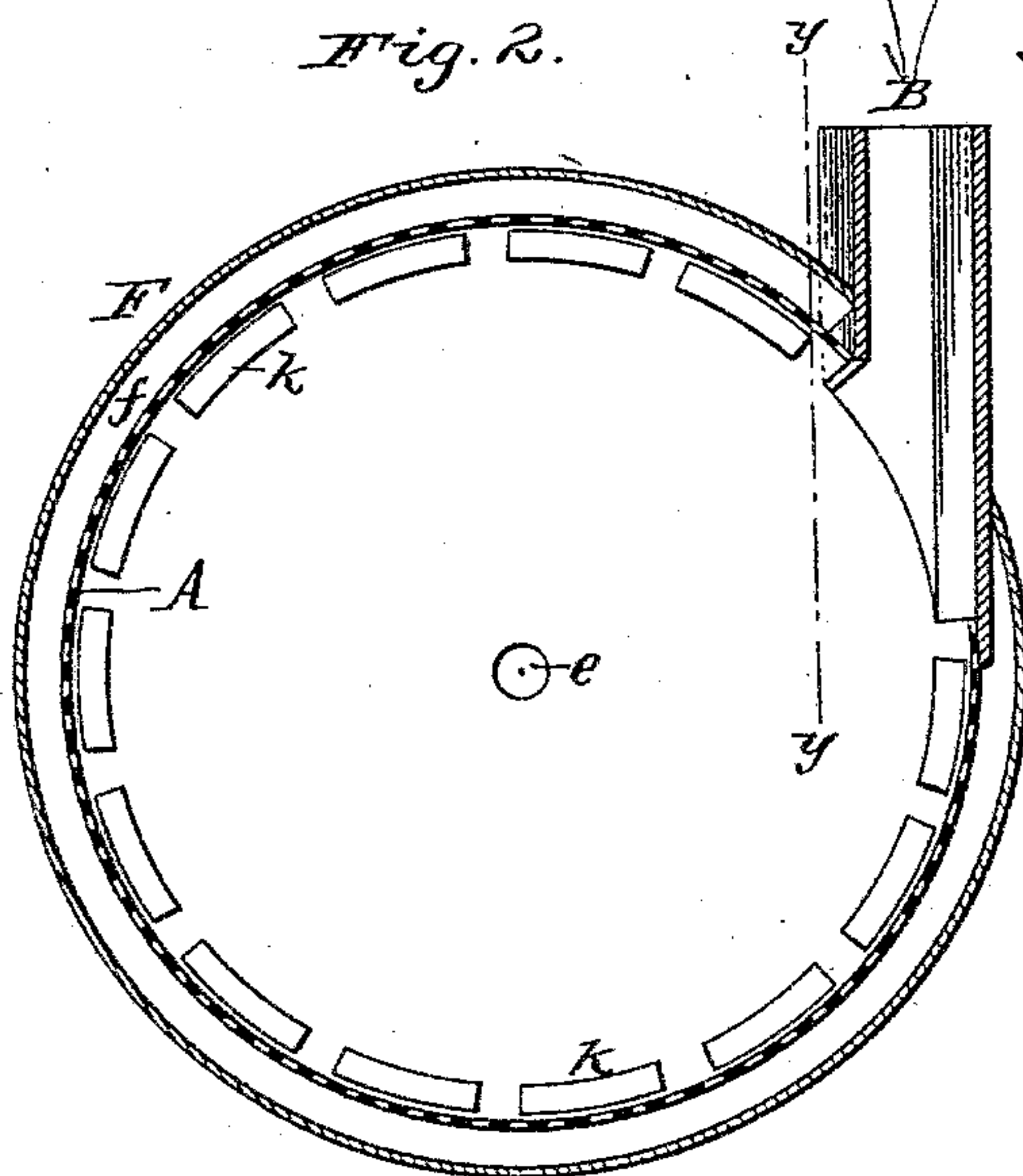
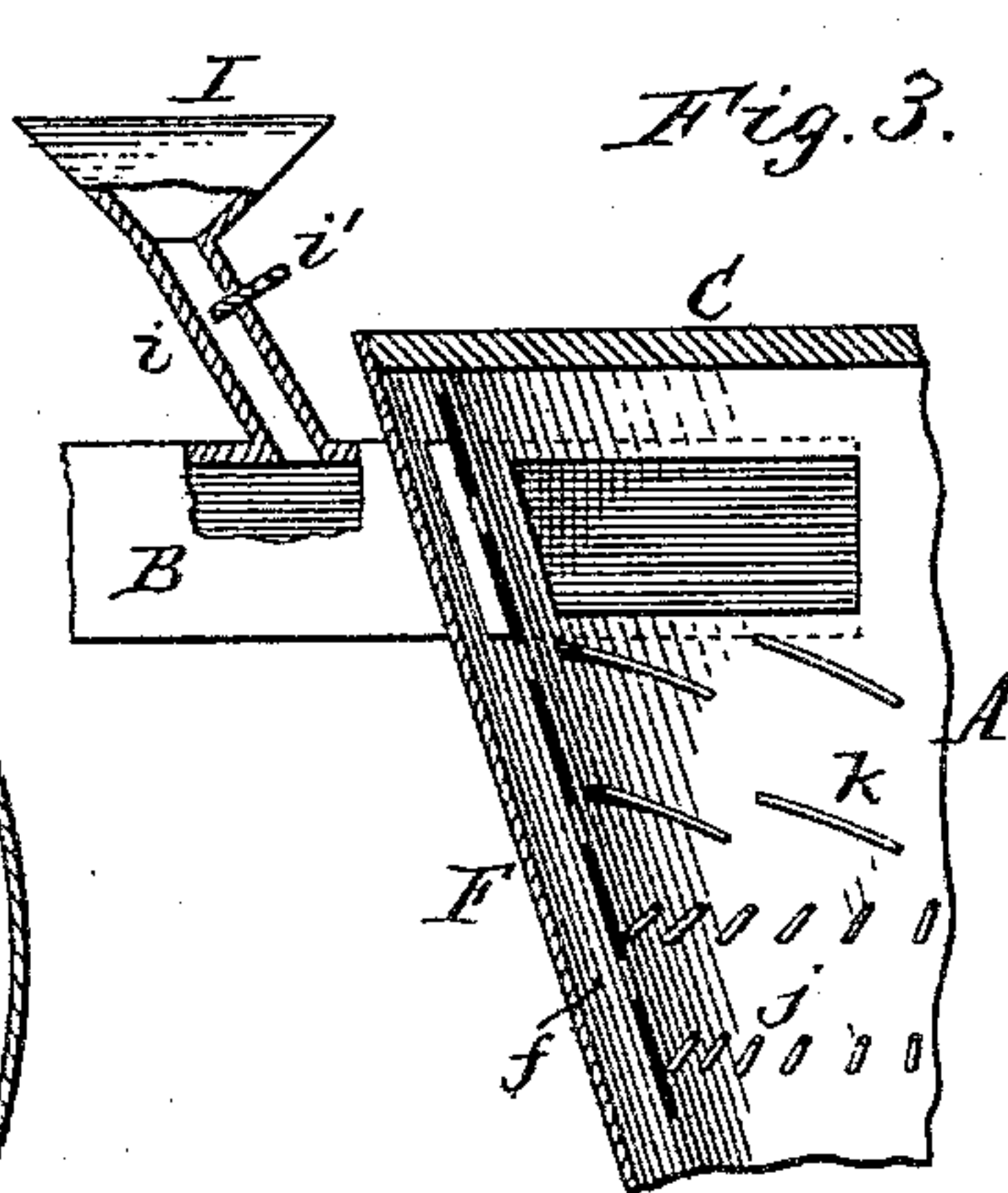


Fig. 3.



Chas. J. Buckheit.  
Theodore L. Popp. } Witnesses.

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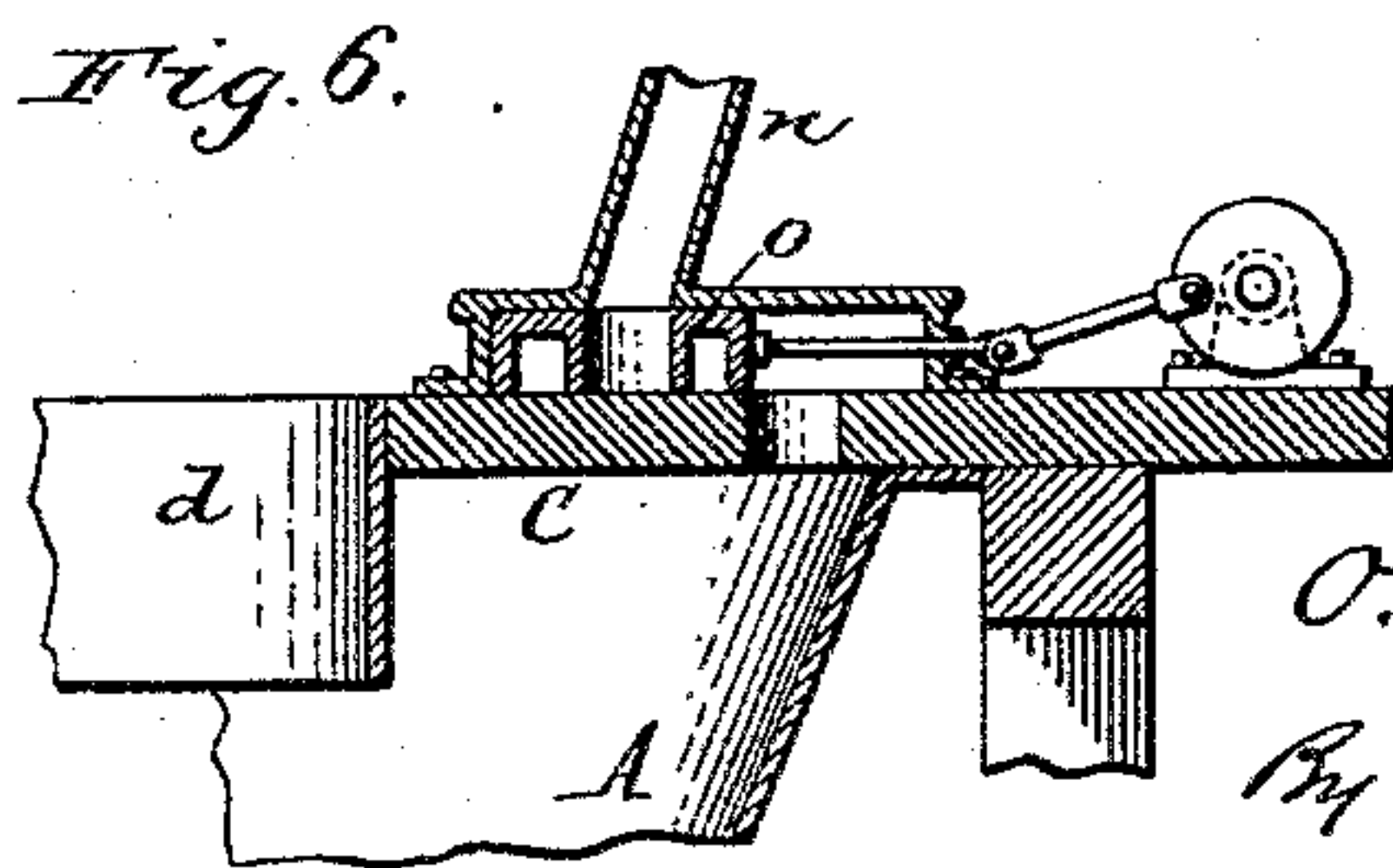
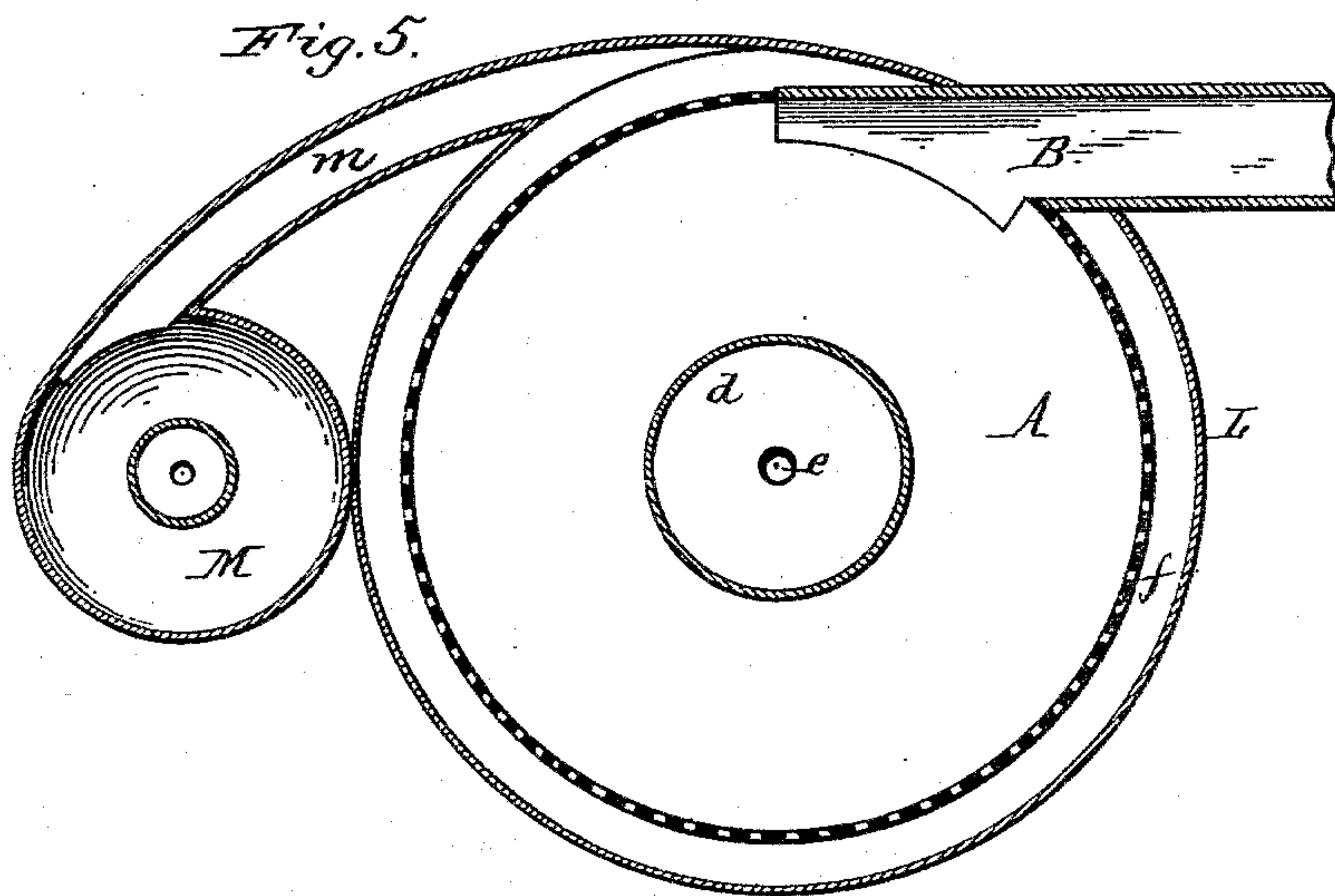
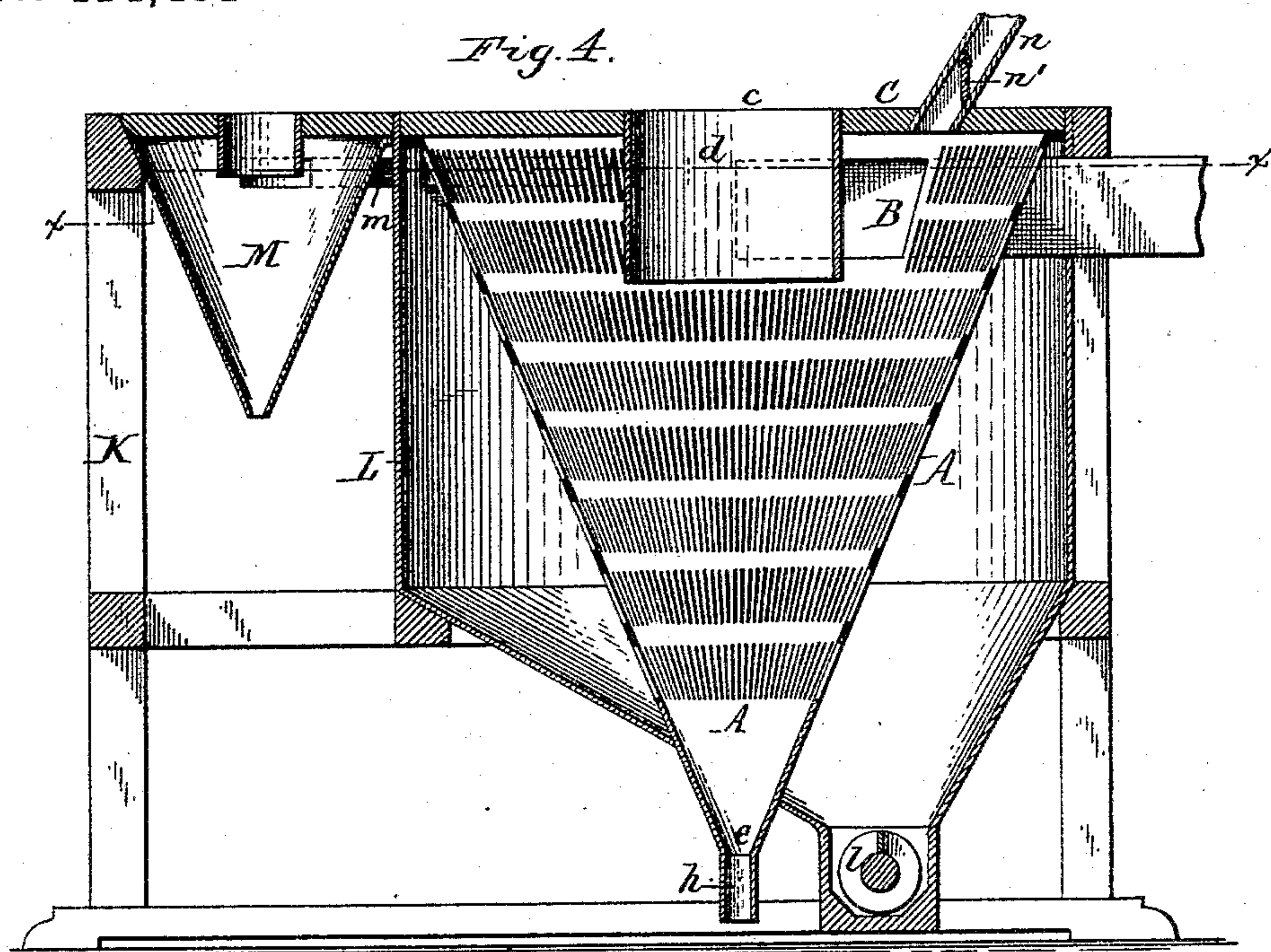
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2 Sheets—Sheet 2.

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No. 414,431.

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Witnesses:

Theo. S. Popp.  
Chas. J. Buckheit.

O. M. Morse Inventor.  
By Wilhelm Bonner  
Attorneys.



# UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN, ASSIGNOR TO THE KNICKERBOCKER COMPANY, OF SAME PLACE.

## GRAIN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 414,431, dated November 5, 1889.

Application filed March 9, 1887. Serial No. 230,199. (No model.)

*To all whom it may concern:*

Be it known that I, ORVILLE M. MORSE, of Jackson, in the county of Jackson and State of Michigan, have invented new and useful  
5 Improvements in Grain-Cleaners, of which the following is a specification.

This invention relates to a grain-cleaner which is provided with a perforated scouring-case in which the grain is freed from the  
10 adhering dust and impurities and a surrounding tight jacket which receives the dust and air passing through the perforations of the scouring-case. Grain-cleaners of this kind are now generally connected with a dust-col-  
15 lector, which receives the dust-laden air-current from the fan of the grain-cleaner and which separates the dust from the air.

The object of my invention is to produce a machine in which the scouring-machine is di-  
20 rectly combined with a dust-collecting contrivance, so that the air which escapes from the machine is practically free from dust, thereby greatly simplifying the construction of the machine, reducing its first cost, and  
25 lessening the expense of operating the same.

My invention consists of the improvements which will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting  
30 of two sheets, Figure 1 is a sectional elevation of my improved grain-cleaner. Fig. 2 is a horizontal section in line *x x*, Fig. 1. Fig. 3 is a fragmentary vertical section in line *y y*, Fig. 2. Fig. 4 is a sectional elevation show-  
35 ing a modified construction of the grain-cleaner. Fig. 5 is a horizontal section in line *x x*, Fig. 4. Fig. 6 is a vertical section showing a modified construction of the feed mechanism.

40 Like letters of reference refer to like parts in the several figures.

A represents the tapering or conical scouring-case, provided with suitable slots or perforations, which permit the dust to escape,  
45 while retaining the grain within the case.

B represents a blast-spout connected with the large end of the scouring-case tangentially, so that the air-current which enters the scouring-case through this spout is caused  
50 to assume a rotative or whirling motion within the case. This air-current is derived from

a fan or other suitable air-propelling device. (Not shown in the drawings.)

C represents the head which closes the large end of the scouring-case, and which is  
55 provided with a central opening *c*, through which the air escapes from the machine. The opening *c* is preferably provided with a tubular guard *d*, extending into the scouring-case below the opening of the blast-spout B, so  
60 as to prevent any grain or dust particles from passing to the exit-opening *e* from the blast-spout B.

*e* represents a small opening formed at the apex or small end of the scouring-case for  
65 the escape of the grain therefrom.

F represents the conical or tapering tight jacket which incloses the perforated scouring-case A, and *f* represents the dust-space  
70 formed between the tight jacket F and the perforated scouring-case A.

The large end of the tight jacket F is secured to the head C, which latter closes the upper end of the dust-space *f*. The small  
75 end of the jacket F is provided with a spout *g*, through which the collected dust escapes from the jacket.

*h* is the grain-discharge spout, which communicates with the opening *e* at the small  
80 end of the perforated scouring-case, and which penetrates the dust-spout *g*.

I represents the grain-hopper, which communicates with the blast-spout B by a spout  
85 *i*, provided with a gate *i'*.

K represents the stationary frame in which  
85 the scouring-case and inclosing-jacket are supported.

The grain is fed from the hopper I into the blast-spout B in a steady stream, and is carried by the air-current into the scouring-case  
90 A. The rotative or whirling motion of the air in the scouring-case causes the grain to move to the periphery of the whirling body of air and brings the grain in forcible contact with the perforated scouring-case. The  
95 grain is scoured by contact with the scouring-case, and the detached dust and impurities pass through the perforations of the scouring-case into the surrounding dust-space *f*. The grain passes in helical lines through the  
100 scouring-case from the large end to the small end thereof and escapes therefrom through



the discharge-spout *h*. The dust passes down over the interior surface of the tight case *F* in similar helical lines and escapes through the discharge-spout *g*. The air, freed from grain, dust, and other solid impurities, escapes from the center or core of the whirling body of air upwardly through the opening *c*. The inner surface of the scouring-case may be provided with projecting pins *j*, for the purpose of intensifying the scouring action. If it is desired to accelerate or retard the movement of the grain toward the grain-exit of the scouring-case, the inner surface of the latter may be provided with suitable inclined or spiral deflecting-flanges *k*. As shown in the drawings, these flanges are arranged to accelerate the movement of the grain toward the grain-exit.

In my improved grain-cleaner the operations of scouring the grain and separating the dust from the air are carried on simultaneously, so that the grain and the collected dust are discharged separately and independently of the blast, which escapes from the machine practically free from solid impurities, and which can be turned directly into the mill or other building in which the grain-cleaner is arranged.

In the modified construction of the machine represented in Fig. 4 the tight jacket *L*, which incloses the perforated scouring-case *A*, is made cylindrical and provided with a hopper-shaped bottom which delivers the dust to a conveyer *l*. The jacket *L* is furnished at its upper end with a tangential spout *m*, through which the air escapes from said jacket, and which is preferably connected with a dust-collector *M*, which separates from the air any dust particles which may be contained in the escaping-air current. This dust-collector is preferably constructed as described and shown in an application for Letters Patent of the United States filed by me March 31, 1886, Serial No. 197,307, and patented May 14, 1889, No. 403,362.

The grain may be delivered directly into the upper portion of the perforated scouring-case, where it is seized by the whirling body of air, as represented in Figs. 4 and 6. The scouring-case may be provided for this purpose with a grain-spout *n*, entering through an opening in the head *C*, and provided with a valve *n'*, which prevents the air from pass-

ing upwardly through said spout, as represented in Fig. 4; or the grain may be fed into the scouring-case by a reciprocating feed-slide *O*, as represented in Fig. 6.

I claim as my invention—

1. The combination, with the perforated tapering separating-case having an air-exit at its large end, a discharge-opening at its small end, and a tangential inlet-spout, of a tight case which surrounds the perforated case and collects the dust which passes through the perforations, substantially as set forth.

2. The combination, with a tapering perforated scouring-case provided at its large end with an air-exit and at its small end with a grain-exit, of a tangential blast-spout through which an air-current is delivered into the scouring-case, a feeder by which the grain is introduced into the air-current, and an inclosing-case which receives the dust from the scouring-case, substantially as set forth.

3. The combination, with a tapering perforated scouring-case provided at its large end with an air-exit and at its small end with a grain-exit, of a tangential blast-spout through which an air-current is delivered into the scouring-case, an inclosing tapering case provided at its small end with a dust-exit, and a feeder by which the grain is introduced into the air-current, substantially as set forth.

4. The combination, with a perforated scouring-case provided with exits for the grain and the air and having projecting pins secured to its inner surface, of a tangential blast-spout through which the air-current is delivered into the scouring-case, a feeder by which the grain is introduced, and an inclosing tight case provided with a dust-exit, substantially as set forth.

5. The combination, with a perforated scouring-case provided with exits for the grain and the air, of a tangential blast-spout through which the air-current is introduced into the scouring-case, deflectors secured to the inner side of the scouring-case, a surrounding tight case provided with a dust-exit, and a grain-feeder, substantially as set forth.

Witness my hand this 10th day of February, 1887.

O. M. MORSE.

Witnesses:

C. H. BENNETT,  
JNO. G. MUNDY.