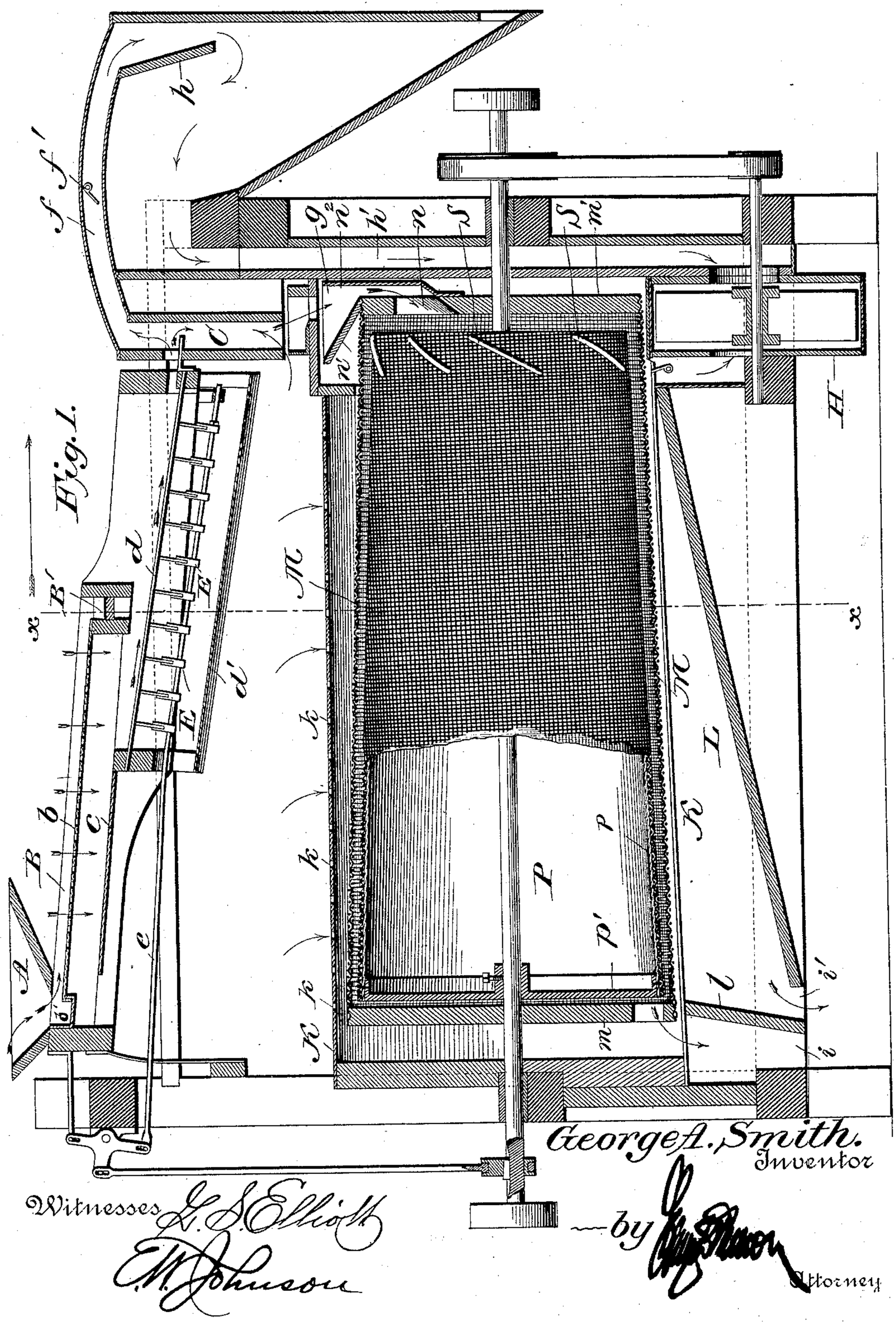
(No Model.) 3 Sheets—Sheet 1.

G. A. SMITH.

GRAIN CLEANER AND SCOURER.

No. 473,794. Patented Apr. 26, 1892.



Witnesses L. S. Elliott
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(No Model.) 3 Sheets—Sheet 2.

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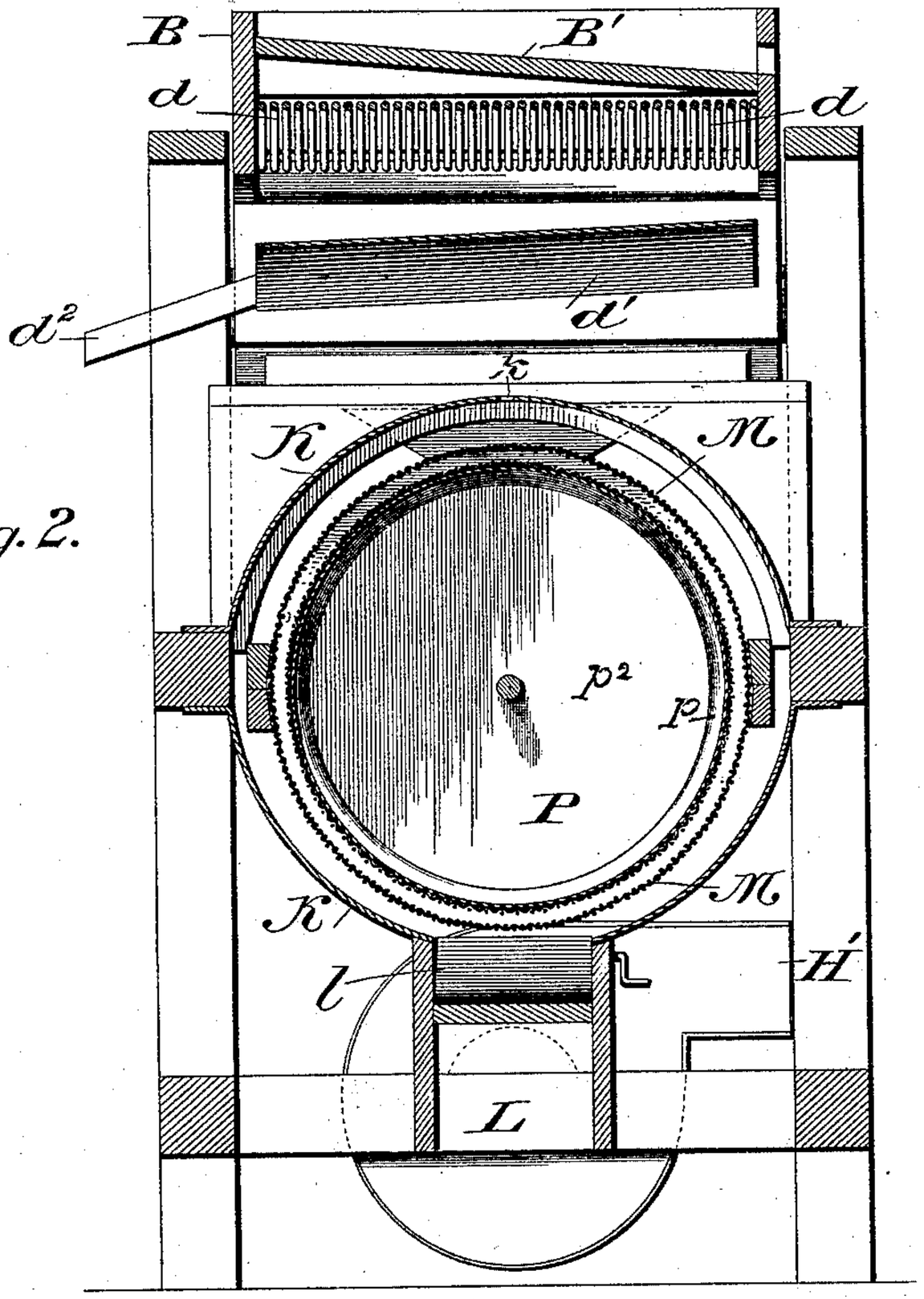
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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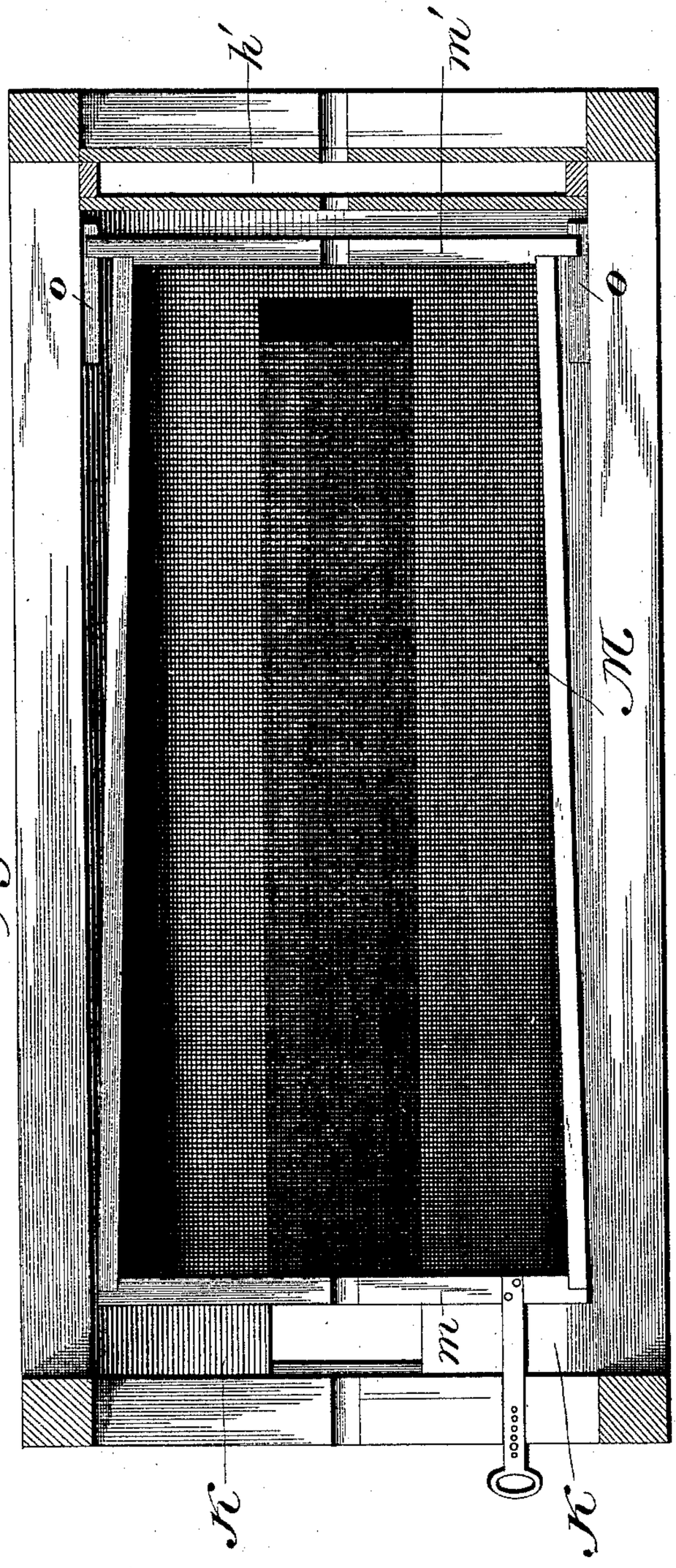

Fig. 3.

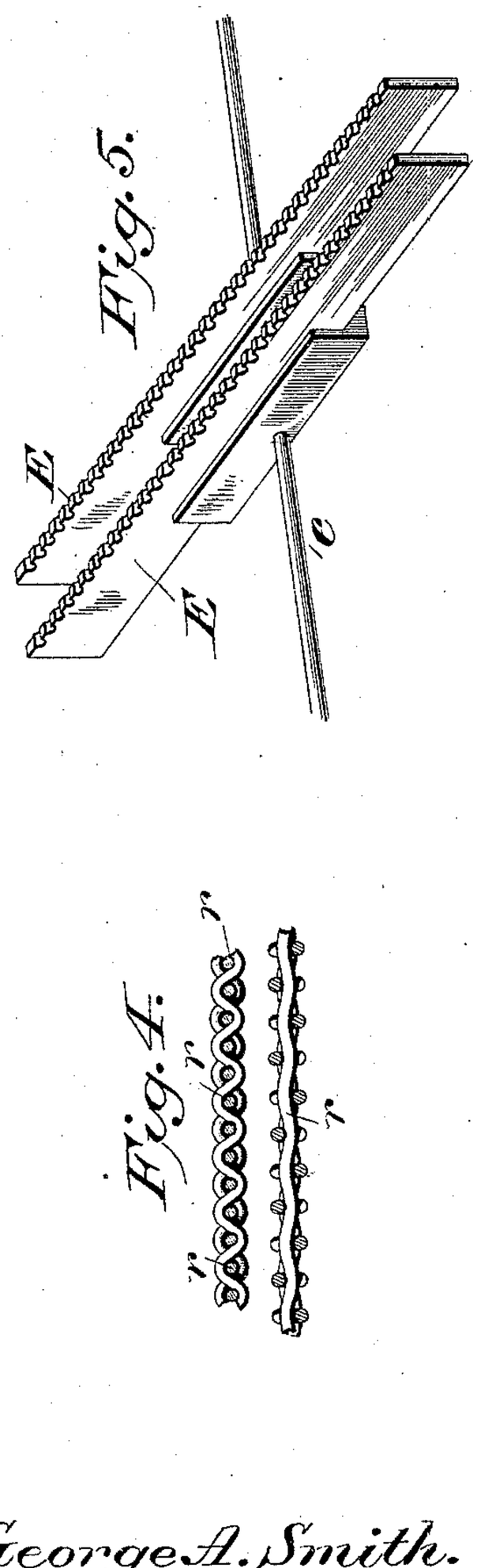

Fig. 5.

Fig. 4.

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Attorneys

UNITED STATES PATENT OFFICE.

GEORGE A. SMITH, OF PAULDING, OHIO.

GRAIN CLEANER AND SCOURER.

SPECIFICATION forming part of Letters Patent No. 473,794, dated April 26, 1892.

Application filed September 26, 1891. Serial No. 406,964. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. SMITH, a citizen of the United States of America, residing at Paulding, in the county of Paulding and State of Ohio, have invented certain new and useful Improvements in Grain Cleaners and Scourers; 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in grain-scourers of that class which are provided with horizontally-rotating cylinders in which the grain is freed from impurities by contact with the surfaces of the rotary cylinder and stationary casing.

The object of the invention is to provide improved devices whereby the grain is scoured and the impurities and germs separated therefrom; and the invention consists in the construction and combination of the parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical sectional view. Fig. 2 is a sectional view taken on the line *x x* of Fig. 1, the scrapers being removed. Fig. 3 is a horizontal sectional view on the line of the shaft, the upper part of the casing, as well as the conical cylinder, being removed. Fig. 4 is a detail perspective view of the metal fabric used in the construction of the conical cylinder and casing. Fig. 5 is a detail perspective view of the scrapers.

My improved grain-scourer is mounted upon a frame of ordinary construction, the upper portion supporting a riddle which carries a hopper, into which the grain to be cleaned and scoured is fed.

The vibrating riddle-frame B has a plate *b*, with circular perforations, said plate having a slight downward inclination from the hopper A, the lower end thereof terminating above a trough B′, which leads to a discharge-spout, through which pass substances larger than the wheat and which cannot pass through the perforations in the plate *b*, such as sticks, straws, &c. At the upper end of the plate *b* is a depression or trough, into which the grain falls from the hopper, and this depression receives and retains substances heavier than the grain, as iron, gravel, &c. Beneath the upper portion of the inclined plate *b* is a solid plate *c*, which is disposed parallel with said plate and leads to a series of metallic bars *d*, carried by the riddle-frame and inclined so that the grain falling thereon will travel downwardly. These bars may be arranged either parallel to each other or diverge slightly, so as to permit the cheat and such foreign substances to pass through the bars upon a solid plate *d′*, which is inclined both sidewise and endwise and discharges into a spout d^2. The grain after passing from the bars *d* passes into a leg or shaft C, where it meets an upward current of air, as will be hereinafter specified. The riddle-frame is suitably supported upon spring-bars, as shown, and is vibrated by a rod connected to a bell-crank lever operated from the shaft of the scouring mechanism. One of the arms of said bell-crank lever operates a rod *e*, upon which are mounted scrapers E, which reciprocate beneath the bars *d* to keep the spaces between said bars at all times open. In operating upon grain of certain character these scrapers may be dispensed with.

It will be observed that by the construction of the riddle hereinbefore described means are provided for separating iron, gravel, and heavy refuse from the grain before it reaches the scouring mechanism, as well as such foreign substances as sticks, straws, &c. The grain after passing from the riddle into the leg or shaft C of the wind-trunk is fed through the hopper *g* into the scouring mechanism. The leg or shaft C is connected with a passage *f*, having a damper *f′*, said passage being provided at it opposite end with a deflecting-board *h*, below which is a receptacle for cheat, dust, and foreign particles, which connects by means of the leg *h′* with one of the side openings in the fan-casing H. This fan receives air on both sides and discharges through an opening H′ below the same.

The lower front end of the apparatus is provided with openings *i* and *i'*, through which the air is drawn to the fan. The passage of the different currents of air is indicated by the light arrows, while that of the grain is indicated by the dark arrows.

K refers to the sections of the casing, which are made up of sheet metal, the upper one being provided at its top with perforations *k*, through which a current of air is drawn by the fan. The lower section of the casing terminates at the vertical walls of a way or trough L, having a partition-board *l*, as shown. Within this two-part casing is secured a scouring-casing M, which is made up of upper and lower sections of interlocked metallic fabric, said fabric being secured to heads *m* and *m'*, the smaller end of the upper section being provided with an inlet-opening *n*, an inclined board *n'*, and a guide-board n^2, these parts moving with the adjustable scouring-casing. This casing is mounted on a shaft and is of less length than the casing K, the lower section preferably resting at one end upon cleats *o o*, attached to the inner side of the main frame, while the opposite end has a rigid handle-bar for adjusting the case with respect to the conical scouring drum or cylinder. This conical scouring-case is of a different pitch or taper to the scouring-drum, so that at all times, irrespective of the adjustment, there will be a greater space between the drum and casing at the feed end than at the opposite end thereto. The scouring-drum P is rigidly mounted on the main shaft and is made up of the heads *p'* and p^2, to which is rigidly attached a sheet-metal casing, over which is bent and secured a metallic fabric of wire or metal bars of the proper gage, these wires being round in cross-section, the warp and woof thereof being bent to interlock, the meshes being of less size than the grain. It will be noted that the wires *r*, or warp, have less degree of crimp or bend than the encircling wires, or woof, and by this special construction no sharp edges are presented which would be liable to break the grain, and the grain is constantly turned, so that the different surfaces thereof will be exposed to thoroughly clean the same and remove the germs therefrom. Beneath the fabric of the conical scouring-drum a solid sheet-metal plate *p* is secured, so that the grain cannot pass into said drum. To each section of the scouring-case are secured similar pieces of the fabric described, and the germs and substances separated from the grain by the drum and case will pass through said case and fall upon the inclined board L' and pass down thrcugh the discharge-opening. The main shaft is driven in any suitable manner and is connected with the fan-shaft by a belt. The bell-crank lever, which vibrates the riddle and scraper, is operated by a rod connected eccentrically to the main shaft.

The apparatus is provided with dampers or air cut-offs where shown, so that the strength of the currents of air may be varied where desired, and the wind-trunk has a receptacle with spouts, into which the dust and light particles collected by the air-currents will be deposited.

The scouring-drum P is provided at the feed end with inclined flights S, which serve to feed the grain toward the discharge-opening.

It is not deemed necessary to specify the passage of the air and grain and the separation of the foreign substances therefrom, as this is sufficiently indicated by the arrows.

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

1. The combination, in a grain-scourer, of a conical scouring-drum mounted on a rotary shaft, said drum having an outer surface of interlocked wire fabric held over a solid backing, and a two-part conical scouring-case loosely mounted on said shaft and provided with means for holding the same against rotation and for adjusting the same longitudinally, said conical scouring-case having the body portion made up of interlocked wire fabric, the scouring drum and case being inclosed within a casing having air-inlet apertures in the upper part thereof, the lower portion of said case being connected by a chute or way with a fan, substantially as shown, and for the purpose set forth.

2. The combination, in a grain-scourer, of a rotary scouring-drum constructed substantially as shown and mounted on a horizontal shaft, a two-part scouring-case loosely mounted on the shaft and provided with means for holding the same against rotation and for adjusting it longitudinally with respect to the scouring-drum, an inclosing casing K, having perforations *k* in the upper part thereof, the lower portion of said inclosing casing connecting with a chute or way, and a fan for drawing air through the perforations and around the casing, substantially as set forth.

3. In combination with a grain scourer or cleaner, a vibrating riddle carrying a hopper, an inclined screen *b*, a depression *b'* beneath the hopper and below the upper surface of the screen at the upper end thereof, and a trough B', connected with a discharge-spout at the lower end of the screen, an imperforate guide-plate *c* and downwardly-inclined bars *d*, placed in close proximity to each other, said bars leading into the air-leg of the air-trunk which communicates with the scouring mechanism, and reciprocating scrapers having grooved or recessed edges contacting with the under side of the bars *d*, the grain-separating device being operated from the shaft of the scouring-drum, substantially as set forth.

4. The combination, in a grain-scourer, of a riddle B, constructed substantially as shown and provided with a perforated plate *b*, an imperforate plate *c*, and bars *d*, scrapers adapted to reciprocate beneath the bars *d*, the scrapers having recessed upper edges, in which the bars lie, and mechanism for alternately reciprocating the riddle and scrapers in opposite directions, said mechanism being operated from the main shaft of the scourer, substantially as set forth.

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

GEORGE A. SMITH.

Witnesses:
E. W. JOHNSON,
H. S. BEALL.