

(No Model.)

G. L. SQUIER.
GRAIN SCOURER.

No. 379,337.

Patented Mar. 13, 1888.

Fig. 1.

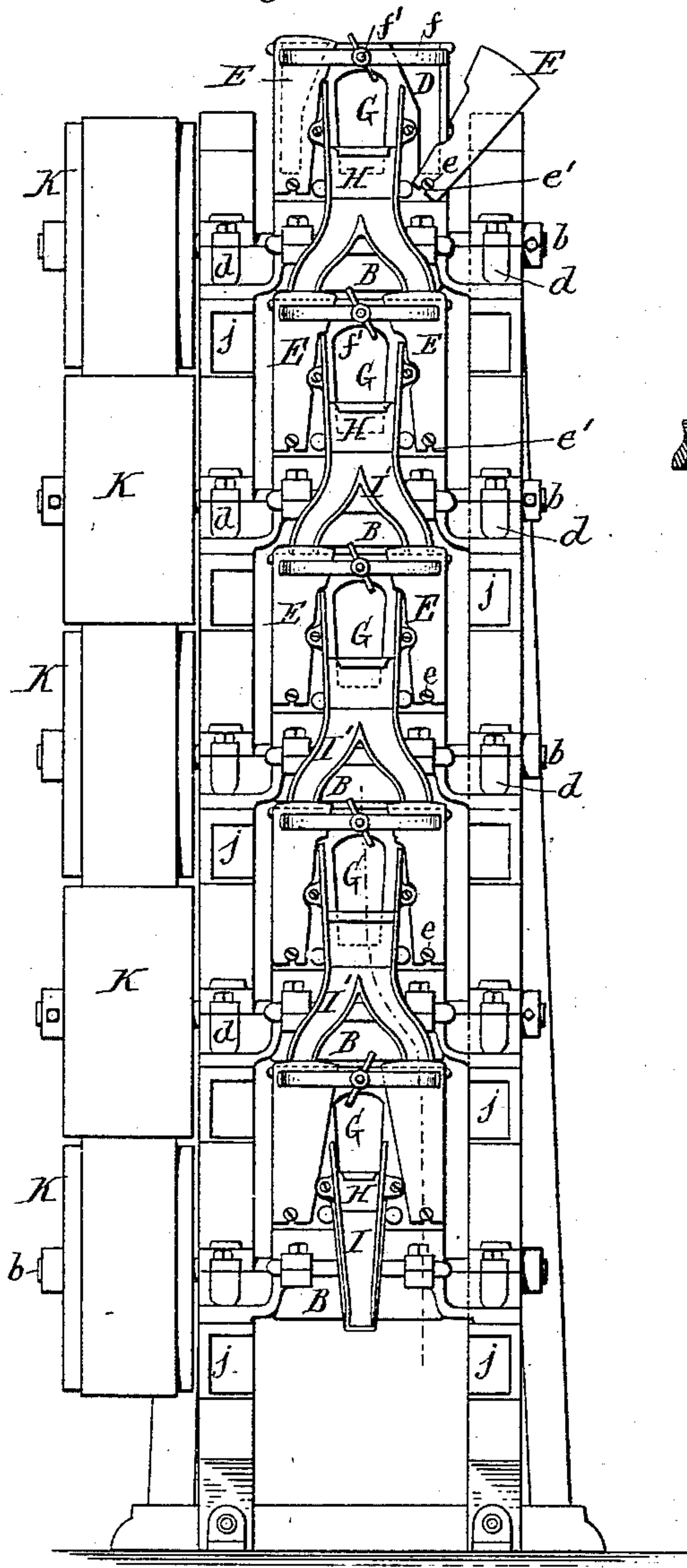


Fig. 2.

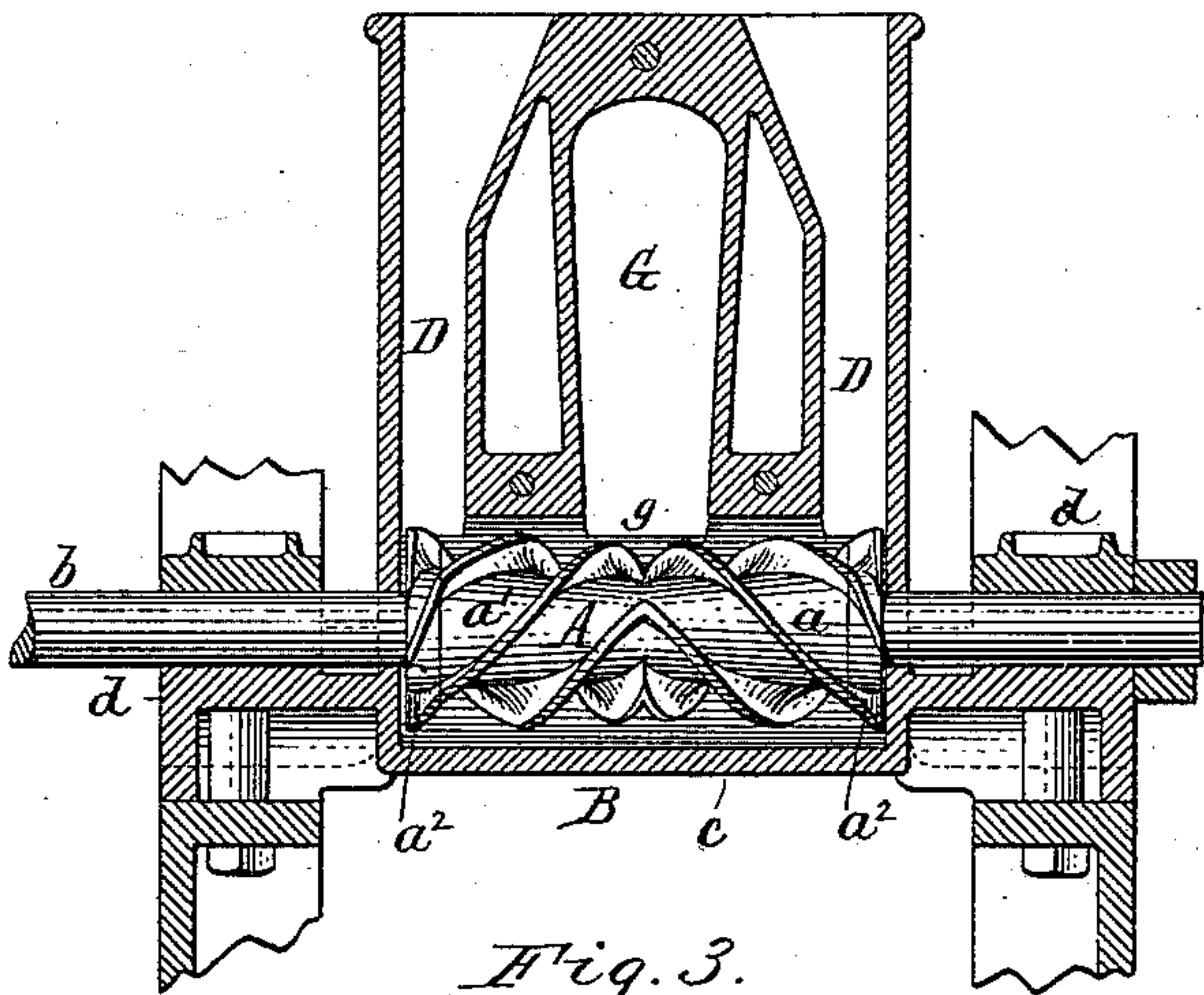
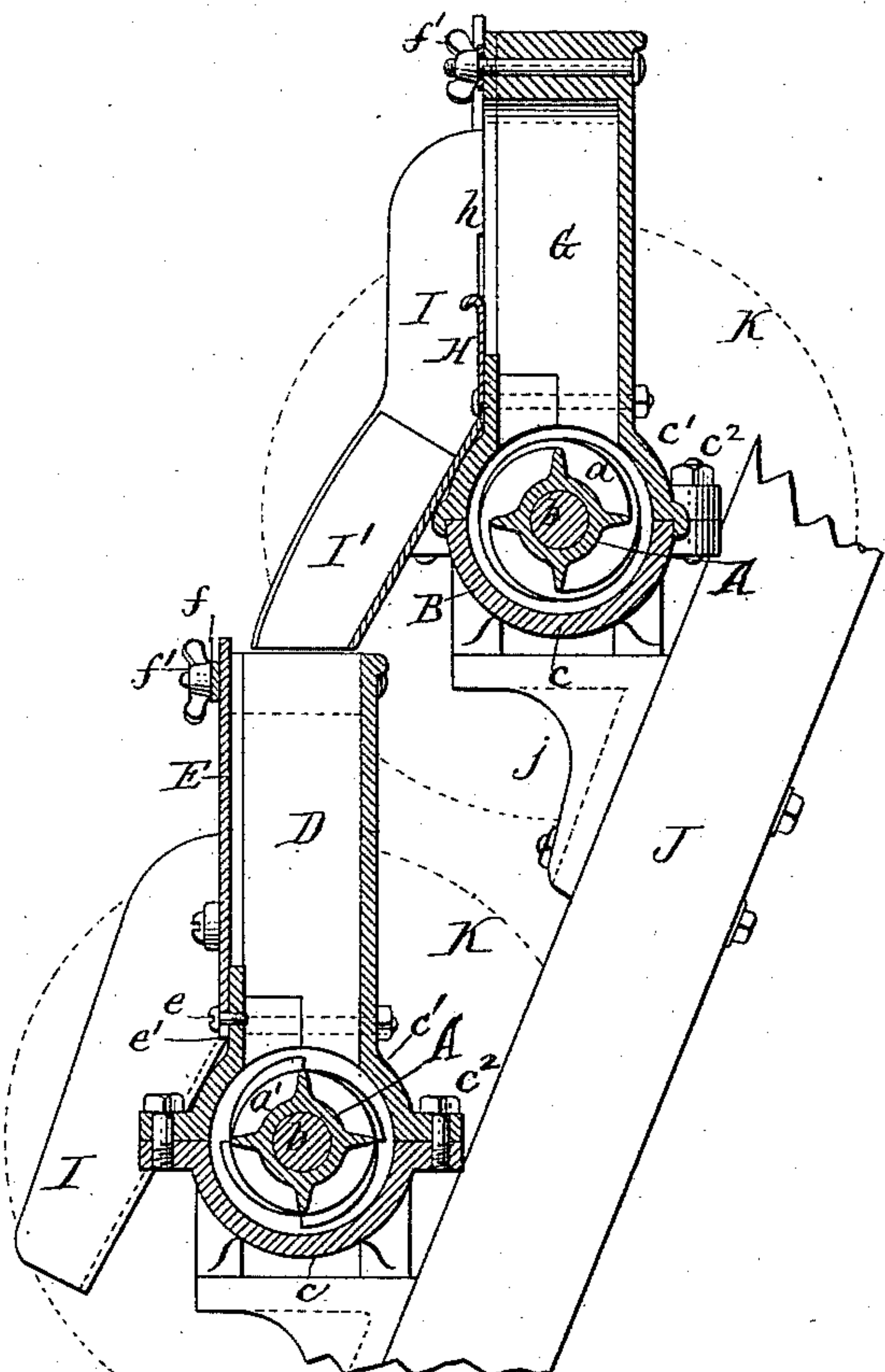


Fig. 3.



Chas. Buchheit.
Geo. Buchheit Jr. } Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE L. SQUIER, OF EVANS, NEW YORK, ASSIGNOR TO THE GEORGE L. SQUIER MANUFACTURING COMPANY, OF SAME PLACE.

GRAIN-SCOURER.

SPECIFICATION forming part of Letters Patent No. 379,337, dated March 13, 1888.

Application filed December 6, 1886. Serial No. 220,770. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. SQUIER, of the town of Evans, in the county of Erie and State of New York, have invented new and
5 useful Improvements in Grain-Scourers, of which the following is a specification.

This invention relates to a machine for scouring rice and other grains and seeds by means of a revolving screw. When the hulls are re-
10 moved from rice, the kernels or berries are still enveloped by an inner cuticle which is not easily detached from the kernels. The common method of removing this cuticle is to pound the rice in mortars until the cuticle is
15 worn off; but by this method a large portion of the rice is broken, causing considerable waste and loss.

My invention is especially designed to remove this cuticle from rice with little or no
20 breakage to the kernels; but it may be also employed in machines for hulling and polishing coffee and other grains and seeds.

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

In the accompanying drawings, Figure 1 is a front elevation of a series of my improved scouring-machines in which the grain is suc-
30 cessively treated. Fig. 2 is a vertical longitudinal section of one of the scouring-machines. Fig. 3 is a vertical cross-section through two of the scouring-machines.

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

35 A represents the hulling-screw, secured to a horizontal shaft, *b*, and arranged in a hulling cylinder or case, B. Each hulling-screw consists of a right and left screw, *a a'*, joined together at their inner ends and provided at
40 their outer ends with propelling screw-sections *a''*, which are made of less pitch than the screws *a a'*, so as to offer a greater resistance to the grains than the screws *a a'*, thereby preventing the grains from sliding back un-
45 der pressure. The screws *a a'* and propelling-sections *a''* are so arranged on the shaft *b* as to move the grains from both ends of the cylinder toward the middle thereof. The cylinder B is preferably composed of a lower section,
50 *c*, and an upper section, *c'*, secured together by screws *c''*. The lower section, *c*, is pro-

vided with bearings *d*, in which the shaft *b* is journaled. The inner surface of the cylinder B may be either corrugated or smooth, as may
55 be preferred.

D D represent two vertical feed-spouts arranged at opposite ends of the cylinder B and communicating at their lower ends with the cylinder, so as to deliver the grain into the cylinder at both ends thereof, while the grain
60 is seized by the propellers *a''* and fed to the hulling-screws *a a'*, which in turn move the grain to the middle of the cylinder. The feed-spouts D are provided, preferably at their front sides, with doors E, which are opened
65 when the spouts or the adjacent portions of the cylinder require to be cleaned.

In scouring rice it is necessary to provide a free flow of the material through the feed and delivery passages, because the mealy material
70 which is scoured off the kernels is adhesive and tends to accumulate and pack in the passages. By making the feed passages vertical this lodging of the meal is to a large extent avoided; but if an obstruction should be
75 formed, it can be easily removed upon opening the doors E. The latter are secured in place by screws or buttons *e*, passing through vertical slots *e'* in the lower edges of the doors, and by a cross-piece, *f*, extending across the
80 upper portions of both doors and secured by a thumb-nut, *f'*. If preferred, however, the doors may be attached by hinges or secured in any other suitable manner.

G represents the elevated delivery-passage
85 arranged between the feed-spouts D, and communicating at its lower end with the central portion of the cylinder B by an opening, *g*, formed in the top of the cylinder above the point of junction of the right and left screws
90 *a a'*. The latter force the grain upwardly through the opening *g* and the elevated delivery-passage G.

H represents a vertically-adjustable gate arranged in the front portion of the delivery-
95 passage G, so that the grain escapes from the delivery-passage forwardly over the upper edge of the gate H. The gate H is arranged in a delivery-opening, *h*, formed in the delivery-passage G between the feed-spouts D. The
100 delivery-passage G and the feed-spouts D are preferably formed in one piece with the upper

section, *c'*, of the cylinder. The gate H is fitted snugly in vertical ways formed in the front portion of the delivery-passage, and in which the gate is moved up and down, as may
5 be required.

I represents a discharge-spout, which receives the grain from the delivery-passage G, and which is provided with two diverging branches, I' I', which conduct the grain to the
10 feed-spouts D of the scouring-machine next below. A suitable number of these scouring-machines are secured, one below the other, to an inclined frame, J, by means of brackets *j*. The grain is fed into the feed-spouts D of the
15 uppermost scouring-machine, and after having been scoured in this machine is conducted by the spouts I' I' to the feed-spouts of the next following scouring-machine, and so on through the entire series of machines. The
20 shafts *b* of the scouring-machines are provided with pulleys K, which are driven by a single belt, and the screws *a a'* are reversed on every other machine to correspond with the reversed direction in which the screw in every
25 other machine is rotated. If preferred, the shafts of the machines may be connected by gear-wheels.

In operating the machines the grain which passes from the feed-spouts into the ends of
30 the cylinder is fed by the propellers *a²* to the right and left screws *a a'*. The latter force the grain toward the middle of the cylinder and upwardly through the delivery-passage, whereby a powerful pressure is exerted upon the
35 kernels, which causes the kernels to rub against each other and against the metallic surfaces of the cylinder and screws, and which causes the enveloping skins to be detached from the kernels. By raising and lowering the adjustable

delivery-gates the pressure upon the grain is 40 regulated.

When the grain is of such a nature that a single operation of scouring is insufficient to properly clean the grain, the latter is passed
45 through two or more of my improved scouring-machines, as above described, until the desired effect is produced.

I do not broadly claim the combination, with the hulling or scouring screws and cylinder, of feed-spouts at the ends of the cylinder and a central discharge, as I am aware that this is not new; but

I claim—

1. The combination, with the right and left scouring-screws and the inclosing-cylinder, of
55 the vertical feed-spouts connected with the ends of the cylinder, an elevated central delivery-passage, a discharge-spout, I, connected with the delivery-passage and having diverging branches I', and a similar scourer having
60 its feed-spouts arranged to receive the grain from the branches I', substantially as set forth.

2. The combination, with a supporting-frame, of a series of scouring-machines mounted upon said frame, one below the other, and
65 each provided with a right and left scouring-screw, an inclosing-cylinder, vertical end feed-spouts, and an elevated central delivery-passage and discharge-spouts, whereby the scoured grain is conducted from the delivery-passage
70 of one machine to the feed-spouts of the machine next below, substantially as set forth.

Witness my hand this 24th day of November, 1886.

GEORGE L. SQUIER.

Witnesses:

JNO. J. BONNER,
CARL F. GEYER.