

L. LANGEVIN
Grain Cleaning and Scouring Machine.

No. 223,153.

Patented Dec. 30, 1879.

Fig. 1.

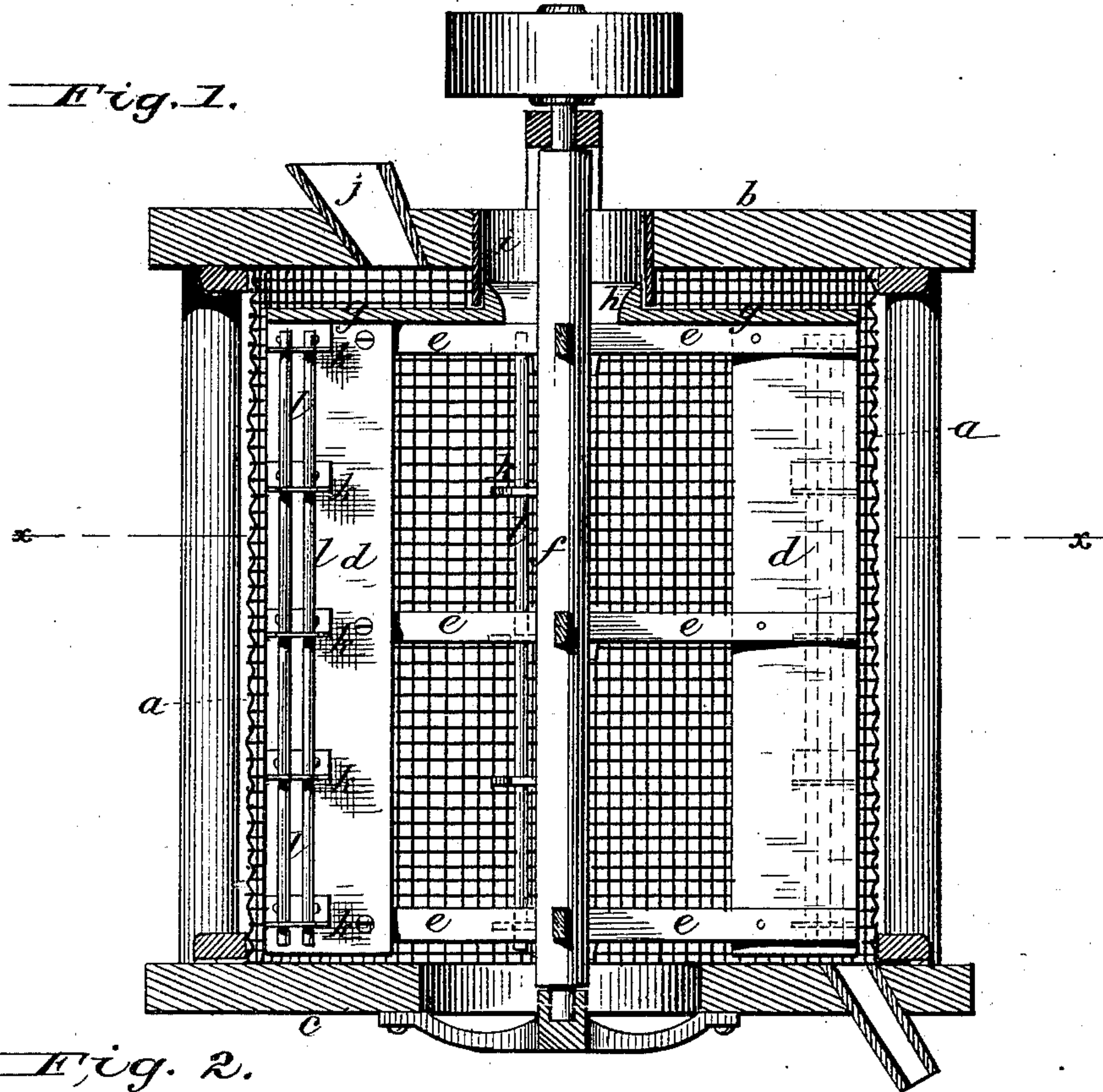
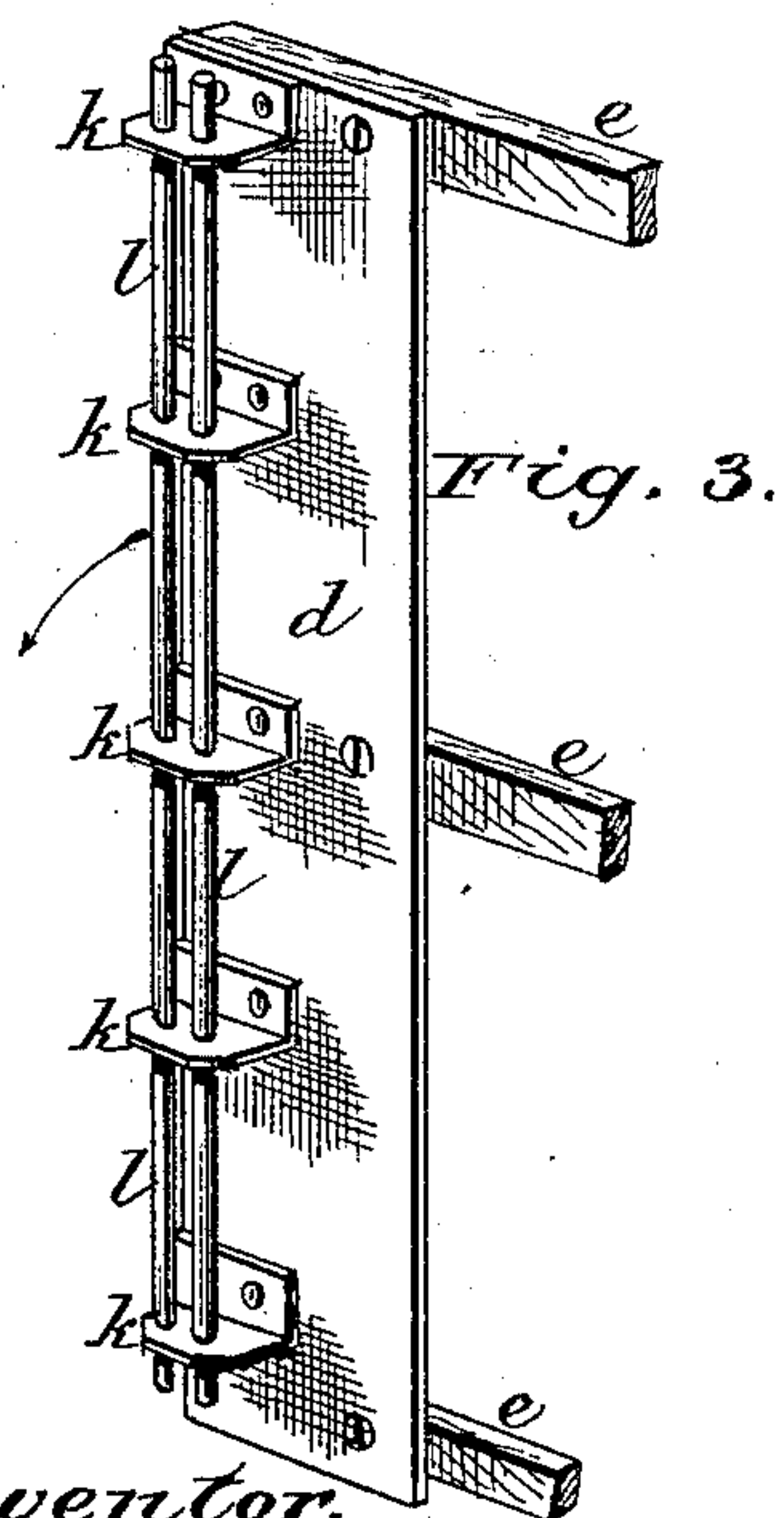
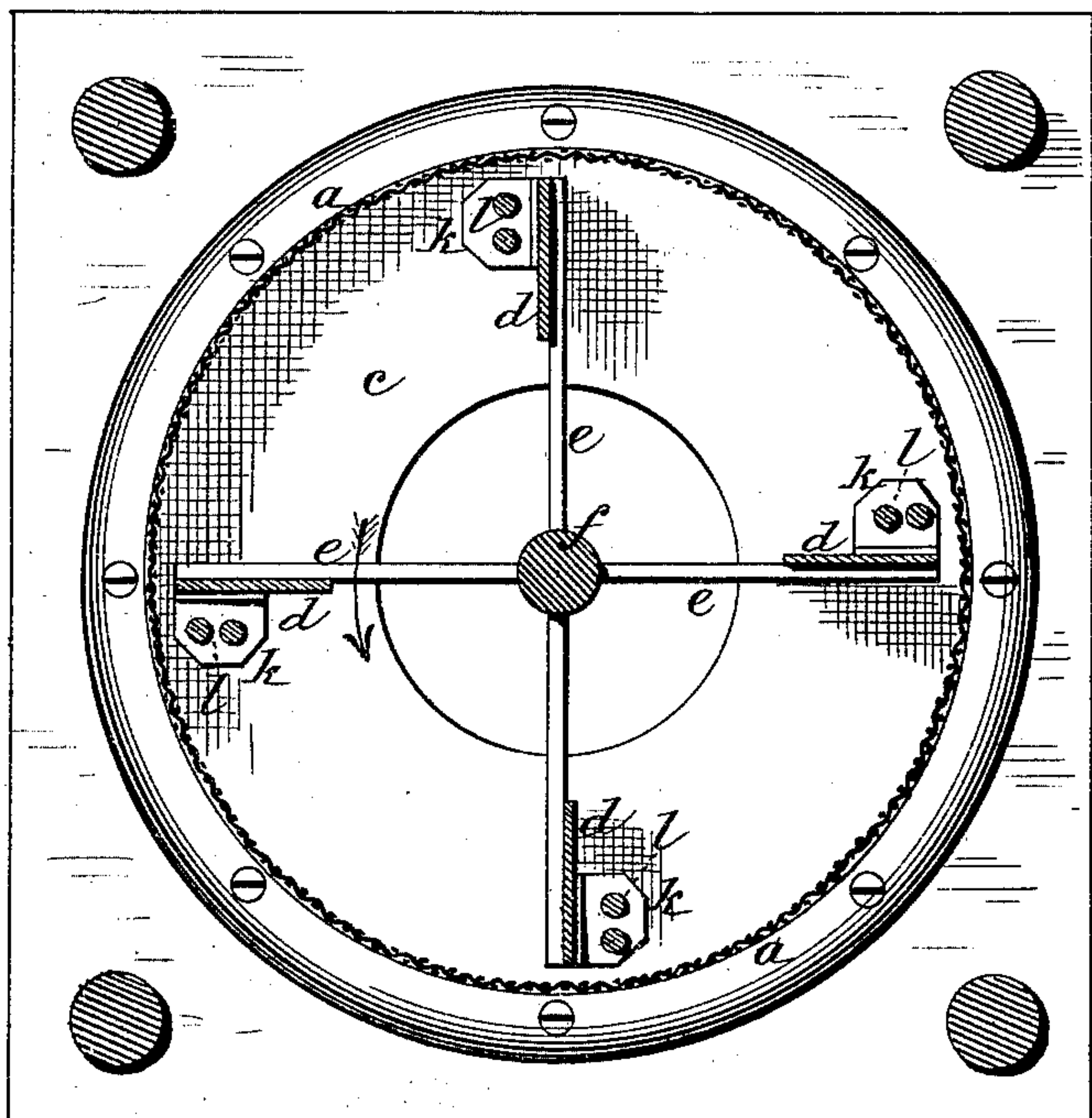


Fig. 2.



Attest:
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UNITED STATES PATENT OFFICE.

LOUIS LANGEVIN, OF BUENOS AYRES, SOUTH AMERICA, ASSIGNOR TO
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IMPROVEMENT IN GRAIN CLEANING AND SCOURING MACHINES.

Specification forming part of Letters Patent No. **223,153**, dated December 30, 1879; application filed
March 10, 1879.

To all whom it may concern:

Be it known that I, LOUIS LANGEVIN, a citizen of the United States, but now a resident of Buenos Ayres, South America, have invented certain new and useful Improvements in Grain-Cleaning Machines, of which the following is a specification.

In my improved machine for cleaning grain the construction is adapted with special reference to cleaning the crease of wheat-kernels in the scouring action upon the grain, and in this particular to effect a more perfect cleaning of the grain than is possible in any machine of which I have knowledge.

My plan embraces that kind of machine known as the "vertical cylinder" with revolving radial beaters. The cylinder is of wire and forms a screen, and the grain is received and distributed against its inner surface by the centrifugal action of a horizontal head fixed to and revolving with the vertical beating-wings, and the grain is sustained against the screen-surface by the outward pressure of air (drawn in through a central opening in said head by the action of the beaters) and the rubbing function of small shelves arranged upon and projecting horizontally from the advancing vertical sides of said radial beaters at or near their outer edges, and at suitable distance apart from the top to the bottom of said beaters. This sustaining of the grain by the blast is not, however, so fully as to prevent it descending gradually against the screen-surface and passing out in a cleaned condition at the bottom of the cylinder.

The edges of the projecting shelves are co-incident with the outer edges of the beaters, and co-operate in their function with the inward projections of the horizontal screen-wires of the cylinder in passing into the crease of the wheat-kernels, and thus reaching and cleaning that part of the surface of grain very satisfactorily. With these horizontal projecting shelves, the vertical radial beating-wings which carry them, and the wire-screen cylinder I combine rods, arranged vertically in pairs or nests through the shelves, so as to leave intervening spaces, and co-operate with the several parts to scour and hold the grain to the wire-screen surface by the revolving action of the

wings upon the grain, by the sustaining and crease-cleaning action of the shelves carried by the wings, and by the beating and holding action of the rods carried in vertical pairs or nests by the projecting shelves, thereby effecting a most thorough cleaning of the grain, and discharging the dust and impurities out through the meshes of the cylinder.

Referring to the drawings, Figure 1 represents a vertical section of a grain-cleaning machine embracing my invention; Fig. 2, a horizontal section of the same; and Fig. 3, a view of one of the radial beating-wings, showing the shelves projecting therefrom and the vertical beating-rods passing through said shelves.

The cylinder is a wire screen, *a*, having meshes of the proper size for the purpose, and is properly secured between a top, *b*, and bottom *c*, and within which the vertical beating-wings *d* are arranged upon radial arms *e* from a central shaft, *f*, having suitable bearings and revolved by suitable motor connections with the required speed.

The beating-wings have flat surfaces, are of suitable width, and revolve with their outer edges in such proximity to the wire screen as to give the proper scouring action without cutting the kernels.

A horizontal head, *g*, upon which the grain is received, is arranged upon the upper radial arms and just below the top *b*, with a central collar, *h*, extending within a tube or collar, *i*, from the top, or through an opening in said top, to form a central inlet for the air, said head *g* receiving and distributing the grain uniformly to the surface of the wire-screen and to the action of the beaters by delivering the grain by centrifugal action over the edges of said head, which forms a cover to the beating-wings and receives the grain through an opening, *j*, in the top.

The grain distributed over the head *g* is sustained against the inner surface of the cylinder partly by the outward pressure of air, by the rubbing action of the beating-wings, and partly by the rubbing action of the shelves *k*, secured by flanges to the beating-wings, extending horizontally therefrom in the direction of the motion thereof, and at suitable dis-

tances apart, one above the other, and with their outer edges coincident with the outer edges of the beating-wings.

A peculiarity of the arrangement and relation of these comparatively small shelves to the beating-wings and to the screen-cylinder is, that the edges of the shelves next to the cylinder co-operate with the inward projections formed by the bends in the horizontal wires of the screen in passing into the crease of the wheat-kernel as the grain is held, rubbed, and scoured against the screen, and thus clean the surface of the grain, aided by the beating-wings and the action of beating-rods *l*, arranged vertically through the shelves in pairs or nests, so as to leave spaces between the rods wide enough to allow the grain to pass between them, thereby not only giving a rubbing action, but co-operating with the wings in beating the grain against the cylinder. These rods I prefer to arrange in pairs, standing out from the wings *d* and extending from the top to the bottom thereof; but they may be arranged in nests of any suitable open form, so long as they are combined with and stand out from the beating-wings, and with or without the co-operation of the projecting shelves, for these rods may be used with the beaters without the shelves. These shelves catch and hold the grain and give it a sort of intermittent descent against the screen and upon the vertical sides of the wings as they revolve, and in this respect their action is highly advantageous, and gives important results in cleaning grain against a screen-surface, through which the impurities are blown by the action of the beating-wings, the shelves, and the rods.

The cleaned grain passes out of the cylinder through a discharging-spout or a central opening of the bottom.

My invention relates to improvements in means for cleaning grain, in which I use the skeleton radial beater in connection with a free supply of air in large volume from the central space between the broad radial, or nearly radial, surfaces of the wings, upon the forward radial sides of which the shelves project horizontally, and are provided with ranges or nests of vertical beating-rods set with spaces between them, and with a space between said beating-rods and the wings, so that as the beater revolves the grain beats against and through between the rods, and, striking against the radial surfaces of the wings, is thrown outward behind the rods against the screen-cylinder. The rods ranging in front of the wings first subject the grain to a beating and rubbing action as it passes through the spaces between the rods; then the radial beaters, by centrifugal action, throw it outward, so that the beating and rubbing action of the rods is preliminary to the beating and centrifugal action of the radial wings upon the grain.

The placing of the shelves upon the advance sides of the radial wings—that is, between the advancing side of one and the rear side

of the other—is important in this, that such disposition exposes the shelves to the full effect of the blast from the central space of the beater, so that the grain lodging upon the shelves is projected nearly radially and with considerable force against the screen. Such disposition also forms beaters of the shelves, because their advancing edges will act upon the grain to a greater or less extent, while their outer edges enter and clean out the impurities from the crease of the grain-kernels to a greater or less extent as it is held against the surface of the screen by the force of the blast.

In connection with such arrangement of shelves upon the radial sides of the wing-beaters, I make the screen-cylinder of proper mesh, with the filling-wires horizontal, so that the lines of motion of the kernels of the grain will be parallel with the length of the filling-wires of the web, and will be carried over the inward bends thereof in a manner to clean the crease to a very considerable degree and more thoroughly clean the grain. For this purpose the shelves are placed to operate sufficiently close to the screen to act upon and rub the grain more or less against the screen as the grain is held in contact therewith by the force of the blast. In this particular there is a co-operative action between the shelves, the skeleton winged beater, and the inward bends of the filling-wires of the screen, so as to obtain a better cleaning effect upon the grain. This rubbing action of the edges of the shelves, in connection with the force of strong currents of air against the screen, gives to the latter a greater degree of vibratory motion and keeps the meshes of the screen free and open—a matter of the highest importance, the satisfactory results of which were only obtained after many experiments, running through a number of years.

I know that a vertically-revolving beater forming a solid body, with shelves or chutes projecting horizontally one above the other from helical or eccentric surfaces of said body, has been used in what is known as “bran-dusters,” and in which the eccentric surfaces form the beaters and the shelves or chutes the means of feeding the bran faster or slower against the screen-cylinder to separate the flour by means of a vertically-adjusting rod, upon which the shelves are strung at one end, while at the other they are pivoted so that their strung ends can be raised and lowered to incline them more or less to feed the stuff from said shelves against the screen.

In this construction the eccentric surfaces form radial shoulders, whereon are secured brushes, and behind these solid shoulders and the brushes the stringing and adjusting rod for the shelves is placed, so that the shelves are behind the beater-forming projections, and shelve off the stuff against the screen as the beater revolves, while the vertical stringing-rod is shielded behind the beater-projections,

so that it has no other purpose or function than to support the free ends of the shelves, and by which to change their inclination horizontally.

I claim—

1. In a machine for cleaning grain, the combination, with a revolving skeleton-beater having radial, or nearly radial, wings and an unobstructed central space, of shelves on the forward sides of said radial wings and the wire screen, having the filling-wires horizontal, whereby the outer edges of said shelves co-operate with the inward bends of the filling-wires of the screen-cylinder to clean the crease of the grain-kernels, substantially as herein set forth.

2. In a machine for cleaning grain, the revolving skeleton-beater having radial, or nearly radial, wings and an unobstructed central space, and having shelves projecting horizontally from the forward radial sides of said wings, substantially as specified, in combination with vertical beating-rods, in pairs or nests, in advance of the radial sides of said wings, for operation as specified.

3. In a machine for cleaning grain, the vertical beating-rods set out from the radial sides of beating-wings and supported by horizontal shelves, with spaces between said rods and between them and said wings, whereby, under the forward motion of the revolving beater, the grain is driven between said rods against the front sides of said radial wings and out against the wire cylinder.

4. A machine for cleaning grain consisting of a wire cylinder, a revolving skeleton-beater of vertical radial wings, horizontal shelves carried upon the forward radial sides of said wings, vertical beating-rods in pairs or nests, carried within the spaces between the front and rear sides of said wings, a horizontal head capping said wings, and a central collar or tube projecting from said head, for operation as stated.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

LOUIS LANGEVIN.

Witnesses:

ALBERT P. LANGEVIN,
E. E. LOMBARD.