2 Sheets--Sheet 1.

H. W. & R. LAFFERTY.

Centrifugal Machines for Drying Sugar.

No. 154,686. Patented Sept. 1, 1874.

Fig: 1

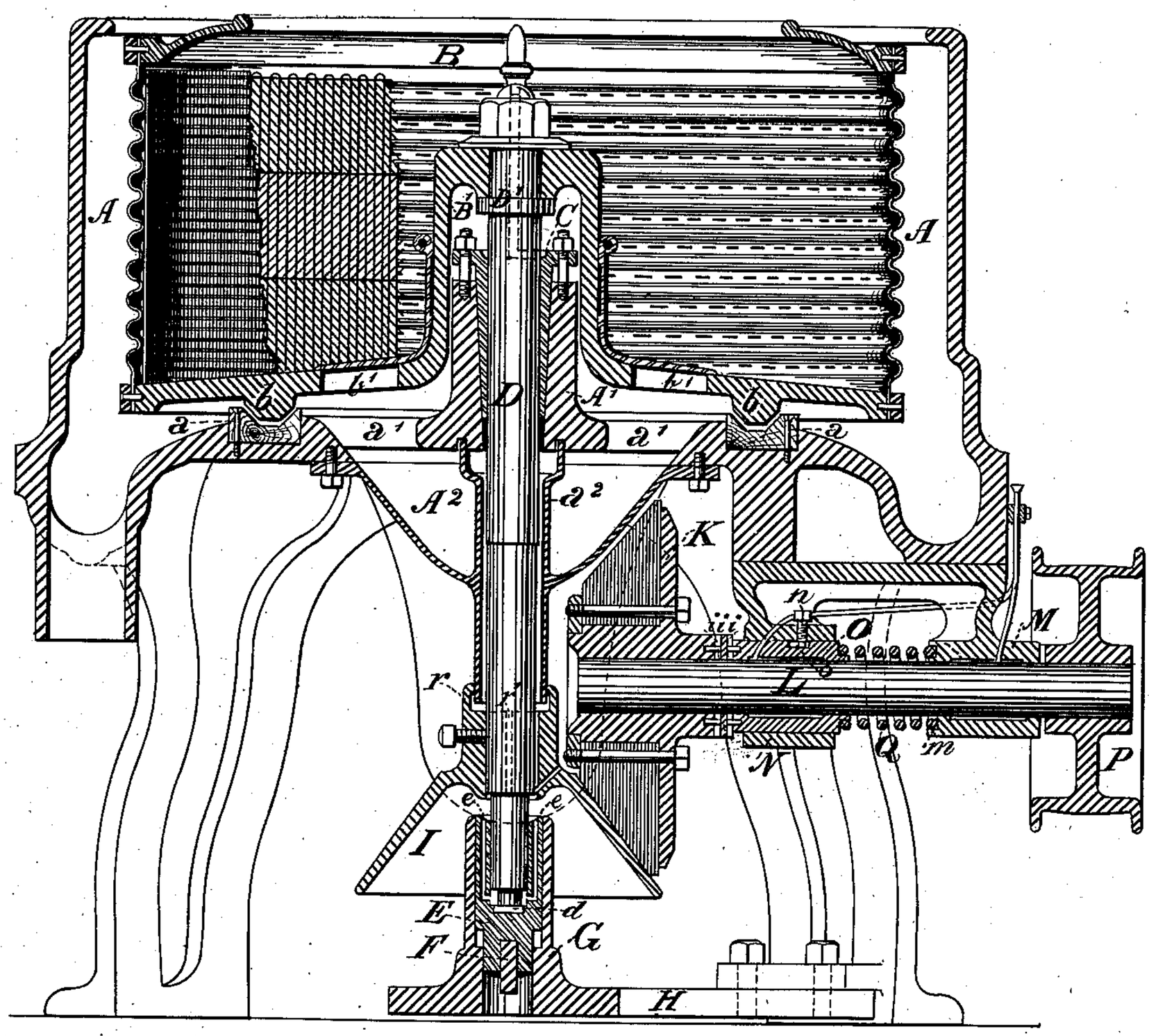
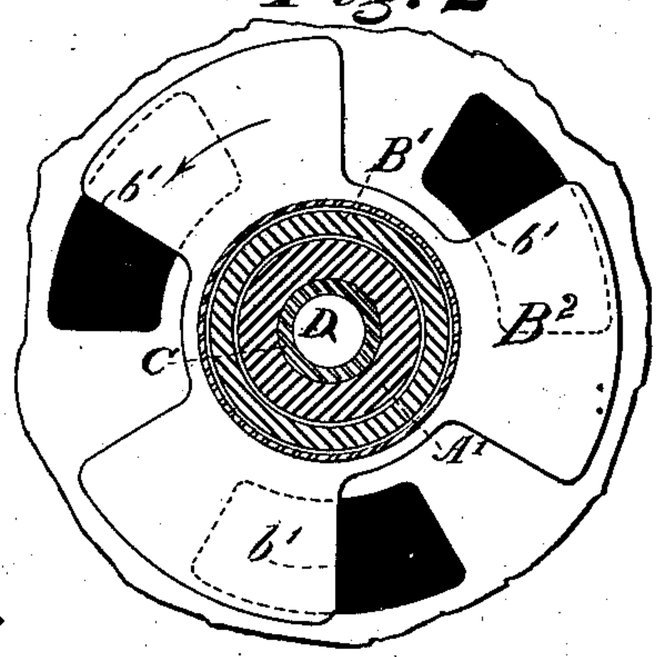


Fig: 2



Witnesses:

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2 Sheets--Sheet 2.

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Fig. 3

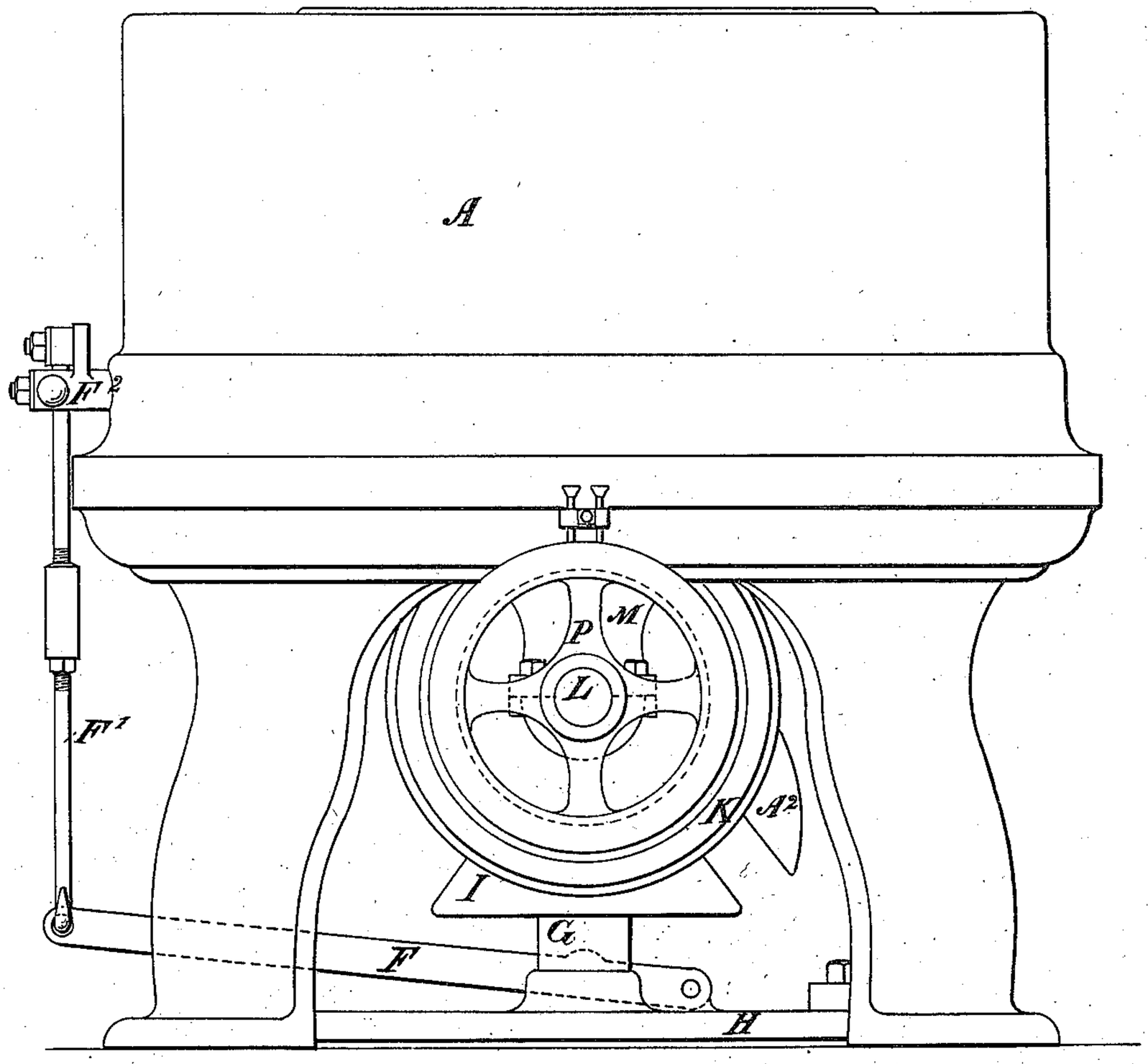


Fig. 4

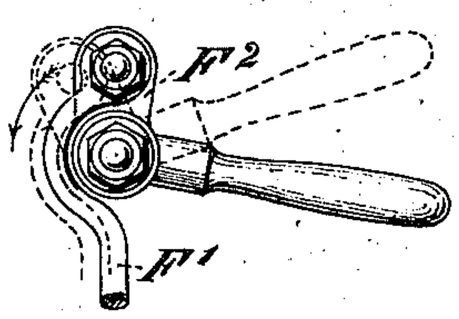
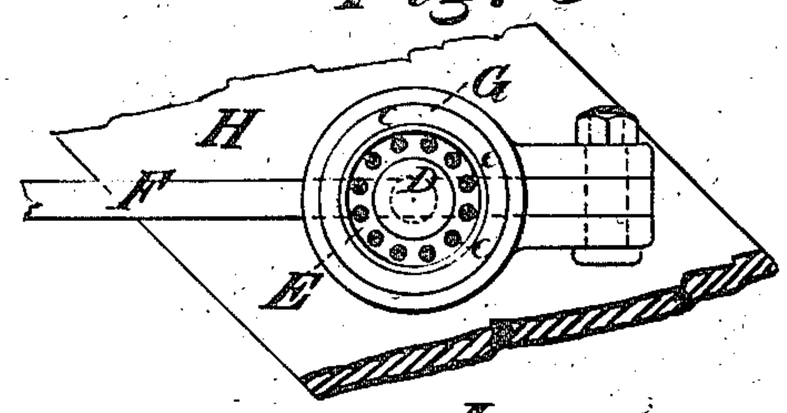


Fig. 5



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UNITED STATES PATENT OFFICE.

HUGH W. LAFFERTY AND ROBERT LAFFERTY, OF GLOUCESTER CITY, N. J.

IMPROVEMENT IN CENTRIFUGAL MACHINES FOR DRYING SUGAR.

Specification forming part of Letters Patent No. **154,686**, dated September 1, 1874; application filed March 3, 1874.

To all whom it may concern:

Be it known that we, HUGH W. LAFFERTY and ROBERT LAFFERTY, both of Gloucester City, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Centrifugal Draining-Machines for Drying Sugar and other Substances, of which the following is a specification:

Our invention relates to the centrifugal draining-machine for which Letters Patent of the United States No. 106,491 were granted and issued to us under date of August 16, 1870, and is designed to provide improved facilities for the rotation and stoppage of the drum, and the discharge of the dried material therefrom; to which end our improvements consist of an improved device for imparting lateral motion to the driving-shaft, an arrangement of devices for discharging the dried material from the drum or basket, and an improved construction of the automatic brake for arresting the motion of the drum, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a vertical central section of a centrifugal draining-machine embodying our improvements; Fig. 2, a plan view of the openings in the bottom of the drum or basket, also of the movable cover thereof; Fig. 3, a view in elevation of the machine, taken at right angles to Fig. 1; Fig. 4, a view on an enlarged scale of the lever for stopping and starting the machine, and Fig. 5 a plan or top view on an enlarged scale of the lower bearing of the drum-spindle.

The cylindrical outer casing A of the machine is substantially similar to those now in use, and is provided with proper legs or supports for securing it to the floor. A corrugated drum or basket, B, similar in form and construction to those heretofore used by us, is attached to and supported by a vertical spindle, D. This spindle passes centrally through a hub or cylindrical projection, A^1, of the outer casing, which hub is provided with a cylindrical gland or bushing, C, made to fit the spindle, and adjustable thereon by standing bolts and one or more longitudinal slots. By forcing the gland downward, the slots will permit the opening or bearing for the spindle to contract, and any lost motion consequent upon long-continued use may be readily taken up. The bottom of the drum or basket is provided with a cylindrical projection, B^1, which surrounds and covers the hub A^1, leaving sufficient space for the free movement of the drum, and is fitted and fastened to the spindle, upon which it is supported by the collar D′. The lower end of the spindle D rests and revolves upon a steel step, *d*, inserted in the bottom of a box, E, resting upon a lever, F, and incased in an outer box, G, in which it has a free vertical movement. The box E forms the lower bearing of the spindle D, and is provided with suitable oil-channels *e e e*, to afford proper lubrication to the step. The lever F has its fulcrum-point upon a cross-bar, H, which also supports the casing G, and it will be seen that by raising or lowering the end of the lever the box E will be correspondingly raised or lowered in the casing G, and with it the spindle D. A conical friction-wheel, I, is attached to the spindle D, and when the latter is raised it is brought in contact with a corresponding wheel, K, upon a shaft, L, which is mounted in boxes or bearings M N, secured to the outer casing A. The outer box M is made to fit the shaft, but the inner box N is provided with a movable sleeve or bushing, O. Steel friction-collars *i i i* are placed between the inner end of the sleeve O, and the hub of the friction-wheel K, to prevent the excessive wear of these surfaces when the machine is in operation. Between the sleeve O and the outer box M is placed a spiral spring, Q, which surrounds without touching the shaft L, and has its respective ends resting, the one in an annular groove, *m*, on the inner face of the box M, and the other on a shoulder formed upon the adjacent face of the sleeve O. The spring Q bears against the movable sleeve O, and this, in turn, against the friction-collars *i i i* and the wheel K, and thus imparts a lateral motion to the shaft L, simultaneously with the lowering of the spindle D, and the consequent release of the wheel I from its contact with the wheel K. To limit the lateral motion of the shaft L, and to prevent the contact of any of the end surfaces when the drum is not being rotated, as well as to prevent the sleeve O from turning in the box N, we provide a set-screw, *n*, the end of which enters a longitudi-

nal slot, *o*, in the sleeve O. Another advantage of imparting lateral motion to the shaft L is found in the fact that the deviation of the spindle from its perpendicular line by reason of any irregularities in the friction-wheels is thereby prevented. A flanged pulley, P, is attached to the outer end of the shaft L, and receives motion by a direct belt from a pulley of suitable size on a line of shafting, or is otherwise properly connected with the prime mover. An annular V-shaped projection, *b*, is formed upon the under side of the drum or basket B, and a ring, *a*, of wood or other suitable material, having a corresponding V shaped channel or groove, is inserted in and secured to the bottom of the outer casing A, beneath the projection *b*, forming a powerful, safe, and almost instantaneous brake when its surface and that of the projection *b* are brought into contact by the lowering of the spindle and drum or basket. Radial openings *b'* *b'* are formed in the bottom of the drum or basket, and corresponding openings a^1 a^1 are formed in the bottom of the outer casing, which latter openings communicate with a chute, A^2, for conveying the dried or purged material from the drum or basket. This chute is united to or formed in a piece with a casing, a^2, which encircles the spindle D. The top of the casing a^2 is enlarged and fitted into a recess in the bottom of the casing A, and, passing through the chute A^2, has its lower end fitted into a cup, *r*, formed in the hub of the friction-wheel I, the casing being made long enough to be retained by the cup when the spindle D is lowered. A channel, *r'*, extends through the hub of the friction-wheel I, to allow the oil to pass freely from the cup *r* to the bottom step of the spindle. It will be seen that the casing a^2 effectually confines the oil used in lubricating the spindle to its proper channels, and prevents its contact with the friction-wheels, or the dried material passing through the chute. A light cover, B^2, encircles the projection B^1 of the drum or basket B, for the purpose of allowing or preventing the passage of material through the openings therein, as may be required. The end of the lever F is connected, by means of an adjustable rod, F^1, to an eccentric or bell-crank lever, F^2, secured to the outer casing within convenient reach of the operator.

The operation of our machine is as follows: By raising the lever F, the box E, which rests upon the lever and the spindle D, which has its step in the box E, will be simultaneously raised, and the conical friction-wheel I will be brought in contact with the wheel K, which will impart its motion to the wheel I, and consequently to the spindle D and drum or basket B. Simultaneously with the upward movement of the spindle D, the annular projection *b* will be raised from the ring *a*, and free rotation of the drum and spindle will thereby be permitted. Upon lowering the lever F, the friction-wheels I and K will be separated, and the annular projection *b* will be brought in contact with the ring *a*, the contact of these two members inducing the action of a powerful, noiseless, and reliable brake, to stop the rotation of the drum or basket. By moving the cover B^2 the dried material is allowed to pass, through the openings *b'* in the drum and the openings a^1 in the outer casing, into the chute A^2, by which it is conveyed to a proper receptacle.

We claim as our invention—

1. In a centrifugal draining-machine, the device for imparting lateral motion to the shaft L, consisting in the combination of the sleeve O, the set-screw *n*, and slot *o*, the friction-collars *i i i*, and the spiral spring Q, substantially as set forth.

2. The combination, in a centrifugal draining-machine, of an annular V-shaped projection on the bottom of the drum or basket with a corresponding groove or channel upon the bottom of the outer casing, substantially as set forth.

3. The combination, in a centrifugal draining-machine, supported entirely from below, of an opening in the outer casing A with a chute, A^2, casing a^2, and cup *r* upon the friction-wheel of the vertical spindle, substantially as set forth.

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