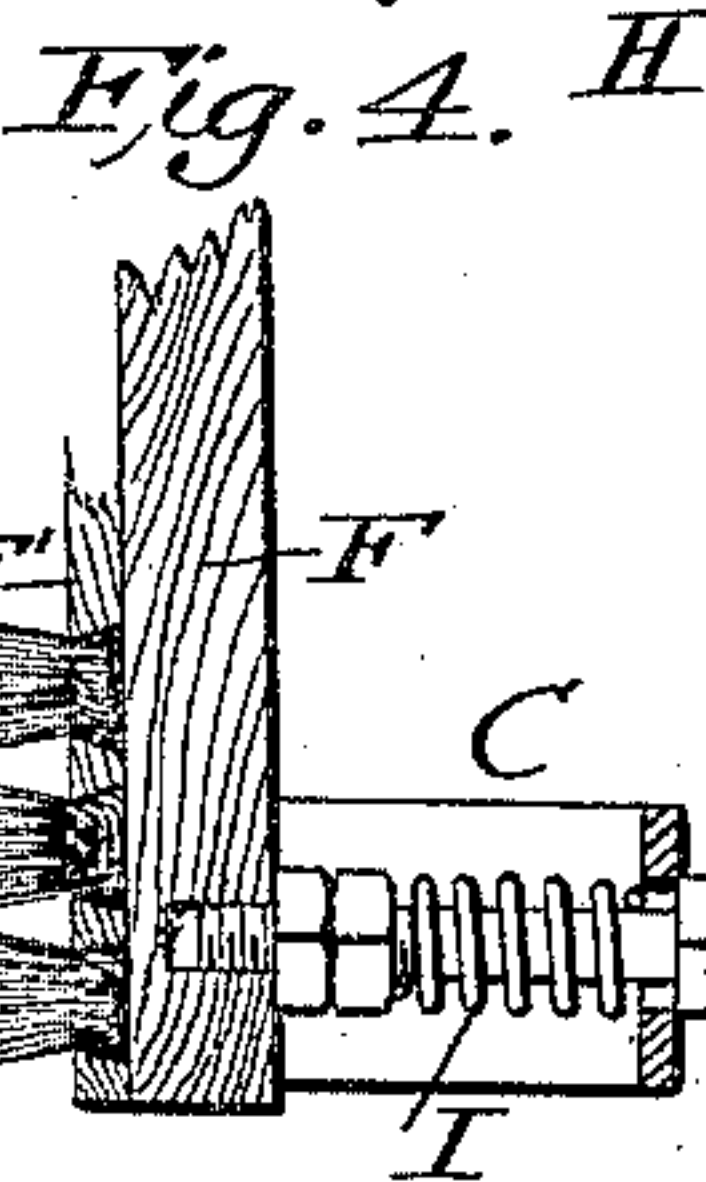
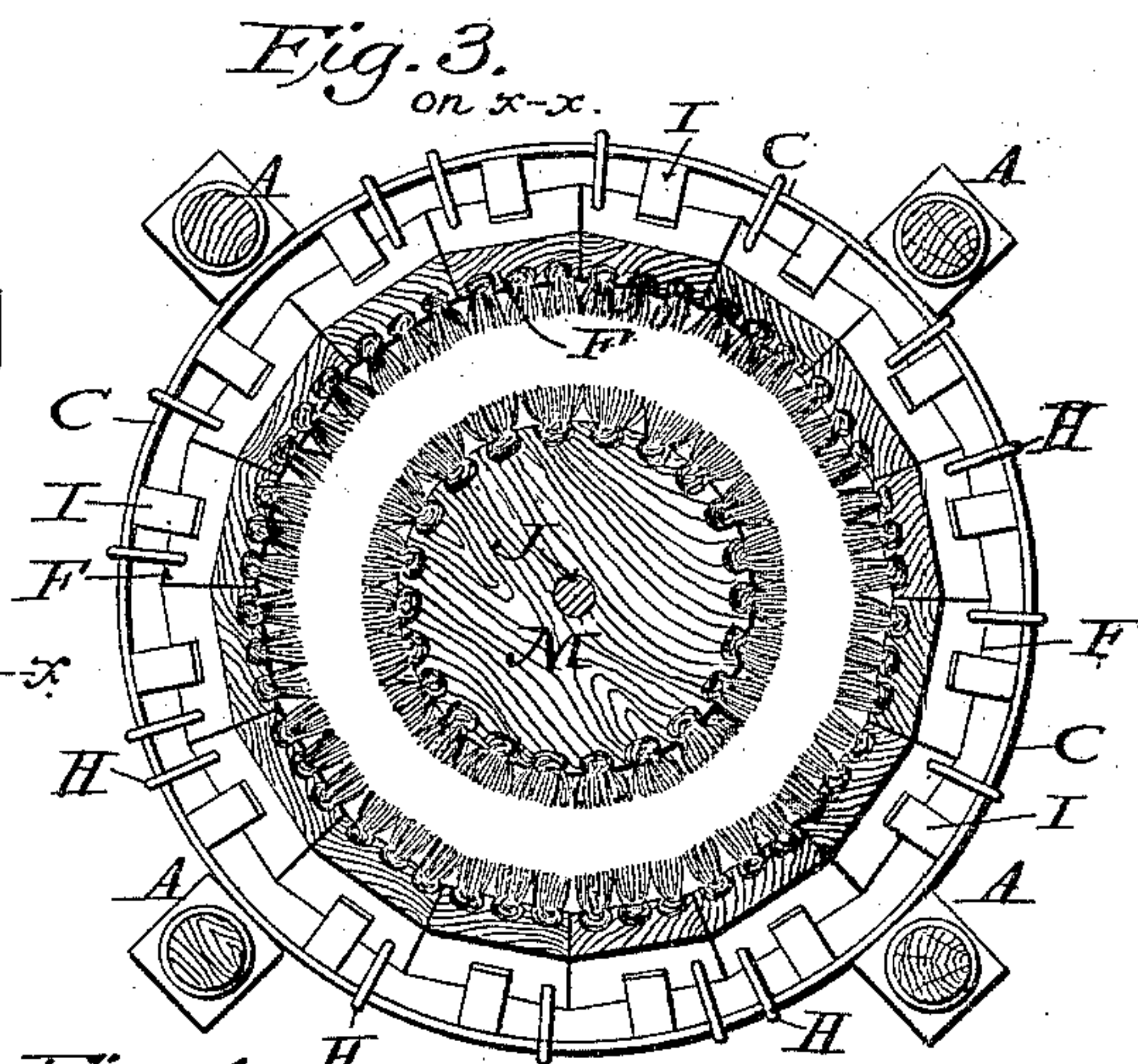
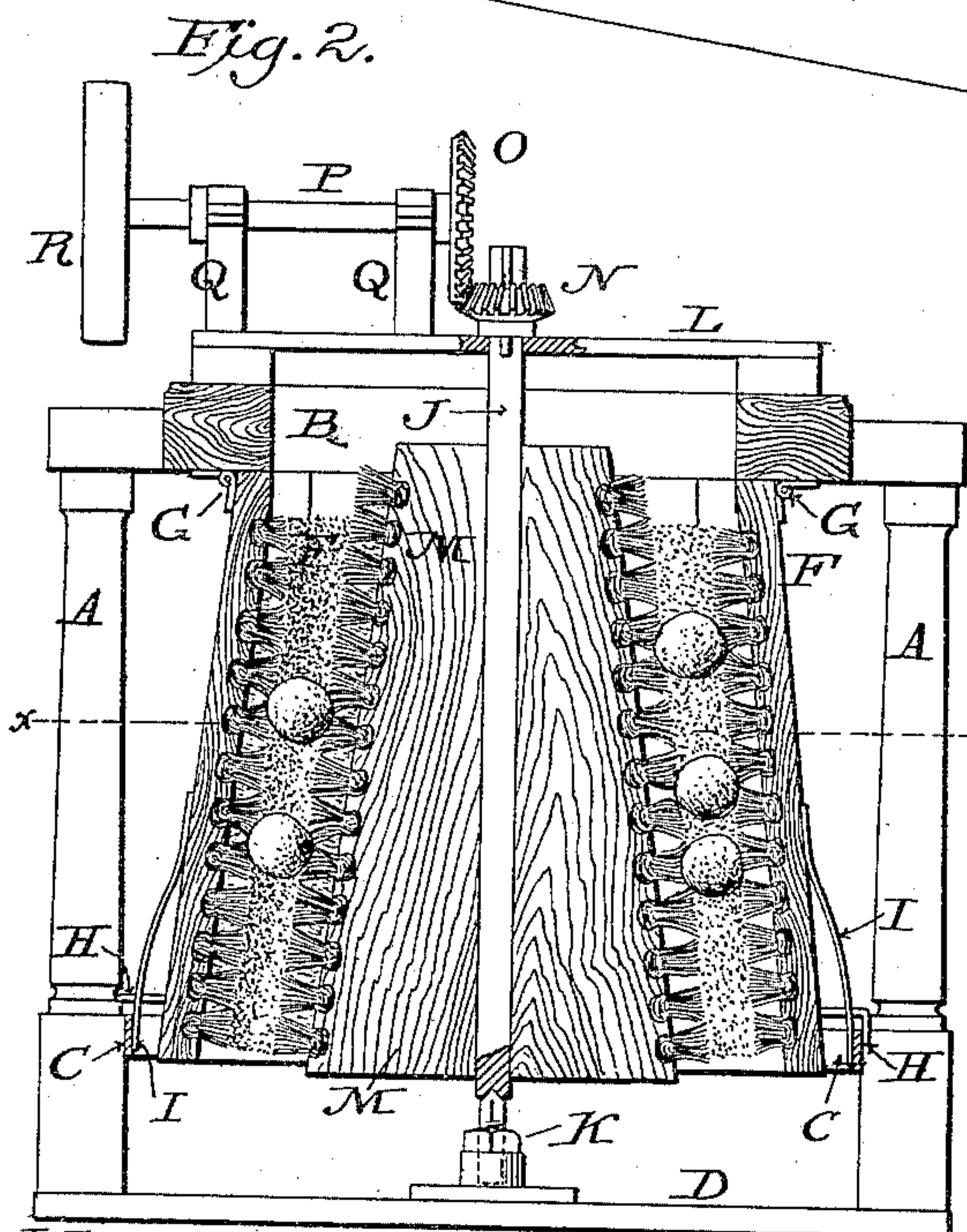
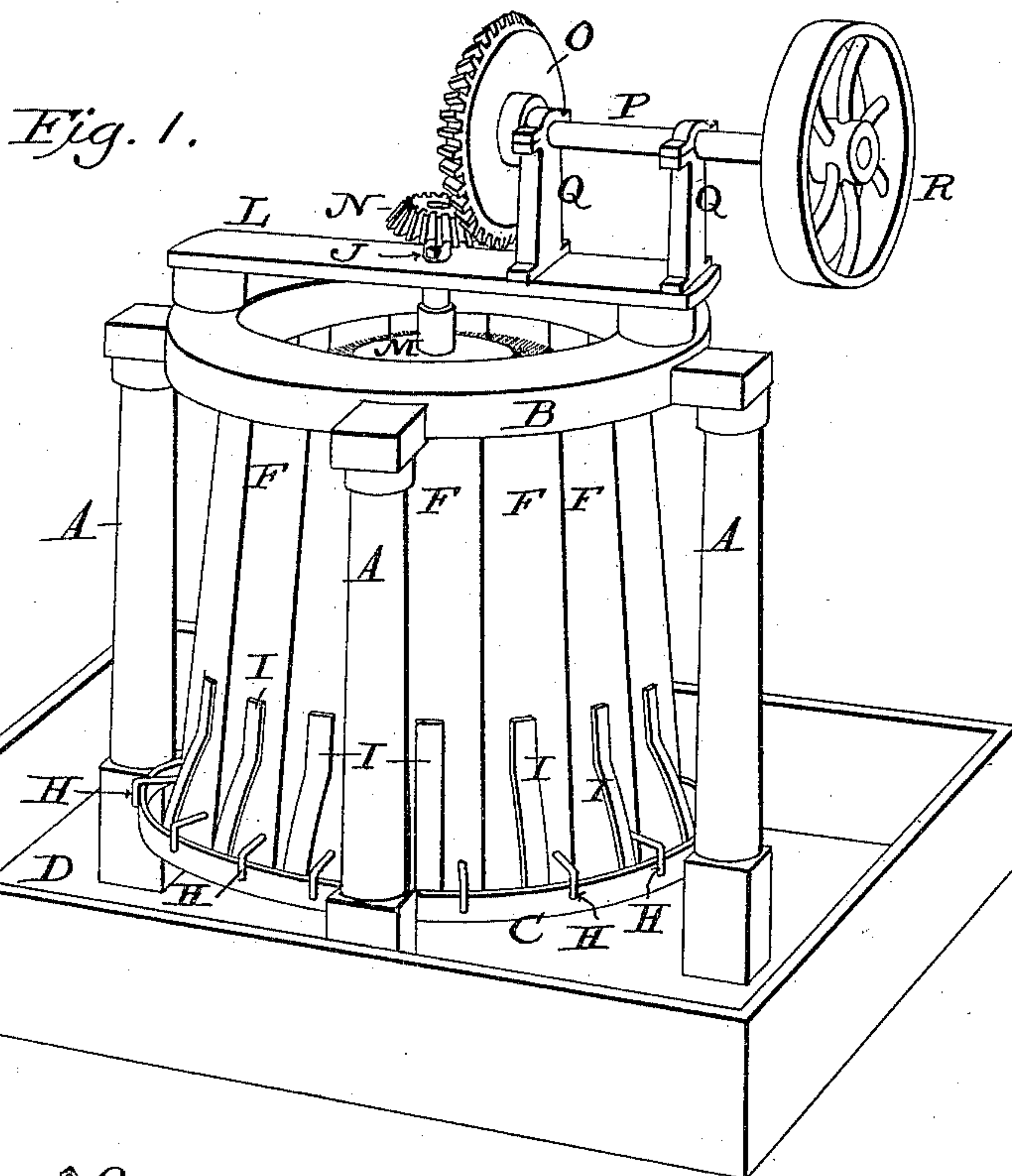


(No Model.)

L. PHELPS & D. P. BURDON.
FRUIT CLEANING MACHINE.

No. 409,754.

Patented Aug. 27, 1889.



Witnesses:

James F. O'Hamel.
Horace A. Dodge.

Inventors:

Lyman Phelps,
David P. Burdon,
by Dodge & Sons
Attys.

UNITED STATES PATENT OFFICE.

LYMAN PHELPS AND DAVID PATTON BURDON, OF SANFORD, FLORIDA.

FRUIT-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,754, dated August 27, 1889.

Application filed December 3, 1888. Serial No. 292,530. (No model.)

To all whom it may concern:

Be it known that we, LYMAN PHELPS and DAVID PATTON BURDON, of Sanford, in the county of Orange and State of Florida, have invented certain new and useful Improvements in Fruit-Cleaning Machines, of which the following is a specification.

Our invention relates to machines for brushing or brushing and washing oranges, and is designed to clean and to generally improve the condition and appearance of the oranges.

In the drawings, Figure 1 is a perspective view of our improved machine; Fig. 2, a vertical central sectional view; Fig. 3, a horizontal sectional view on the line $x x$, and Fig. 4 a view illustrating a slight modification.

A A indicate uprights or standards, supporting at their upper ends a hoop or ring B and at their lower ends a narrower hoop or ring C, the said uprights being connected one with the other at their lower ends or secured to a base-board D, as shown in Figs. 1 and 2. When the machine is adapted for washing as well as brushing the fruit, this base-board D may be the bottom of a tank or vessel E, adapted to receive water; but we prefer to have the base-board separate from the tank in order that it may be removed therefrom. These are matters of minor importance, however, and may be varied as desired, both constructions being fairly included within the spirit of our invention.

The design of the frame-work above referred to may obviously be varied considerably, and it is immaterial whether it be made of wood or of metal, though wood will generally be preferred on account of its cheapness.

Hinged or pivoted to the under side of the ring B, near or on line with its inner edge, is a series of long narrow brushes F, which are wider at their lower than at their upper ends, this construction and arrangement forming a hollow casing in the form of a frustum of a cone. The adjacent edges of the brushes will be beveled on lines radial to the center of the hoop B, so as to enable them to be placed closely together and so, also, as not to interfere with one another in their movements. These brushes are provided with bristles or material suitable for the purpose on their inner faces, which will preferably, though not nec-

essarily, be trimmed, so as to present an approximately circular surface. If the brushes are quite narrow, the unevenness would be so slight as to render any trimming unnecessary. The brushes may either be applied directly to the hoop or ring B, as shown, or secured to separate blocks F', which latter would in turn be pivoted or hinged to said ring, as shown in Fig. 4. The hinges or pivots G of these brushes are arranged so as to permit the latter to swing radially toward or from the center of the ring, their outward motion being limited by the hook or ring C, encircling their lower ends, while their inward motion is limited by hooked arms or rods H, secured to said brushes and engaging with the hoop C, as clearly shown in Figs. 1 and 2. A spring I, secured to the outer face of each brush and bearing against the hoop C, urges said brushes inward toward the center of the hoop B, though permitting them to yield when necessary.

In lieu of the arrangement of springs shown various other forms might be used—for instance, such a construction as that shown in Fig. 4, in which, instead of using a flat spring, a coiled spring I is employed, encircling a headed rod or bolt H. The rod is provided with nuts, by which the tension of the spring may be varied, and is headed at its outer end to limit the inward movement of the brushes. This arrangement is the equivalent of the construction shown in the remaining figures, but, owing to the adjustability of the spring, may to that extent be considered the preferable arrangement.

J indicates an upright shaft located centrally within the hoop or rings B C and equidistant from the brushes F, said shaft being supported at its lower end in an adjustable step or bearing K and supported at its upper end by a cross-bar L, secured to the ring or hoop B, as shown. Mounted upon and rotating with said shaft is a brush M, which is tapered to correspond with the shape or form of the chamber formed by the brushes F, the construction of the brush and the manner of securing it upon its shaft being matters capable of considerable variation.

Secured upon the upper end of the shaft J is a bevel-pinion N, which is provided with a spline or feather or a set-screw, which, while

permitting the shaft to slide vertically through the pinion for adjustment, causes it to turn or rotate therewith. This pinion N engages with a second bevel-gear O, carried
 5 by a shaft P, mounted in standards Q, projecting upward from the cross-bar L, as shown in Fig. 1, the said shaft being provided with a band-wheel R or a handle, according as the machine is to be operated by power or man-
 10 ually.

The operation of the machine is as follows: Oranges are placed in the top of the machine, between the brushes F and M, and motion imparted to the brush M. As the brush re-
 15 volves, the oranges are carried downward toward the lower end of the machine, and in thus traveling downward are turned or rotated upon their own axes, and thus subjected to a thorough brushing and cleaning action.
 20 The travel and discharge of the fruit through the machine between the brushes are effected by the yielding of the brushes F at their lower ends. The brushes, acting upon the oranges, scour or clean the skin and set free
 25 enough of the essential oil to coat it and close the pores of the peel, thereby rendering the oranges in better condition for transportation. Water may be run into the machine between the brushes to aid in cleaning the
 30 fruit, if desired, and as the fruit is discharged from the machine it will fall into and float upon the water in the tank. When the brushes become worn, the shaft J is adjusted vertically, thereby carrying the rotating
 35 brush M farther upward into the interior of the machine and bringing it closer to the brushes F. The upper end of the shaft J is provided with a groove to receive a spline or feather carried by the pinion N, so that when
 40 the step or bearing K at the lower end of the shaft is adjusted vertically the shaft may slide freely through the pinion.

The construction of the adjustable step or bearing K is a matter that may be varied as
 45 desired.

While the machine is designed more particularly for cleaning oranges, it is apparent that it may be used for cleaning other fruits or vegetables.

50 We are aware that in machines of this general character it is not new to employ a brush working within a hollow brush, and to such an idea, broadly considered, we make no claim.

We are not aware, however, that any one has heretofore provided such a machine with a
 55 series of yielding brushes to act in conjunction with the internal brush.

By the term "yielding brushes" we mean a brush adapted to yield bodily as contradistinguished from one having a fixed stock and
 60 elastic bristles, which bristles, by reason of their elasticity, are enabled to yield.

Having thus described our invention, what we claim is—

1. In a machine for cleaning fruit, the combination, with a suitable frame, of a rotating
 65 brush and a series of bodily-yielding brushes separated a distance therefrom and adapted to form a chamber therearound.

2. In a machine for cleaning fruit, the combination, with a suitable frame, of a rotating
 70 brush and a series of brushes secured to the frame at the receiving end of the machine and adapted to yield at the delivery end thereof.

3. In a machine for cleaning fruit, the combination, with a suitable frame, of a rotating
 75 brush and a series of brushes surrounding the rotating brush and movable bodily toward and from the same in lines radial to the latter.

4. In a machine for cleaning fruit, the combination, with the conical internal brush, of the conical surrounding brush-chamber having yielding walls.

5. In a machine for cleaning fruit, the combination, with the internal brush and the surrounding brushes, of springs adapted to urge the latter inward toward the internal brush and stops to limit the movement of the brushes.

6. In a machine for cleaning fruit, the combination, with uprights A A, of hoops B C, secured thereto, brushes F, pivoted to the ring B and provided with springs I and stops H, the latter to engage the hoop C, a shaft J, mounted within the frame and provided with
 95 a brush M and pinion N, and a second shaft P, provided with a gear O to engage with wheel N, all substantially as shown.

In witness whereof we hereunto set our hands in the presence of two witnesses.

LYMAN PHELPS.

DAVID PATTON BURDON.

Witnesses:

E. B. DEVELIN,

F. P. FORSTER.