

No. 611,765.

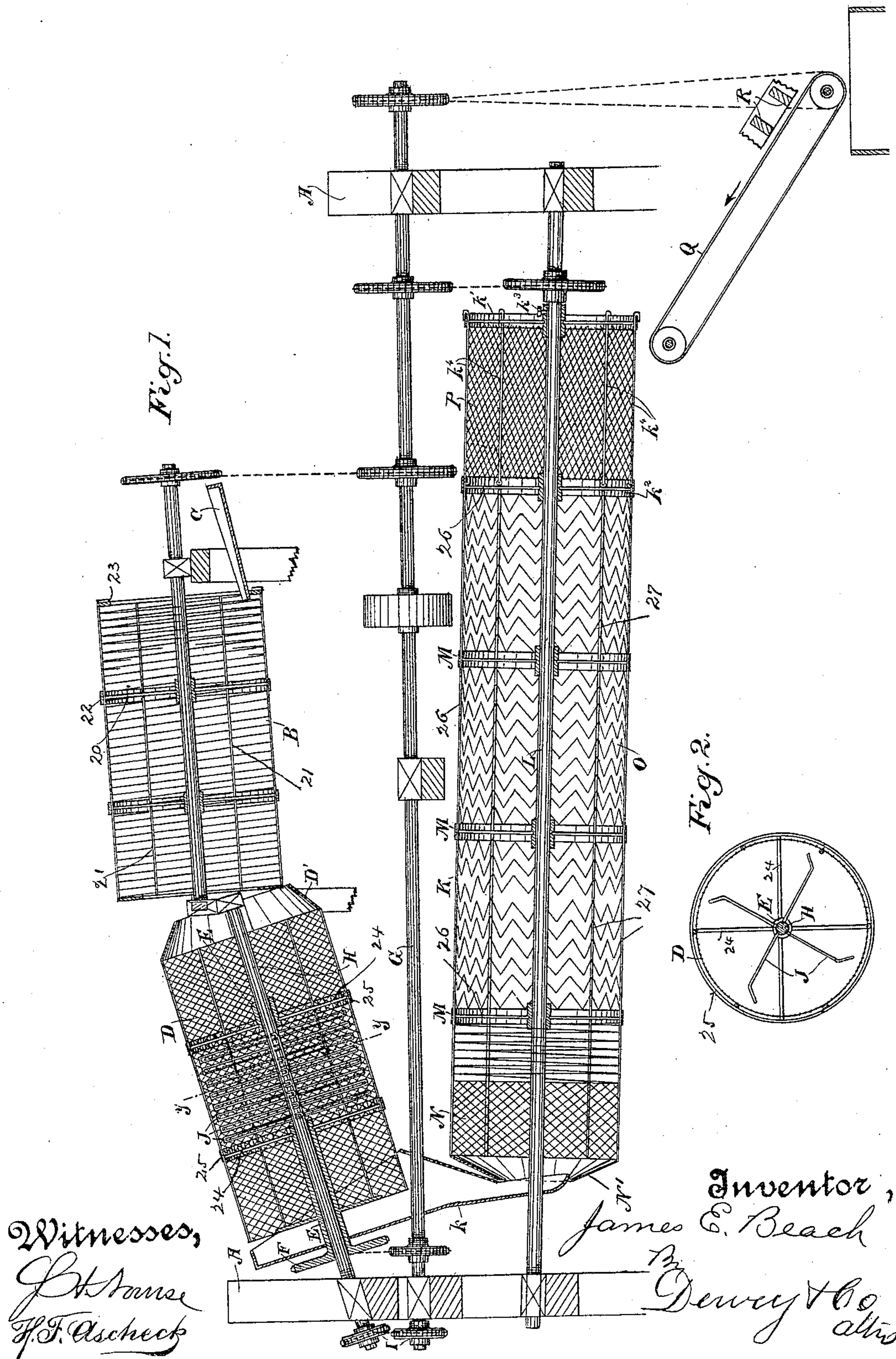
Patented Oct. 4, 1898.

J. E. BEACH.
ALMOND HULLER.

(Application filed Oct. 22, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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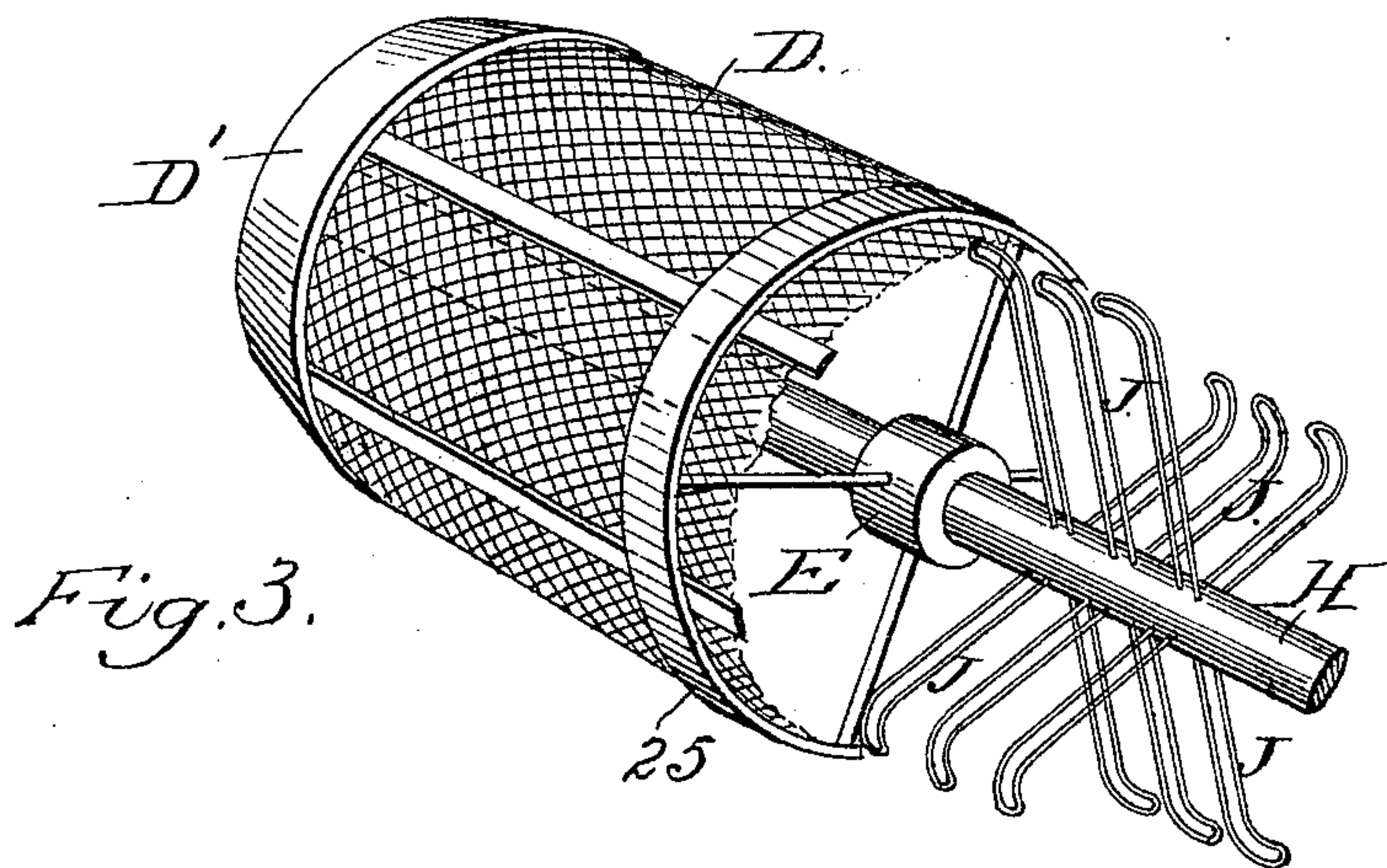
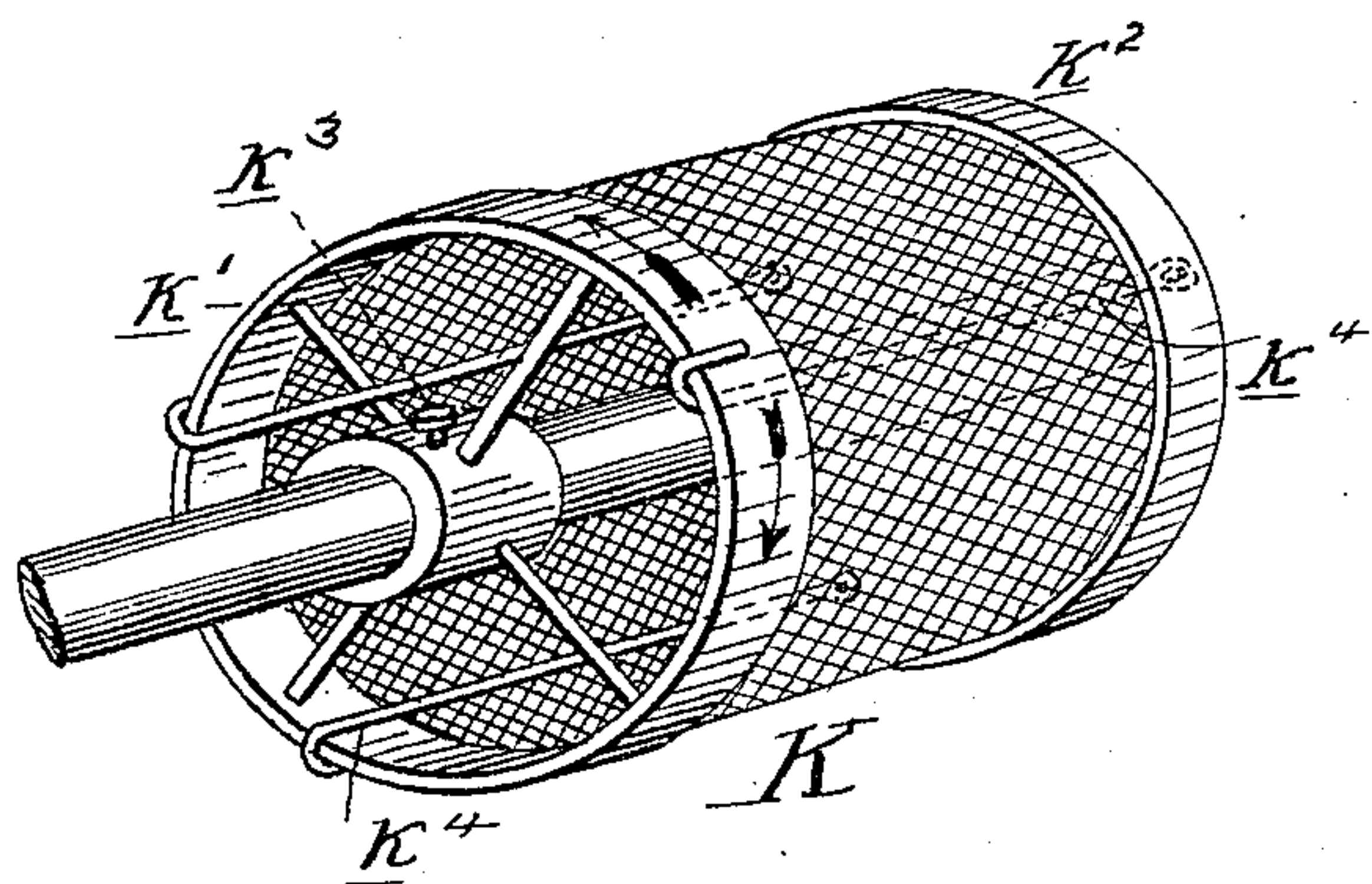


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES ELLIOTT BEACH, OF ROUTIER, CALIFORNIA.

ALMOND-HULLER.

SPECIFICATION forming part of Letters Patent No. 611,765, dated October 4, 1898.

Application filed October 22, 1897. Serial No. 656,016. (No model.)

To all whom it may concern:

Be it known that I, JAMES ELLIOTT BEACH, a citizen of the United States, residing at Routier, county of Sacramento, State of California, have invented an Improvement in Almond-Hullers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for the cleaning, hulling, and separating of almonds.

It consists in certain details of construction, which are more fully explained in this specification and in the accompanying drawings, in which—

Figure 1 is a vertical section through the apparatus. Fig. 2 is a cross-section through the huller on line *y y* of Fig. 1. Fig. 3 is an enlarged perspective view of a portion of the hulling-cylinder. Fig. 4 is a similar view of a portion of the separating-cylinder.

The apparatus has a wooden frame of any suitable size. In the present case I have shown it between nine and ten feet long, between four and five feet high, and between two and three feet wide, with corner-posts upon which the whole is supported.

The apparatus consists of three parts. The first part serves to free the almonds of sticks, leaves, and dirt, which accumulate in gathering, the second to thresh or free the almonds from the hulls, and the third to separate the one from the other.

In the drawings, A represents the frame of the machine.

B is a hollow cylinder about two and one-half feet long by one and one-half feet in diameter, having a central shaft suitably journaled so that the cylinder stands at a slight inclination. This cylinder is made with spokes 20 radiating from hubs on the shaft and having rims 22 situated about ten inches from each end of the cylinder. Interior to the rims are six or more bars 21 of No. 6 or No. 8 wire, fastened to the rims equidistant from each other and parallel with the shaft. Each bar extends about ten inches beyond the rim, and at the receiving end of the cylinder these wires are bent inwardly toward the center, thus forming radial ribs for partially closing that end, which is also formed with a corresponding sheet-iron flange 23. Around this

cylinder is wound No. 10 galvanized wire in a continuous length, so as to form a spiral from end to end, with a space of about one-half an inch between the adjacent wires.

The almonds are fed into the partially-closed end from a V-shaped box or hopper C, and the cylinder being rotated any dirt, sticks, or leaves will pass out between the spirally-arranged surrounding wires, while the almonds will be delivered from the lower end of the cylinder into the second part or huller. It is to this second part that a portion of my present improvement applies, and it is constructed as follows: The cylinder D is the hulling-cylinder and is mounted on sleeves E at each end and revoluble independently of the inner shaft H, upon which they turn by a sprocket F, having suitable connection with the driving-shaft G. This cylinder is made with spokes 24 radiating from the sleeves and having rims 25 situated near its ends. The periphery of this cylinder is surrounded with a wire-netting of suitable mesh, and at its receiving end there is an inwardly-bent metal flange D', adapted to guide the nuts as they pass in from the preliminary cleaner.

The shaft H, upon which the cylinder-sleeves or journal-boxes turn, is driven at a higher rate of speed than the cylinder by means of the sprocket-gearing I. Upon this shaft H, intermediate between the sleeves, are arms J, formed of wires bent to form double loops, the bights of which turn backwardly with relation to the direction of the rotation of the shaft H. The cylinder D and the arms J revolve in the same direction; but the arms revolve with much greater rapidity than the cylinder, the speed of which is, however, sufficiently great to lift the almonds as they pass into it from the cleaning-cylinder up to near the top, whence they drop into the more rapidly revolving arms J, which, forcibly throwing the nuts against the inside of the cylinder, loosens the exterior hulls. This device acts efficiently upon all sizes of nuts as they pass through it, neither crushing large nuts nor allowing smaller ones to escape unhulled. From this second portion of the machine the nuts and hulls are delivered by means of a chute or guide *k* into a hollow cylinder or separator K, mounted upon a shaft L, inclined

oppositely to the shaft H and constructed with sets of radial spokes 26 projecting outwardly and carrying rims M, upon which the outer surface of the cylinder is formed and supported. These rims M are here shown as four in number, one about fifteen inches from the receiving end of the cylinder, two about midway, and the outer one about fifteen inches from the lower or discharge end. The whole length of this part of the apparatus is approximately about seven feet by one and one-half feet in diameter, the inclination being about four inches for the entire length. Upon the rims are fastened eight heavy wire bars 27, made of about No. 7 or No. 8 wire, fixed equidistant from each other and parallel with the shaft, and at the upper end these ribs terminate with a sheet-iron flange N', bent inwardly toward the center, so as to form a partially-closed end. Around the first portion of the upper section of this cylinder is secured a wire screen N, made, preferably, of from No. 15 to No. 18 wire having one-half to three-fourth inch mesh. This allows the kernels or broken almonds to pass out into a box (not shown) which is situated below. The remaining portion of this section of the cylinder K is spirally wound with wire similar to the cleaning-cylinder B. The next four and one-half feet of the cylinder K are covered with No. 10 galvanized wire, extending around this portion for its entire length, as shown at O. This wire is bent so as to form angles and when applied is in appearance corrugated or zigzag, the wires being nearly equidistant apart with a space of from one-half to five-eighths of an inch between them. These angular spaces allow the cup-shaped hulls to pass out through them, especially at the angles, which are of such shape that the hulls, although wider than the spaces themselves, will fall into such position as to slip through. These angles are such that they occur about every one and one-half inches around the circumference of the cylinder. The remaining portion P of this cylinder K, which includes the rest of my improvements, is made of wire-netting so loosely woven that the shape of the mesh may be changed by twisting one of the rims M with relation to the adjacent one, the netting being secured on those two rims. In its normal shape the wires of this netting cross each other substantially at right angles. The rim at the discharge end is secured by a set-screw k^3 , and rods k^4 extend between this rim and the next one exterior to the netting and hold the rims and netting firmly in place. When it is desired to change the form of the meshes, the set-screw k^3 is loosened, the rods k^4 being also slackened, so as to allow one rim to turn with relation to the other. This twists the netting so as to make the meshes of a more elongated and narrower diamond form. The set-screw is then fixed and the rods are placed and tightened to hold the netting in its new position. This method allows of a consider-

able adjustment of the meshes in the section P of the cylinder K, so as to suit different sizes of nuts and hulls.

Power may be applied in any suitable manner to the shaft of the huller, and by means of a pulley upon this shaft and upon the shaft of the separator the latter, which runs easily, can be driven by a belt passing around the two pulleys. The separating-cylinder is also driven from the huller-shaft by means of pulleys and belts applied in any suitable manner which is most convenient for operation.

The contents of the separator are discharged upon an endless smooth belt Q. The almonds will drop off at the lower end of the belt into a box, while the hulls will be carried up the belt and over its upper end. Slats R may be stretched across the belt to check the rolling of hulls downwardly, but the nuts will be allowed to pass beneath.

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

1. In an apparatus for cleaning, hulling and separating almonds, the combination of a cleaner, a rotary cylinder into which the unhulled almonds are delivered from said cleaner, said cylinder having a wire covering and a metal flange at the receiving end, a central inclined shaft, the sleeves mounted upon said shaft and radial spokes and peripheral rims connecting the sleeves with the cylinder, radial arms on the shaft between the sleeves, having their outer ends bent into loops and turned backwardly with relation to the direction of rotation of the shaft, and means for rotating the shaft and cylinder at different rates of speed.

2. In an apparatus for cleaning, hulling and separating almonds, the combination of a separator comprising a sectional cylinder having a covering of loosely-woven wire, rims fitted to said cylinder and rods extending between said rims adapted to hold the heads and netting together, a shaft for said cylinder, and sleeves on said shaft and having arms connecting with the rims, one of the said rims adapted to be turned axially with relation to the other, for changing the form of the meshes of the loosely-woven wire.

3. In an apparatus for cleaning, hulling and separating almonds, the combination of a frame, a feed-hopper, a rotary cleaning-cylinder having its periphery formed of spirally-coiled wire with interstices for the escape of the dirt, a hulling-cylinder, having a periphery of wire-netting and having a flange at its receiving end adjacent to the discharge end of the cleaning-cylinder, a shaft for the hulling-cylinder, sleeves loose on said shaft and radial spokes and peripheral rims connecting the sleeves with the periphery of the cylinder, arms on said shaft, extending radially and having their outer ends bent into loops and turned backwardly with relation to the rotation of the shaft, means for rotating the sleeves and cylinder, and means for rotating the shaft at

a higher rate of speed than that of the cylinder.

4. In an almond-hulling device, the combination with cleaning and hulling cylinders, 5 of a shaft, a sectional separating-cylinder consisting of peripheral spaced rims, interior sleeves mounted on said shaft, and connecting radial spokes, said separating-cylinder having a wire-netting covering, one section 10 of which, between adjacent rims, is loosely woven and one of said rims and sleeves axially mounted so that it may be turned to adjust the meshes of the said section, means for holding the parts after adjustment, and rods 15 extending from the outermost rim to the adjacent one and holding the rims and netting together, said rods having their outer ends bent so as to embrace the terminal rim, and means for rotating said shaft.

20 5. In an almond-hulling device, cleaning,

hulling and separating cylinders journaled in a single frame with relation to each other so that the unhulled almonds delivered into the first cylinder are transmitted successively and continuously from one to another, an inclined rotary separating-cylinder into which 25 the nuts and hulls are delivered having an adjustable network-covered section thereof, an inclined traveling belt to receive the discharge from the cylinder and separate the 30 nuts from the hulls and transverse bars fixed above the belt at such a height as to allow the nuts to pass and prevent the hulls from rolling downward upon the belt.

In witness whereof I have hereunto set my hand. 35

JAMES ELLIOTT BEACH.

Witnesses:

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