2 Sheets—Sheet 1.

H. T. DOUGLAS.

Sugar Cane Mill.

No. 29,773. Patented Aug. 28, 1860.

Fig. 1

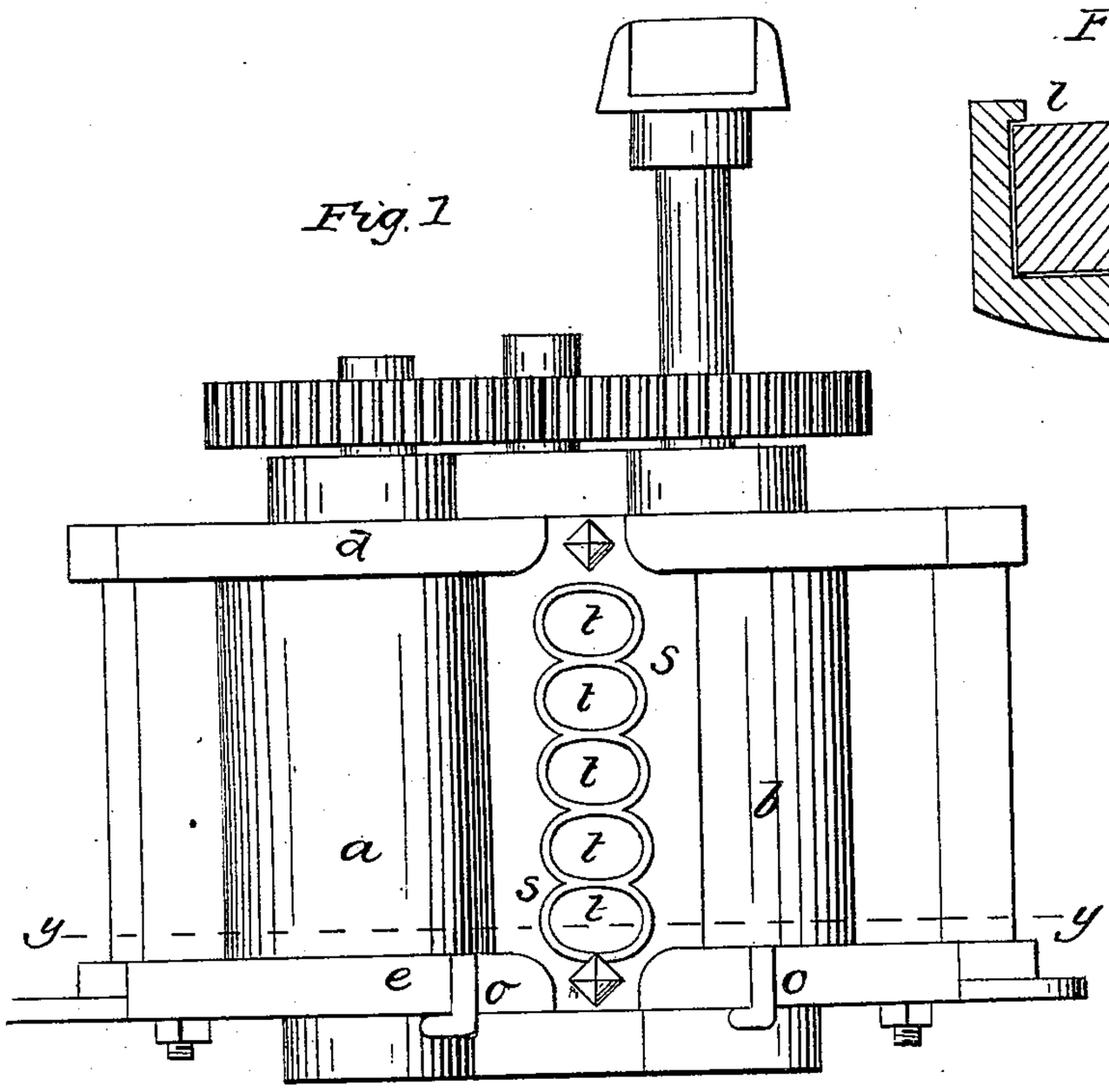


Fig. 6

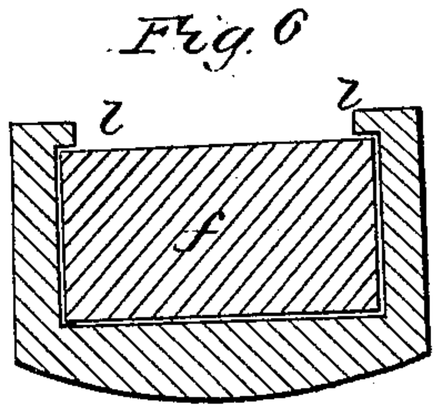


Fig. 4

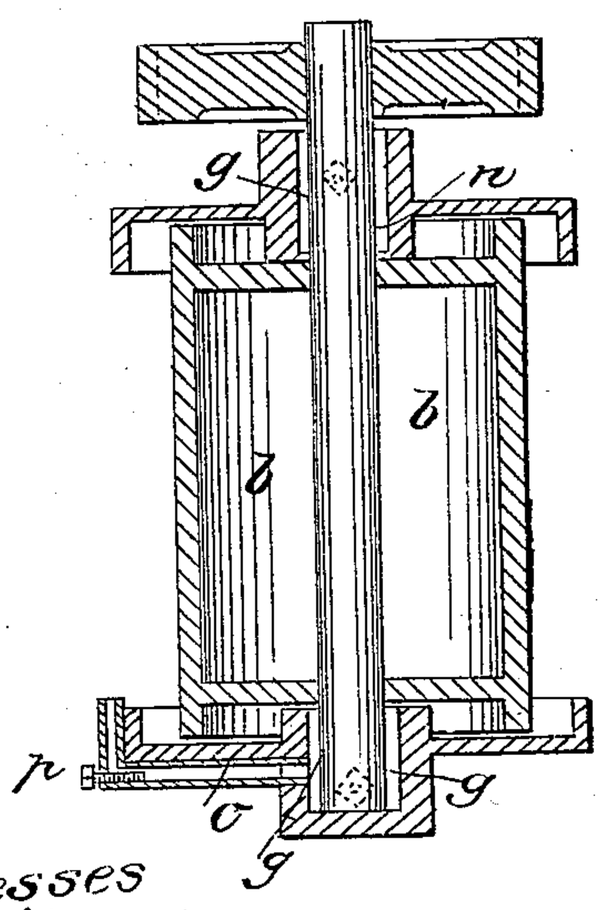
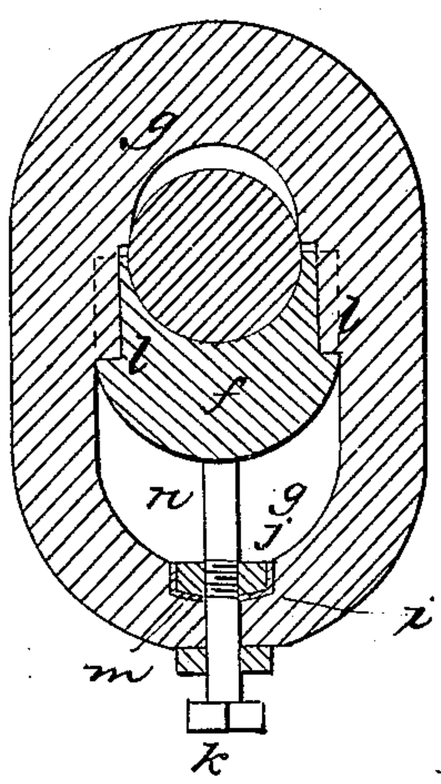


Fig. 5



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2 Sheets—Sheet 2.

H. T. DOUGLAS.

Sugar Cane Mill.

No. 29,773.

Patented Aug. 28, 1860.

Fig. 2

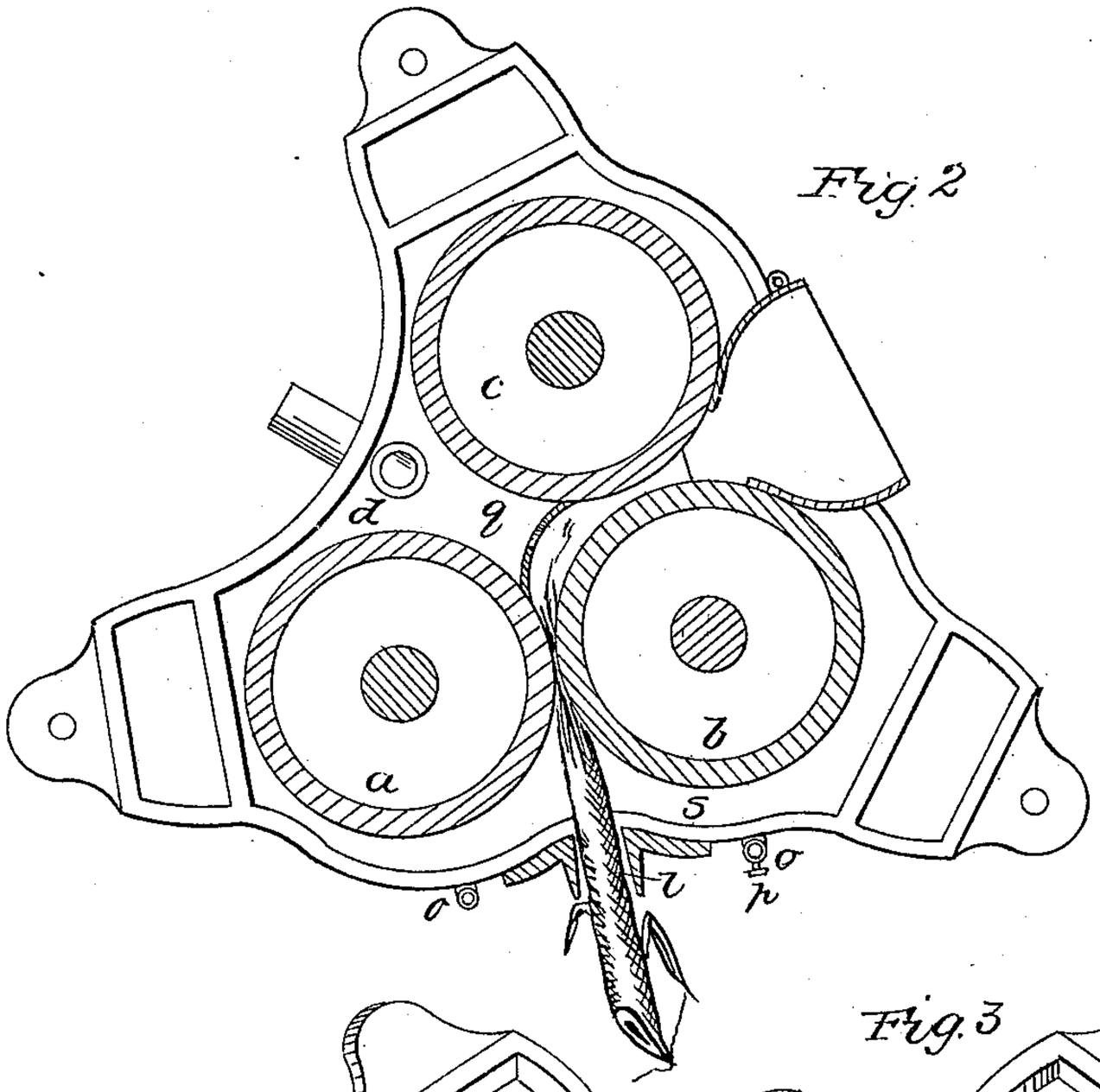
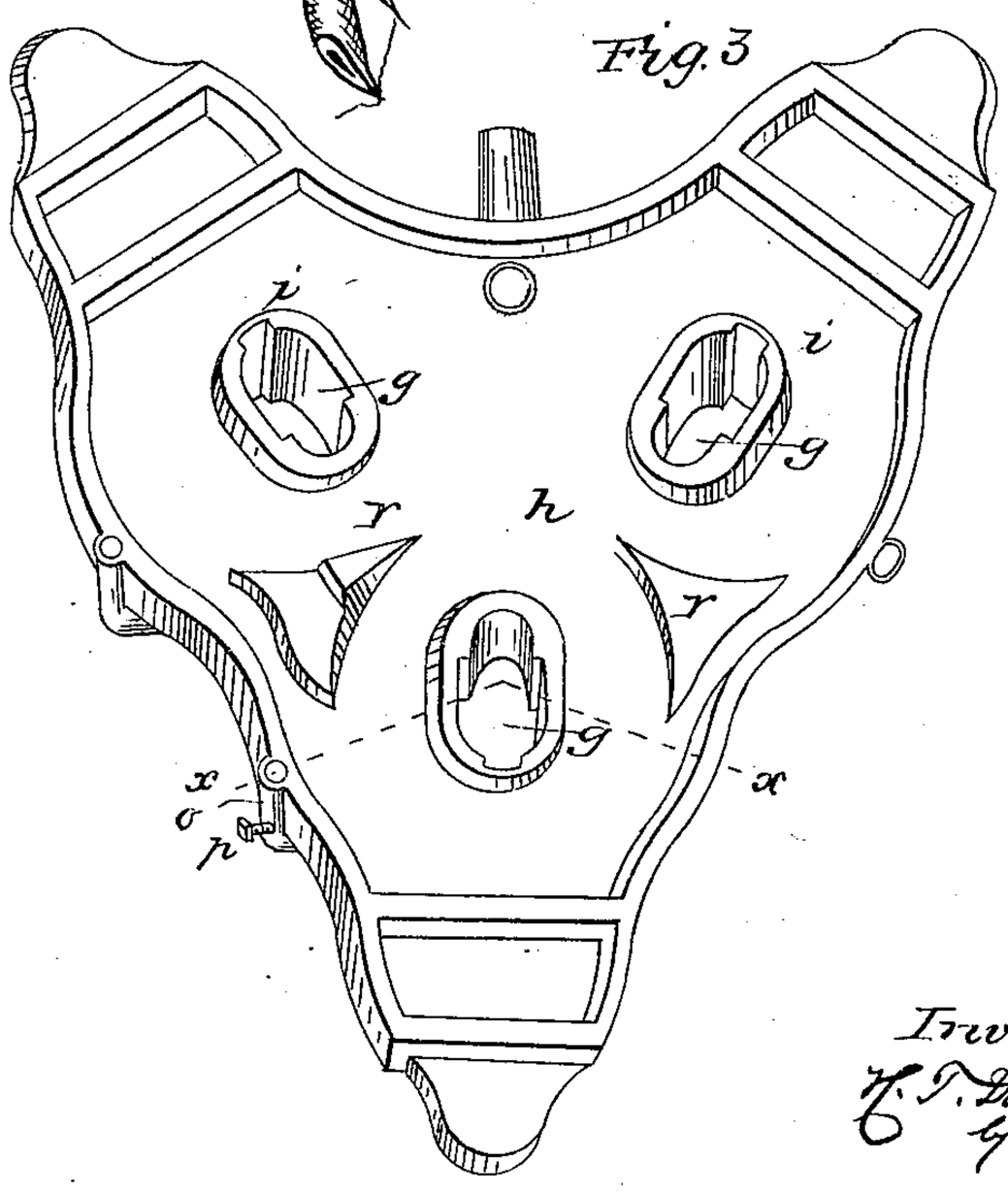


Fig. 3



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UNITED STATES PATENT OFFICE.

HUGH THOS. DOUGLAS, OF ZANESVILLE, OHIO.

IMPROVEMENT IN SUGAR-CANE MILLS.

Specification forming part of Letters Patent No. **29,773**, dated August 28, 1860.

To all whom it may concern:

Be it known that I, HUGH T. DOUGLAS, of Zanesville, in the county of Muskingum and State of Ohio, have invented a new and useful Improvement in Sugar-Cane Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side view, and Fig. 2 a horizontal section, of my improved mill. Fig. 3 is a perspective view of the bottom plate of the mill. Fig. 4 is a section in the line *x x*. Figs. 5 and 6 are detached views of the lower journal-boxes.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of my invention consists, first, in combining a series of thimble-shaped sharp-edged feed-openings with the rollers of a sugar-mill, for the purpose of preventing the cane from being broken, and supporting, guiding, and perfectly stripping it while being fed to the rollers of the mill.

It consists, second, in peculiarly-formed elliptical boxes having horizontal shoulders formed on their inside, in combination with adjustable bearing-blocks, in the manner and for the purpose described.

It consists, third, in constructing, on the top and bottom plates of a sugar-mill, V-shaped inclined planes, which come between the rollers and prevent the cane from working between the ends of the rollers and the plates, and thereby obstructing the working of the mill.

It consists, fourth, in providing a passage in the elbow of the oil-siphon pipe, and fitting a screw in the same, for the purpose hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Three rollers, *a b c*, are arranged on vertical shafts, the bearings of which are in a top and a bottom plate, *d* and *e*, the two plates being bolted firmly together, so as to constitute a solid frame for the whole machine. The ends of the roller-shafts bear against blocks *f*, which are placed in elliptical recesses *g* in the top and bottom plates, *d* and *e*. The great axis of each of these ellipses is in line with the common center, *h*, of the three rollers, *a b c*. That side of the elliptical recess, which is remotest from center *h*, is made with an upright slot, *i*, which receives a small plate, *j*. This plate, *j*, bears against the block *f*, and a set-screw, *k*, screws through the flange, forming the circumference of the elliptical recess into the plate *j*. By working these set-screws *k* the rollers can be set at a greater or less distance from the common center of the rollers, so as to adjust the distance between each two of the rollers. The inner edges of each of the recesses or boxes are provided with little shoulders *l*, under which the forward portion of the block *f* will slide as the block is screwed up against the roller-shaft by means of its set-screw *k*. These shoulders prevent the blocks of the recesses of the plate which is at the bottom of the mill from slipping up, so as to come to rest against the roller ends, and thereby increase the friction. If all the recesses of the lower plate are made with such shoulders, the blocks will always be retained in their proper places, although the machine may be reversed while being transported, &c. The recesses are provided with suitable leather washers, *m n*, so as to prevent unnecessary loss of lubricating substance. The end of each elliptical recess which is nearest the center *h* is not in contact with the roller-shaft, because the rollers are pressed from the center *h* outward. This open space at the inner end of each recess is filled with sponge or other porous material, to suck up the lubricating substance and distribute it over the whole length of the shaft inside of the recess. The recesses of the bottom plate are each provided with horizontal pipes *o*, bent upward at their outer ends. These pipes serve for the passage of the lubricating substance into the bottom-plate recesses. A screw-hole is cut into each of these pipes at the point where it is bent upward. This screw-hole, which is closed up by a male screw, *p*, is in line with the horizontal part of the pipe *o*. On removing the screw *p*, a wire may be inserted through pipe *o*, for the purpose of cleaning it whenever it should have become clogged by impurities mixed with the lubricating substance. In or near the center *h* there is a returner or curved plate, *q*, which is intended to guide the cane as it issues from be-

tween the two rollers *a b* toward and between the rollers *a c*. The latter two rollers may be set closer together than the first pair, *a b*, so as to subject the cane to a final and increased pressure.

The plates *d* and *e* are each provided with two projections, *r r*, between the rollers *a b* and *a c*. The sides of these projections fit (as nearly as possible) the circumferences of the two rollers between which they are arranged, and the upper surface of each of these projections forms an inclined plane rising toward the apex of the somewhat triangular outline of the projection, this apex being close to or at the point where the two rollers are nearest together. These incline projections serve to guide the cane in its passage through the rollers, and prevent it from getting between the roller ends and the top and bottom plates, *d e*, and thereby entangling with the roller-shafts, and obstructing proper operation of the mill. In front of the two rollers *a b* there is a plate, *s*, fastened to the plates *d e*, and made with a series of circular or elliptical flanges or thimbles, *t*, the outer edges of which are sharp. The cane-stalks are fed through these thimbles toward and between the first two rollers, *a b*. These thimbles possess a double advantage over the perforated plate heretofore in use for the same purpose. The stalks resting on the whole length of the thimbles are steadied and kept in the proper direction toward the point where they are to enter between the two rollers *a b*, and are (in consequence of the greater length of the supporting-surface) prevented from breaking by their own weight, and thus obstructing their free passage through the openings in the guide-plate. This liability to break is a serious impediment in the usual mill, where the guide-plate has no flange or thimbles, and the cane-stalks are supported on a length equal to the thickness of the guide-plate only.

The object of making the thimbles elliptical is to allow the stalks to pass through without hindrance, even when (as they are fed in close succession, one after the other) two of the butt-ends should happen to meet, which is frequently the case. The outer edges of the thimbles are sharp, in order to strip the cane (while passing through the thimbles) of whatever of the foliage may still adhere to it.

By the combination of the above-described devices, I obtain a mill which works with great ease and precision, and which is at the same time very durable, and not liable to get out of order.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Constructing, on the top and bottom plates of a sugar-mill, V-shaped inclined planes which come between the rollers and prevent the cane from working between the ends of the rollers and the plates, and thereby obstructing the working of the mill, substantially as set forth.

2. The combination, in a sugar-mill, of the incline projections *r r*, elliptical boxes *g*, with shoulders *l*, and the feed-plate *s*, the whole constructed, arranged, and operating substantially as described, for the purposes set forth.

HUGH THOS. DOUGLAS.

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