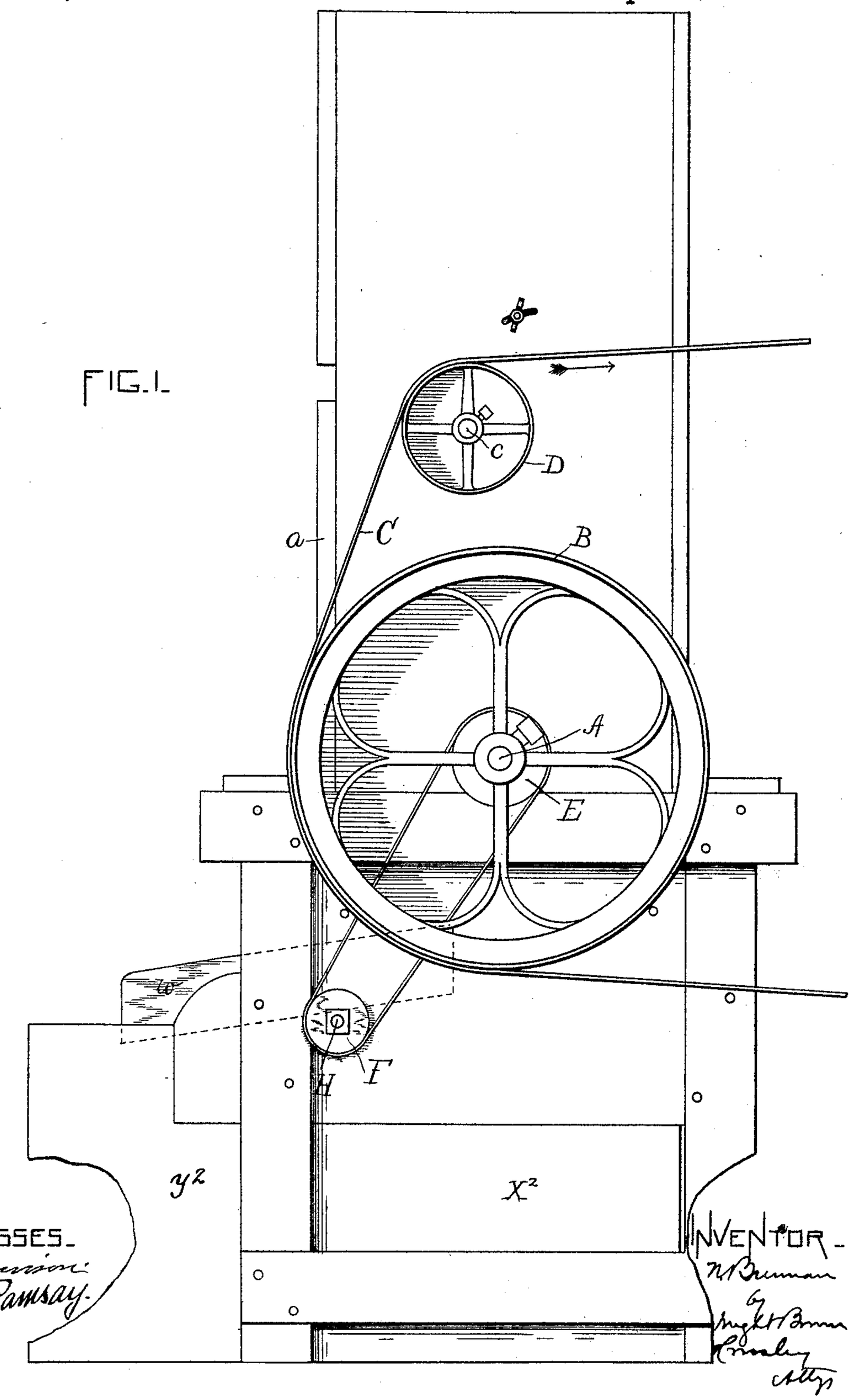
(No Model.) 4 Sheets—Sheet 1.

N. BRENNAN.

CORN SHELLER AND GRINDER.

No. 410,399. Patented Sept. 3, 1889.

FIG. 1.



WITNESSES.
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(No Model.) 4 Sheets—Sheet 2.

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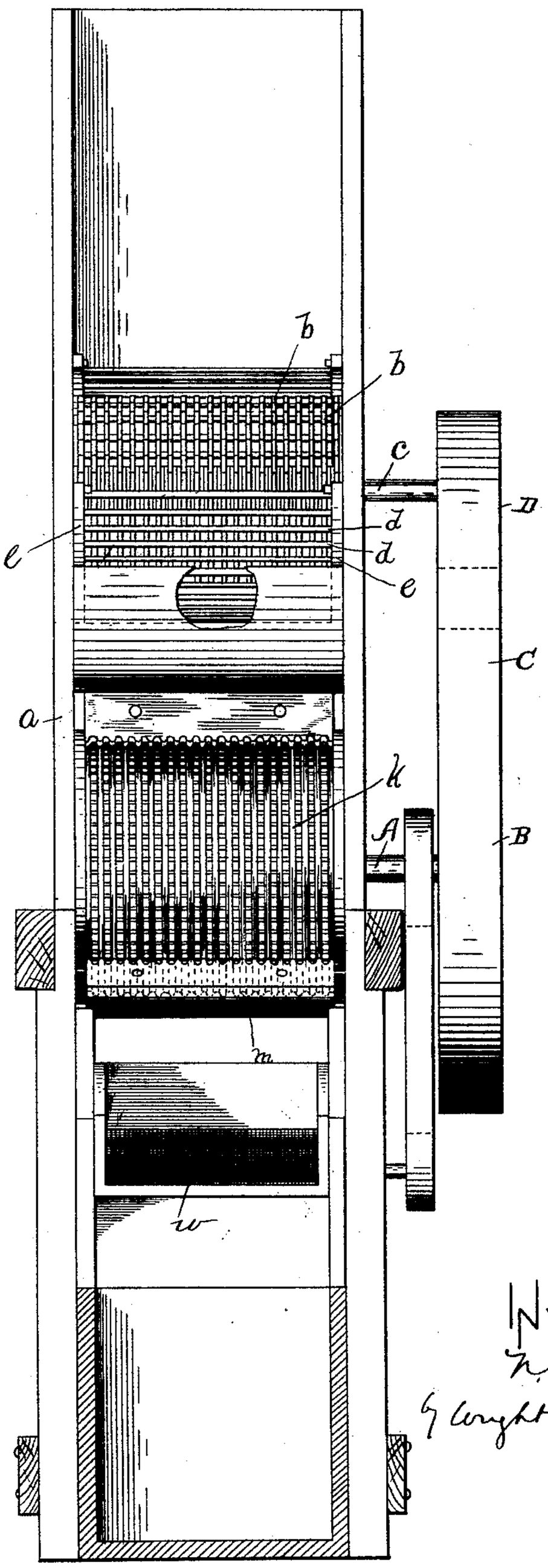
FIG. 2.



WITNESSES.
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(No Model.) 4 Sheets—Sheet 3.

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CORN SHELLER AND GRINDER.

No. 410,399. Patented Sept. 3, 1889.

FIG. 3

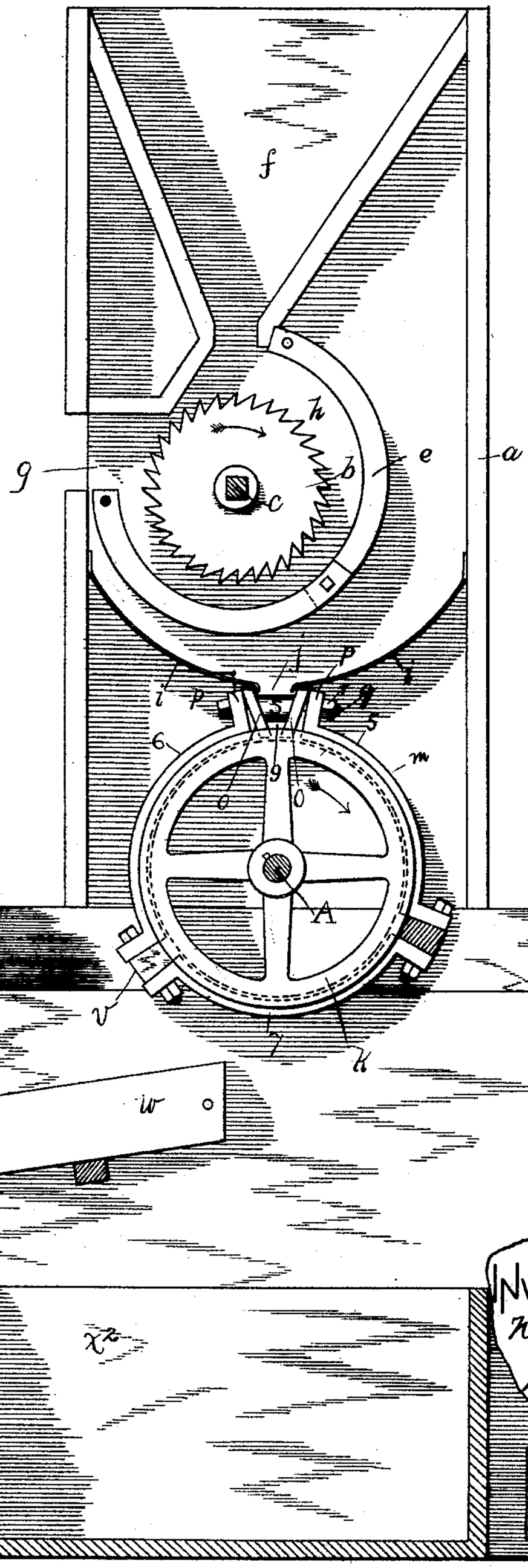

FIG. 8.

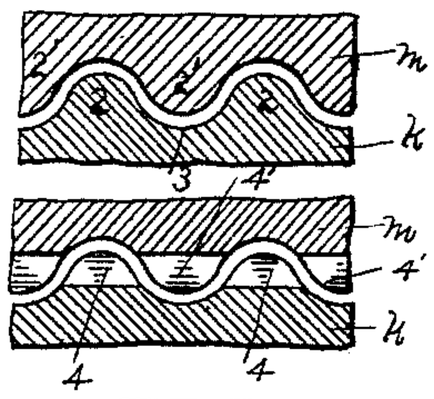

FIG. 9.

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(No Model.) 4 Sheets—Sheet 4.

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CORN SHELLER AND GRINDER.

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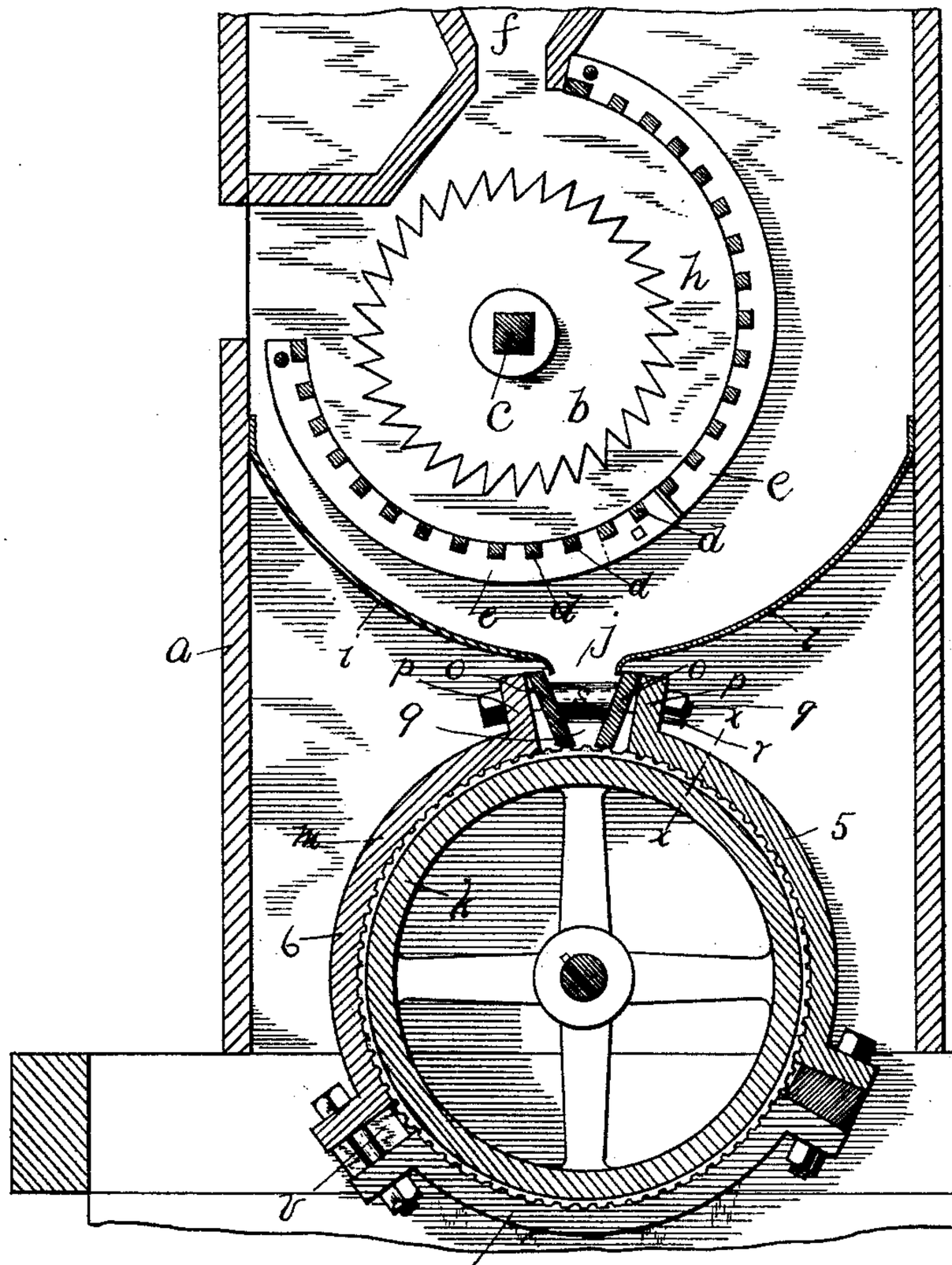

FIG. 4

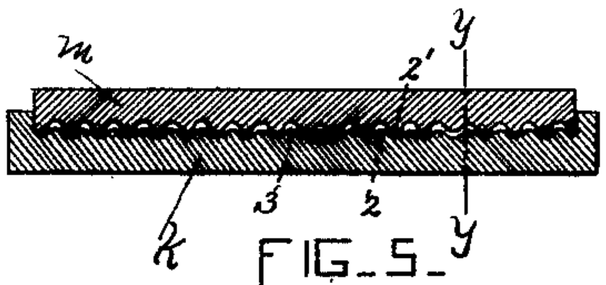

FIG. 5.

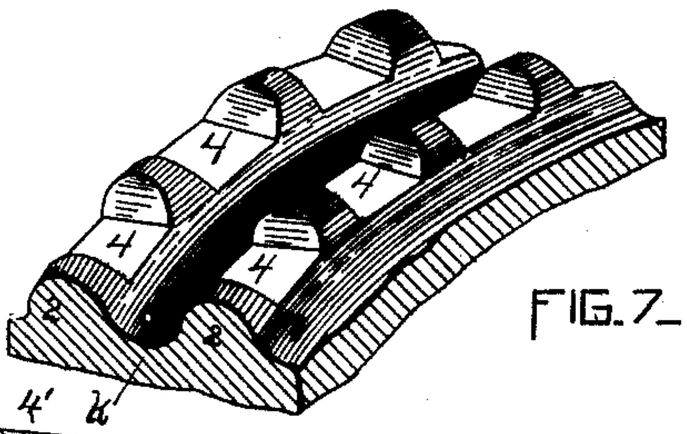

FIG. 7.

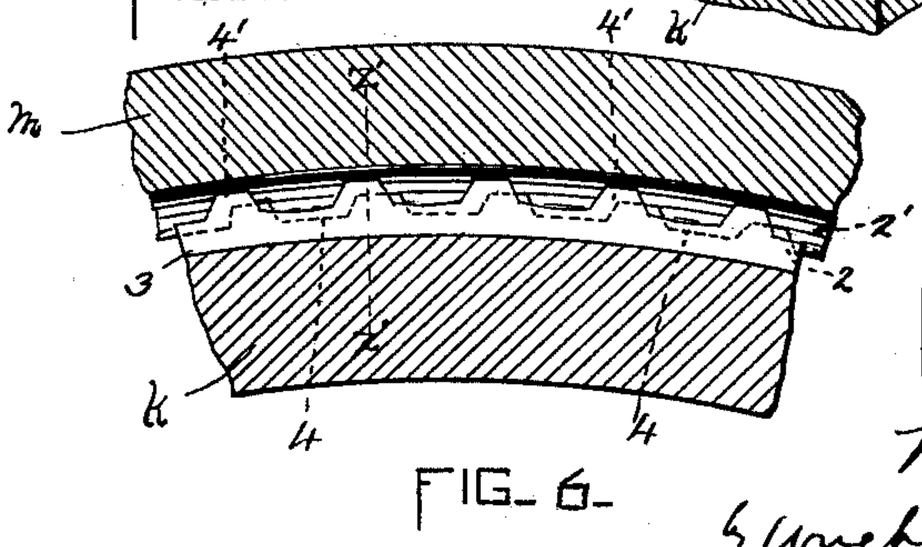

FIG. 6.

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UNITED STATES PATENT OFFICE.

NICHOLAS BRENNAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO LEROY P. LAWRENCE, OF SAME PLACE.

CORN SHELLER AND GRINDER.

SPECIFICATION forming part of Letters Patent No. 410,399, dated September 3, 1889.

Application filed April 29, 1889. Serial No. 308,931. (No model.)

To all whom it may concern:

Be it known that I, NICHOLAS BRENNAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Corn Shellers and Grinders, of which the following is a specification.

This invention has for its object to provide an improved machine for both shelling and grinding or cracking corn; and it consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of my improved sheller and grinder. Fig. 2 represents a front elevation of the same, a portion of the casing and one of the sections of the concave of the grinder being removed. Fig. 3 represents an end elevation, with one end of the casing removed. Fig. 4 represents a transverse section of a part of the machine. Fig. 5 represents a section on line *x x*, Fig. 4. Fig. 6 represents an enlarged section of a portion of the grinding-cylinder and concave on line *y y*, Fig. 5. Fig. 7 represents a perspective view of a portion of the grinding-cylinder. Figs. 8 and 9 represent sections, respectively, on lines *z z* and *z′ z′*, Fig. 6.

The same letters and figures of reference indicate the same parts in all of the figures.

In the drawings, *a* represents the frame or casing inclosing the shelling and grinding devices.

The shelling devices consist of a series of saws *b*, mounted side by side upon shaft *c*, which is journaled in suitable bearings on the casing, and a concave grate or sieve composed of parallel bars *d d*, attached at their ends to curved end pieces *e*, which are attached to the casing, and are substantially concentric with the arbor *c*. The bars *d* are parallel with said arbor, and are separated by spaces of sufficient width to permit the passage of kernels of corn between the bars without permitting the passage of corn-cobs.

f represents a spout or hopper above the series of saws *b*, said hopper feeding the ears of corn into the annular space *h* between the saws and the concave grate. The ears of corn are carried by the rotation of the saws through the said annular space, and by the conjoint action of the fixed bars and the revolving saw-teeth the kernels of corn are detached and allowed to fall through the grate, the cobs passing out through an escape-opening *g*, with which the space *h* communicates.

Below the grate are two partitions or diaphragms *i i*, preferably of sheet metal, attached at their outer edges to the sides of the casing, their inner edges being separated by a slot or opening *j* over the center of the grinding-cylinder *k* and grinding-concave *m*. The grinding-cylinder is composed of cast-iron or other suitable metal, and has a series of peripheral ridges 2 2, separated by peripheral grooves 3. Said ridges are provided with transverse slots or recesses 4, the ends of which, in conjunction with the portions of the ridges between said slots, form double-ended grinding-teeth, each tooth having two operative ends, so that the cylinder can be operated while rotating in either direction. The concave *m* is composed of sections 5 6 7, connected by bolts passing through flanges on the ends of the sections. The inner surfaces of said sections are provided with ridges 2′, divided into double-ended teeth by transverse slots 4′, said slots and teeth being formed like those on the ribs of the cylinder. The ribs of the concave project into the grooves between the teeth of the cylinder, and two series of ribs by their conjoint action reduce the kernels of corn to a degree of fineness which is determined by the space between the cylinder and concave. The sections 5 and 6 of the concave, which cover the upper portion of the cylinder, are separated by an opening 9, which coincides with the opening *j*, between the diaphragms *i i*. In said opening are two longitudinal strips *o o*, which are secured to bear against the flanges *p p*, which constitute the sides of the opening, and form a tapering throat, through which the corn passes. Said flanges *p p* are connected by bolts *q q*, passing through the flanges and having nuts bearing on the outer sides of the flanges. On said bolts, between the flanges and between the strips *o o*, are placed springs *s s*, which are preferably rubber tubes or collars. Said springs are compressed, and act to press the flanges *p p* outwardly against the

heads and nuts of the bolts. When said nuts are screwed up, the flanges *p p* are forced toward each other, and the diameter of the concave is diminished, thus causing the corn to be reduced to finer particles. When said nuts are turned in the opposite directions, the springs *s s* expand and increase the diameter of the concave, thus causing coarser grinding. The strips *o o* are correspondingly adjusted at the same time, so that the feeding-opening between said strips is always proportioned to the adjustment of the concave.

v represents the escape opening for meal or cracked corn. Said opening is a space between two of the sections of the concave, and is arranged over an inclined sieve *w*, which is shaken by any suitable means during the operation of the machine. The finer portions of the meal pass through the sieve into a receptacle x^2, Fig. 3, while the coarser particles fall from the lower end of the sieve to a receptacle y^2.

It will be seen that the described machine is light and simple in construction, and is particularly adapted for use as a portable sheller and grinder, which can be easily set up and transported, and can be operated by a horse-power.

I have here shown the shaft A of the grinding-wheel provided with a pulley B and the shaft *c* of the shelling-saws provided with a pulley D. A belt C runs on said pulleys, as shown in Figs. 1 and 2. The shaft A has a pulley E, which is belted to a pulley F on a shaft H, which shakes the sieve *w*.

It will be seen that the double-ended teeth on the cylinder and concave enable the cylinder to be rotated in one direction until the operative ends of the teeth are worn, and then rotated in the opposite direction, thus virtually bringing new sets of teeth into operation.

The sections of the concave are all alike in form and size, and are all detachably connected by bolts, so that they may be interchanged with each other. The lower section receives the greatest wear, and when this section has become worn one of the other sections may be put in its place. The double-ended teeth of the sections enable either section to be provided with new teeth by simply reversing it, so that the ends which under the original arrangement were at the rear become the front ends.

I claim—

1. The grinding-cylinder having peripheral ribs which are transversely slotted to form double-ended teeth, each tooth having two operative ends, whereby the cylinder is adapted to operate while rotating in either direction, combined with the concave having correspondingly-slotted ribs alternating with the ribs of the cylinder, as set forth.

2. The combination, with the cylinder, of the concave composed of the detachably-connected sections, each provided with ribs, which are transversely slotted to form double-ended teeth, each tooth having two operative ends, the detachable connection of the sections enabling either section to be reversed and make either of the ends of its teeth the acting ends, as set forth.

3. The combination of the grinding-cylinder, the adjustable concave composed of sections 5 6 7 and having the receiving-opening 9 and the discharge-opening *v*, and means for simultaneously adjusting the diameter of the concave and the width of the opening 9, said means consisting in the bolts *q*, connecting the sections at opposite sides of the opening 9, and the springs *s*, interposed between the sections in said opening.

4. The combination of the casing *a*, the shelling devices consisting of the saws *b*, a shaft *c*, journaled in the casing supporting the saws, and the concave grating attached to the casing under the saws, the grinding-cylinder, a shaft A, supporting said cylinder and journaled in the casing below the shaft *c*, the concave inclosing the said cylinder and having a receiving-opening 9 in its upper portion, and a discharge-opening *v* in its lower portion, means, substantially as described, for simultaneously rotating the shafts *c* and A, and the partitions *i i* under the grating of the sheller separated by an opening *j*, which is located over the receiving-opening of the concave, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 20th day of April, A. D. 1889.

NICHOLAS BRENNAN.

Witnesses:
A. D. HARRISON,
ARTHUR W. CROSSLEY.