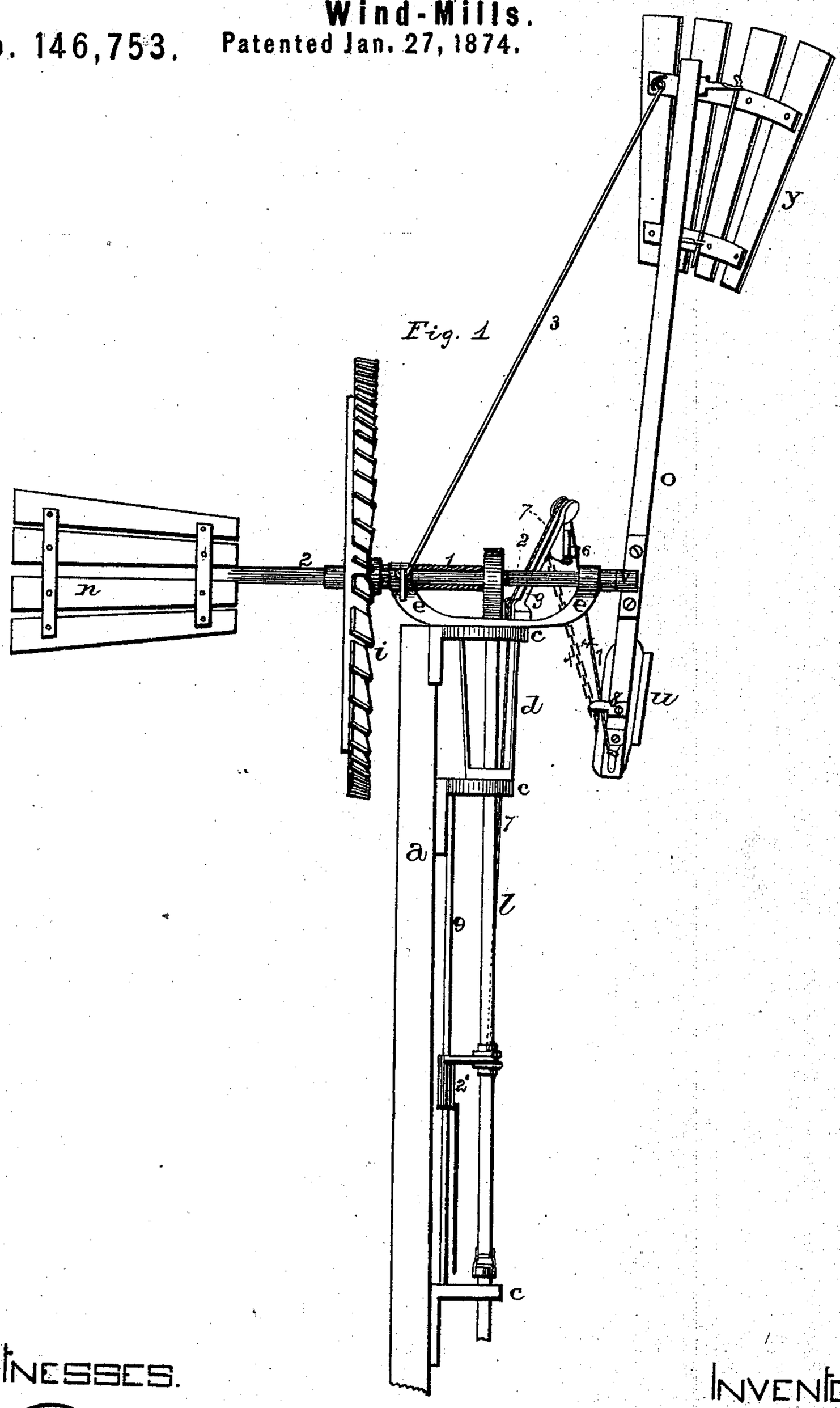
2 Sheets--Sheet 1.

M. CROSSMAN & P. A. SPICER.

Wind-Mills.

No. 146,753. Patented Jan. 27, 1874.

Fig. 1



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2 Sheets--Sheet 2.

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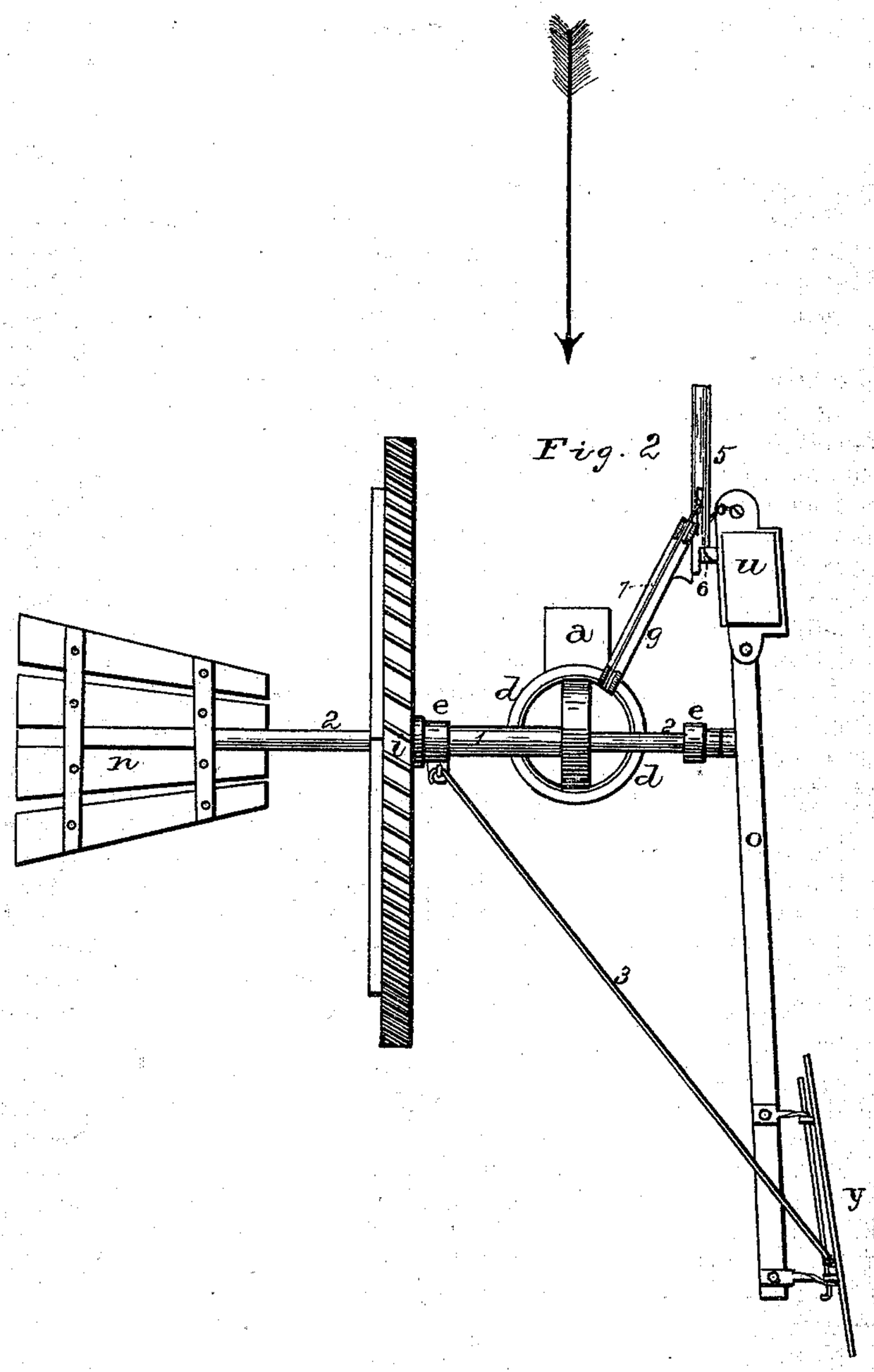

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UNITED STATES PATENT OFFICE.

MONTGOMERY CROSSMAN AND PRATT A. SPICER, OF MARSHALL, MICHIGAN.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **146,753**, dated January 27, 1874; application filed June 23, 1873.

To all whom it may concern:

Be it known that we, MONTGOMERY CROSSMAN and PRATT A. SPICER, of Marshall, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Windmills, of which the following is a specification:

The nature of our invention relates to an improvement in windmills; and it consists in, first, an oscillating vane, secured to a shaft, which allows it to revolve about a quarter of a circle, and which is so constructed that the pressure of the wind against the sails will cause it to turn or bend downward, at the same time causing it to act upon the wheel and vane in such a manner as to swing them more or less around, so as to present only their edges to the wind; second, a pivoted arm or lever, provided with a beveled stop or projection, upon which a catch on the oscillating vane catches and holds this vane in a horizontal position after it has been blown over by a high wind, so as to prevent it from suddenly assuming a vertical position, which it might do during a momentary lull in a storm; third, a shaft having an oscillating vane secured to one end for swinging the wheel around out of the wind, and a common vane to the other, the said shaft being made to rotate by the oscillating vane only about a quarter of a turn, so as to change the common vane from a vertical to a horizontal position; fourth, a hollow arm or sleeve, which passes over the non-rotating shaft to which the wind-wheel is secured, and which has the eccentric formed solidly upon its end, for operating the pitman; fifth, and in the arrangement and combination of parts, which will be more fully described hereafter, whereby a cheap, simple, and efficient windmill is produced.

Figure 1 represents a side elevation of our mill, showing the mill ready for work. Fig. 2 is a plan view of the same, showing the position assumed by the parts during a fierce wind or storm.

a represents the mast, having the two brackets or supports *c* secured to its top, in which the pivot *d* revolves. The turn-table, or upper part of the pivot, is provided with two bearings, *e*, and an arm or support, *g*. The wheel *i*, which may be of any desired kind, is secured to the sleeve 1, which is journaled in one of the bearings *e*, and which passes over, and revolves around, the non-rotating shaft 2, having the eccentric, for operating the pitman *l*, cast or formed solidly with it. Passing through one of the bearings *e* and the sleeve 1 is a shaft, 2, having an ordinary vane, *n*, secured to one end, and an oscillating weighted and winged lever, *o*, keyed or fastened to the other by an arm, *v*, for moving the wind-wheel in and out of the wind. The lever *o* has a weight, *u*, fastened to its lower end, which acts as a counter-balance, and a vane, *y*, to its upper one, which is so hinged as to always stand angling to the wind when the lever is in a vertical position, or nearly so. In order to make the vane always assume this position, we attach a rod, 3, to it, the other end of which is secured to the top of the turn-table, and which, as the lever moves back and forth, turns the vane slightly from or to the wind. The wind, pressing against this vane, presses it over and downward, which causes it to act on the turn-table, and thus move the wind-wheel, revolving behind the mast, more or less around to its side, so as to move it out of the wind. As it moves over and downward, this lever, being rigidly secured to the shaft 2, causes it to revolve or turn about one-quarter way around, and, in so doing, turns the vane *n* from a vertical to a horizontal position, as shown in Fig. 2, so that, when the wheel is swung around so as to be on the side of the mast and present only its edge to the wind, the vane will present only its edge, also. Extending upward and outward from the top of the turn-table is the arm *g*, to which is fastened a stop-chain, 4, to limit the movements of the lever *o*, and a slotted arm or lever, 5, having a beveled stop or projection, 6, extending outward from its side. Passing through the slot in the lever is a cord or chain, 7, having a link or other device secured near to its end, so as to prevent it from drawing through without lifting the arm 5, and which then passes over suitable pulleys down through the pivot, and is fastened to a sliding collar on the pitman.

Should the wind blow too violently, the oscillating lever will be moved over and downward until the weighted end has been raised sufficiently high for the catch 8 to catch on top of the projection 6 on the side of the arm, when the lever

will be retained in this horizontal position, so as to prevent it from too suddenly returning to an upright position, which it might do in a momentary lull of a storm. By a slight pull upon the cord or chain the arm will be raised sufficiently to let the catch 8 slide off the top of the beveled projection, when the weight will instantly return the lever to a vertical position again.

Should it be desired to stop the mill at any time, by pulling upon the cord or chain the lever *o*, with oscillating vane, will descend, and the wind acting on it, it will act as a rudder to swing the wheel around from the rear of the mast to the side, so as to present only its edge to the wind, when it will stop entirely, or revolve but very slowly.

Moving up and down upon a guide-rod, 9, on the side of the mast, is a forked slide, 2′, to which a rope or rod may be attached, so as to extend down within easy reach of a person on the ground, for operating the rope. This slide has two movements—one a vertical sliding and the other a rotary one—so as to accommodate itself to the motion of the pitman.

Having thus described our invention, we claim—

1. The weighted oscillating lever *o*, having the vane *y* hinged to its upper end, and connected to the wind-wheel in such a manner as to swing it around from the rear to the side of the mast, substantially as set forth.

2. The combination of the pivoted arm or lever 5, provided with a suitable projection, 6, and the catch or stop on the oscillating lever, substantially as specified.

In testimony that we claim the foregoing as our invention we hereunto affix our signatures this 11th day of June, 1873.

MONTGOMERY CROSSMAN.
PRATT A. SPICER.

Witnesses:
A. MORTON,
N. A. BROOKS.