J. & E. C. NICHOLS & D. SHEPARD.

Thrashing Machine.

No. 34,071. Patented Jan. 7, 1862.

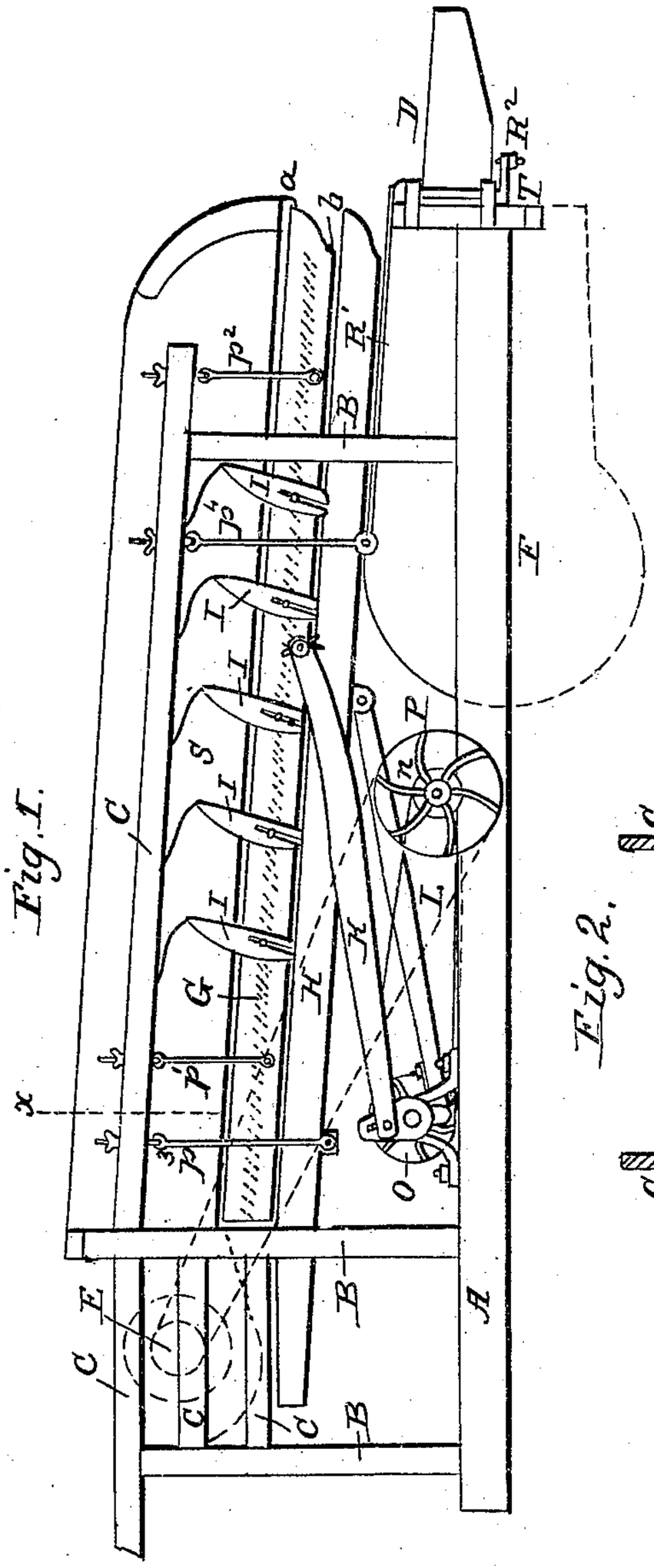

Fig. 1.

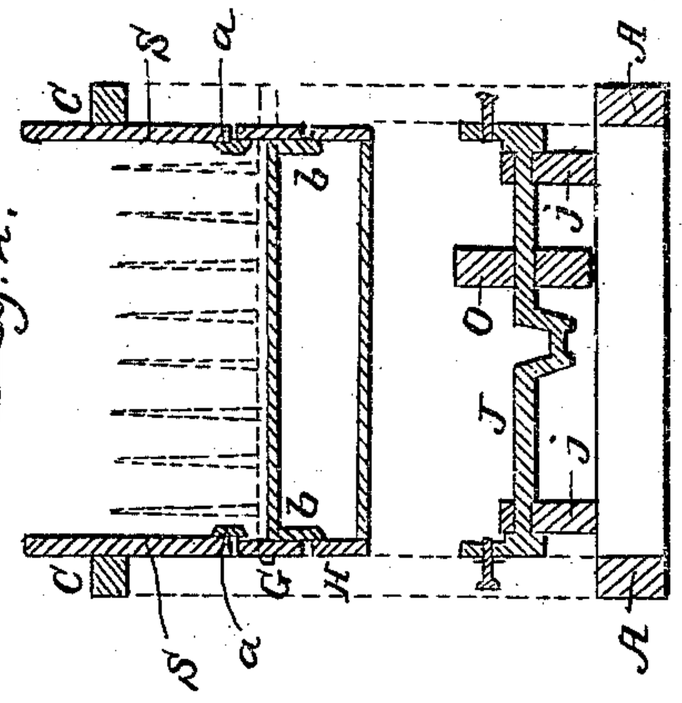

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN NICHOLS, EDWIN C. NICHOLS, AND DAVID SHEPARD, OF BATTLE CREEK, MICHIGAN.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **34,071**, dated January 7, 1862.

To all whom it may concern:

Be it known that we, JOHN NICHOLS, EDWIN C. NICHOLS, and DAVID SHEPARD, all of the city of Battle Creek, in the county of Calhoun and State of Michigan, have invented a new and useful Improvement in Grain-Separators, to be used in connection with thrashing-machines; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation; Fig. 2, a transverse section in the line *x*.

This improvement relates to that class of separators which receive the grain and straw from the thrashing-cylinder on a long inclined "shoe," (suspended by pendulum-rods,) to which a longitudinal swinging or vibratory movement is communicated; and to obviate the shocks produced by such rapid changes of motion in so ponderous a body is the main object of this invention, the several parts being arranged relatively in the manner we are now about to describe.

Similar letters indicate corresponding parts in both the figures.

The combined thrashing and separator frame is of the ordinary kind for this class, A representing the sills, B the posts, and C the hanging rails.

The feed-board, side tables, elevators, &c., are not shown or described, as they do not vary materially from such details in common use, neither does the winnower, with the exception of the mode (hereinafter to be described) of operating the shoe D, containing the sieves. The position of the axis of the thrashing-cylinder is shown at E and that of the fan-blower at F.

S S represent two side boards, nailed or otherwise secured, one on each side at a proper height, to the inside of the frame, for the purpose of confining the straw laterally in its passage from the thrashing-cylinder to the endless straw-carrier. (Not shown.) Immediately below these side boards an open frame G is suspended by two pendulum-rods p' p^2 on each side. These rods are hooked above to "eye-bolts," which pass through the hanging rails C, and are made adjustable by being screwed therein, or, which is better, by means of "thumb-nuts" on the outside. The lower ends work on pins secured in the sides of the frame G and the rods are adjusted in such manner as to allow free vibration. This frame G has the ordinary "lattice" arrangement extending its entire length, (see dotted lines, Fig. 1,) and is provided with the usual series of lifting-fingers for agitating the straw, which are operated by the vibratory motion of the lattice-frame itself through the instrumentality of the attached arms I I I, &c., to the upper ends of which leather straps are fastened, which connect with the rail C in such manner as to be capable of ready adjustment to give the proper motion to the fingers.

Below the open frame G a shallower frame H is suspended by two pairs of rods p^3 p^4 in a precisely similar manner. The frame H has a bottom board, and it extends below the thrashing "concave," so as to receive the thrashed grain which passes through. At the extreme end of this frame, which projects over the sieves, the bottom board is cut out so as to form ranges of bars, between which the thrashed matter is distributed more evenly. Motion is communicated so as to swing or vibrate the two frames G and H simultaneously in opposite directions by means of the crank-shaft J, (revolving in bearings *j j*,) which drives the upper frame G by two external connecting-rods, one of which is seen at K, while the lower frame H is driven by the middle internal crank and the connecting-rod L.

The crank-shaft J receives motion by a belt passing over pulley *o* from a pulley *n* on shaft M. This shaft M may be driven by a belt direct from the main power or from an intervening "jack," or, which is more usual with us, by a pair of bevel-wheels, the driver being keyed to a longitudinal shaft, (not shown,) which couples with the "tumbling-shaft" of the horse-power. In such case we drive the thrashing-cylinder by two belts, one on each side, (see dotted lines,) from overhanging pulleys, one of which is seen at P, Fig. 1.

The vibration of the frame H gives a lateral shake to sieve-shoe D by means of the rods R′ and R², connected, respectively, with the said frame and shoe by an elbow rock-shaft T.

The separations between the two frames G

and H are guarded so as to prevent leakage by projecting strips *a a* and *b b* fastened to the inner sides, but so as to allow plenty of freedom from motion.

The ordinary mode of constructing vibrating separators which receive the grain and straw at one end and convey it to the other is to use but one frame or shoe provided with separating-slats, lifting-fingers, or similar devices, and furnished with a bottom to receive the grain which falls and conduct it on an incline to the sieves. As the effectual separation of the grain from the straw requires great length of surface in the separator, it follows that such a frame is necessarily ponderous and unwieldy, the vibration of which produces a heavy jar and renders it extremely difficult to keep the machine staked down.

To obviate injurious vibration, we divide the ordinary frame or shoe into two parts, as at G and H, and suspend each part independently, causing them to vibrate in opposition to each other; but as it requires a much greater power to operate the sparating portion G than it does the conducting one H an equilibrium of forces would not even then be maintained by opposing vibrations alone. To do this we load the conductor H by causing it to work the sieve in the manner described, which enables us, by a proper adjustment of the extent of the vibration in connection therewith, to preserve a perfect equilibrium and at the same time to operate the sieve-shoe D more economically and to much better advantage than by the usual way.

What we claim is—

The arrangement of the shoe D, the rock-shaft T, rods R′ R^2, the separating and conducting frames G H, operated in different directions by means of the crank-shaft I and its connections, together with the agitating-fingers, the several parts operating conjointly for the separation of grain from the straw, as is herein specified.

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