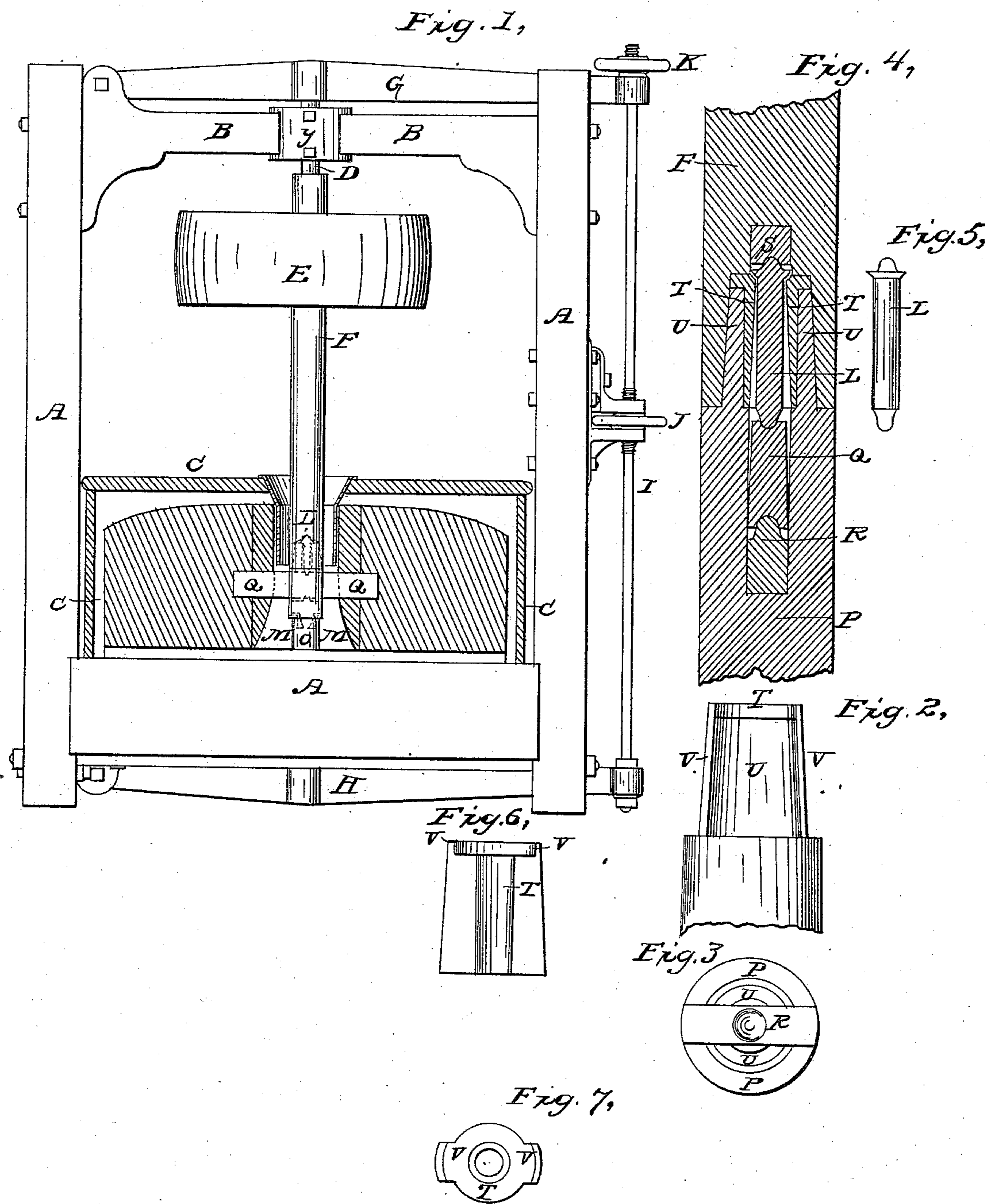


E. T. BUTLER.
Mill Spindle.

No. 8,682.

Patented Jan. 27, 1852.



UNITED STATES PATENT OFFICE.

EGBERT T. BUTLER, OF BUFFALO, NEW YORK.

MILL-SPINDLE.

Specification of Letters Patent No. 8,682, dated January 27, 1852.

To all whom it may concern:

Be it known that I, EGBERT T. BUTLER, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Mill-Spindles, of which the following description, illustrated by the accompanying drawings and references, is sufficiently clear and comprehensive to enable others of competent skill to make and use my invention.

My invention relates to spindles for mills in which the runner stone is held to its work by pressure, and consists in making and uniting the parts of the spindle where they connect to the driver, and connecting them to the driver in such a manner as to secure solidity, compactness, durability, and ease of operation, by the means hereinafter described.

The construction adopted by Eli B. Nichols and David Marsh, and described in the schedule of Letters Patent granted to them under date of October 30, 1849, has been justly popular with millers and is probably the best that has come into general use, but has been found on trial to be subject to the following objections: Viz: The slotted chuck, or cylinder which receives the driving iron, and lower end of the spindle has a projecting shoulder which so fills the eye of the runner stone as frequently to cause light grain and other light substances to rest upon it and clog the eye of the stone, and this shoulder cannot be removed, as it would weaken the chuck to do so, which at the ordinary size is liable to be, and is often broken. Also when the mill is put in motion the tendency of this chuck is to slide backward or turn on the spindle so as to cause the driver or balance iron to bind and thus prevent its free action with the stone, and again the constant wear of the upper edge of the balance iron or driver, on the lower end of the upper part of the spindle, soon permits the stone to play up from its balancing point, this upper edge of driver being in such a position that it cannot be lubricated. These difficulties are entirely obviated by the arrangement herein described.

Figure 1 is a side elevation of the mill showing the runner stone in section, and the interior construction of the spindle and interior parts by dotted lines. Fig. 2 is a side elevation of a section of the lower part of the spindle containing a chuck or driving

key which communicates the motion of the upper part of the spindle to the lower part. Fig. 3 is plan, or top view of the upper portion of the lower part of the spindle without other parts. Fig. 4 is a vertical section of the spindle, showing in section all the parts combined in the improvement. Figs. 2, 3, 4, 5, 6, and 7, are drawn full size.

A is the frame of the mill.

B is a cast iron beam or tie secured firmly by bolts to the upper part of the frame, and through which the center D upon which the tops of the spindle turns, passes to the upper bridge tree G. An adjustable sleeve or socket in the hub *y* receives the center D and thus provides for tramming the stone.

E is the driving pulley to which the power is applied to turn the stone.

F, is the spindle or rather the upper part of it, and P is the lower part of it. In Fig. 1, it is represented as resting on the steel step or center O, and in Figs. 2 and 4 it is shown as adapted to passing through the bush of the bed stone and running in a step below, upon the top of the bridge tree H, or it may pass some distance farther down; and the power to drive the mill may be applied below the bed stone. As shown in Fig. 1, the spindle is represented as terminating in a point in the step O, with a flange at the periphery which surrounds the top of the step to prevent grain or other substances getting into the oil cup which surrounds the point of the spindle as shown by dotted lines. The step O, is made to fit exactly in the bush of the bed stone and rests upon the bridge tree H, by the operation of which it is raised and lowered. From just above the top of the step the lower part of the spindle is made cylindrical as shown in Fig. 4 to a short distance above the driver Q, above which it is turned slightly conical, the base of the conical part being about three fourths of an inch smaller than the cylindrical portion of the spindle. A rectangular mortise is cut through the lower portion of the spindle, from the top of it to about one fourth of an inch below the bottom of the driver and a trifle more than the thickness of the driver in thickness. A hardened steel point R, is inserted in the center of the spindle, below the driver and the driver rests upon it. A cylindrical hole about an inch in diameter is also bored in the top of the lower portion of the spindle extending down as far as the conical part U, extends.

This hole is for the purpose of receiving the driving chuck or key T, represented in section in Fig. 4; in elevation in Fig. 6; in plan in Fig. 7; and partially, in combination with the lower part of the spindle, in Fig. 2, which chuck is turned to exactly fit the hole in the spindle, with a flange on the upper end of it the same size as the top of the part U, and conical like it. The key or chuck T, also has wings V, V, attached to, and forming a part of it, which fit the mortise in the part U, and extend outward about one eighth of an inch beyond the said part U. These projections fit in key seats in the upper part F of the spindle, and are for the purpose of communicating the rotary motion of one part of the spindle to the other. The lower end of the upper part of the spindle is bored out conically to exactly fit the part U, and key seats as before intimated are cut in it to receive the wings v v.

The runner stone is held down to its work by the vibrating center L, shown by dotted lines in Fig. 1; in section in Fig. 4 combined with the other parts; and alone in elevation in Fig. 5. It is made of steel, hardened, and the precise length to fit very exactly between the top of the driver, and the hardened steel step S, which is firmly fixed in the upper part F of the spindle. It passes through the chuck T, which is bored a trifle larger than the center L, at the top and considerably so at the bottom, to allow the center to vibrate to accommodate the vibratory motion of the stone while running. The center L, has also a flange or shoulder near its upper end, and a corresponding recess is sunk in the chuck T, for the purpose of raising the center L with the chuck, when the latter is raised out of the lower part of the spindle, to allow the runner stone to be taken up to dress.

The bridge trees G, and H, are connected by the rod I, and their distance apart is adjusted by the hand wheel K, so as to allow

the spindle no endwise play between the centers D, and O. The runner is then adjusted to the proper distance from the bed stone by the hand wheel J.

C, is the curb around the runner stone, made as usual.

M is a cast iron eye in the runner.

By this arrangement the upper part of the spindle is easily detached, and the driving chuck T, with the vibrating center L, removed so that the runner stone may be easily taken off to dress; and yet the spindle is so firm when put together that it may be driven from below the bed stone without the necessity of having it touch or bear upon it, thus relieving it from a great amount of friction, and allowing the mill to be run at a greater speed than otherwise.

It is indispensable to the successful operation of these mills that the runner stone should be kept perfectly to its work while the stone is in motion. This object is attained by the construction and arrangement of parts herein described, while at the same time it is strong, and durable, operates with ease and freedom, is not liable to get out of order, and what is of considerable importance; there is no enlargement of the spindle to cause the grain to lodge under the driver and thus prevent its free action.

Having thus fully described my invention I claim—

1. Uniting the upper and lower parts of the spindle by means of the driving chuck or key T, made substantially in the manner and for the purposes herein set forth.

2. I do not claim the vibrating center L separately but I do claim it in combination with the driving chuck or key T and the method herein described of uniting the parts of the spindle.

EGBERT T. BUTLER.

Witnesses:

J. G. DICKIE,
H. H. MARTIN.