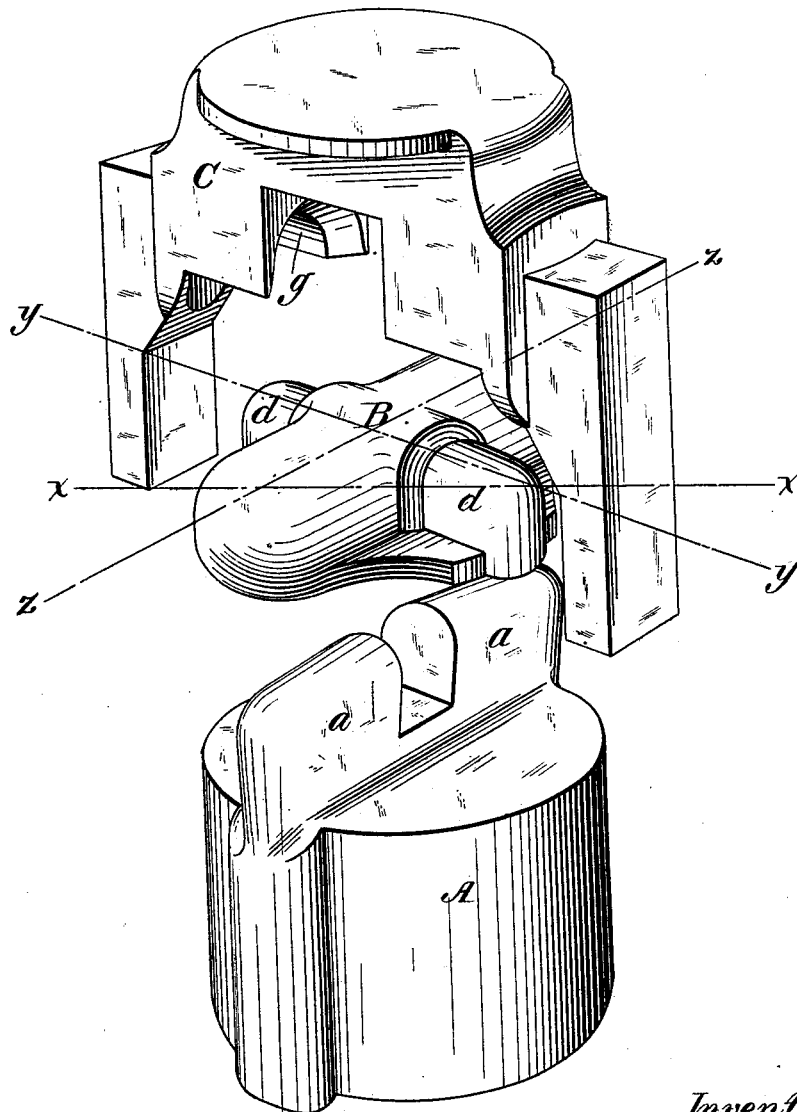


W. T. DUVALL.  
Millstone-Driver.

No. 214,118.

Patented April 8, 1879.

*Fig. 1.*



Witnesses:

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William W. Dodge.

Inventor:

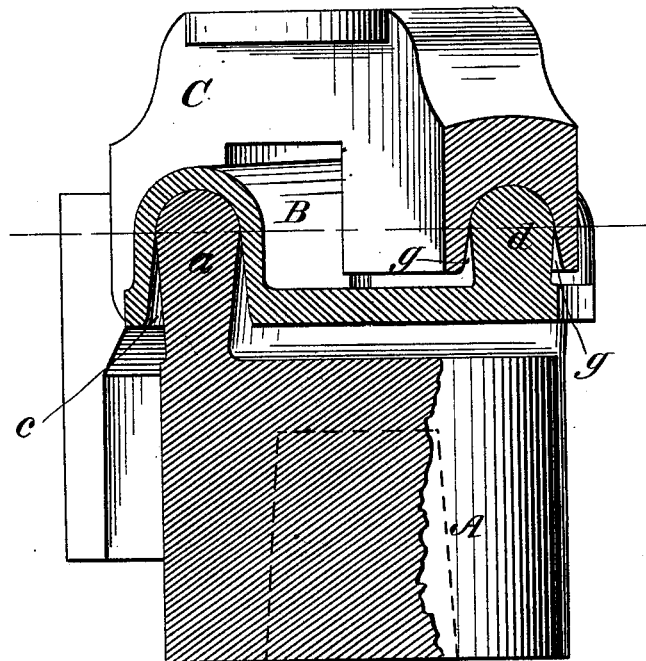
W. T. Duvall  
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Dodge & Son

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*Fig. 2.*



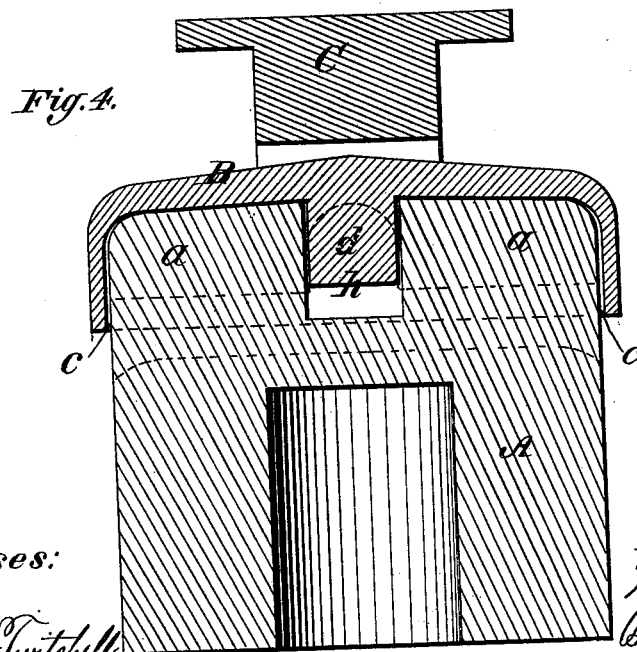
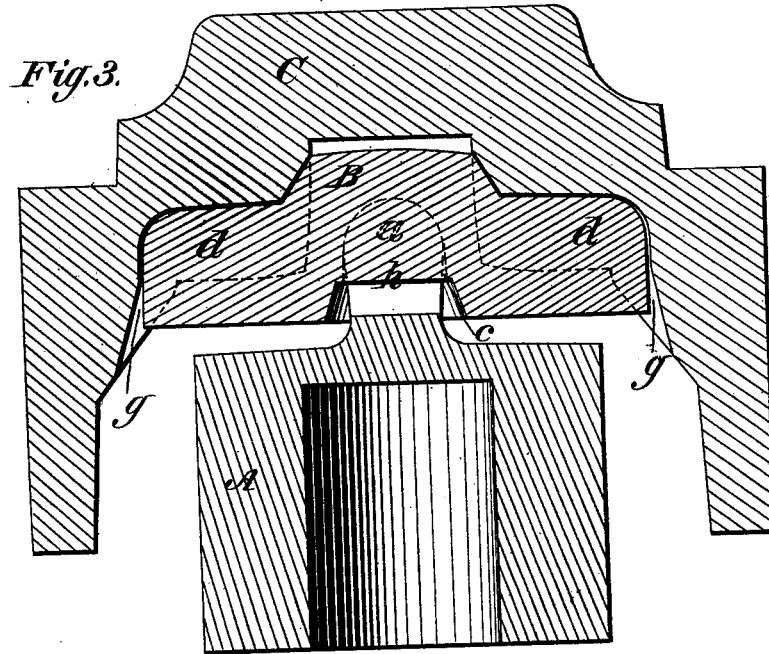
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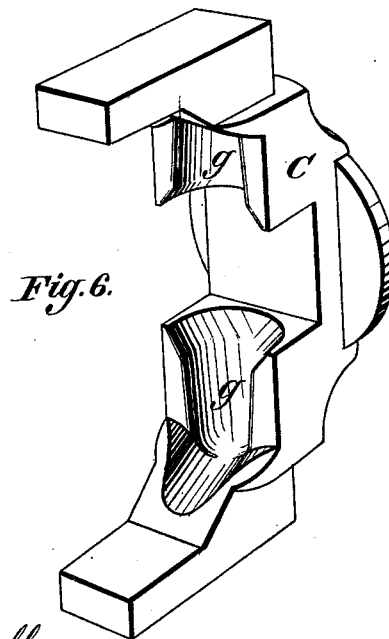
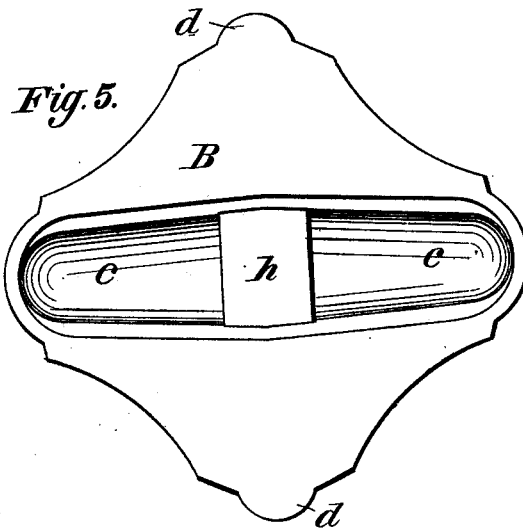
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# UNITED STATES PATENT OFFICE.

WILLIAM T. DUVALL, OF GEORGETOWN, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN MILLSTONE-DRIVERS.

Specification forming part of Letters Patent No. **214,118**, dated April 8, 1879; application filed February 15, 1879.

*To all whom it may concern:*

Be it known that I, WILLIAM T. DUVALL, of Georgetown, in the county of Washington and District of Columbia, have invented certain Improvements in Millstone-Drivers, of which the following is a specification.

The object of this invention is to produce a driver which will permit the runner-stone to adjust itself with ease and freedom to the bed-stone, regardless of the inclination or deviation of the spindle from the perpendicular; to render such driver cheap, simple, and durable; to avoid the usual excessive friction and wear between the parts, and to adapt the driver for use in connection with existing stones and spindles.

With these ends in view the invention consists in constructing the driver of three simple pieces, a spindle-head, a bail or balance-rynd, and an intermediate plate, which parts are provided with and connected in two directions by ribs and grooves, so arranged as to permit a universal rocking or tipping action of the bail, and at the same time impart a positive rotary motion thereto. The parts are constructed in such manner that they may be cast complete and assembled for use without being machined or fitted by hand.

Figure 1 represents a perspective view of my driver with its parts separated and raised from each other, the better to show their form and construction; Fig. 2, a vertical section obliquely through the driver on the line *x x*, showing the manner in which the two joints are arranged in the same horizontal plane; Fig. 3, a vertical cross-section on the line *y y*; Fig. 4, a similar section on the line *z z*; Fig. 5, a bottom face view of the intermediate driving-plate; Fig. 6, a perspective view of the bail or balance-rynd.

In constructing my driver, I first provide a spindle-head, A, consisting of a round cap or body adapted to fit firmly upon the upper end of the usual spindle, to which it will be keyed or otherwise secured, and provided across the center with an elevated rib or horn, *a*, which is rounded on the top and ends, as shown. The best action is secured when the driving ribs or horns are given a slight taper toward the ends. They may be diminished in height and thickness toward the outer ends, as shown

in the drawings, or the outer ends, which receive the most severe strain, may be made the largest, as preferred. I next provide a plate, B, having in its under side a transverse groove or cavity, *c*, adapted to receive the rib *a* of head A and permit the plate to rock or tip sidewise thereon, and also having on the upper side transverse ribs or horns *d*, rounded on their ends and upper sides, as shown. The construction of this plate is such that the groove *c* and the ribs or horns *d* stand at right angles to each other, as shown in Fig. 5, but in the same horizontal plane, as shown in Figs. 2 and 4, the groove being extended upward in the interior to the level of the top of the ribs or horns on the exterior. Lastly, I provide the bail or balance-rynd C, adapted to receive and sustain the stone as usual, and provided in its under side with recesses *g*, to receive the ribs or horns *d* of the plate B, as shown, the construction being such that the bail is susceptible of a limited rocking action on the plate in a direction at right angles to that in which the plate rocks upon the spindle-head.

The parts being constructed and fitted together as above described, it will be seen that the head A supports the plate, and that the latter in turn sustains the bail, and that, as the plate and bail are free to tip in different directions, the bail and stone are allowed a universal tipping action or adjustment with reference to the head and spindle, and this, too, while the plate serves to transmit a positive rotary motion from one to the other.

Owing to the peculiar construction of the plate, by which its connections with the head and the bail are brought in one and the same plane, there is no tendency of the plate to tip sidewise, or of the parts to be thrown away from the center, either by the strain or the tipping action of the stone. Lateral movement of the parts is prevented by the ends of the ribs bearing against the ends of the recesses in which they are seated. As the bail fits over the ribs of the plate and the latter over the rib of the head, the wearing-surfaces are guarded and protected from the entrance of grain or other foreign matters between them.

While it is preferred, for the above reason, to construct the parts as shown, the rib *a* may be made on the plate B and seated in the head,

and the ribs or horns *d* formed on the bail and seated in the plate. As shown in Figs. 1 and 3, the rib *a* is cut away at the center to admit a strengthening or stiffening rib, *h*, which is formed in the center of the plate, as shown in Figs. 3 and 5; but this rib may be omitted and the rib *a* made continuous.

It is to be particularly noted that the construction of my driver is such that its parts may be cast complete and ready for use upon being dropped together; that there are no parts or surfaces which have a vertical sliding action upon each other, as usual; that a very large wearing-surface is provided; that the wearing away of the surfaces will have no tendency to render the parts eccentric, and that in every position of the stone it receives a positive and equal driving force on both sides of the center.

I am aware that various drivers have been devised to permit a universal action or adjustment of the runner-stone, and that among such devices is that known in the art as the "English ring-driver," constructed and operating in the same manner as the ordinary gimbal-joint, and to such device I lay no claim; but,

Having described my invention, what I do claim is—

1. A head, *A*, a bail, and an intermediate driving-plate provided with and connected by ribs and grooves extending in two directions at right angles to each other, as described and shown, said ribs serving the double purpose of fulcrums for the parts to rock upon and of driving devices to transmit rotary motion from the head to the bail.

2. In a millstone-driver, the combination of the spindle-head *A*, the bail *C*, and the intermediate supporting and driving plate *B*, having the groove *c* and arms *d* in one and the same horizontal plane.

3. The combination of a driving-head, a bail, and an intermediate driving-plate provided with vertical interlocking studs and recesses, constructed substantially as described and shown, so as to both sustain and drive the parts and permit a universal movement of the bail wholly upon rolling joints or bearings.

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Witnesses:

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