No. 740,480. PATENTED OCT. 6, 1903.

S. SNYDER.

QUICK RELEASE DEVICE FOR GRINDING MILLS.

APPLICATION FILED JUNE 26, 1902.

NO MODEL.

Fig. 1.

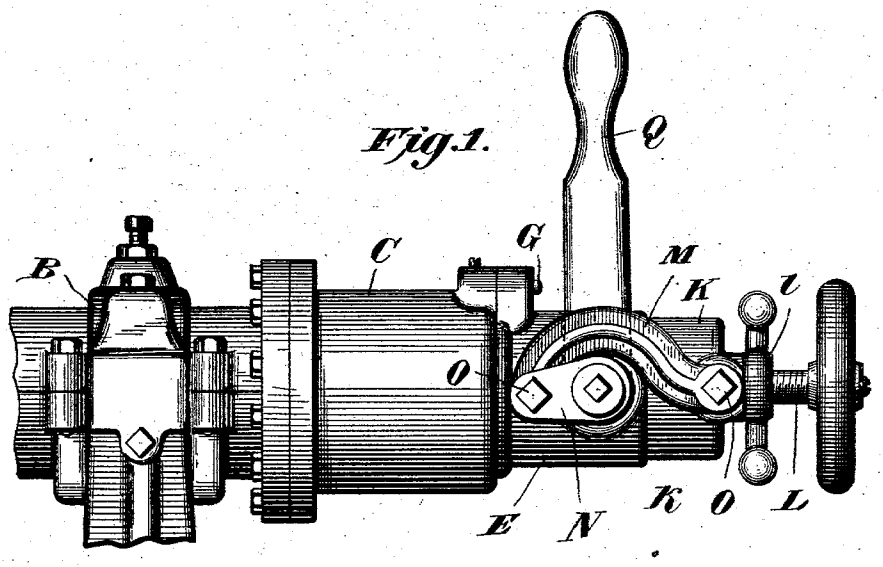


Fig. 2.

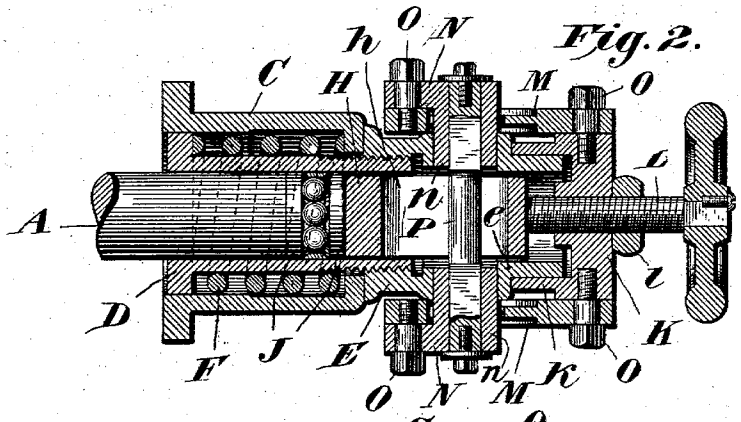
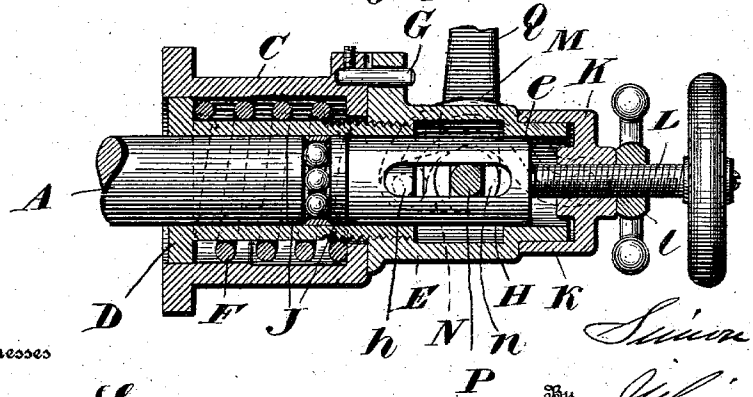


Fig. 3.



Witnesses

Elmer Seavey

Osgood N. Dowell

Inventor.

Simon Snyder

By Julian C. Dowell

his Attorney.

No. 740,480. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

SIMON SNYDER, OF MUNCY, PENNSYLVANIA, ASSIGNOR TO SPROUT, WALDRON AND COMPANY, OF BOROUGH OF MUNCY, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

QUICK-RELEASE DEVICE FOR GRINDING-MILLS.

SPECIFICATION forming part of Letters Patent No. 740,480, dated October 6, 1903.

Application filed June 26, 1902. Serial No. 113,340. (No model.)

To all whom it may concern:

Be it known that I, SIMON SNYDER, a citizen of the United States, residing at Muncy, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Quick-Release Devices for Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to attrition-mills, and particularly to mechanism for effecting instant release of the pressure by which the grinding disks, burs, or plates are held together or in operative relation.

The invention is an improvement on quick-release devices of that type in which the end thrust of the driving shaft or spindle is sustained by a member adapted to be shifted by lever-and-link mechanism for releasing the shaft and restoring it to normal position; and the principal objects are to reduce to a minimum the motion required in such mechanisms for releasing or separating the grinding-surfaces and bringing them together, to render the release device independent of the shaft-bearings or other fixtures, to provide for maintaining in a device of the character referred to a yieldable pressure between the grinding-surfaces and to permit adjustment of the tension or pressure, and to improve generally upon devices of this same character. These objects are attained by mechanism substantially such as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a quick-release device embodying my invention. Fig. 2 is a horizontal section, and Fig. 3 is a longitudinal vertical section thereof.

Referring to said drawings, in which the same letters of reference indicate corresponding parts in the different figures, A designates the driving-shaft of one of the grinding disks or plates of an attrition-mill. The other grinding disk or plate, which of course confronts the first, may be either fixed or rotary. Said grinding devices are not illustrated herein, since this is unnecessary for an explanation of the present invention.

The letter B represents one of the bearings of the driving-shaft, and C denotes a casing, which is shown bolted to said bearing, but may be otherwise fixed in place. Slidably arranged in said casing is a step-box D, in which the end of the driving-shaft is journaled. The rear end of this step-box projects beyond the casing and is exteriorly threaded and has screwed thereon a member or casing E, which thus constitutes an adjustable part or extension of the step-box. A spring F, interposed between suitable flanges or shoulders on the casing C and step-box D, forces the said step-box forwardly, movement thereof being limited by abutment of the front end of the adjustable casing or member E against the rear end of casing C. A pin G may be inserted through registering apertures in lugs or ears on the casings C and E and secured in place by a set-screw or other means, said pin thus preventing the casing or member E from turning. However, on loosening the set-screw and withdrawing the pin the said casing E may be given one or more complete turns, either to the right or left, thus screwing or unscrewing on the step-box D for adjusting the pressure of the spring.

The end thrust of the driving-shaft is received within the step-box by a block H, a suitable antifriction device, consisting of chilled plates J and interposed balls, being preferably arranged between the shaft and block. The said block is slidably fitted in the step-box and its adjustable extension or casing E. In the construction represented the block is cylindrical, and its rear end is fitted within a tubular rear portion *e* of casing E; but it is obvious that the block may be differently formed and may be guided by other suitable means.

The letter K denotes a slidable or shiftable cross-head, through which is screwed a temper-screw L, the inner end of which bears against the block H, and thus opposes the end thrust of the driving-shaft. The temper-screw is provided with a suitable hand-wheel or other operating device and is screwed through a lock-nut *l*, preferably of the winged or finger type, for manipulation thereof. The

cross-head, as shown, is formed with an elongated tubular flange or sleeve portion *k*, which fits slidably over the rear tubular end *e* of the casing E, though said cross-head may be mounted on pins projecting from the casing or may be otherwise held in place. A pair of curved or bowed links M M are pivoted at their rear ends to opposite sides of said cross-head and pivoted at their front ends to short parallel arms or cranks N, the trunnions or studs *n* of which are journaled in suitable openings or bearings at opposite sides of the casing E. The pivotal connections are effected in the present instance by means of shoulder-bolts O, entered through the links and having reduced threaded ends screwed into the said cross-head and the said cranks. The trunnions *n* are mounted on or rigidly secured to an axial stem or rod P for operating the cranks and links in unison. In the construction shown the ends of said stem are square or polygonal and fit within similarly-shaped central openings in the studs, the latter being detachably secured thereto by washers and shoulder-bolts. The stem passes through a longitudinal elongated slot *h* in the block H, and thus is prevented from interfering with the longitudinal movement of said block. Any suitable device or handle may be connected with the stem P or with either or both of the cranks; but I preferably employ a single hand-lever Q, which may be formed integrally with one of the trunnions or otherwise mounted on the axial stem. This lever is preferably disposed at about right angles to the cranks N, though this arrangement is not essential.

The quick-release device is represented in the drawings in normal position, the hand-lever being upright and the cranks and links holding the cross-head and temper-screw and through the latter the block H and driving-shaft in forward position, thus maintaining the grinding-surfaces of the mill in operative relation. It will be observed that the pivotal connections between the links and cranks are slightly below the plane or line of trunnions *n* and pivotal connections between the links and cross-head, whereby the hand-lever is locked in position. In such normal or holding position the temper-screw may be adjusted to compensate for wear or to regulate the pressure between the grinding-surfaces, and, as before explained, the tension or pressure of the spring F, which permits yielding of the step-box and connected parts, may also be adjusted by withdrawing the pin G and screwing or unscrewing the member or casing E on the step-box D.

In order to release the grinding-surfaces, the lever is moved backward, which action, through the medium of the cranks and links, slides back the cross-head and permits the driving-shaft to shift longitudinally, driving back the antifriction devices and the block H. Only sufficient force is required to raise the pivotal connections between the links and cranks above the plane of the trunnions and pivotal connections between the links and cross-head, since the force of the spring F and the device or devices used for separating the grinding-surfaces when released completes the movement. A short turn of the lever accomplishes this, and the operator is thus enabled to release the grinding-surfaces in an instant. To bring the grinding-surfaces together again, the lever is returned to its former position, which, through the medium of the cranks and links, advances the cross-head, temper-screw, and block, thus shifting forwardly the driving-shaft or restoring it to normal position.

While my improved quick-release device is preferably combined with a spring-actuated step-box, as herein illustrated and described, it will be understood that said releasing device is not restricted to such or any special form of bearing, but may be otherwise applied. The device is also susceptible of various changes in details of construction and arrangement without departing from the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by United States Letters Patent, is—

1. In a quick-release mechanism, the combination with the runner-shaft, of a movable end-thrust-sustaining member having a longitudinal slot or opening therethrough, a relatively fixed stem or rod extending through said slot and having cranks thereon at opposite sides of said member, links for shifting said member pivoted to said cranks, and means for turning said stem, substantially as described.

2. In a quick-release mechanism, the combination with the runner-shaft, of an end casing therefor, a thrust-sustaining member slidable in said casing and having a longitudinal slot or opening therethrough, a stem or rod extending through said slot and journaled in opposite sides of said casing, cranks on said stem at opposite sides of said thrust-sustaining member, links for shifting said member pivoted to said cranks, and means for turning said stem, substantially as described.

3. In a quick-release mechanism, the combination with the runner-shaft, of a slidable cross-head carrying a shaft-adjusting device, a slidable block interposed between said device and the end of the shaft and having a longitudinal slot or opening therethrough, a relatively fixed stem or rod extending through said slot and having cranks thereon at opposite sides of said block, links connecting said cranks and cross-head, and means for turning said stem, substantially as described.

4. In a quick-release mechanism, the combination with the runner-shaft, of a slidable cross-head, a slidable block interposed between said cross-head and the end of the shaft through which the end thrust is transmitted to said cross-head, said block having a longitudinal slot or opening therethrough, a rela-

tively fixed stem or rod extending through said slot or opening and having cranks thereon at opposite sides of said block, connections between said cranks and cross-head, and means for turning said stem, substantially as described.

5. In a quick-release mechanism, the combination with the runner-shaft, of a slidable cross-head sustaining end thrust, a transverse relatively fixed stem or rod between said cross-head and the end of the shaft, means for sustaining and transmitting thrust or pressure between the shaft and cross-head, cranks on said stem at opposite sides of the shaft having connections with the cross-head, and means for turning said stem substantially as described.

6. In a quick-release mechanism, the combination with the runner-shaft, of a slidable cross-head sustaining end thrust, a transverse relatively fixed stem or rod between said cross-head and the end of the shaft, means for sustaining and transmitting thrust or pressure between the shaft and cross-head, cranks on said stem at opposite sides of the shaft, and bowed links pivoted to said cross-head and spanning said stem and pivoted to said cranks in advance of the stem and slightly below the plane of the stem and pivoted connections at the cross-head, substantially as described.

7. In a quick-release mechanism, the combination with the runner-shaft, of an end casing therefor, a slidable cross-head suitably mounted on the rear of said casing, a temper-screw screwed through said cross-head, a slidable block interposed between the end of the shaft and the end of said temper-screw, said block having a longitudinal slot or opening therethrough, cranks having trunnions journaled in opposite sides of said casing, a stem or rod extending through the slot in said block and rigidly connecting said trunnions, links connecting said cranks and cross-head, and means for turning said stem to operate the cranks and links to shift the cross-head, substantially as described.

8. In combination with the runner-shaft, a fixed casing, a spring-actuated or yieldable step-box for the shaft slidable therein, an adjustable casing on the rear of said step-box limiting its forward movement by abutment against said fixed casing, a thrust-sustaining member slidable in said step-box and adjustable casing, and crank-and-link mechanism carried by said adjustable casing for shifting said member, substantially as described.

9. In combination with the runner-shaft, a spring-held step-box therefor, a slidable thrust-sustaining member carried by said step-box, a lever having its pivot connected to said step-box, and a link connecting said lever and member, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SIMON SNYDER.

Witnesses:
WALTER A. KRAMER,
C. E. SPROUT.