(No Model.)

J. MILLS.

ADJUSTABLE CRANK PIN.

No. 421,297. Patented Feb. 11, 1890.

FIG. 1.

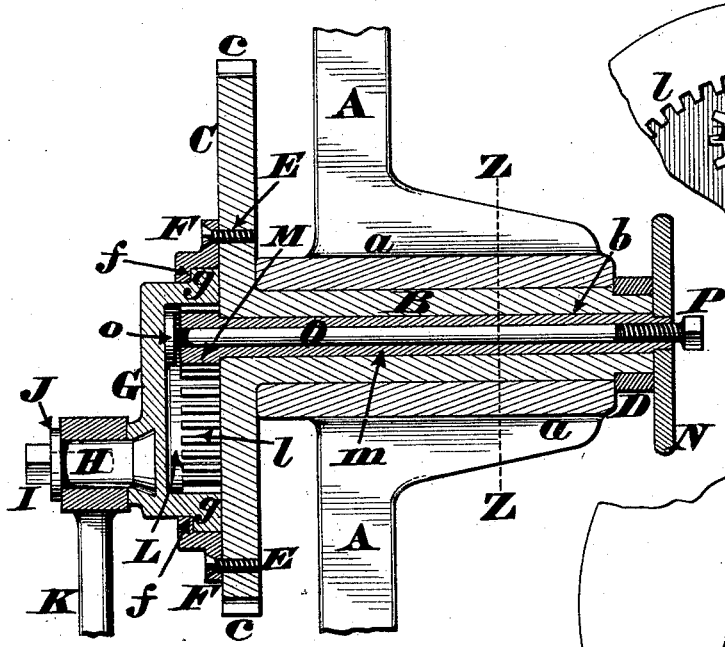


FIG. 3.

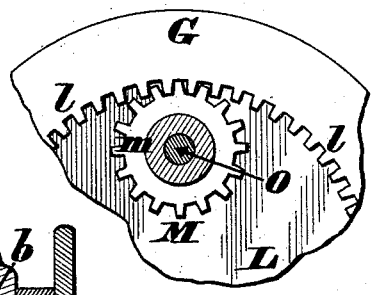


FIG. 4.

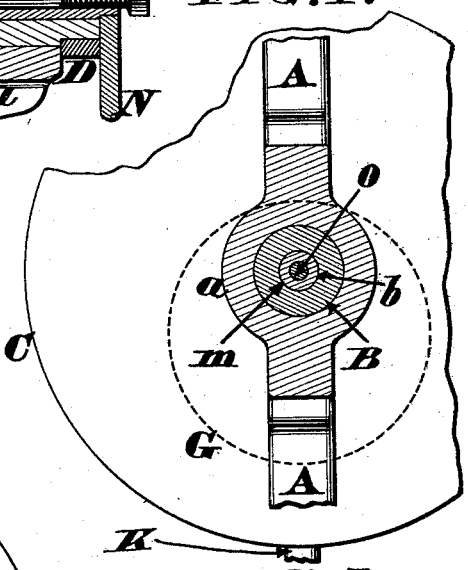


FIG. 2.

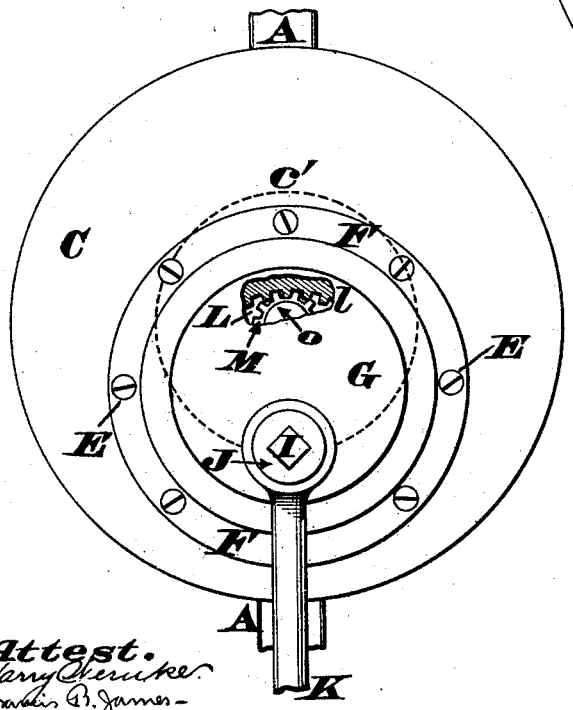
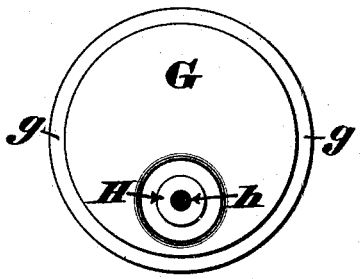


FIG. 5.



Attest.
Harry Sheridan
Franklin B. James

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Atty.

UNITED STATES PATENT OFFICE.

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ADJUSTABLE CRANK-PIN.

SPECIFICATION forming part of Letters Patent No. 421,297, dated February 11, 1890.

Application filed September 11, 1889. Serial No. 323,669. (No model.)

To all whom it may concern:

Be it known that I, JAMES MILLS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Adjustable Crank-Pins; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

My invention comprises a novel combination of devices for adjusting a crank-pin or wrist-pin of any class of machinery, so as to vary the stroke of a pitman or connecting-rod coupled to said pin and without stopping the machine or detaching any of its operative parts. Said combination includes a driving-wheel journaled in a suitable bearing, a circular plate or disk applied eccentrically to the face of said driver and carrying the wrist-pin to which the connecting-rod is coupled, gearing on the back of said disk, and a pinion that engages with said gearing, which pinion is operated by a spindle occupying an axial bore of the driving-wheel shaft. These devices are so arranged that the simple turning of the pinion-spindle will effect any desired revolution of the eccentric disk, and thus cause the crank-pin of the latter to advance toward the center of the driving-wheel or to recede therefrom, and thereby vary the stroke of the connecting-rod, as hereinafter more fully described.

Another feature of my invention consists in fitting a push-stem within the pinion-spindle, which push-stem is capable of being advanced forcibly for the purpose of binding the eccentric disk within its surrounding ring, so as to prevent accidental turning of said disk. Therefore this push-stem serves as a simple but efficient locking device that retains the eccentric disk to any specific adjustment, as hereinafter more fully described.

In the annexed drawings, Figure 1 is an axial section of a machine embodying my invention, the eccentric disk being locked in such a position as to impart a full stroke to the connecting-rod. Fig. 2 is a front elevation of the machine, a portion of this disk being broken away to expose its gearing and the pinion engaged therewith. Fig. 3 is an enlarged rear elevation of said pinion and a portion of the eccentric disk, the pinion-spindle and its inclosed push-stem being sectioned. Fig. 4 is a vertical section of the machine, taken at the line Z Z of Fig. 1. Fig. 5 is a front elevation of the eccentric disk detached from the driving-wheel of the machine.

A represents a portion of the main frame of the machine, and *a* is a bearing, within which is journaled the shaft B of a driving-wheel C, which wheel may be set in motion by peripheral teeth *c*, as seen in Fig. 1, or by a pulley at the rear end of shaft B, as suggested by the dotted circle *c'* in Fig. 2. Longitudinal shifting of shaft B is prevented by a collar D, fixed to its rear end. The front or face of driving-wheel C is flat, and has secured eccentrically to it by screws or bolts E a ring F, having an annular bearing *f*, which ring serves to clamp the disk G to said wheel, but not so tightly as to prevent said disk being turned within said ring when occasion requires. This eccentric disk has an annular ledge or shoulder *g*, which fits against the bearing *f*, and said disk carries the crank-pin or wrist-pin H, which pin is usually placed in a mold, and the disk G is then cast around it.

Pin H may be tapped at *h* to admit a bolt I, which bolt, together with a washer J, couples one end of a pitman or connecting-rod K to said wrist-pin, the other end of said rod being attached to any device whose stroke requires to be adjusted for special purposes—such, for example, as the "ram" of a metal shaping or slotting machine. Disk G has a cylindrical chamber L in the rear, the wall of said chamber being provided with gearing *l*, to admit the teeth of a pinion M, secured to the front end of a tubular spindle *m*, which latter is journaled within the longitudinal bore *b* of driving-shaft B, the rear end of said spindle being furnished with a hand-wheel or other convenient turning device N. This spindle *m* is traversed by a push-stem O, having at its front end a head or button *o* of practically the same diameter as pinion M, the rear end of said spindle being in contact with a screw or bolt P, tapped in the spindle.

When the various parts of the machine are in the position seen in Fig. 1, the wrist-pin H

is diametrically under the center of driving-wheel C, and therefore said pin will now impart the longest possible stroke to the connecting-rod K, accidental turning of the eccentric disk G being prevented by screwing the bolt P in very tightly. This act forces the button *o* of push-stem O against the inner surface of disk G, thereby pressing the shoulder *g* of the latter so firmly against the annular bearing *f* of the ring F as to prevent said disk turning within said ring, and thereby relieving the gearing of any severe strain. Consequently the eccentric disk is now immovably locked to the driving-wheel and revolves in unison with the latter, every revolution of said wheel causing the connecting-rod to make a stroke equal to twice the distance from the center of said wheel to the center of wrist-pin H; but when it is desired to shorten the stroke of said rod K the bolt P is slackened sufficiently to relieve the disk G from the pressure of button *o*, and the hand-wheel N is then turned either to the right or left, so as to cause said disk to revolve within the ring F. As this disk revolves, the wrist-pin H describes a circular path, and is gradually brought nearer and nearer to the center of driver C, and when the proper position is reached said disk is again immovably locked to said driver by screwing in the bolt P, as above described. It is evident that this shortening of the distance between the center of wheel C and the center of wrist-pin H decreases the stroke of the connecting-rod accordingly, and in many cases this adjustment can be readily effected without stopping the machine; hence my invention will be especially applicable for working the rams of metal-shapers and metal-slotters, although it is not limited to such use, as it is serviceable for a great number of purposes. Finally, if the bolt P should work loose or be intentionally unscrewed, the disk G would simply describe a circular path within its ring-bearing *f*, and thereby prevent the machine being injured.

I claim as my invention—

1. In an adjustable crank-pin mechanism, the combination of a driver having a tubular shaft, a spindle traversing said shaft, a pinion operated by said spindle, a toothed disk applied eccentrically to the face of said driver and describing a circular path thereon, which disk is provided with a wrist-pin and is revolved by said pinion, and a locking device wherewith said disk is retained at any specific adjustment, substantially as herein described.

2. In an adjustable crank-pin mechanism, the combination of a driver having a tubular shaft, a tubular spindle traversing said shaft, a pinion secured to said spindle, an internally-toothed disk applied eccentrically to the face of said driver, which disk carries a wrist-pin and is revolved by said pinion, and a push-pin that traverses said spindle and bears against the back of said disk, thereby retaining it at any specific adjustment, substantially as herein described.

3. The combination, in an adjustable crank-pin mechanism, of driver C, tubular shaft B *b*, tubular spindle *m*, traversing said shaft, a pinion M, secured to said spindle, a push-stem O, traversing said spindle, a screw P, for advancing said push-stem, a ring F *f*, attached eccentrically to the face of said driver C, a disk G, journaled in said ring and having internal gear-teeth *l*, which teeth engage with said pinion M, and a wrist-pin H, projecting from said disk, all as herein described.

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

JAMES MILLS.

Witnesses:
JAMES H. LAYMAN,
FRANCIS M. BIDDLE.