

No. 623,683.

Patented Apr. 25, 1899.

M. W. NEUENS & J. J. HOELLER, JR.

GRINDING MACHINE.

(Application filed Nov. 21, 1898.)

(No Model.)

2 Sheets—Sheet 1.

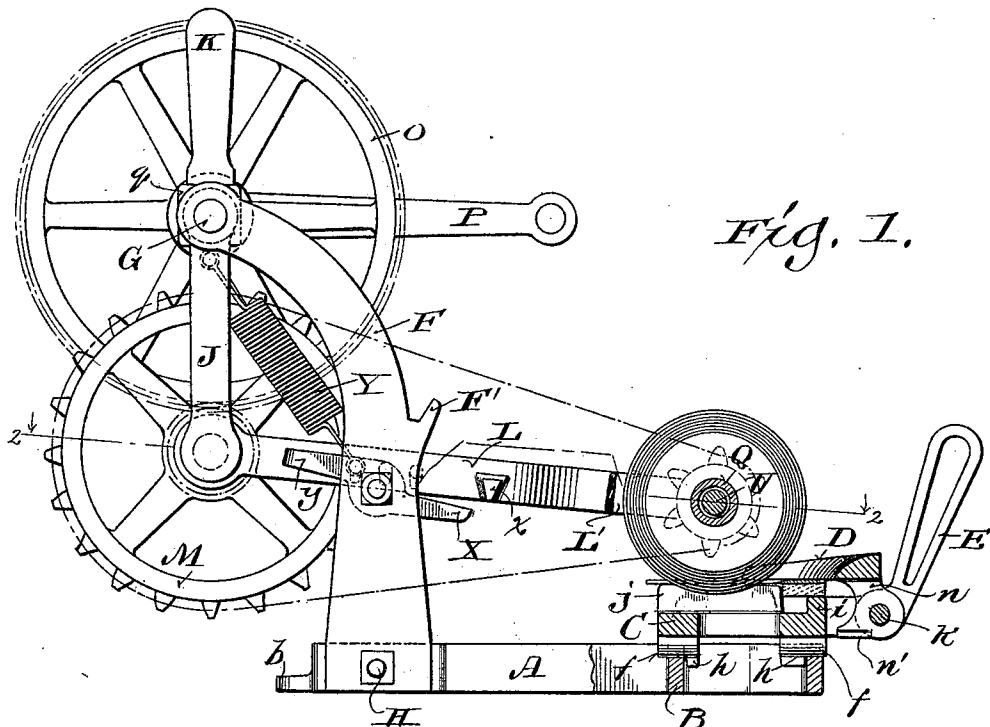


Fig. 1.

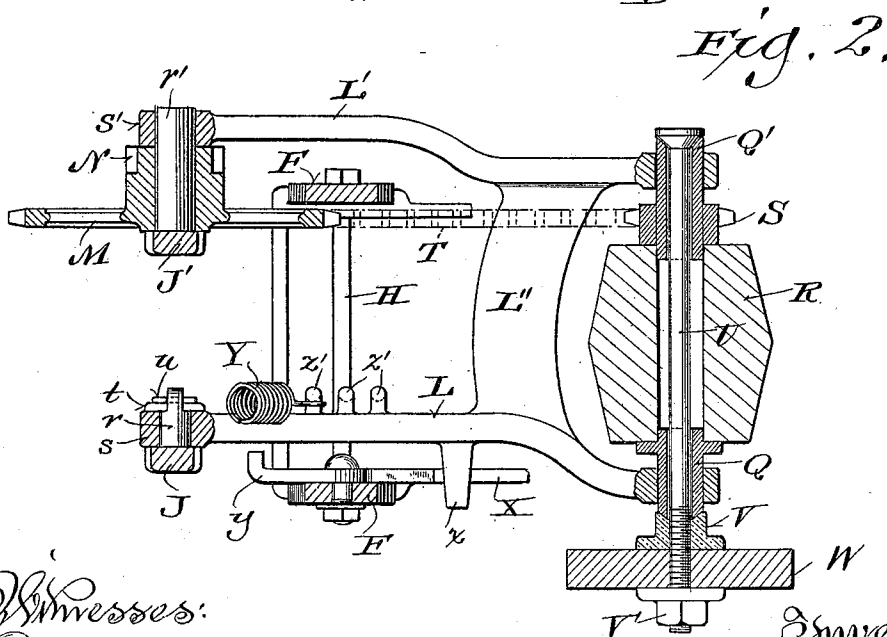


Fig. 2.

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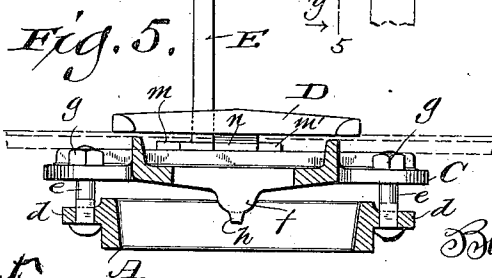
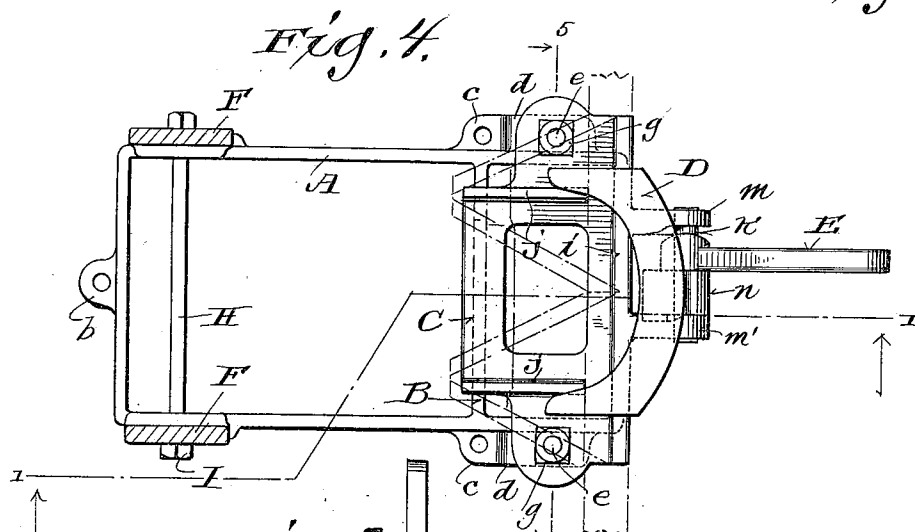
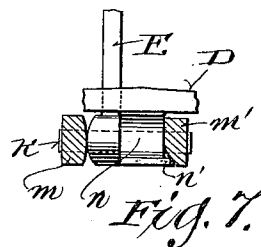
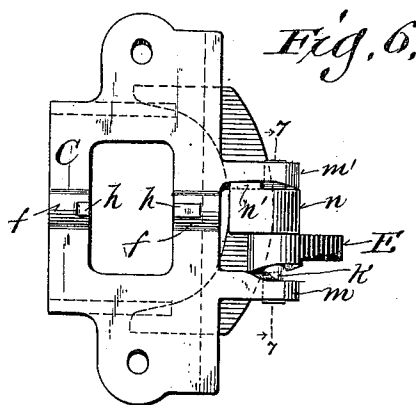
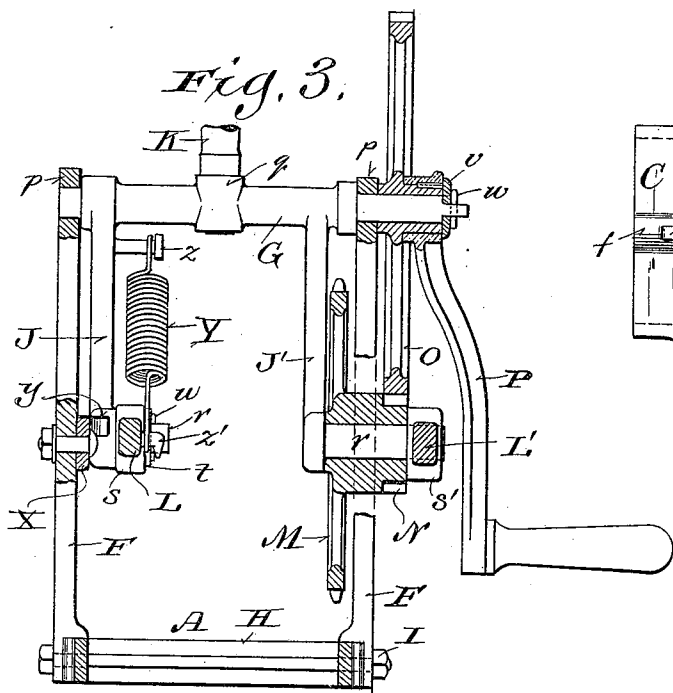
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UNITED STATES PATENT OFFICE.

MICHAEL W. NEUENS AND JOSEPH J. HOELLER, JR., OF PORT WASHINGTON,
WISCONSIN.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 623,683, dated April 25, 1899.

Application filed November 21, 1898. Serial No. 697,013. (No model.)

To all whom it may concern:

Be it known that we, MICHAEL W. NEUENS and JOSEPH J. HOELLER, Jr., citizens of the United States, and residents of Port Washington, in the county of Ozaukee and State of Wisconsin, have invented certain new and useful Improvements in Grinding-Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention has for its object to provide simple economical high-speed grinding-machines especially designed for sharpening knife-sections on sickle-bars of mowers and reapers, but capable of adaptation for sharpening all the various edge-tools employed about a farm. Therefore said invention consists in certain peculiarities of construction and combinations of parts hereinafter particularly set forth with reference to the accompanying drawings and subsequently claimed.

Figure 1 of the drawings represents a side elevation of our improved grinding-machine, partly in vertical longitudinal section, as indicated by the dotted lines in the fourth figure of the series; Fig. 2, a horizontal section on the plane indicated by lines 2 2 in the preceding figure; Fig. 3, a detail transverse sectional view of the rear portion of the machine; Fig. 4, a detail plan view, partly in horizontal section, particularly illustrating the base and sickle-bar-clamp portions of said machine; Fig. 5, a detail transverse section indicated by line 5 5 in the preceding figure; Fig. 6, a plan view of the sickle-bar clamp inverted, and Fig. 7 a detail sectional view on the plane indicated by line 7 7 in the figure last aforesaid.

Referring by letter to the drawings, A indicates a cast-metal base in the form of a rectangular frame having a cross-bar B adjacent to its front, and this base is shown provided with apertured rear and side lugs *b c* for screws or bolts by which it may be rigidly secured to a bench or other convenient support, if desirable. The side lugs *c* have offset forward extensions *d* on a higher plane, and bolts *e*, having angular fit therein, are engaged by a plate C, constituting part of the sickle-bar clamp pertaining to the machine. Upon its under side the plate C is provided with central convex rocker-lugs *f*, that loosely

engage corresponding notches in the upper edges of cross-bar B and the front member of the base-frame, whereby provision is had for tilting said plate to various angles, the degree of tilt in either direction being regulated and maintained by adjustment of set-nuts *g* on said bolts above the aforesaid plate, with which they have contact. Ears *h* of the lugs *f* about the cross-bar B and forward portion of the base-frame, and thus the plate C is held against displacement longitudinally of the machine. The plate C has its upper face provided with a longitudinal front ledge *i* and transverse ribs *j*, the latter extending to a greater elevation than the ledge and being a predetermined distance in rear of same. In practice a sickle-bar has support upon the ledge *i* of plate C and abuts the forward ends of the ribs *j* on said plate, these ribs serving as rests for knife-sections fast to said bar, as clearly illustrated in Figs. 1 and 4. Projecting forward from the ledge or plate C is a pair of ears that support a pivot-rod *k*, one ear, *m*, being cam-faced upon the inner side and the other ear, *m'*, beveled upon its inner side below the pivot-rod. Loose on the pivot-rod is a lug *n*, depending from another plate D, constituting part of the clamp for the sickle-bar and knife-sections. The plate-lug *n* is provided with a side flange *n'*, that is forced over against the beveled inner face of the aforesaid ear *m'* of the plate C by means of a lever E, the inner end of this lever being loose on pivot-rod *k* and having a cam-surface opposing that of the ear *m* above specified. The lever E being swung down, the plate D may be lifted to permit adjustment of a sickle-bar on the machine, and said plate being brought back opposite said sickle-bar and knife-sections thereof the lever is swung up to lock the aforesaid plate in working position. From the foregoing it will be appreciated that we not only facilitate the loosening or tightening of said plate, but also provide for obtaining greater leverage upon the same than is usually the case. The tilt adjustment of the entire clamp is also an important feature of our improvements, for the reason that at any time the plane of the sickle-bar may be varied to have a rotatory grinding device, hereinafter described, work alto-

gether upon one knife-section or more on the latter than on another knife-section in position to be ground at the same time, it frequently happening that an edge of one of these knife-sections requires more grinding than the neighboring edge of the other to put it in good cutting condition.

Between vertical ribs on each side member of the base-frame, at the rear of the latter, is the lower end of a standard F, having its upper end curved toward the rear and terminating in a bearing *p* for a journal of a horizontal bar G, constituting part of a swing-yoke hereinafter more particularly specified. A bolt H extends through the lower ends of both standards and adjacent sides of the base-frame, and a nut I is run on the screw-threaded end of the bolt against one of the standards.

Depending from the journal-bar G to therewith constitute the swing-yoke are branches J J', each of which is provided at its lower end with a boss, both bosses being extended in the same direction. The cross-bar of the yoke is also shown provided with an eye *q*, into which a wooden handle K is made fast, the aforesaid standards and said yoke being cast metal.

The boss *r* of yoke branch J is loose in an eye *s* at the rear end of a side bar L, constituting part of a skeleton-frame carrier that ordinarily has reciprocative movement longitudinally of the machine under control of the operator grasping handle K aforesaid, this movement being necessary when said machine is employed as a grinder for knife-sections of a sickle-bar. A washer *t* fits the slabbed outer end of boss *r*, and a key *u*, extending through an aperture in said slabbed end of the boss against the washer, serves to maintain the engagement of bar-eye *s* with said boss. The boss *r'* of yoke branch J' is loose in the hub of a sprocket-wheel M and an eye *s'* in another side bar L' of the aforesaid carrier.

The hub of sprocket-wheel M has its outer end in the form of a pinion N, and the latter meshes with a spur-wheel O, having its hub loose on a journal of the horizontal-bar portion G of the aforesaid swing-yoke. A washer *v* fits upon the slabbed outer end of the yoke-bar journal, against the hub of spur-wheel O, and also against the inner end of a crank P, keyed to said hub, a key *w* being extended through an aperture in the slab end of said journal against the washer.

The side bars of the reciprocative carrier are connected by a cross-bar L'', cast integral therewith, and the forward ends of said side bars are in the form of eyes that constitute bearings for flanged journal-sleeves Q Q', that fit the bore of a grinding device R, that is of conical form in opposite directions from its longitudinal center, the same being similar to the grinding devices common in various machines organized for sharpening knife-sections of a sickle-bar. The flange of sleeve Q' is made wider than the flange of the opposite sleeve and provided with teeth to form a

sprocket-pinion S, engaging a link belt T, that is driven by the sprocket-wheel M aforesaid. Extending through the aforesaid sleeves and interposed grinding device is an ordinary long bolt U, and run on the screw-threaded end of the same is a flanged nut V, that is tightened against sleeve Q to thereby clamp the latter and opposite sleeve Q' tight in said grinding device. The distance between the side bars L L' of the reciprocative carrier and the length of sleeves Q Q' is such that the latter and interposed grinding device, as well as bolt U, rigid therewith, may have ample side thrust to permit automatic adjustment of said grinding device to knife-sections on a sickle-bar held by the clamp aforesaid. The bolt U has its screw-threaded end extended beyond the flanged nut V, and the latter has its inner end conically recessed to match the cone-shaped end of the sleeve Q, with which it has frictional contact, whereby there is automatic centering of said bolt. As shown in Fig. 2, another grinding device W in the form of a wheel may be slipped on bolt U against the flanged outer end of nut V and clamped in place by another flanged nut V', run on said bolt, the latter grinding device being for work on the cutting edges of various tools for which the former grinding device is not suitable.

The side bar L of the reciprocative carrier is provided with an outer lateral lug *x*, and held in pivotally adjustable connection with the adjacent standard by a bolt and nut is a rest X for the lug. The set of the lug-rest determines the initial elevation of the grinding device R with respect to knife-sections on a sickle-bar in the above-described clamp, whereby the points of said knife-sections are saved from harm, and by employment of the carrier-lug and the rest for same unnecessary pull on the tension-spring hereinafter specified is avoided.

As herein shown, the lug-rest X may have an upwardly-offset rear extension *y*, constituting a stop to limit forward play of the reciprocative carrier and grinding device aforesaid.

A pin *z*, extending inward from the yoke branch J, constitutes a support for a spiral tension-spring Y, the lower end of which is made to have engagement with any one of a series of hooks *z'* upon the inner side of the bar L, constituting part of the reciprocative carrier. The degree of tension necessary to insure pressure of the grinding device R when operating upon sickle-bar knife-sections may be regulated by adjustment of spring Y with respect to the hooks *z'* aforesaid. The spring resistance increases as the carrier moves forward, and this movement being limited, as above specified, the spring cannot be overstrained.

The grinding device W is an attachment that is not positioned on rotatory bolt U, if the machine be used for grinding knife-sections of a sickle-bar, and one of the standards F is shown provided with a branch F', by which a crotch is formed in which to rest the

lug α , so that the otherwise reciprocative carrier may be held stationary in an elevated position when the latter grinding-device attachment is utilized. This elevation of the carrier permits the use of a greater-diameter grinding device W than is herein shown.

Owing to the gearing above specified, the speed of the machine is very high in proportion to the power necessary to drive the same, this in itself being an important feature.

The machine may be readily taken apart for knockdown shipment or storage and as readily assembled without the use of tools other than an ordinary monkey-wrench, and especial attention is called to our employment of an ordinary long bolt as an arbor for the grinding devices above specified, as thereby we economize in the manufacture of our machine and provide for quick cheap repair of the same in case said arbor becomes fractured or lost, as bolts of the kind set forth are carried in stock by hardware dealers and require no work to adapt them to our purpose.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A grinding-machine comprising a base, rear standards rising from the base, a swing-yoke journaled in the upper ends of the standards, a driving spur-wheel loose on a swing-yoke journal, a carrier having its rear in spring-tension pivotal connection with the swing-yoke, a sprocket-wheel loose on a carrier-pivot, a pinion rigid with the sprocket-wheel and in mesh with the spur-wheel, a grinding device journaled in the forward portion of said carrier, a sprocket-pinion rigid with a grinding-device journal, a link belt connecting the latter pinion with said sprocket-wheel, and a sickle-bar clamp in connection with the forward portion of said base.

2. A grinding-machine comprising a base, rear standards rising from the base, a swing-yoke journaled in the upper ends of the standards, a driving spur-gear loose on a swing-yoke journal, a carrier having its rear in adjustable spring-tension pivotal connection with the swing-yoke, a sprocket-wheel loose on a carrier-pivot, a pinion rigid with the sprocket-wheel and in mesh with the spur-wheel, a grinding device journaled in the forward portion of said carrier, a sprocket-pinion rigid with a grinding-device journal, a link belt connecting the latter pinion with said sprocket-wheel, and a sickle-bar clamp in connection with the forward portion of said base.

3. A grinding-machine comprising a swing-yoke, a carrier in spring-tension pivotal connection with the yoke, a lug extending laterally from the carrier, a lug-rest pivotally adjustable on a fixed support, a grinding device in rotary connection with the carrier, driving mechanism for the grinding device, and a sickle-bar clamp arranged forward of the normal position of said grinding device.

4. A grinding-machine comprising a swing-yoke, a carrier in spring-tension pivotal connection with the yoke, a lug extending laterally from the carrier, a lug-rest pivotally adjustable on a fixed support and extended rearward to form a stop by which forward play of said carrier is limited, a grinding device in rotary connection with the carrier, driving mechanism for the grinding device, and a sickle-bar clamp arranged forward of the normal position of said grinding device.

5. A grinding-machine comprising a base, rear standards rising from the base, a swing-yoke journaled to the upper ends of the standards, a driving spur-wheel loose on a swing-yoke journal a carrier having its rear in spring-tension pivotal connection with the swing-yoke, a lateral lug on the carrier, a lug-rest in pivotal connection with one of the standards, a sprocket-wheel loose on a carrier-pivot, a pinion rigid with the sprocket-wheel and in mesh with the spur-wheel, a grinding device journaled in the forward portion of said carrier, a sprocket-pinion rigid with a grinding-device journal, a link belt connecting the latter pinion with the sprocket-wheel, and a sickle-bar clamp in connection with the forward portion of said base.

6. A grinding-machine comprising a swing-yoke, a carrier in spring-tension pivotal connection with the yoke, a lug extending laterally from the carrier, a branch extending from one of a pair of yoke-supporting standards to form a crotch in which the carrier-lug may be rested, a grinding device in rotary connection with the carrier, driving mechanism for the grinding device, and a sickle-bar clamp arranged forward of the normal position of said grinding device.

7. A grinding-machine comprising a reciprocative carrier, a pair of flanged journal-sleeves having their bearing in eyes of the carrier, a grinding device having a bore engaged at its ends by the journal-sleeves, a bolt extending through both journal-sleeves and interposed grinding device to have its head in contact with the outer end of one of said sleeves, a nut run on the bolt against the other journal-sleeve, driving mechanism in gear with one of the journal-sleeves, and a sickle-bar clamp arranged forward of the grinding device.

8. A grinding-machine comprising a reciprocative carrier, a pair of flanged journal-sleeves having their bearing in eyes of the carrier, a grinding device having a bore engaged at its ends by the journal-sleeves, a bolt extending through both journal-sleeves and interposed grinding device to have its head in contact with the outer end of one of said sleeves, a nut run on the bolt against the other journal-sleeve, said bolt being of length sufficient to project outward far enough from the nut to receive another grinding device and nut, driving mechanism in gear with one of the journal-sleeves, and a sickle-bar clamp

arranged forward of the normal position of the former grinding device.

9. A grinding-machine comprising a reciprocative carrier, a pair of flanged journal-sleeves having their bearing in eyes of the carrier, a grinding device having a bore engaged at its ends by the journal-sleeves, a bolt extending through both journal-sleeves and interposed grinding device to have its head in contact with the outer end of one of said sleeves, a nut run on the bolt and having conical contact with the other journal-sleeve, the bolt being of length sufficient to project outward far enough from the nut to receive another grinding device and nut, driving mechanism in gear with one of the journal-sleeves, and a sickle-bar clamp arranged forward of the normal position of the former grinding device.

10. A grinding-machine comprising a base, rear standards rising from the base, a swing-yoke journaled in the upper ends of the standards, a spur-wheel loose on a swing-yoke journal, a crank fast on the spur-wheel hub, a carrier in spring-tension pivotal connection with the swing-yoke, a grinding device journaled in the forward portion of the carrier, gearing connecting the spur-wheel with a grinding-device journal, and a clamp in connection with the forward portion of said base.

11. A grinding-machine organized for sharpening knife-sections of sickle-bars and comprising a rocker-bearing clamp as well as means for maintaining the same in adjusted position.

12. A grinding-machine organized for sharpening knife-sections of sickle-bars and comprising a clamp in rocker bearing on the machine-base, bolts that have angular fit with the machine-base to extend through clamp-apertures, and nuts run on the bolts against the clamp.

13. A grinding-machine organized for sharpening knife-sections of sickle-bars and comprising a rocker-bearing clamp consisting of a lower plate having its upper face provided with a front ledge and ribs at right angles to the ledge a predetermined distance therefrom, an upper plate in hinge connection with the lower one, and means for clamping the latter plate in opposition to a sickle-bar and knife-sections supported on said ledge and ribs, together with means for maintaining the clamp in adjusted position.

14. A grinding-machine organized for sharpening knife-sections of sickle-bars and comprising a front ledge as well as ribs at right angles to the ledge a predetermined distance therefrom, a plate in hinge connection with the ledge forward of the same, and a cam-lever mechanism operative to clamp the

plate in opposition to a sickle-bar and knife-sections supported by said ledge and ribs.

15. A grinding-machine organized for sharpening knife-sections of sickle-bars and comprising a front ledge as well as ribs at right angles to the ledge a predetermined distance from the same, ears extending forward from said ledge, a pivot-rod supported by the ears, one of the latter being beveled upon the inner side below the pivot-rod and the other cam-faced upon its inner side, a plate having a depending flanged lug loose on the pivot-rod, and a lever having a cam-surfaced end also loose on said pivot-rod intermediate of the cam-ear and plate-lug, movement of the lever in one direction operating to bind the lug-flange against the bevel of the other ear.

16. A grinding-machine organized for sharpening knife-sections of sickle-bars and comprising a rocker-bearing clamp consisting of a lower plate having its upper face provided with a front ledge and ribs at right angles to the ledge a predetermined distance therefrom, an upper plate in hinge connection with the one aforesaid, and a cam-lever mechanism operative to clamp the upper plate in opposition to a sickle-bar and knife-sections supported by said ledge and ribs, together with means for maintaining the clamp in adjusted position.

17. A grinding-machine comprising a grinding device having a bore, flanged sleeves engaging said bore, a bolt extending through the sleeves and interposed grinding device, a nut run on the bolt to abut one of said sleeves, a reciprocative carrier for the parts aforesaid, a driving mechanism in gear with one of the sleeves, and a sickle-bar clamp arranged forward of the grinding device.

18. A grinding-machine comprising a grinding device having a bore, a pair of flanged sleeves engaging the ends of said bore, a bolt extending through both sleeves and interposed grinding device to have its head in contact with the outer end of one of the sleeves, a nut run on the bolt and having conical contact with the other of said sleeves, a reciprocative carrier for the parts aforesaid, driving mechanism in gear with one of the sleeves, and a sickle-bar clamp arranged forward of the grinding device.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

MICHAEL W. NEUENS.
JOSEPH J. HOELLER, Jr.

Witnesses:

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