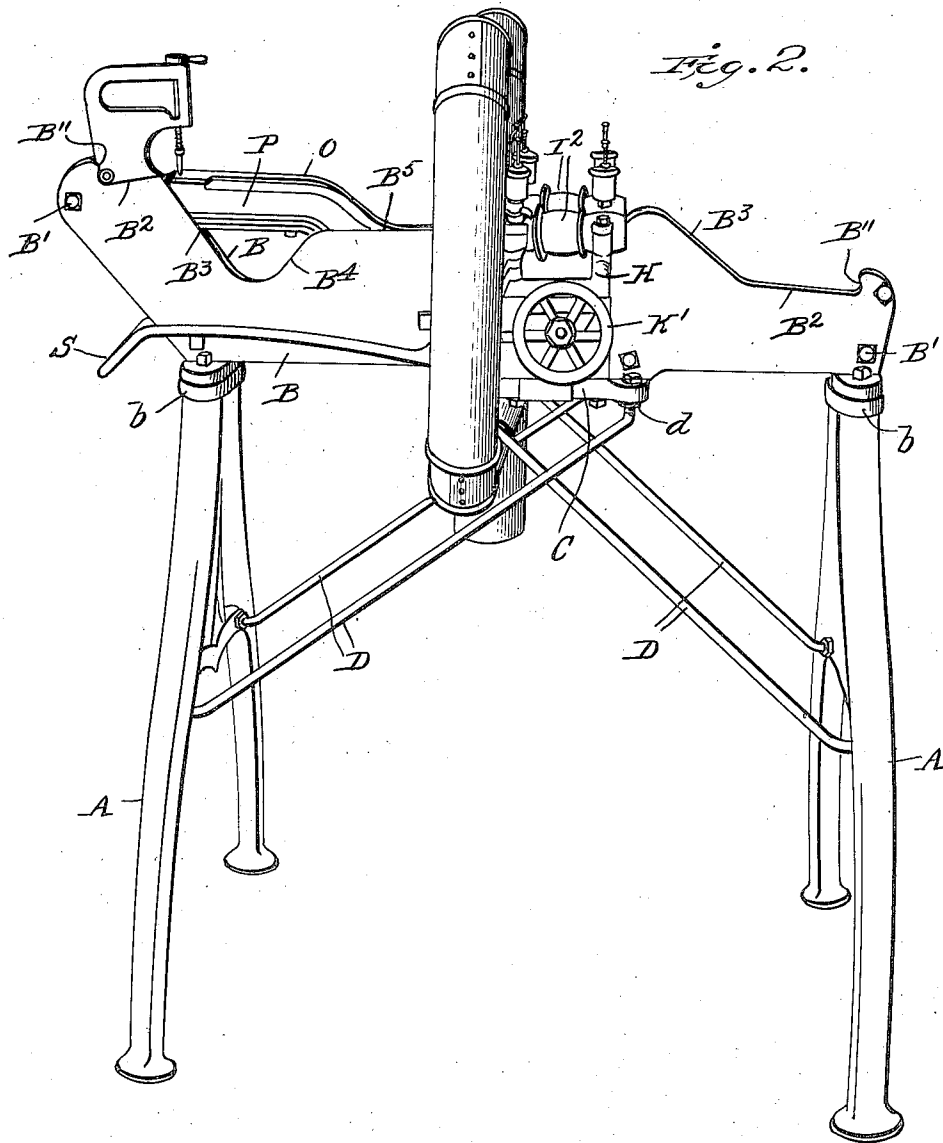


H. W. LIGON.
COTTON GIN RIB GRINDING MACHINE.
APPLICATION FILED JUNE 29, 1909.

934,976.

Patented Sept. 21, 1909.

5 SHEETS—SHEET 2.



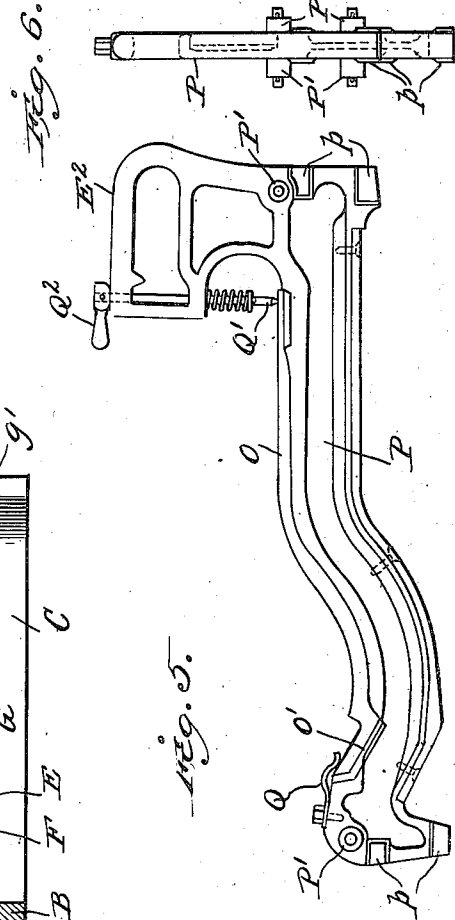
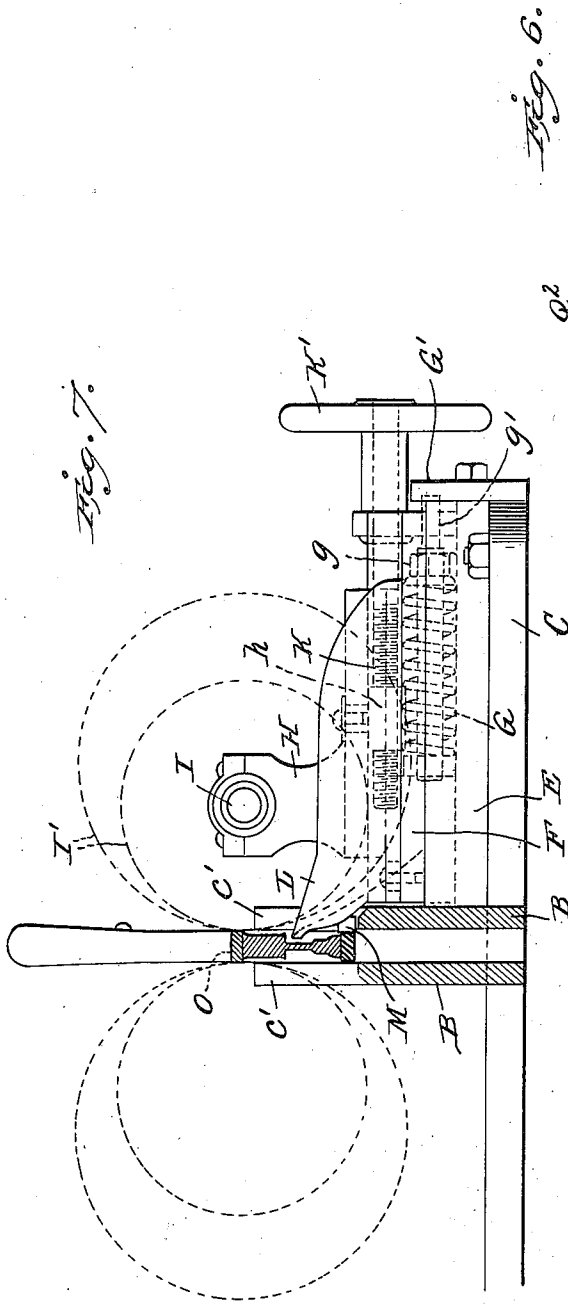
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Fig. 8.

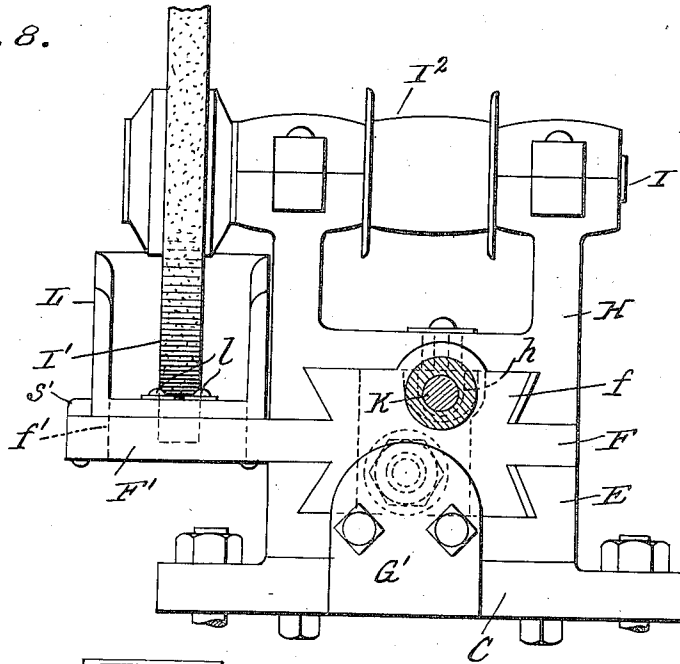
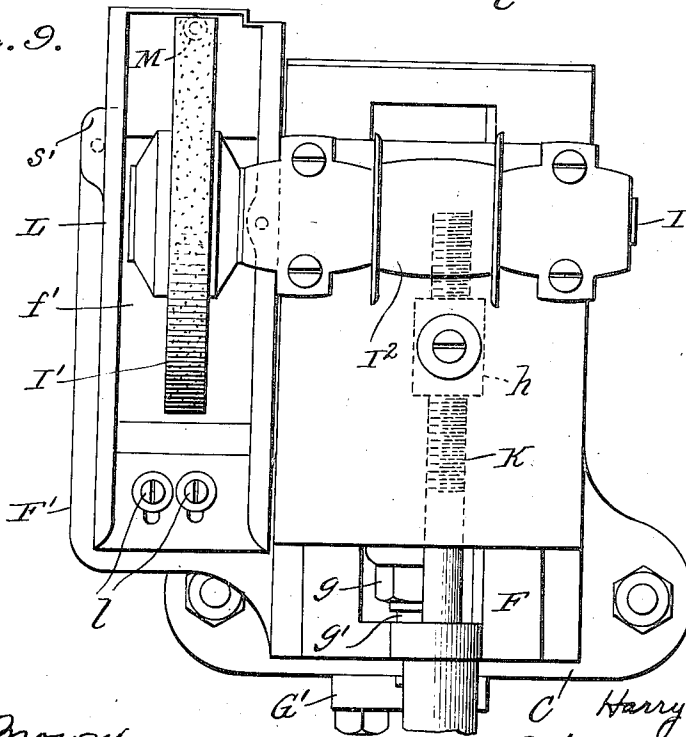


Fig. 9.



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UNITED STATES PATENT OFFICE.

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OF BIRMINGHAM, ALABAMA, A CORPORATION OF DELAWARE.

COTTON-GIN-RIB-GRINDING MACHINE.

934,976.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed June 29, 1909. Serial No. 505,041.

To all whom it may concern:

Be it known that I, HARRY W. LIGON, of Atlanta, in the county of Fulton and State of Georgia, have invented a certain new and useful Improvement in Cotton-Gin-Rib-Grinding Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to grinding machines designed for grinding articles to definite dimensions, the objects of the invention being to provide a simple and practical machine which will simultaneously grind both sides of an object and at the same time have the capacity of varying the distance between the ground surfaces as the work progresses through the machine.

The particular machine described and the details of which are covered by the specific claims herein, is one designed for the grinding of the opposite faces of cotton gin ribs, which ribs, as is well known, are of irregular contour and differ in thickness at different points in their length.

In the accompanying drawings—Figures 1 and 2 are perspective views of a cotton gin rib grinding machine looking respectively at the front and one side of the machine. Fig. 3 is an elevation of one of the guide frames between which the ribs are presented to the grinders and by which they are properly positioned in a vertical plane. Fig. 4 is a plan view of the two guide frames secured together and with the transverse grinder frame properly positioned with relation thereto, but omitting the stand and working parts of the machine. Fig. 5 is a side elevation of the work or rib carrying carriage having a rib mounted thereon. Fig. 6 is an end elevation of the carriage shown in Fig. 5, looking at the right hand end. Fig. 7 is a sectional elevation, partly diagrammatic, showing one of the grinder heads, its carriage and operating mechanism, large and small opposed grinders being shown in outline. Fig. 8 is an elevation looking at the parts shown in Fig. 7 from the right hand side but with the adjusting wheels and screw omitted. Fig. 9 is a top plan view of the parts shown in Fig. 8.

Like letters of reference in the several figures indicate the same parts.

As shown in said drawings, particularly in Figs. 1 and 2, the working parts of the machine are supported on legs A which, at their upper ends, are adapted for the reception of frame feet *b* upon which the longitudinally extending guide frames B are rigidly mounted. These guide frames B are preferably in the form of upright plates or castings arranged parallel to each other and spaced apart a proper distance by filling pieces and bolts B' to permit the rib carriage to travel between them. Their upper surfaces or edges are given a peculiar conformation in order to properly present the surfaces of the rib to the grinding wheels as will be hereinafter described. Arranged transversely of the guiding frames B is a grinder carrying frame C preferably extending up into a recess or seat *c*, as best seen in Figs. 3 and 4. Downwardly extending brace and supporting rods D connect the grinder carrying frame C with the legs A and the connection between said supporting and brace rods and grinder carrying frame C is preferably an adjustable connection formed, for instance, by the screw threads and nuts *d*, whereby the said grinder carrying frame may be raised or lowered for grinding the sides of the rib to give the desired clearance at the sides of the saw.

Slideways E are mounted on the grinder carrying frame C at each side of the guide frames and on these slideways are mounted grinder carriages F, each adapted to be advanced by a spring G (Fig. 7) preferably located within the carriage and bearing on its outer end against a nut *g* adjustably mounted on a rod *g'* which passes through the outer end of the carriage and contacts with an upwardly extending bracket G' on the grinder carrying frame C. The grinder carriages F are in turn provided with slideways *f* extending parallel with the slideways E and adapted for the reception of the standards H, in which the grinder shafts I are journaled, the standards H carrying the grinder shafts I and grinders I' are made adjustable on the carriages through the medium of an adjusting screw K working through nuts *h* on the standards and having at their outer ends hand wheels K' by means of which the adjustment may be manually effected. This adjustment permits the grinders to be advanced to the grinding point regardless of their size and provides a

convenient and ready means whereby the grinder may be kept up to its work as its size diminishes through wear, for instance, as shown in Fig. 7, grinders of the diameter indicated by the outline circles may be utilized with equal efficiency and without material change in the conformation of the ground surface.

The grinders I' are preferably mounted in proximity to the ends of the grinder shafts and the pulleys I², through which power is applied for rotating the grinders, are located at an intermediate point and between the arms of the standard, as is usual in grinder heads.

Each grinder carriage F is provided with an extension F' projecting out under the grinder, said extension having a bottom aperture f' (Fig. 9) for the escape of dust and an upwardly extending guard base or flange L, the latter being preferably adjustably mounted on the carriage extension F' by set screws l passing through suitable slots in the guard base. Each guard base which, when secured in position, forms an extension of the carriage itself, carries at its front end a guide roller M arranged on a vertical axis and preferably located in the grinding plane of the grinder and immediately below the grinding point, as shown in full lines in Fig. 7 and in dotted lines in Fig. 9. The preferred working adjustment of the grinder is such that at the grinding point the surface is vertically in line with the forward side of the guide rollers and, consequently, by causing said guide rollers to bear against and follow the contour of a guiding surface the grinders will be correspondingly moved to grind a surface corresponding in shape to said guiding surface.

The two grinders are arranged directly opposite each other and at the grinding point project through top recesses or cut away portions c' in the guide frames (see Figs. 3 and 7), said spaces also serving for the passage of the guide rollers on the grinder carriages whereby both the grinder and the guide rollers may project into the space between the guide frames.

As before stated, the upper edges of the guide frames are made of peculiar conformation or contour and this contour is such that the gin ribs will be presented between the grinders with their side faces at substantially right angles to grinders in order that the cut of the grinders may be transversely of the ribs, even though the ribs be of extremely irregular contour. Obviously, the contour of the upper edges of the guide frames may be made to suit the particular contour lines of any particular style of gin rib. As shown, the contour lines are for grinding a gin rib having the shape indicated by the rib O shown mounted on the

carriage in Fig. 5 of the accompanying drawings, thus the said guide frames have, in addition to the stops B'' at each end, short substantially horizontal surfaces B², long curved inclines B³, shorter reverse curved inclines B⁴, a long horizontal surface B⁵ and a short straight incline B⁶, the latter being located in proximity to the grinders on one side for guiding the rib during the grinding of the inclined end foot O'. The carriage P on which the rib O is clamped preferably has its upper surface made to conform to the under side of the rib and at the ends it is provided with transverse projections or rollers P' adapted to ride on the upper edges of the guide frames for properly positioning the rib with relation to the grinders in a vertical plane, as heretofore explained.

In addition to the transverse guiding projections or rollers P' the rib carriage P is provided with faced transverse projections p adapted to bear against the inner or proximate faces of the guide frames and thereby prevent transverse displacement or tilting of the rib carriage as it is moved back and forth along the guide frame. At its lower edge the said work carriage is provided with a steel guide bar preferably arranged parallel with the rib and having its transverse faces made to conform to the ground faces of the rib itself and said guide bar is so positioned on the carriage with relation to the rib as that it will occupy a position between the guide rollers M and serve as the means whereby the advance of the grinder carriages toward each other is controlled. Said carriages are moved back against the tension of their springs and advanced by the springs as the distance between the ground faces increases and diminishes during the movement of the rib between the grinders. Between the top and bottom surfaces the said carriage is preferably reduced in thickness, as shown in Fig. 7, whereby the forward edge of the guard bases may project slightly beyond the plane of the grinding face to thereby catch dust and grindings carried downwardly by the grinders.

For holding the ribs in position on the carriage, said carriage may be provided at one end with a spring clip Q and at the opposite end with a spring pressed centering plunger Q' having at its upper end a lever Q², whereby it may be raised and held in an elevated position during the time a rib is being removed or a new one inserted. At its forward end the said work carriage is also provided with a handle portion E² by which it may be grasped and moved back and forth during the presentation of a rib to the grinder.

Each grinder is provided with a hood or guard R extending upwardly from the guard base L and opening into a branch R' of a

suction pipe R^2 . Another branch R^3 of said suction pipe extends beneath the grinders and communicates with the openings f' in the carriage extension. The branch R^3 has a
 5 telescopic joint R^4 whereby the carriages are free to advance or recede with respect to each other. For the purpose of enabling the grinders to be more completely inclosed and at the same time give convenient access for
 10 changing the grinders, the guard or hood R of each grinder is provided with a removable extension R^5 preferably held in place by pins r adapted to be passed through alined eyes or sleeves r' on the removable extension
 15 and edges of the guard, respectively.

In order to provide a means whereby the carriages may be separated for the insertion of the work carriage or a rib, or for permitting the work carriage to be passed between
 20 the wheels without grinding, a lever S is pivoted on the guide frames and at its inner end is provided with arms S' having inclined faces s adapted to engage projections s' on the carriages. When the outer end of the
 25 lever is raised the inclined faces force the carriages back and separate the grinders.

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

30 1. In a grinding machine, the combination of the oppositely arranged grinders, carriages in which said grinders are mounted to move toward and from each other, a work guide extending transversely of the plane of
 35 the grinders, and means whereby the grinder carriages are automatically moved toward and from each other in accordance with the distance between the surfaces to be ground.

40 2. In a grinding machine, the combination of the following instrumentalities, to-wit; oppositely arranged grinders, carriages in which said grinders are mounted movable toward and from each other, means for normally holding said carriages advanced, a
 45 work guide extending transversely of the plane of the grinders, and a guide movable between the carriages for positioning the carriages with relation to each other in accordance with the distance between the sur-
 50 faces being ground.

3. In a grinding machine, the combination of the following instrumentalities, to-wit; oppositely disposed grinders, carriages in which said grinders are mounted movable to-
 55 ward and from each other, means for holding said carriages normally advanced toward each other, work guiding frames extending transversely of the grinders, a work carriage mounted on said frames and movable be-
 60 tween the grinders and a guide bar for positioning the grinders with relation to each other mounted on said work carriage.

4. In a grinding machine, the combination of the following instrumentalities, to-wit;

oppositely disposed grinders, standards in 65 which said grinders are journaled, carriages movable toward and from each other, adjustable connections between said carriages and grinders, means for holding the carriages normally advanced toward each other, 70 a transversely extending work guide, a work carriage mounted on said guide, and a guide bar mounted on said work carriage for positioning the grinder carriages, substantially as described. 75

5. In a grinding machine, the combination of the following instrumentalities, to-wit; parallel guide frames having their upper edges formed to position the work in a vertical plane, a work carriage mounted be- 80 tween said guide frames and having supporting projections resting on the upper edges of said frames, a guide bar mounted on said carriage, a grinder movable toward and from the carriage transversely of the 85 guide frames, and a bearing movable with the grinder and adapted to cooperate with the guide bar on the carriage.

6. In a grinding machine, the combination of the following instrumentalities, to-wit; 90 parallel vertically arranged guide frames having their upper edges formed to position the work in a vertical plane, a work carriage mounted between said guide frames and having projections bearing on the upper edges 95 of said frames, a guide bar on said carriage, oppositely disposed grinders arranged in a plane transversely of the guide frames and movable toward and from each other, oppositely disposed bearings movable with the 100 grinders and adapted to contact with the guide bar, and springs for advancing said grinders toward the work carriage.

7. In a grinding machine, the combination of the following instrumentalities, to-wit; 105 oppositely disposed grinders movable toward and from each other, guide frames extending on opposite sides of the plane of the grinders and having their upper edges formed to position the work in a vertical 110 plane, a work carriage mounted between the guide frames, and projections on the carriage resting on said guide frames on opposite sides of the grinders, said carriage having means whereby the work may be clamped 115 thereto between the projections.

8. In a grinding machine, the combination of the following instrumentalities, to-wit; oppositely disposed grinders movable toward and from each other, guide frames extend- 120 ing on opposite sides of said grinders and having their upper edges formed to position the work in a vertical plane, a carriage mounted between said guide frames, projections on said carriage resting on the upper 125 edges of the guide frames on opposite sides of the grinder, work holding means intermediate said projection, a guide bar on the car-

riage for separating the grinders in accordance with the distance between the surfaces to be ground, and means for advancing said grinders, substantially as described.

5 9. In a grinding machine, the combination of the following instrumentalities, to-wit; a guide frame having its upper edge formed to position the work in a vertical plane, a work carriage mounted on said guide frame and
10 movable longitudinally thereof, oppositely disposed grinders arranged transversely of said guide frame, and a vertically adjustable support for said grinders whereby the grinding point may be raised or lowered with respect to the work held by the work carriage.

15 10. In a grinding machine, the combination of the following instrumentalities, to-wit; a guide frame having its upper edge formed to position the work in a vertical plane and having stops at opposite ends thereof, a work carriage mounted on said guide frame and movable longitudinally thereof between said stops, transversely disposed grinders movable toward and from
20 each other and having oppositely disposed bearings movable therewith, and a guide bar on the work carriage movable between and cooperating with said bearings to position the grinders transversely.

30 11. In a grinding machine, the combination of the following instrumentalities, to-wit; a guide frame having its upper edge formed to position the work in a vertical plane, a work carriage movable longitudinally on said frame, oppositely disposed grinders movable toward and from each other transversely of the guide frame, a guide bar on the carriage for positioning the grinders transversely, and a vertically adjustable support for said grinders, substantially as described.

45 12. In a grinding machine, the combination of the following instrumentalities, to-wit; a guide frame having its upper edge formed to position the work in a vertical plane, a work carriage mounted on said guide frame and movable longitudinally thereof, oppositely disposed grinders arranged transversely of said guide frames, carriages on which said grinders are mounted and vertically adjustable slideways for said carriages, substantially as described.

55 13. In a grinding machine, the combination of the following instrumentalities, to-wit; a horizontally disposed guide frame having its upper edge formed to position the work in a vertical plane, a work carriage mounted on and movable longitudinally of said guide frame, transversely movable
60 grinder carriages mounted on ways on opposite sides of said frame, springs for advancing said carriages, a guide bar mounted on the work carriage for limiting the advance of said carriages, and oppositely disposed grinders adjustably mounted on said

carriages, the adjustment of said grinders being in a direction parallel with the movement of the carriages, substantially as described.

70 14. In a grinding machine, the combination with the guide frame having its upper edge formed to position the work in a vertical plane and a work carriage mounted on and movable longitudinally of said guide frame, of a transversely arranged vertically adjustable grinder support projecting on opposite sides of the guide frame and having grinder carriage-ways thereon, grinder carriages mounted on said ways and movable toward and from the guide frame, grinder standards adjustably mounted on said carriages, hand wheels for adjusting said grinder standards on the carriages, springs for advancing the carriages, a movable guide bar for limiting the advance movement of the carriages, and oppositely disposed grinders mounted in said standards.

90 15. In a grinding machine such as described, the combination with a guide frame having its upper edge formed to position the work in a vertical plane, a work carriage mounted on said guide frame and having projections on opposite ends cooperating with said positioning edge, work clamps at opposite ends of said carriage, and a guide bar having oppositely disposed guiding surfaces, of transversely disposed grinders on opposite sides of the guide frame, carriages in which said grinders are mounted, movable toward and from the guide frame, means for advancing said grinder carriages, and rollers on said grinder carriages adapted to contact with opposite sides of the guide bar.

105 16. In a grinding machine, such as described, the combination with the horizontally disposed guide frame having its upper edge formed to position the work in a vertical plane, a work carriage mounted on and movable longitudinally of said guide frame and a guide bar on said carriage, of a grinder supporting frame extending on opposite sides of the guide frame, ways on said grinder supporting frame, grinder carriages mounted on said ways, grinders journaled on the carriages and rollers journaled on the carriages directly below the grinders at the grinding point and adapted to cooperate with the guide bar on the work carriage for positioning the grinders transversely, substantially as described.

120 17. In a grinding machine of the class described, the combination with the guide frame, work carriage movable longitudinally thereof and guide bar mounted on the work carriage, of the transversely movable grinder, means for advancing said grinder, and a roller movable with the grinder toward and from the guide frame, said roller being adapted to contact with the guide bar on the work carriage and being located in prox-

imity to and immediately below the grinding point of the grinder.

18. In a grinding machine such as described, the combination with the guide frame and the work carriage mounted on and positioned in a vertical plane by said guide frame, the oppositely disposed transversely arranged grinders movable toward and from each other, a guard surrounding each grinder, branched conveyer ducts communicating with said guards and a telescopic joint in the duct whereby the continuity of the duct is preserved during the movement of the grinders.

19. In a grinding machine such as described, the combination with a guide frame, work carriage movable longitudinally on said frame and positioned thereby in a vertical plane, of the oppositely disposed grinders, grinder carriages in which said grinders are journaled, adjustable guard bases mounted on said carriages and surrounding the lower parts of the grinder and apertures in said guard bases for the escape of dust.

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