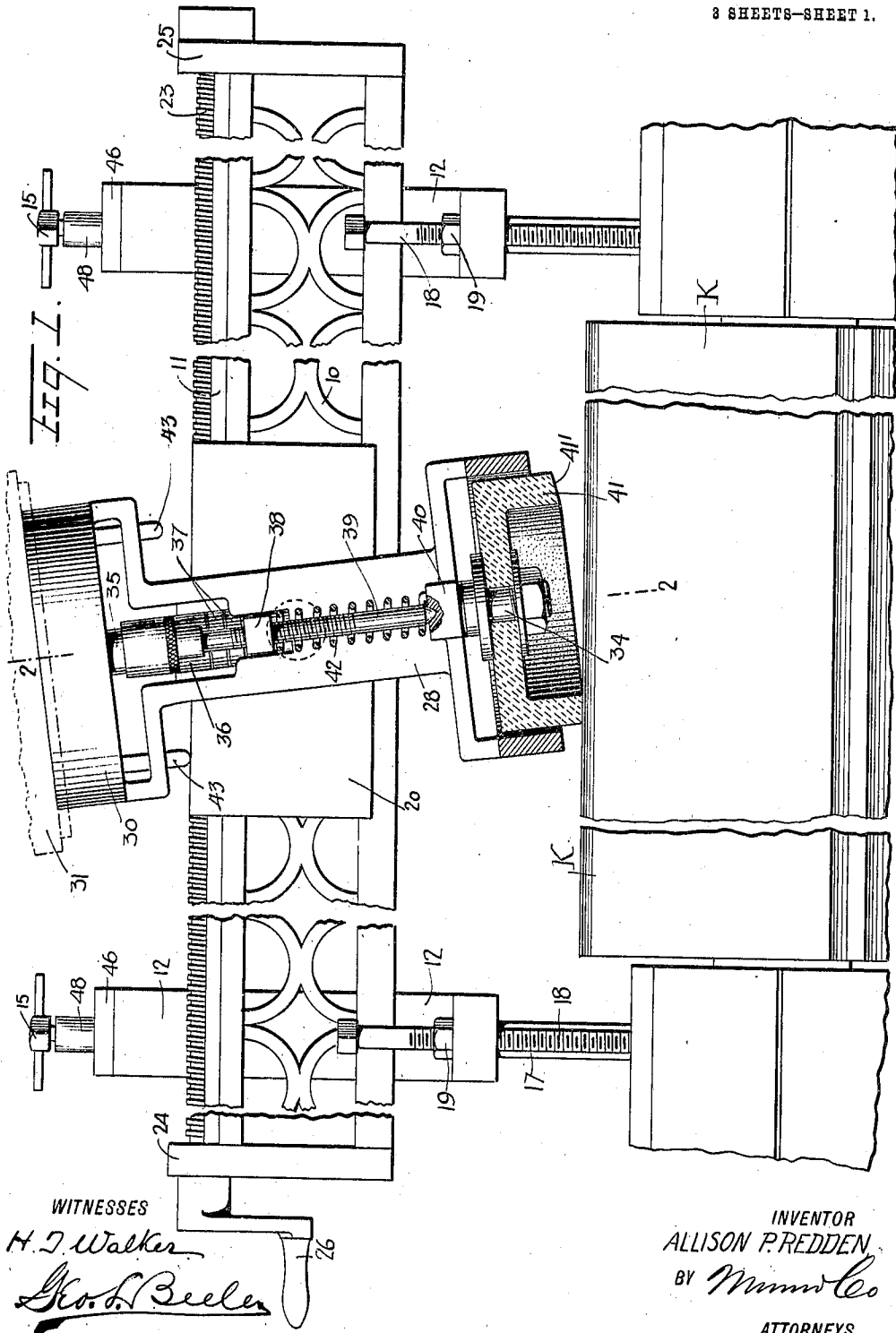


A. P. REDDEN.
MOTOR KNIFE GRINDER.
APPLICATION FILED FEB. 6, 1913,

1,085,876.

Patented Feb. 3, 1914.

3 SHEETS—SHEET 1.

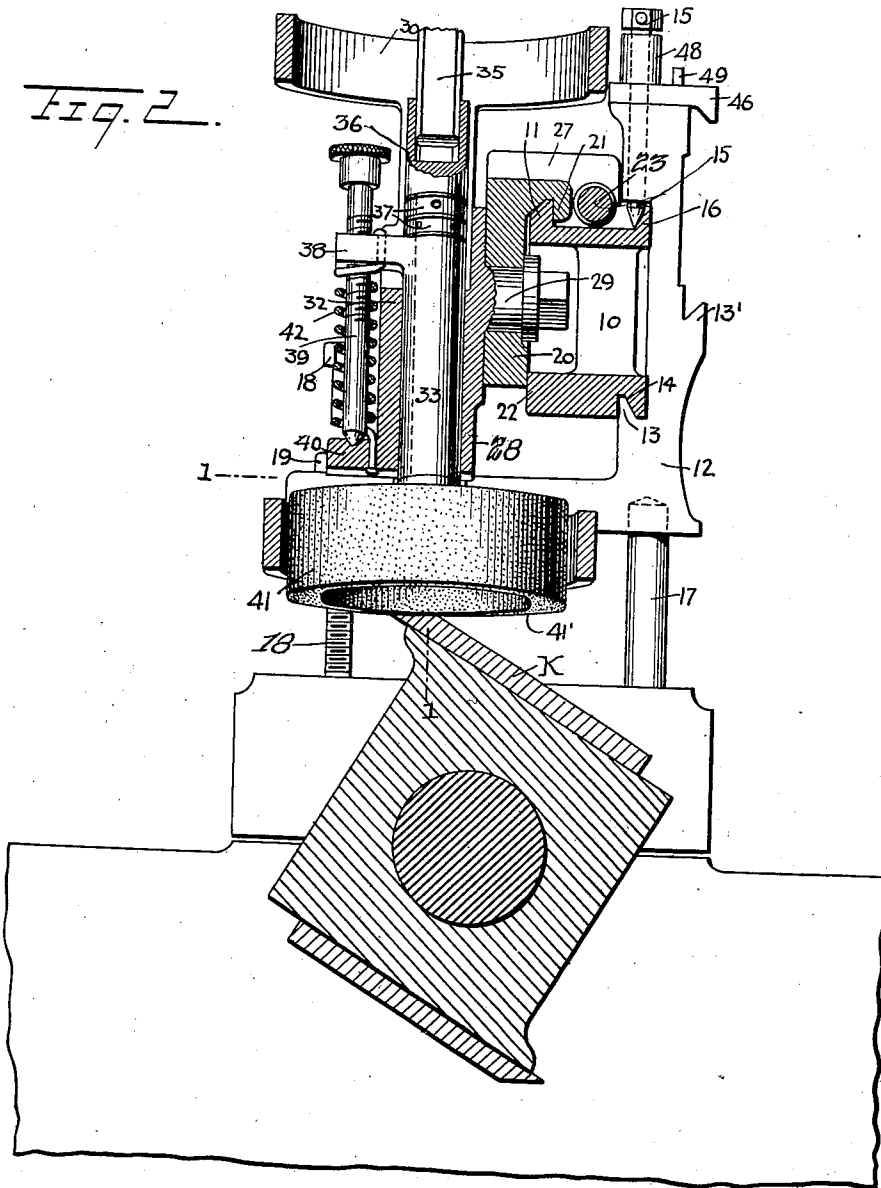


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3 SHEETS-SHEET 3.

Fig. 3.

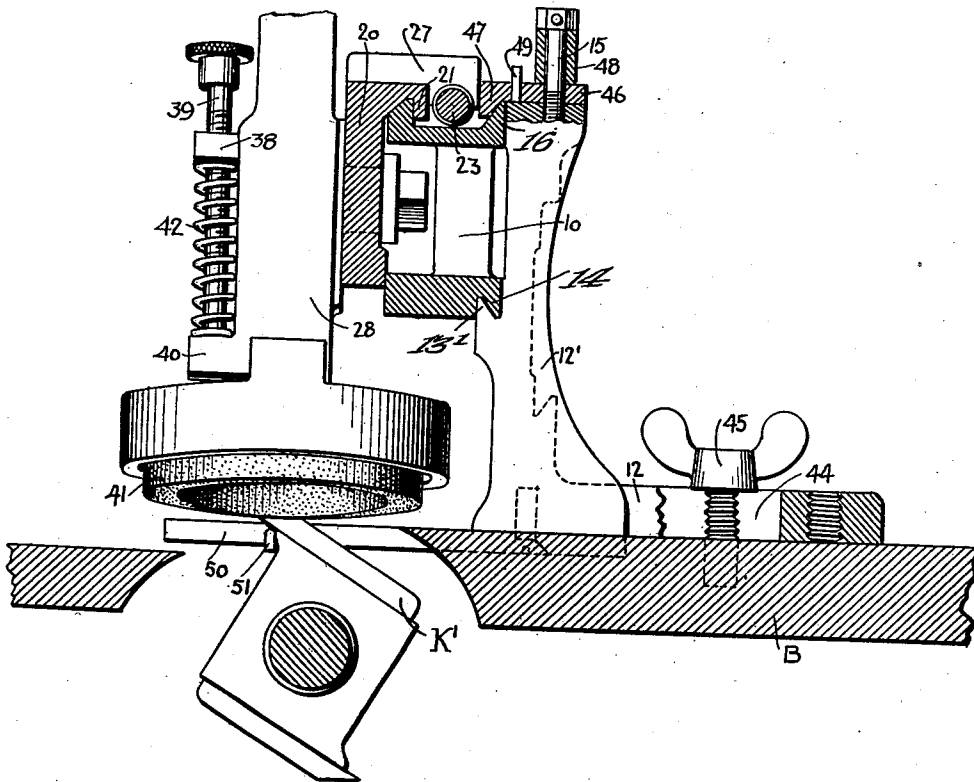
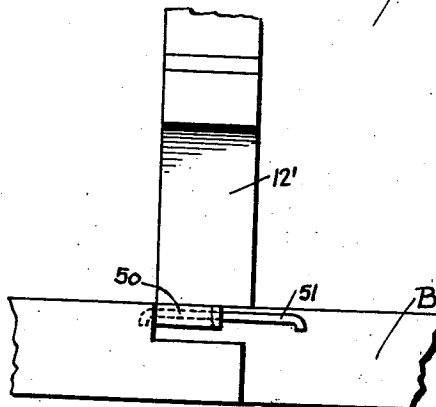


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MOTOR KNIFE-GRINDER.

1,085,876.

Specification of Letters Patent.

Patented Feb. 3, 1914.

Application filed February 5, 1913. Serial No. 746,299.

To all whom it may concern:

Be it known that I, ALLISON P. REDDEN, a subject of the King of Great Britain, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and Improved Motor Knife-Grinder, of which the following is a full, clear, and exact description.

This invention relates to machines for grinding wood working tools and has particular reference to a machine adapted to be operated especially by electric motor and is therefore portable so as to be moved in any suitable position in a work-shop or mill.

A further object of the invention is to so improve this class of devices as to render them not only easy of manipulation or adjustment, but in other ways well adapted to grind knives in a satisfactory and uniform manner.

More particularly stated, with a machine of this character in a mill or shop, the operator may keep his knives in perfect working condition both as to adjustment and sharpness with the minimum amount of time and expense with the obvious result that the output of the mill in proportion to the cost of operation may be greatly enhanced.

The foregoing and other objects of the invention will hereinafter be more fully described and claimed and illustrated in the drawings forming a part of this specification in which like characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a side elevation, partly in section and partly broken away, of a preferred embodiment of the invention shown as in position for operation upon a surface planer; Fig. 2 is a transverse section of the same substantially on the broken line 2—2 of Fig. 1; Fig. 3 is a view corresponding somewhat to Fig. 2, but showing the machine adapted to the grinding of a buzz planer; and Fig. 4 is a vertical detail of a part looking toward the right in Fig. 3.

As herein set forth the invention comprises a bridge 10 of a length great enough to span the length of any tool to be operated upon, said bridge being composed of a truss-like construction and having a guide rib 11 along its upper front edge. The bridge is straight and is sufficiently rigid to maintain the operating motor and grinding wheel adapted to be supported and guided therealong at a uniform level. The bridge is

adapted to be supported in any suitable manner portably. As a preferred means for so supporting the bridge I employ a plurality of brackets 12, each of which is adapted to interlock with the rear face of the bridge as by means of a tongue 13 adapted to extend into a groove 14 in the bottom of the bridge adjacent the lower rear edge and also having a screw 15 adjustable through the top of the bracket downwardly into coöperation with a rib 16 at the upper rear edge of the bridge and having a beveled front surface against which the pointed or conical end of the screw is adapted to impinge and thereby clamp the bracket and bridge snugly together. The bracket may be supported upon suitable legs or pins 17, each coöperating with the heel of the bracket, and a screw 18 is adjustable vertically through the toe of each bracket whereby the bridge as a whole may be properly trued for operation. A lock nut 19 may be employed in connection with each screw 18 to secure the adjusted position.

The grinder proper comprises a carriage 20 having a lip 21 engaging over the upper edge of the rib 11, whereby the carriage is held upon the bridge and the lower portion of the carriage is guided along a rail 22 constituting the front portion of the lower part of the bridge. A screw 23 extends longitudinally of the upper part of the bridge and is journaled at its ends in fixed bearings 24 and 25, said screw having a thread extending throughout the length of the bridge. A handle 26 is intended to represent any suitable means for rotating the screw for the purpose of traversing the carriage along the bridge in either direction, the engagement between the thread of the screw and the carriage being had through a lug or projection 27 extending rearwardly from the top of the carriage and meshing with the upper portion of the screw. It will appear, therefore, from the description just above that the carriage may be removed from the bridge and screw by simply lifting it therefrom.

A frame 28 is pivotally mounted upon the front face of the carriage 20 and is adapted for oscillation thereon through a pivot 29 extending rearwardly through the bridge. Said frame 28 is designed to support the motor upon the upper portion thereof or crown 30. The motor 31 indicated diagrammatically by dotted lines in Fig. 1 will be

understood to be of any suitable nature and adapted to be energized through a socket connection with any convenient incandescent electric lamp fixture. The intermediate portion of the frame 28 constitutes a socket 32 in which a sleeve 33 is movable vertically and in which is adapted to rotate the spindle 34 to the upper end of which the motor shaft 35 is adapted to be connected by any suitable form of socket 36 into which the lower end of the motor shaft is projected, the weight of the motor, however, being borne preferably by the crown 30 independently of the sleeve 33. The spindle 34 is adapted to be adjusted properly with respect to the sleeve 33 by one or more adjustment nuts 37. A lug 38 projects laterally from the upper end of the sleeve and is tapped to receive a screw 39 which bears normally at its lower end upon an extension 40 from the frame. By rotation of the screw, the sleeve 33 will be adjusted up or down whereby the downward movement of the grinding wheel 41 may be determined or regulated with respect to the knife K being ground. A spring 42 is connected to said lug 38 and extension 40 and serves, through its contraction, for the purpose of forcing the sleeve downwardly and insuring a substantially uniform pressure or tension of the grinding wheel upon the knife at all times.

As shown particularly in Fig. 1, the grinding wheel 41 is of a hollow cylindrical form and is so connected at the center of one end to the spindle 34 as to bring the lower edge of its rim into abrading contact with the tool. Said rim 41' is preferably beveled, and by virtue of the inclination of the frame 28 with respect to the carriage 20, the cutting edge of the knife will be slightly concaved, as shown in Fig. 2. The extent of inclination of the frame 28 in either direction from the vertical around the axis of the pivot 29 is limited by a stud or projection 43 located at any convenient place as on either side of the crown of the frame and adapted to engage the upper part of the carriage. In the grinding of certain types of knives it is essential that the frame 28 may be tilted in either direction in order for the grinding wheel to operate to the extreme ends of the knife. More specifically, as indicated in Fig. 1, if the carriage be operated toward the left, the engaging point of the wheel 41 is adapted to reach to the left end of the knife, and then for grinding to the other extreme end of the knife the frame requires to be tilted in the other direction.

As shown in Fig. 3, each of the bracket feet is provided with a slot 44, whereby for the proper operation of the grinder in connection with other types of planers, the brackets 12 may be clamped to the machine bed or bench B by means of lag screws 45.

By this means of securing the brackets in place they may be reversed from the position with respect to the bridge indicated in Figs. 1 and 2 so that all of the space in front of the brackets will be left clear and whereby the carriage and motor may be operated throughout the full length of the bridge. For the purpose of thus securing the brackets to the bridge, each of them is provided with a tongue 13' which is adapted to be received in the aforesaid groove 14 and also there is provided a clamp 46 having a finger 47 for coöperation with the aforesaid inclined or beveled front surface of the rib 16. The same screw 15 is adapted to secure the clamp 46 with the finger 47 in coöperation with said bridge rib, the screw acting through a thimble 48 which bears upon the top of the clamp and is forced downward thereupon by the screw head. To increase the stability of the clamp, a pin 49 extends upwardly from the top of the bracket through said clamp. The carriage and motor frame in this adaptation of the invention operate in respect to the bridge precisely as before.

In order to hold the knife K' in proper position to be operated upon by the grinding wheel 41, I may use a gage of the character illustrated in Figs. 3 and 4, the same comprising a bracket 12' adapted to be secured to the rear part of the bridge in any convenient place opposite the end of the knife by means similar to the means for securing the aforesaid brackets 12 to the bridge. To the bottom of the bracket 12' is connected an arm 50 which projects forwardly and from which extends a stop or hook 51 adapted to extend in a direction substantially parallel to the axis of the knife and engage with the knife or cylinder so as to maintain it in proper position, said stop 51 is slidably mounted in said arm so that it may be shifted longitudinally out of the path of the knife K' in order to present a succeeding knife into position.

From the mechanism hereinbefore described, it will be apparent that when the knives are once adjusted to the several cylinders or supports, any number of them may be readily and successively ground so that the resulting edges will all be of a uniform distance from the axis of rotation of the knives because of the manner of mounting and operating the grinding wheel. In this class of machinery it is of the utmost importance that all of the knives perform their proper share of the work, and under ordinary conditions it is a difficult if not an impossible task, to properly adjust and true a series of knives by the means heretofore employed.

The several parts of the device may be made of any suitable materials and the relative sizes, proportions and details of construction

struction of the same may be varied to a considerable extent without departing from the spirit of the invention hereinafter claimed.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. The herein described machine comprising, in combination, a bridge, means to support the bridge in parallelism to the knife to be ground, a carriage supported upon the bridge and removable directly therefrom vertically, means to guide and traverse the carriage longitudinally along the bridge, a rotary grinding wheel, and means to support the grinding wheel upon the carriage and inclined at an angle to the vertical in a plane parallel to the vertical plane of the bridge.

2. The herein described grinding machine comprising, in combination, a bridge, a plurality of detachable brackets for supporting the bridge in proper position, said bridge having a rib at the upper edge of its front face, and a rail at the bottom edge thereof, a carriage having a lip engaging over the bridge rib and guided against said rail, a screw arranged longitudinally of said bridge, means extending from the carriage and extending over and having threaded engagement with said screw, a frame pivoted on a horizontal pivot in said carriage, a spindle journaled in said frame, a hollow cylindrical grinding wheel secured to said spindle, said wheel having a beveled grinding rim, means to limit the pivotal movement of said frame upon the carriage, and means to rotate the spindle and wheel.

3. In a grinding machine, the combination of a carriage support, a frame connected to said support and having a socket, a sleeve movably mounted in said socket and having a laterally projecting lug 38, a screw operating through said lug and against a projection from said frame, a spindle rotatably mounted in said sleeve, and a grinding wheel mounted upon the lower end of said spindle.

4. In a grinding machine, the combination of a bridge, a support detachably mounted upon said bridge, means to traverse the support along the bridge, a frame pivoted on a horizontal pivot to said support and adapted to rock in a plane parallel to the bridge, means cooperating between the support and the frame to limit said pivotal movement, a spindle journaled in said frame, a grinding wheel carried by one end of the spindle, and means to adjust the spindle and grinding wheel with respect to the frame.

5. In a grinding machine, the combination of a frame having a socket there-through and a projection extending laterally therefrom, a sleeve mounted in said socket

and having a lug projecting laterally from one end of the same in alinement with the aforesaid projection, a spring between said lug and said projection, a screw cooperating with said lug and projection, the screw being tapped through one of them and extending through said spring and bearing against the other of said parts, a spindle journaled in said sleeve and adjustable therewith with respect to the frame through the operating of said screw, and a grinding wheel connected to the spindle.

6. The herein described grinding machine including a bridge, a spindle, a grinding wheel movable along said bridge, and means to support the bridge, said supporting means including a bracket having a tongue projecting into a groove extending into the bottom of the bridge, and a screw adjustable downwardly into engagement with the upper part of the bridge, and means to secure the bracket in position.

7. The herein described bracket for grinding machines comprising an L-shaped structure, the stem of the structure having a plurality of bridge engaging devices on opposite sides thereof, substantially as set forth.

8. In combination with a bridge supporting bracket for grinding machines, of a clamping screw extending into the top thereof, a clamp through which the screw passes and having a finger projecting downwardly on the opposite side from the point of the screw, and a pin extending upwardly from the bracket through the clamp plate, substantially as set forth.

9. The herein described bracket for supporting the bridge of a grinding machine comprising a plurality of securing devices on opposite sides thereof, such securing devices including a screw extending downwardly through the top of the bracket and having a point adapted to engage the bridge, the screw head being spaced from the top of the bracket, a clamp plate on the top of the bracket through which said screw passes, said clamp plate having a finger adapted to cooperate with the bridge in another position of the bracket, and a thimble between said plate and the screw head through which the screw secures the clamp plate and finger in proper position.

10. In a machine of the character described, the combination of a bridge, a carriage movable along the bridge, a spindle mounted on said carriage in a plane parallel with the face of the bridge and the knife to be ground but inclined in said plane at an angle to the vertical, and a hollow cylindrical grinding wheel on the bottom of said spindle.

11. In a machine for grinding a knife, the combination of a bridge arranged parallel with the edge of the knife to be ground, a carriage movable along said bridge, a spin-

- dle on said carriage, and a rotary grinding wheel supported at the lower end of the spindle, said spindle being arranged with its axis at a slight angle to a vertical plane at right angles to the vertical plane coinciding with the edge of the knife to be ground, whereby the lower grinding surface of said wheel will grind the blade in concave form.
12. In a machine for grinding a horizontal knife, the combination of a horizontal bridge, a carriage movable along said bridge, a spindle on said carriage, a rotary grinding wheel supported at the lower end of the spindle, said spindle being arranged with its axis inclined at a slight angle to the vertical in the vertical plane of the knife edge, and means for reversing the spindle to a position in which it makes an equal but opposite angle with the vertical, whereby the lower grinding surface of said wheel will grind the blade in the same concave form in both positions of the spindle.
13. In a grinding machine, the combination of a bridge, a carriage mounted thereon, a spindle rotatably mounted on said carriage, a grinding wheel connected to the spindle, means for forcing the spindle and grinding wheel toward the work, and adjustable means for stopping at a predetermined point the motion of the spindle and grinding wheel toward the work.
14. In a grinding machine, the combination of a longitudinally movable spindle, a grinding wheel on the end thereof, yielding means for forcing the spindle longitudinally toward the work, and adjustable means for stopping the motion of the spindle at a predetermined point.
15. In a grinding machine, the combination of a longitudinally movable spindle, a grinding wheel secured thereon at one end, a frame on which said spindle is mounted, a spring carried by said frame and connected with said spindle for forcing said spindle yieldingly toward the end at which the grinding wheel is mounted, and a screw movable with the spindle and adjustable longitudinally of the spindle, said frame having a surface thereon into contact with which the screw can come for limiting the motion of the spindle.
16. In a grinding machine, the combina-

tion of a longitudinally movable spindle, a grinding wheel at one end of said spindle, a spring connected with said spindle for forcing said spindle yieldingly toward the end at which the grinding wheel is mounted, and a screw movable with the spindle and adjustable longitudinally of the spindle for limiting the motion of the spindle, said screw passing through said spring and serving as a guide therefor.

17. In a machine of the character described, the combination of a bridge adapted to be supported in parallelism with the knife to be ground, a carriage supported by the top of said bridge, depending from the top thereof downwardly, and removable from the bridge by a direct upward motion, and means on the carriage for supporting a grinding wheel.

18. In a machine of the character described, the combination of a bridge adapted to be supported in parallelism with the knife to be ground and having a vertical side, a carriage supported on said bridge and depending from the top thereof downwardly along the vertical side, whereby the carriage is removable from the bridge by a direct upward motion, a cylindrical grinding wheel, the means on the carriage for supporting a grinding wheel at the bottom thereof.

19. In a machine of the character described, the combination of a bridge having a vertical face and a vertical guide rib along the top of said vertical face, a carriage having a rear face adapted to engage the vertical face of the bridge and provided with a downwardly extending lip at the top of the rear thereof extending over and engaging behind said rib, the vertical face of said carriage resting freely against the vertical face of the bridge at the bottom of said carriage, whereby said carriage can be removed from the bridge by a direct upward movement, and means for supporting a grinding wheel on said carriage.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALLISON PATRICK REDDEN.

Witnesses:

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PHILIP D. ROLLHAUS.