Aug. 28, 1928.

1,682,471

W. J. BAUMBERGER

WORK SUPPORT

Filed July 31, 1925

3 Sheets-Sheet 1

Fig. 1.

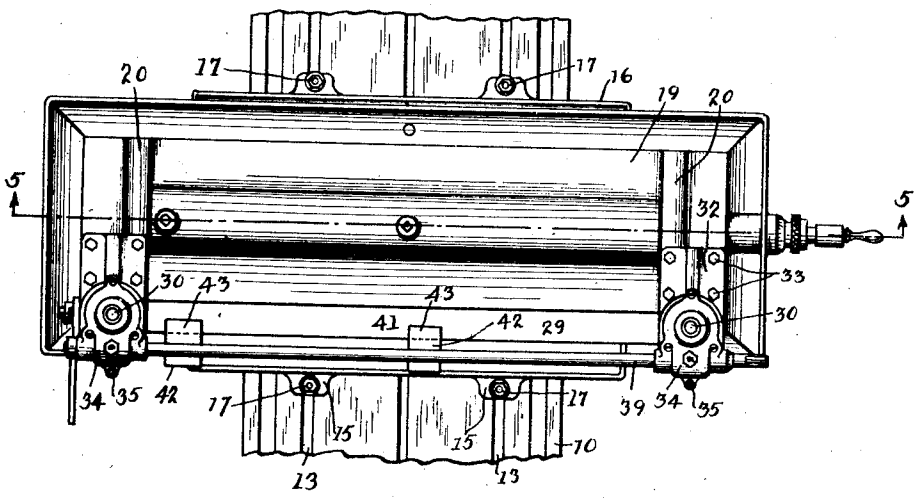
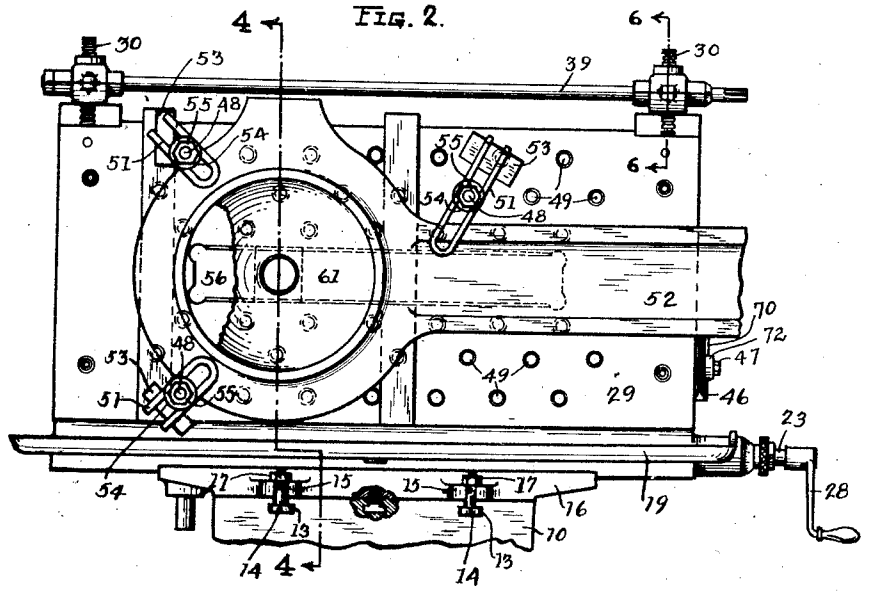


Fig. 2.



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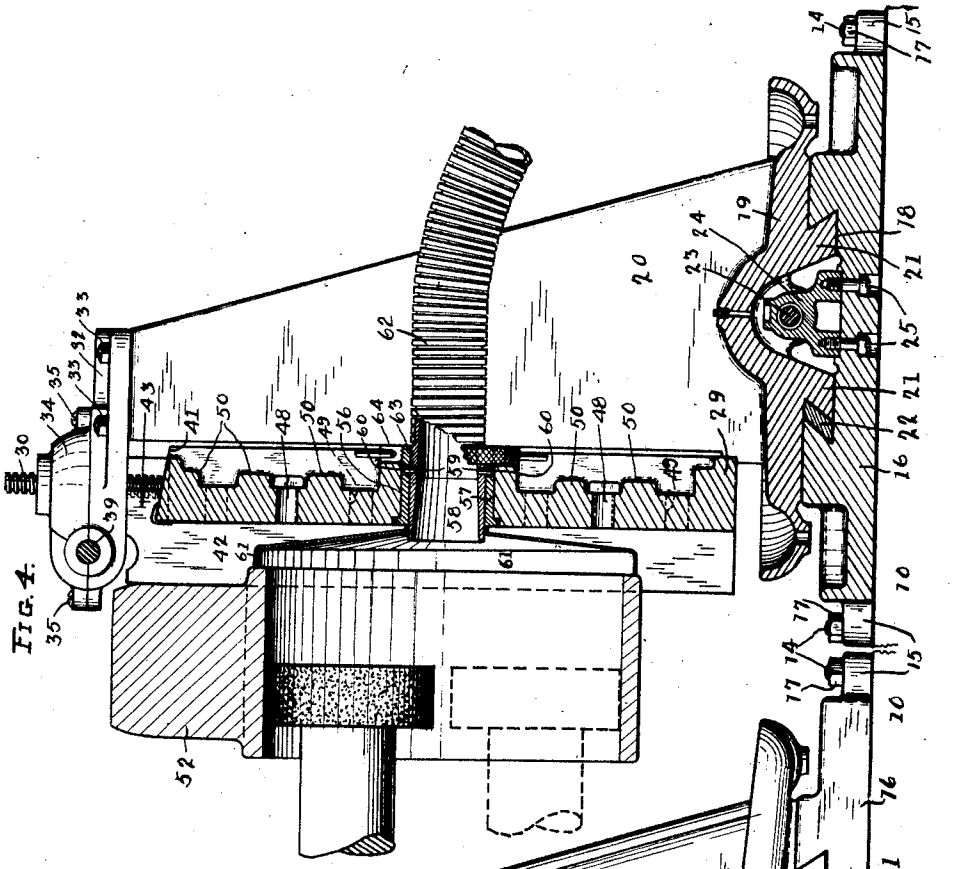


FIG. 4.

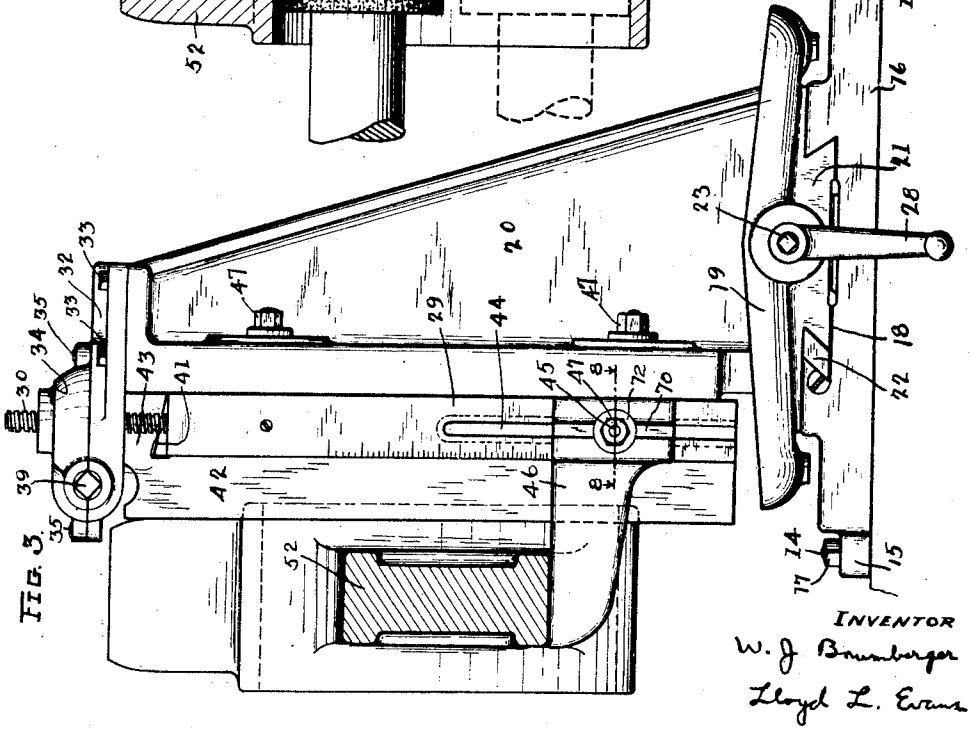


FIG. 5.

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3 Sheets-Sheet 3

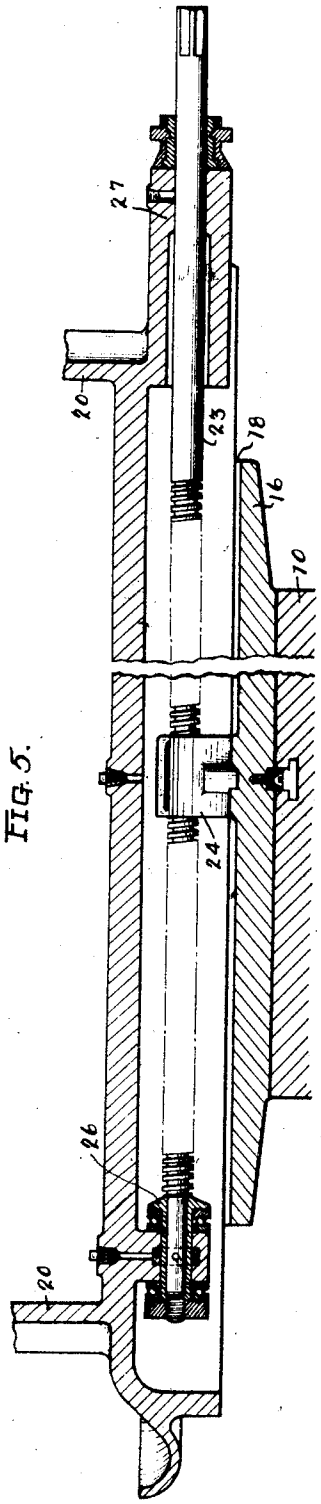


FIG. 5.

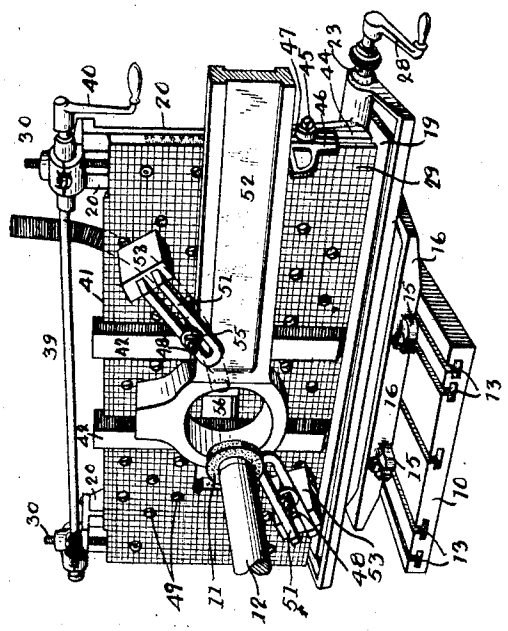


FIG. 7.

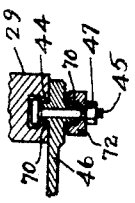


FIG. 8.

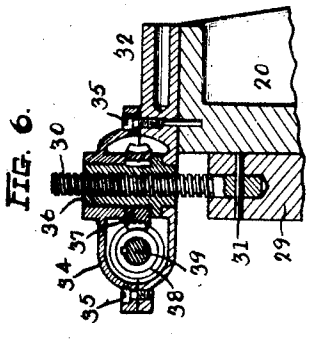


FIG. 6.

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UNITED STATES PATENT OFFICE.

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WORK SUPPORT.

Application filed July 31, 1925. Serial No. 47,225.

This invention relates to grinding machine fixtures and is particularly adapted to carry railroad equipment such as links, rods, and the like during the finishing operation of their bearing walls.

In grinding the bearing walls of railroad equipment of the class described and other irregularly shaped articles, considerable difficulty is experienced in readily securing such work upon a grinding machine so that the wall to be ground will be in accurate alignment with the path of rotation of the grinding wheel.

An object of my invention is to provide a grinding machine fixture upon which work of the character described can be readily secured and positioned so that the bore to be ground will be in accurate relation with the path of the rotation of the grinding wheel.

A further object of my invention is to provide a fixture upon which work can be readily fixed with a definite knowledge of the relation of the bore to be finished to the axis of the rotation of a grinding wheel.

Another object of my invention resides in the provision of a dust collector which is associated with a fixture so that it can be adjusted to center with the bore of an article in any position of attachment in which it is operatively related with a grinding wheel.

These and other objects will appear more fully in the following specification in which I describe one embodiment of my invention.

In the accompanying drawings, Figure 1 is a plan view of a fixture embodying my invention mounted upon the bed of a grinding machine; Fig. 2 is a front elevation of the same; Fig. 3 is a side elevation of the fixture; Fig. 4 is a vertical sectional view of the fixture taken on the line 4—4 of Fig. 2; Fig. 5 is a sectional view through the base portion of the fixture taken on line 5—5 of Fig. 1, illustrating the mechanism for moving a portion of the fixture transversely; Fig. 6 is a sectional view taken on the line 6—6 of Fig. 2 illustrating the mechanism for adjusting the mounting plate vertically; Fig. 7 is a perspective view of the fixture mounted upon a grinding machine bed with a railroad side rod secured thereto with its bore in position to be ground; and Fig. 8 is a sectional view taken on line 8—8 of Fig. 3 showing the side bracket attached to the mounting plate.

Referring now to the drawings by characters of reference, 10 represents the reciprocable bed of a grinding machine which supports the fixture assembly and moves it to and from the grinding wheel 11 which is secured to the end of a shaft or spindle 12 mounted in the head of the machine. It will be understood that the grinding wheel is rotated in an orbital path and also about its own axis in the customary manner for grinding the interior wall forming the bearing portion of articles of the nature set forth.

The machine bed is provided with longitudinally extending undercut slots 13 in which the heads of bolts 14 are slidably associated. The bolts extend through slotted arms 15 which extend from the base member 16 of the fixture seated upon the machine, and nuts 17 are screwed upon the bolts to clamp the fixture base in desired longitudinal position upon the machine.

The upper face of the fixture base member is provided with a dove-tail recess 18 which extends thereacross transversely relative to the axis of the grinding wheel shaft 12. A frame is supported by the base 16 and comprises a base plate 19 from which a pair of ribs 20 extend vertically. The base plate is formed with a dovetail 21 which depends therefrom and is complementary to and is seated in the dove-tail recess 18 of the base member. The fixture frame is slidable transversely upon the base member and is secured in desired adjusted relation therewith by the gib 22. A screw shaft 23 extends lengthwise of the dovetail 21 of the base plate of the frame and is screwed through a bearing 24 which is secured to the base member 16 by studs 25. Suitable bearings 26 and 27, carried by the supporting frame, are provided for each end of the screw shaft and one end of the screw shaft projects from the end of the base plate and is formed to receive a hand crank 28. By rotating the screw shaft 23, the fixture frame can be adjusted across the plate 16 in a direction transversely across the end of the grinding wheel, it being understood that the gib is released during the adjusting operation.

The front faces of the frame ribs 20 lie in the same transverse plane, and pro-ide

bearings for the end portions of the vertically extending mounting plate 29 of the fixture. Screw shafts 30 extend from the top of the mounting plate adjacent each rib of the frame and are secured to the plate by pins 31. A bracket 32 is secured to the top of each rib by studs 33 and such brackets are formed as a housing at one end to receive the shafts 30. A cap 34 is secured over each of the housing portions of the brackets 32 by studs 35, and a vertically internally threaded rotatable bearing 36 is carried by each of the housings so formed. The shafts 30 are screwed through the rotatable bearings, and a gear 37 is keyed to each of the rotatable bearings within the housings. Gears 38 are keyed to a shaft 39 which extends across the housings, and mesh with the gears 37 within the housings. The shaft 39 projects from one of the housings and is formed to receive a hand crank 40 by means of which it can be rotated. The rotation of the shaft 39 rotates the gears 38 which are keyed thereto, and they in turn rotate the gears 37 which will rotate the bearings 36 in unison. The rotation of the bearings will cause the shafts 30 to move vertically and will support the mounting plate in desired vertical position. The mounting plate will in this manner be supported and adjusted in parallelism by the mechanism just described, thus maintaining it in uniform relation with respect to the grinding wheel.

It will be seen that the mounting plate 29 can be adjusted transversely with the fixture frame, that the fixture frame can be adjusted longitudinally upon the machine bed with the fixture base 16, and that the mounting plate can be moved vertically relative to the fixture frame. Such adjustments will permit the operator to move readily the work carried by the fixture so that it will align in the desired relation with the axis of the movement of the grinding wheel. The adjustability of the position of the mounting plate and the mechanism utilized for arranging and securing work upon the plate, makes the fixture especially desirable for supporting railroad and other equipment of an irregular shape, such as side rods, radius links, link hangers, eccentric rods and the like for a grinding operation.

The upper edge portion 41 of the mounting plate, extending intermediate the fixture frame ribs 20 is beveled to serve as a support for a pair of beams 42 against which the work is clamped to the fixture. The beams are provided with gibs 43 having their under surfaces beveled complementary to the upper edge of the mounting plate so that they can be hooked over the same and thus support the beams. The beams are freely slidable so that they can be readily moved upon the mounting plate to receive work having a bore of varying diameter. The work is clamped against the front faces of the beams 42 and the work will thus be spaced from the mounting plate so that a clearance will be proved for the grinding wheel during the finishing operation.

Each end of the mounting plate is provided with a vertically extending slot 44 in which the head of a bolt 45 is slidably mounted. The bolt projects through the slot and extends through an aperture in a work supporting bracket 46, and a nut 47 is screwed against a washer 72 which is positioned on the bolt to secure the bracket against the end of the mounting plate. The bracket is provided with ribs 70 on each side, one of which fits in the slot 44 on one side of the plate to maintain the bracket in a fixed relation. The provision of the two ribs permits the bracket to be used on either side of the mounting plate. The bracket projects transversely from the face of the mounting plate and is provided with a horizontally extending face which serves as a support for one end of a piece of work, and as the bracket can be adjusted in a vertical plane the work can be supported in the desired vertical position. The bracket can be adjusted when the nut 47 is loosened.

The mounting plate 29 is provided with a plurality of apertures 49 through which bolts 48 can be inserted to position clamp members for securing work against the beams 42. The apertures are arranged in horizontal and vertical parallel lines so as to accommodate the bolts in definite relation for the varying sizes and shapes which the work may have. The rear face of the mounting plate is formed with projections 50 which are horizontally arranged in parallel relation adjacent the apertures, and between which the bolt heads can be inserted to secure them in a stationary position. This construction saves time in securing the clamping bolts, thus assisting in the quick assembly and removal of the work from the mounting plate. The bolts extend through slots in the clamping members 51, and one end of such clamping members is placed against the work 52, which is illustrated as a side rod. The other end of the clamps 51 extend from the work and bear against spacer blocks 53 which are placed intermediate the clamps and the plate 29. A washer 54 is positioned upon each bolt so that it extends across the slot in the clamps, and a nut 55 is screwed upon each bolt end and against the washers until the work is securely held between the clamps and the beams 42.

The front face of the mounting plate may be marked with vertical and horizontal graduations so that the work can be accurately positioned upon the plate in a definite relation with the axis of the movement of the grinding wheel. The ends of the

mounting plate are also vertically graduated so that the supporting face of the bracket can be definitely positioned relative to the axis of the rotation of the grinding wheel. These graduations provide means whereby the operator can position the work against the mounting plate in an accurate relation with the grinding wheel.

The mounting plate is provided with a transversely extending slot 56 which serves as a support for an adjustable dust collector which can be positioned with respect to the bore in a piece of work held by the plate so as to collect all of the dust during the grinding operation. A bearing member 57 extends through the slot and is slidably mounted therein, and a conduit member 58 extends through and is carried by the bearing member. The conduit member is provided with outwardly extending pins 59 which engage in bayonet slots 60 formed in the bearing member to removably secure the conduit with the bearing. The end of conduit member 58 projects beyond the front face of the mounting board and an annular collector head 61 may be secured thereto. A hose 62 is secured to the other end of the conduit member and a suitable suction device is associated with the hose. The bearing member is slidably mounted in the slot in the mounting plate and the suction device can thus be bodily adjusted transversely of the plate so that the head 61 will center with the bearing of the work to be finished in the various positions in which it may be secured with the plate. One end of the bearing member is flanged and the other end 63 is threaded, and a nut 64 is screwed upon the threaded end to clamp the bearing against the mounting plate in desired adjusted position.

It will thus be seen that with such an arrangement the dust collector can be adjusted and secured in substantial alignment with the bore of the work being ground so that the dust or grindings may be more readily removed.

It will also be obvious that, if desired, the head 61 of the dust collector may be emptied and the work positioned substantially in alignment with the member 58.

It will be obvious that the work to be ground can be readily and accurately secured to the fixture and that the latter can be quickly adjusted to accurately position the work in alignment with the axis of the orbital movement of the grinding wheel and with the dust collector in substantial alignment with the work.

Furthermore, it is to be understood that the particular forms of apparatus shown and described, and the particular proceedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

What I claim is:

1. In a grinding machine fixture, the combination of a supporting frame, a mounting plate carried by said frame, said plate extending in a vertical plane and having undercut slots in the ends thereof, a bracket extending transversely from the face of said plate for supporting one end of a piece of work, said bracket having a rib engaging within the slot in said plate, and means for securing said bracket rigidly with said plate in desired vertical position.

2. In a grinding machine fixture, the combination with a vertically adjustable work carrying plate having a slot extending transversely thereof, of a dust collecting device, comprising a collector slidably mounted in the slot in said plate, and adjustable conducting means secured to the other end of said collector.

3. In a grinding machine fixture, the combination with a vertically extending work carrying plate having a slot extending transversely thereof, of a dust collecting device comprising a bearing slidably mounted in the slot in said plate, a collector head secured to said bearing on one side of said plate, a suction hose secured to said bearing, and means for securing said bearing rigidly with said plate in desired adjusted relation.

4. In a grinding machine, the combination of a supporting frame adjustably mounted transversely of the machine, a vertically adjustable mounting plate carried by said frame, said mounting plate having a vertical face parallel to which work is to be secured, a vertically adjustable bracket secured to the end of said plate and projecting forwardly of the face of the plate to provide a support for the work, said plate having graduations thereon to indicate the vertical elevation of said bracket, clamping means associated with said plate for securing the work thereto while supported on said bracket, and means for causing relative movement between the work and a grinding wheel spindle of the grinding machine normal to the face of said mounting plate.

5. In a grinding machine in which the grinding wheel has an orbital movement, a fixture including a supporting frame adjustable in a path transversely of said grinding wheel, a mounting plate carried by said frame and adjustable in a vertical plane, said mounting plate having a vertical face parallel to which work is to be secured, means associated with said plate for clamping work thereto, a vertically adjustable bracket secured to one end of said plate and projecting forwardly of the face of said plate, the end and the face of said plate having graduations thereon to indicate the

position of the work relative to said grinding wheel in any relation in which it is clamped to the face of said plate, and means for causing relative movement between the work and a grinding wheel spindle of the grinding machine normal to the face of said mounting plate.

6. In a grinding machine, in combination, a transversely adjustable supporting frame having spaced vertical bearing faces, a vertically adjustable mounting plate bearing against said bearing faces, said mounting plate having a horizontal top edge and a vertical face and a top surface downwardly and rearwardly inclined from said horizontal top edge, a plurality of vertically depending beams slidable transversely of the face of said mounting plate, said beams having portions arranged to cooperate closely with said top inclined surface of the mounting plate whereby said beams may be maintained in vertical depending position and in parallel relation to each other, means for securing work in desired position relative to said beams and in spaced relation to the face of said plate, and means for causing relative movement between the work and a grinding wheel spindle of the grinding machine normal to the face of said mounting plate.

7. In a grinding machine, in combination, a supporting frame having spaced vertical bearing faces, a vertically adjustable mounting plate bearing against said bearing faces, said mounting plate having a vertical face parallel to which work is to be secured, a plurality of vertically depending beams slidable transversely of said mounting plate, said beams and mounting plate having cooperative surfaces whereby said beams may be maintained in vertically depending position and in parallel relation to each other, a vertically adjustable bracket having an upper horizontal bearing face disposed at one end of said mounting plate to assist in supporting work having elongated members, means whereby the work to be mounted may be readily secured in desired position against said beams in spaced relation to said plate and may rest on said bracket, and means for causing relative movement between the work and a grinding wheel spindle of the grinding machine normal to the face of said mounting plate.

In testimony whereof I affix my signature.

WILLIAM J. BAUMBERGER.