Sept. 4, 1928. 1,683,354

V. G. HONSTAIN ET AL

GRINDING MACHINE ATTACHMENT

Filed Feb. 9, 1927 5 Sheets-Sheet 1

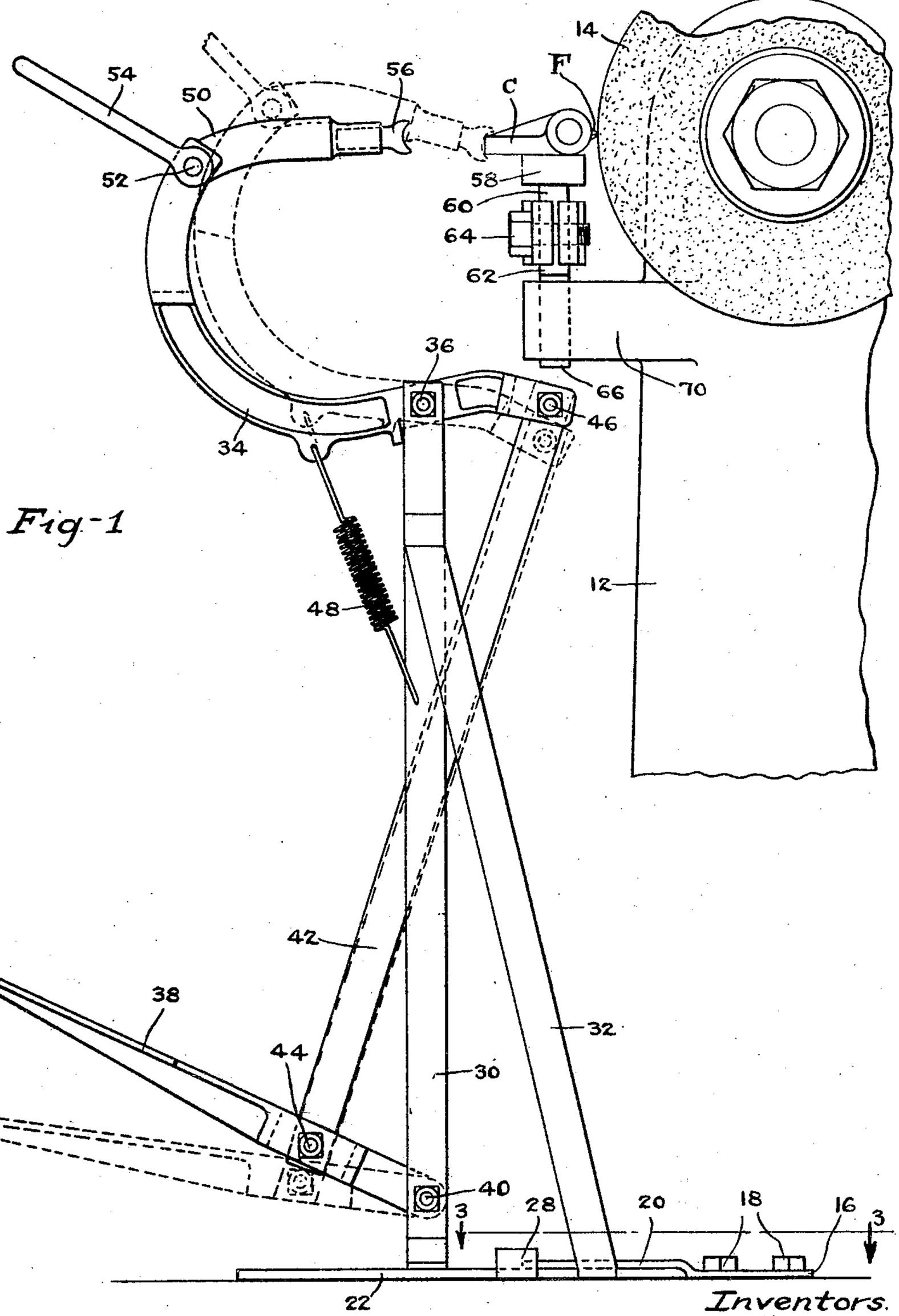

Fig-1

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Fig. 2.

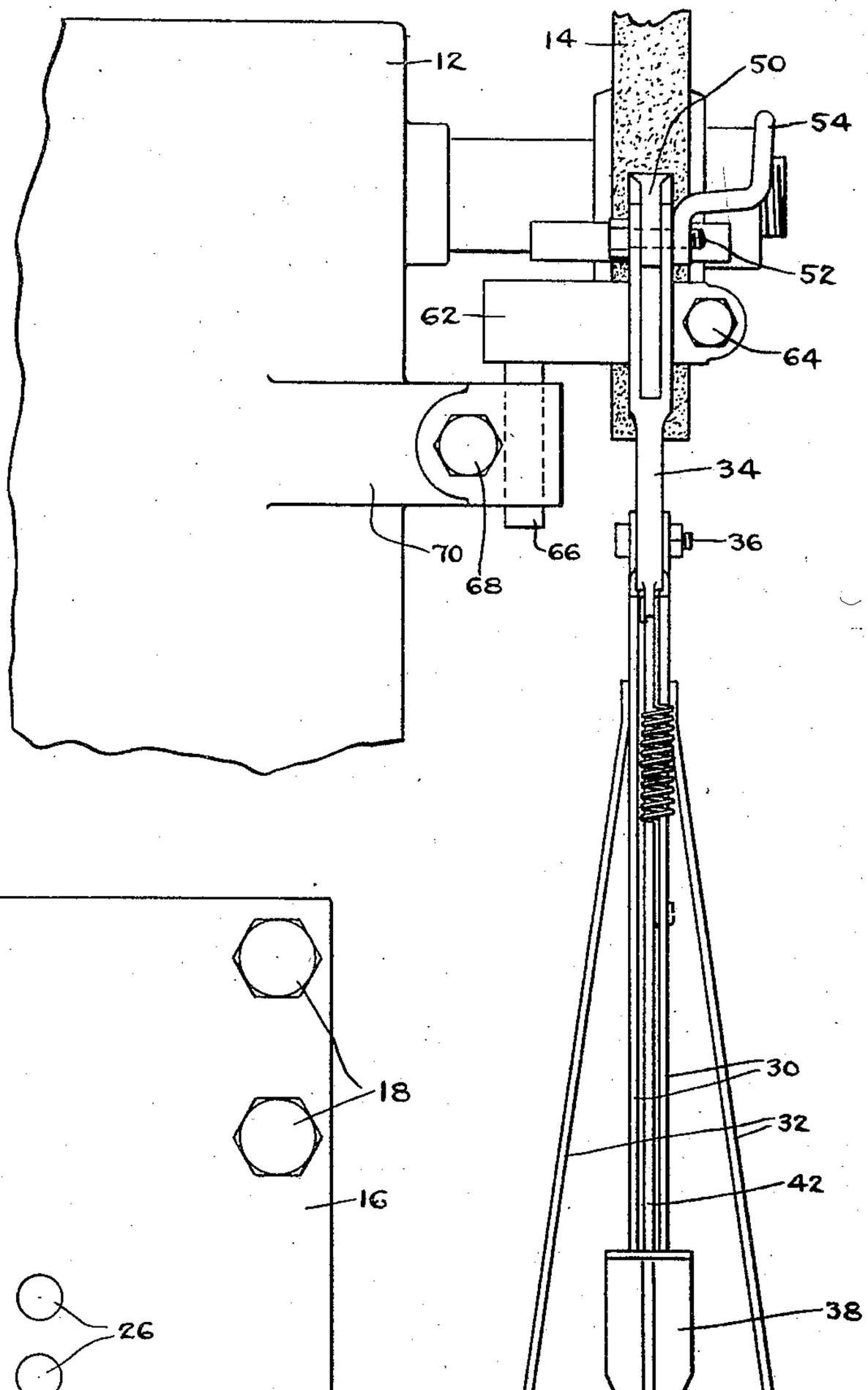
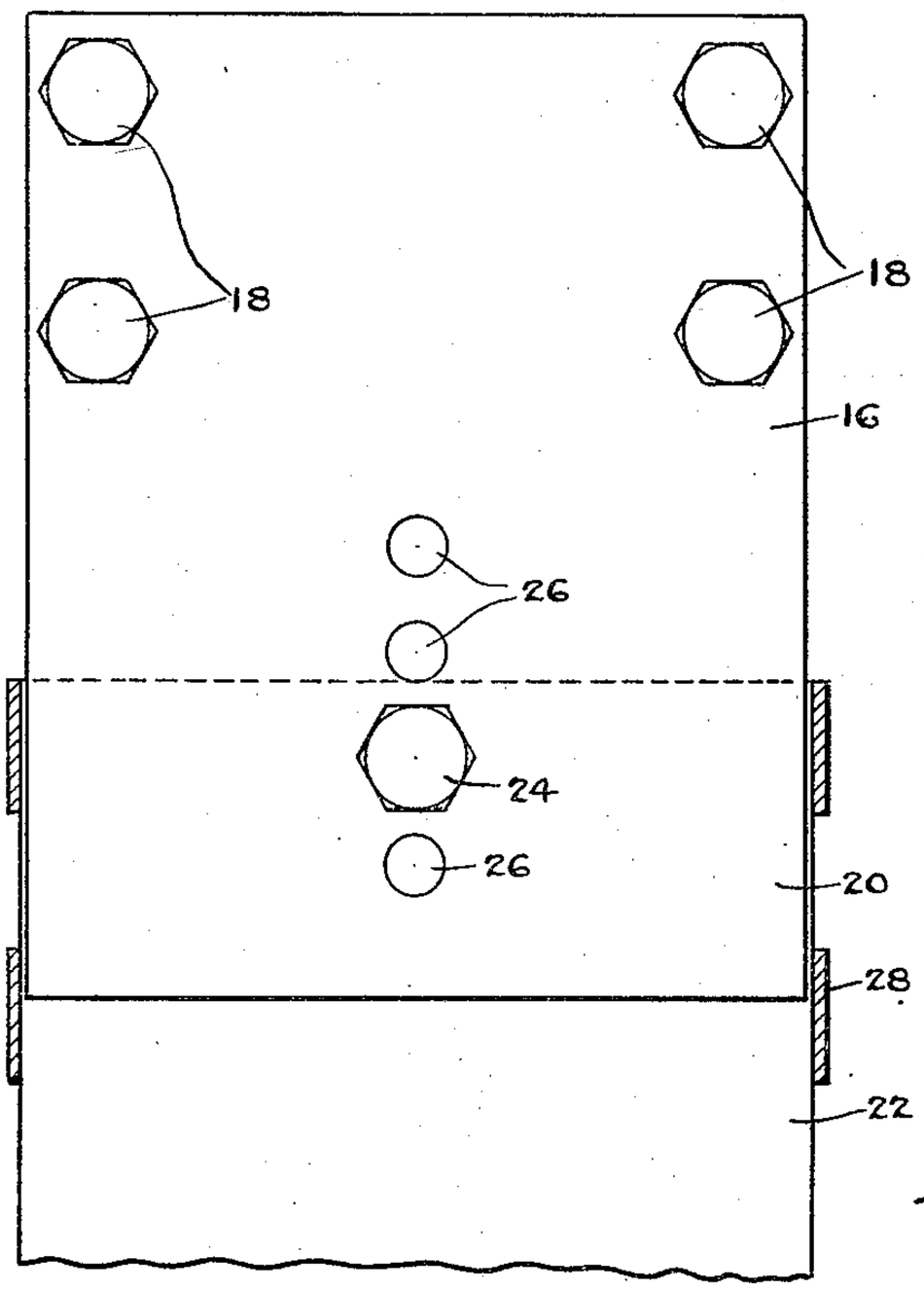


Fig. 3



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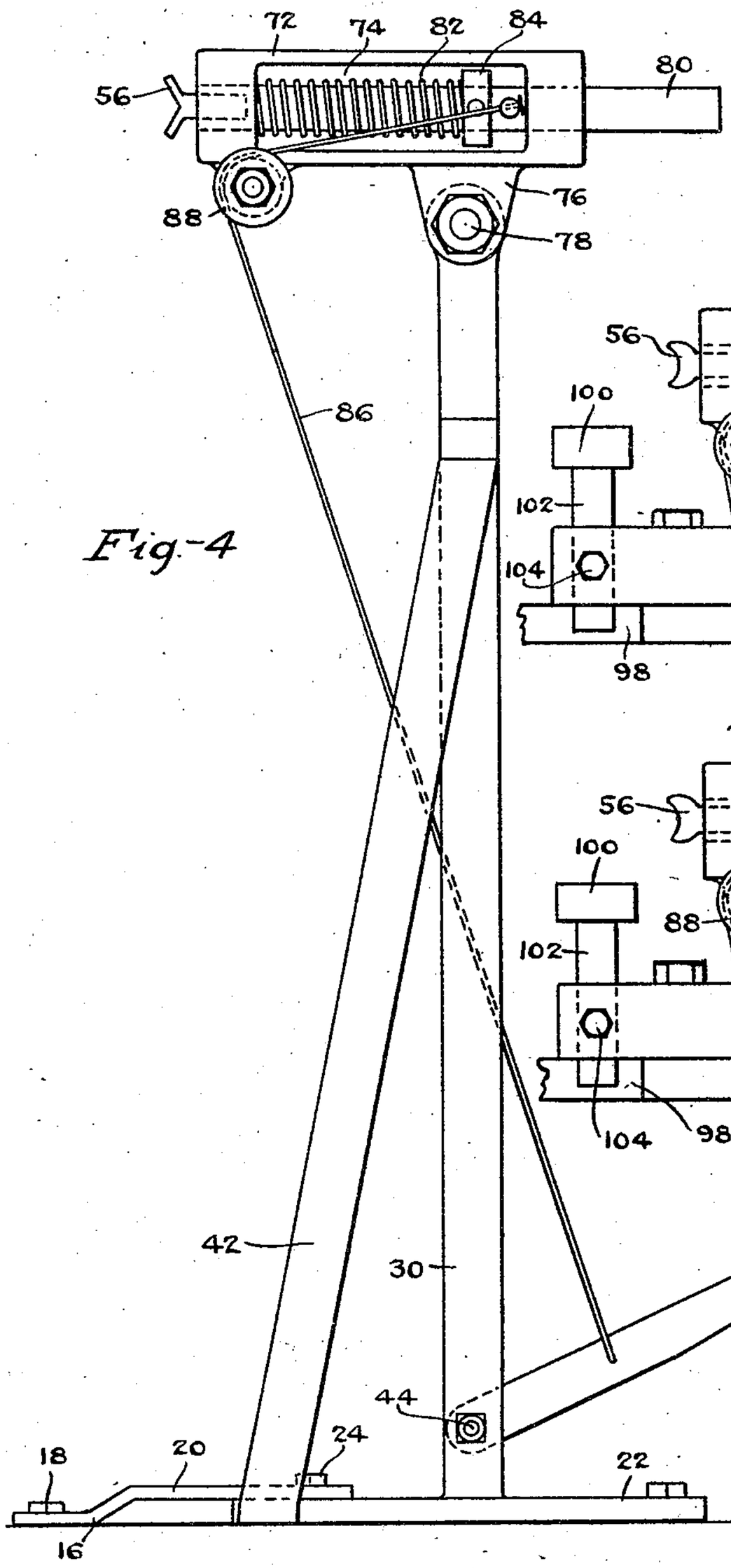

Fig-4

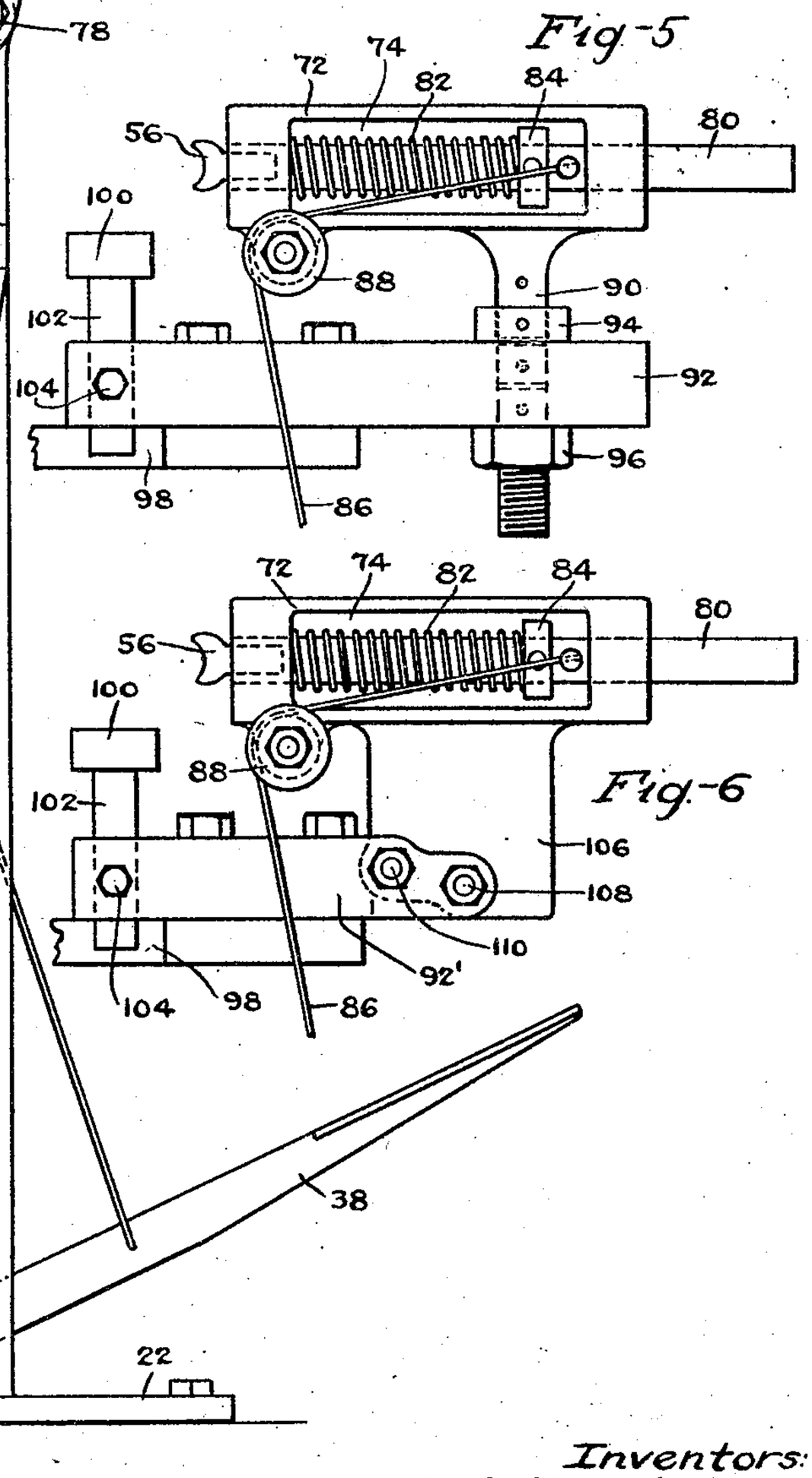

Fig-5

Fig-6

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Fig.-7

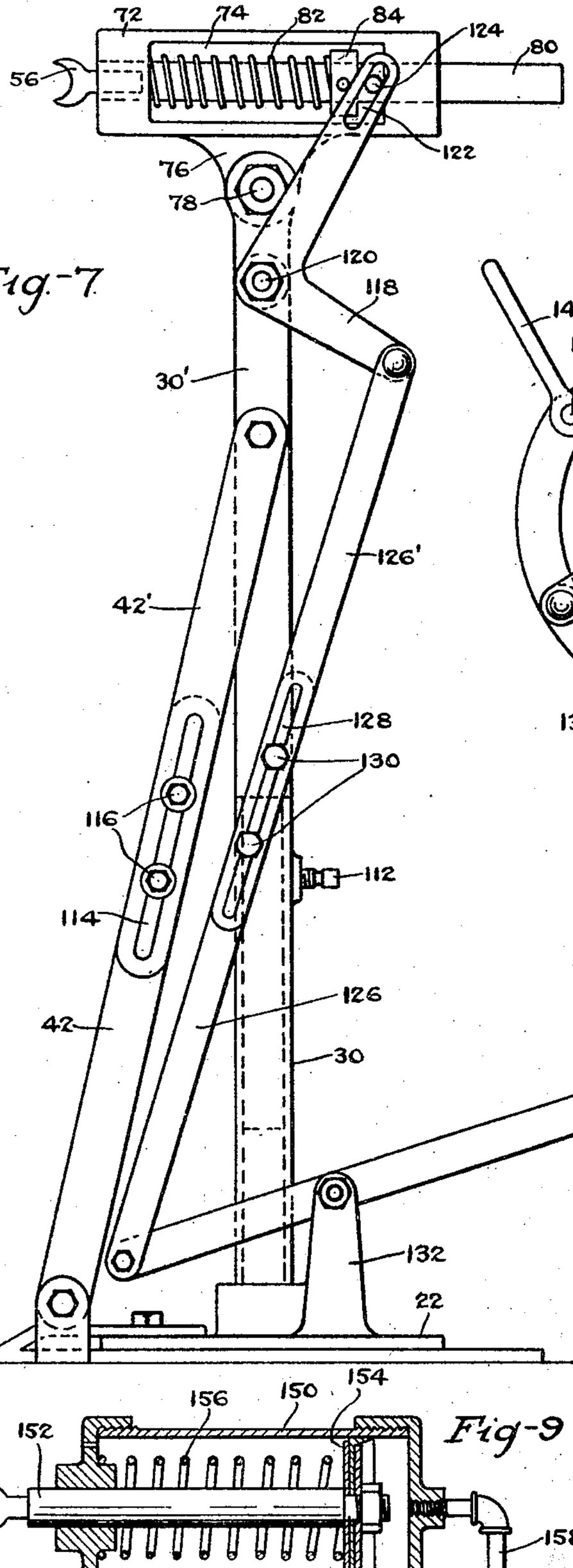


Fig.-8

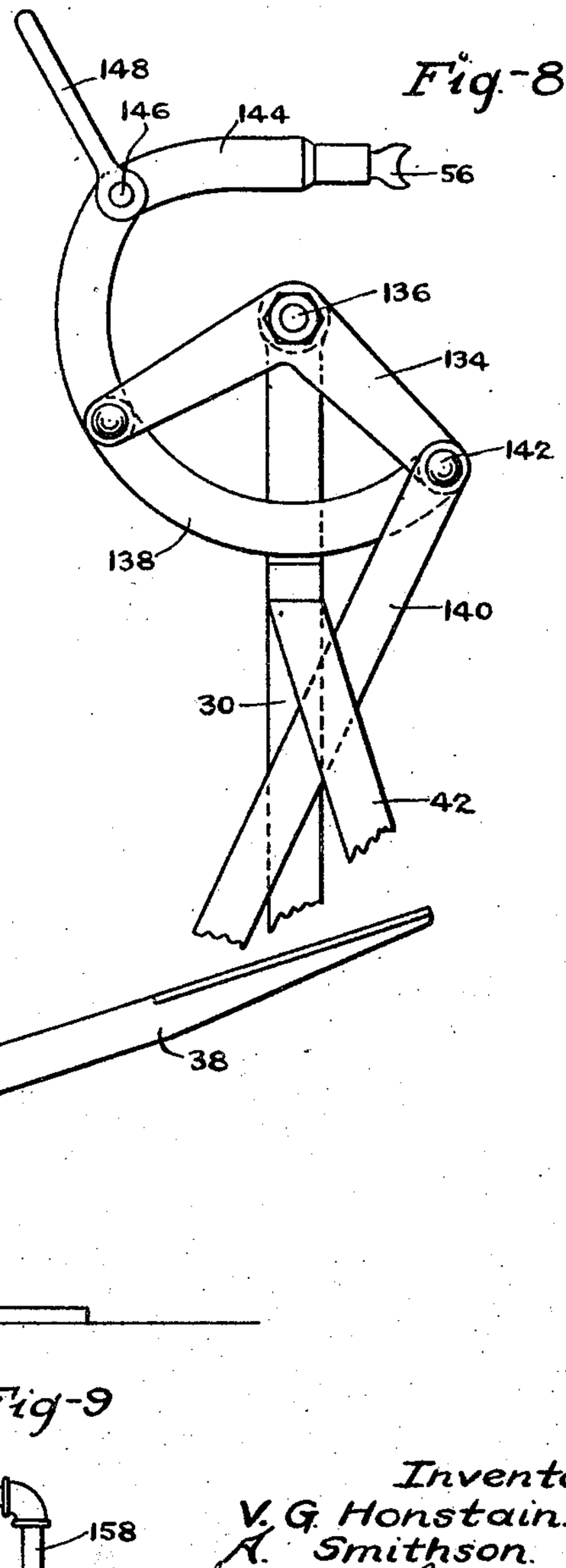
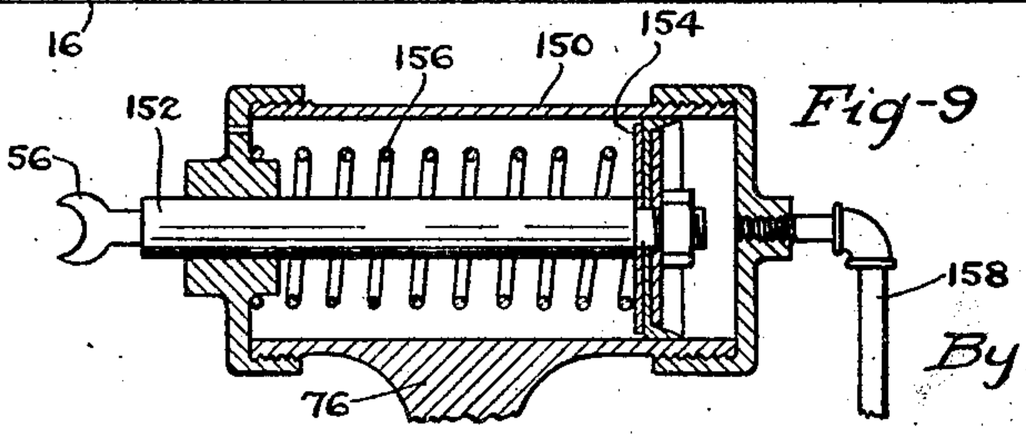


Fig-9



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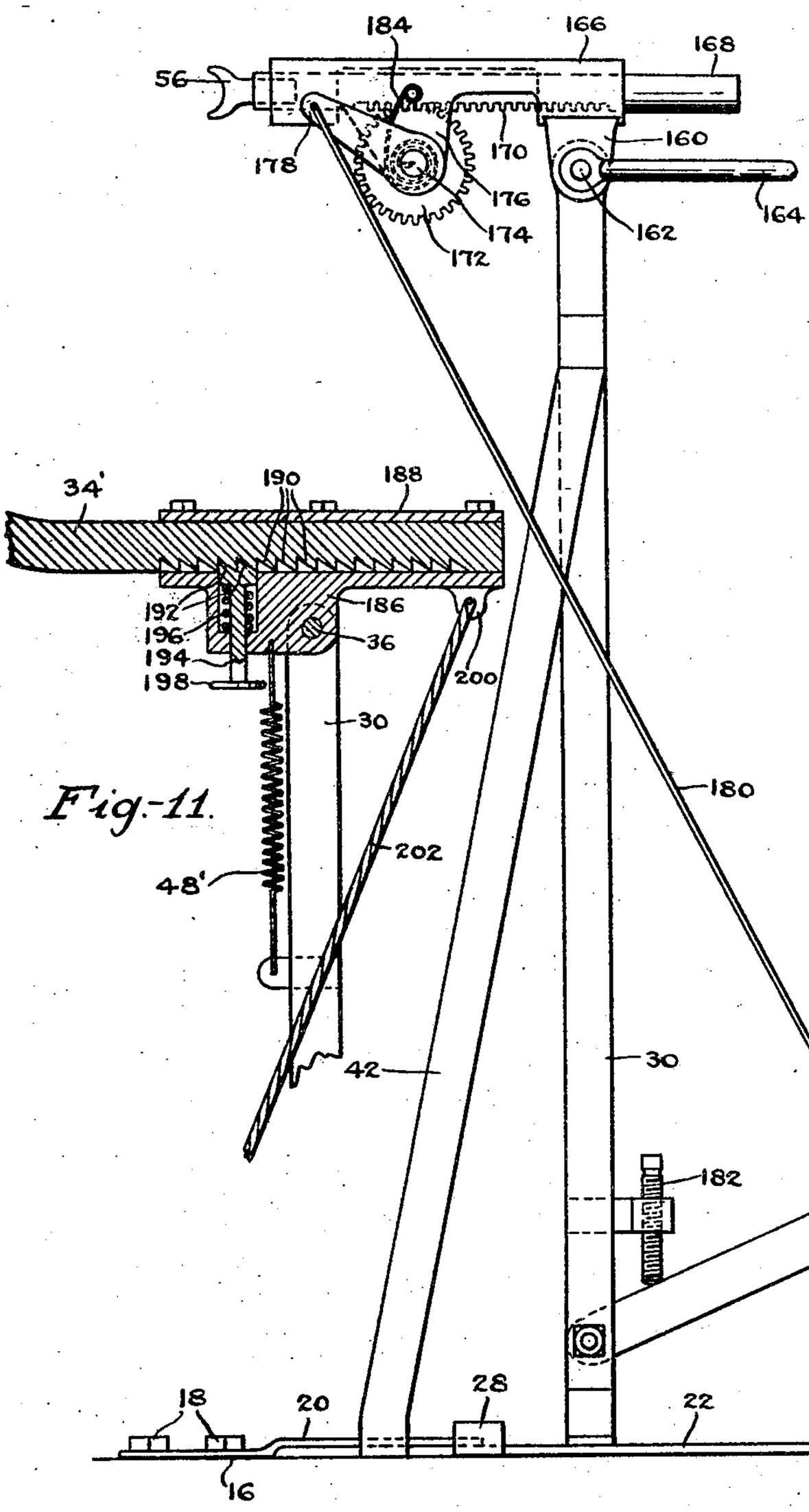

Fig.-10

Fig.-11.

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UNITED STATES PATENT OFFICE.

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GRINDING-MACHINE ATTACHMENT.

Application filed February 9, 1927. Serial No. 166,999.

Our invention relates to grinding machine attachments, and an object is to provide means by which the output of the machine will be increased and the work of the operator will be lightened. In the operation of grinding machines in use at the present time, the article to be ground is forced by the hands of the operator into engagement with the grinding wheel and is held by his hands in such engagement during the grinding operation. In the course of the day's work, this becomes very tiresome to the operator, and subjects him to a great deal of strain not only on account of the force required to hold the article against the grinding wheel but on account of the vibrations imparted to his hands and arms. We overcome these disadvantages and lessen the time required for grinding by the provision of mechanism in which other means than the hands of the operator is employed to force the article to be ground against the grinding wheel.

The full objects and advantages of our invention will appear in connection with the detailed description thereof, and the novel features of our inventive idea will be particularly pointed out in the claims.

In the accompanying drawings which illustrate several of the forms in which our invention may be embodied,—

Fig. 1 is a side elevational view of one form of the device. Fig. 2 is a front elevational view thereof. Fig. 3 is a view in horizontal section on the line 3—3 of Fig. 1. Fig. 4 is a side elevational view of another form of the device. Fig. 5 is a fragmentary side elevational view showing a slight modification of the form shown in Fig. 4. Fig. 6 is a fragmentary side elevational view showing a further slight modification. Fig. 7 is a side elevational view of another form of the device. Fig. 8 is a fragmentary side elevational view of another form. Fig. 9 is a sectional view of another form. Fig. 10 is a side elevational view of still another form. Fig. 11 is a fragmentary sectional view of still another form.

Referring to the drawings, the numeral 12 designates the frame of a customary or suitable grinding machine having an emery wheel or similar grinding wheel 14 rotatably mounted thereon. Referring first more particularly to the form of invention shown in Figs. 1, 2, and 3, the numeral 16 designates a plate secured to the floor by bolts 18 and having an offset forward portion 20 underneath which extends the rear end of an adjustable plate 22 having a hole through which passes a bolt 24, this bolt being adapted to pass also through any one of a series of holes 26 with which the raised portion of the plate 16 is provided. The plate 22 may be adjusted backwardly and forwardly by using different ones of the holes 26 for receiving the bolt. A strap 28 secured to the plate 22 and passing over the plate portion 20 aids in guiding the plate 22. A pair of standards 30 slightly spaced from each other extends up from the plate 22. These standards are reinforced by a pair of inclined brace bars 32 secured at their lower ends to the plate 22 and secured at their upper ends to the upper portions of the standards 30. A gooseneck member 34 is intermediately pivoted upon a pivot member 36 which passes through holes at the uper ends of the standards 30. A foot pedal lever 38 is pivoted at its forward end on a pivot member 40 pasing through holes in the lower portions of the standards 30. A link 42 is attached at its lower end to the lever 38 by a pivot 44 and at its uper end is attached to the forward end of the gooseneck member 34 by a pivot 46. A coiled spring 48 attached at its upper end to the member 34 and at its lower end to one of the standards 30 normally holds the gooseneck 34 in downward position as shown in full lines in Fig. 1. When the pedal 38 is depressed as indicated in dotted lines, the main portion of the gooseneck is swung upwardly and forwardly into the position shown in dotted lines. The upper portion of the gooseneck 34 is bifurcated to receive the forward end of a holder 50 which is adjustably secured thereto by a bolt 52 having a nutlike handle 54. The rear end of the holder 50 is provided with a socket for receiving the shank of a head member 56 whose rear end is suitably shaped to engage the forward end of an article such as a casting C whose rear end is to be ground. It is obvious that different heads 56 may be substituted according to the shape of the article which is to be engaged and forced against the grinding wheel. As shown, the casting has a fin F produced during the casting operation and which is being ground off by the grinding wheel 14. This casting is supported on a rest 58 having a depending stem 60 which is

clamped in the split end of a block 62 by a screw bolt 64 passing through the split portions. The block 62 has a depending stem 66 which is clamped by a screw bolt 68 in the outer end of a projection 70 extending out from the machine frame 12. It is evident that upon loosening the screw bolts 64 and 66, the rest 58 may be adjusted vertically and also toward and away from the grinding wheel 14. The latter adjustment is of particular utility for adjusting the rest toward the grinding wheel as the latter wears down. In the form shown in Fig. 4 instead of employing the gooseneck member 34 previously described, a cylindrical member 72 having a slot 74 is provided. This cylindrical member has downwardly-extending lugs 76 secured by a bolt 78 to the upper ends of the standards 30. A rod 80 passes slidably and axially through the member 72. The rod 80 has a socket in its rear end for receiving the shank of a head member 56 which as previously described may be changed according to the character and shape of the work to be operated upon. The rod 80 is surrounded by a coiled spring 82 which is interposed between an end of the member 72 and a collar 84 secured to the rod so that the spring normally holds the head 56 in retracted position. A flexible member 86 which is secured at its upper end to a projection on the rod 80 passes over a sheave 88 carried by the member 72 and the lower end of this flexible member is secured to an intermediate portion of the foot pedal 38. In the modification shown in Fig. 5, the cylindrical member 72 has a threaded stem 90 in place of the lug 76. The stem 90 extends through a plate 92 and is held in adjusted position by nuts 94 and 96. The plate 92 is secured to a projection 98 which extends out from the frame of the grinding machine and resembles the projection 70 previously referred to. A rest 100 has a stem 102 adjustably held by a screw bolt 104. In the further modification shown in Fig. 6, the cylindrical member 72 has a depending portion 106 which is secured by bolts 108 and 110 to a plate 92′ which is shorter than the plate 92 previously referred to. By removing the bolt 110, the cylindrical member 72 may be swung down out of the way. In the form shown in Fig. 7, the standard is made in two parts 30 and 30′ adjustably held together by a set screw 112 while the inclined braces are made in two parts 42 and 42′ having slots 114 and bolts 116 by means of which the parts may be adjusted. A bell crank 118 is pivotally attached at its elbow to the upper end portion of the standard by a pivot member 120. The upper end of this bell crank has a slot 122 in which works a pin 124 secured to the rod 80. The lower end of the bell crank is pivotally attached to a link made in two parts 126 and 126′ which have a slot 128 and bolts 130 by means of which the two parts may be adjusted. To lower end of this link is pivotally attached to the rear end of a pedal member 38 intermediately pivoted upon a bracket 132 extending up from the slidable plate 22. In the form shown in Fig. 8, a bell crank 134 is pivoted at its elbow upon a pivot member 136 carried by the upper end of the standard 30. The forward end of the bell crank is pivoted to an intermediate portion of a segment 138 while the rear end of the bell crank is pivoted to the rear end of the segment 138 and is also pivoted to the upper end of a link 140 by a common pivot member 142. It will be understood that the lower end of the link 140 is pivoted to a pedal member similar to that already mentioned. A holder 144 is adjustably attached to the upper end of the segment 138 by a bolt 146 having a nutlike handle 148. The holder 144 is provided with a socket for holding the head member 56. In the form shown in Fig. 9, the lugs 76 attached to the upper end of a standard in the manner shown in Fig. 7, carry a cylinder 150 in which a rod 152 is slidably and axially mounted. The forward end of the rod 152 carries a plunger 154 which works in the cylinder. A coiled spring 156 surrounding the rod 152 and interposed between the plunger 154 and the rear head of the cylinder serves to normally retract the rod and attached plunger. The forward end of the cylinder is provided with a supply pipe 158 for the introduction of steam or compressed air whereby the employment of a foot pedal is dispensed with. In the form shown in Fig. 10, a block 160 is adjustably secured to the upper end of the standard 30 by a bolt 162 provided with a nutlike handle 164. The block 160 carries a cylindrical member 166 in which a rod 168 is slidably and axially mounted. This rod at its rear end has a socket for receiving the shank of the head member 56. The lower side of the rod 168 is provided with a rack 170 which is exposed through a cut-out portion of the cylindrical member. Meshing with this rack, there is a pinion 172 secured to a shaft 174 which is mounted in lugs 176 extending down from the cylindrical member. An arm 178 secured to the shaft 174 is connected by a flexible element 180 with the foot pedal 38 which is pivoted to the lower portion of the standard 30. An adjustable stop 182 carried by the standard serves to limit the upward movement of the foot pedal. A coiled spring 184 secured at its outer end to the cylindrical member 166 and secured at its inner end to the shaft 174 normally holds the rod 168 in retracted position. The form shown in Fig. 11 resembles that of Fig. 1 in that a gooseneck member 34′ similar to the gooseneck member

34 is employed and this member is pivotally supported upon the upper end of the standards 30 by a bolt 36. This bolt, however, instead of passing directly through the gooseneck member passes through a depending projection 186 with which a tubular member 188 is provided. The lower portion of the gooseneck extends slidably through the member 188 and on its under side is provided with a series of teeth 190 which are adapted to be engaged by a pair of teeth 192 carried by the upper end of a stem 194. This stem passes through a recess in the projection 186, this recess being of such size as to slidably receive the head of the stem which carries the teeth 194. The stem is encircled by a coiled spring 196 placed in the recess and interposed between the bottom of the recess and the head of the stem. The lower end of the stem is provided with a knob 198 by means of which the teeth 192 may be withdrawn from engagement with the teeth 190 when it is desired to adjust the gooseneck longitudinally with relation to the tubular member 188. The rear end of the latter member is provided with a depending lug 200 to which a flexible connection 202 is attached, the lower end of this connection being attached to a foot pedal as will be understood by reference to Fig. 1. A coiled spring 48′ normally holds the gooseneck in retracted position.

The operation and advantages of our invention will now be readily understood. When it is desired to use the attachment for the grinding operation, such as grinding off fins from castings formed during the casting operation, the article is supported upon the rest in proximity to the grinding wheel. The movable member which may be of any of the forms shown is fitted with a head 56 of such shape as to firmly engage the article without liability of slipping thereover and force is exerted upon the movable member for holding the article in engagement with the grinding wheel until the desired amount of grinding is completed. The operator is relieved from strain on account of the manner in which the movable member is operated. Actual use of the attachment has demonstrated that the operator can accomplish more work during the day and that he is not nearly as tired at the end of the day as is the case when the articles are forced against the grinding wheel by hand in the usual way.

We claim:

1. A grinding machine attachment comprising a work rest upon which the article to be ground is adapted to be supported in proximity to the grinding wheel, a horizontal plate, means for adjustably securing said plate to the floor, a vertical support extending up from said plate, a movable member carried by the upper end of said support and adapted to engage said article, and means for exerting force upon said member for holding said article against the grinding wheel.

2. A grinding machine attachment comprising a work rest upon which the article to be ground is adapted to be supported in proximity to the grinding wheel, a horizontal plate, means for adjustably securing said plate to the floor, a vertical support extending up from said plate, a movable member carried by the upper end of said support and adapted to engage said article, resilient means normally holding said member in retracted position, and means for exerting force upon said member for holding said article against the grinding wheel.

3. A grinding machine attachment comprising a work rest upon which the article to be ground is adapted to be supported in proximity to the grinding wheel, a horizontal plate, means for adjustably securing said plate to the floor, a vertical support extending up from said plate, a gooseneck member pivoted to the upper end of said support, resilient means normally holding said member in retracted position, and means for exerting force upon said member for causing the upper end thereof to engage said article and hold it against the grinding wheel.

4. A grinding machine attachment comprising a work holder upon which the article to be ground is adapted to be supported in proximity to the grinding wheel, a horizontal plate, means for adjustably securing said plate to the floor, a vertical support extending up from said plate, a movable member carried by the upper end of said support and adapted to engage said article, resilient means normally holding said member in retracted position, a foot pedal pivotally attached near the lower end of said vertical support, and connections between said foot pedal and movable member for exerting force upon the latter for holding said article against the grinding wheel.

In testimony whereof we hereunto affix our signatures.

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