

A. E. AYER & A. S. VOSE.
GRINDING MACHINE.
APPLICATION FILED MAY 18, 1906.

908,639.

Patented Jan. 5, 1909.
4 SHEETS—SHEET 1.

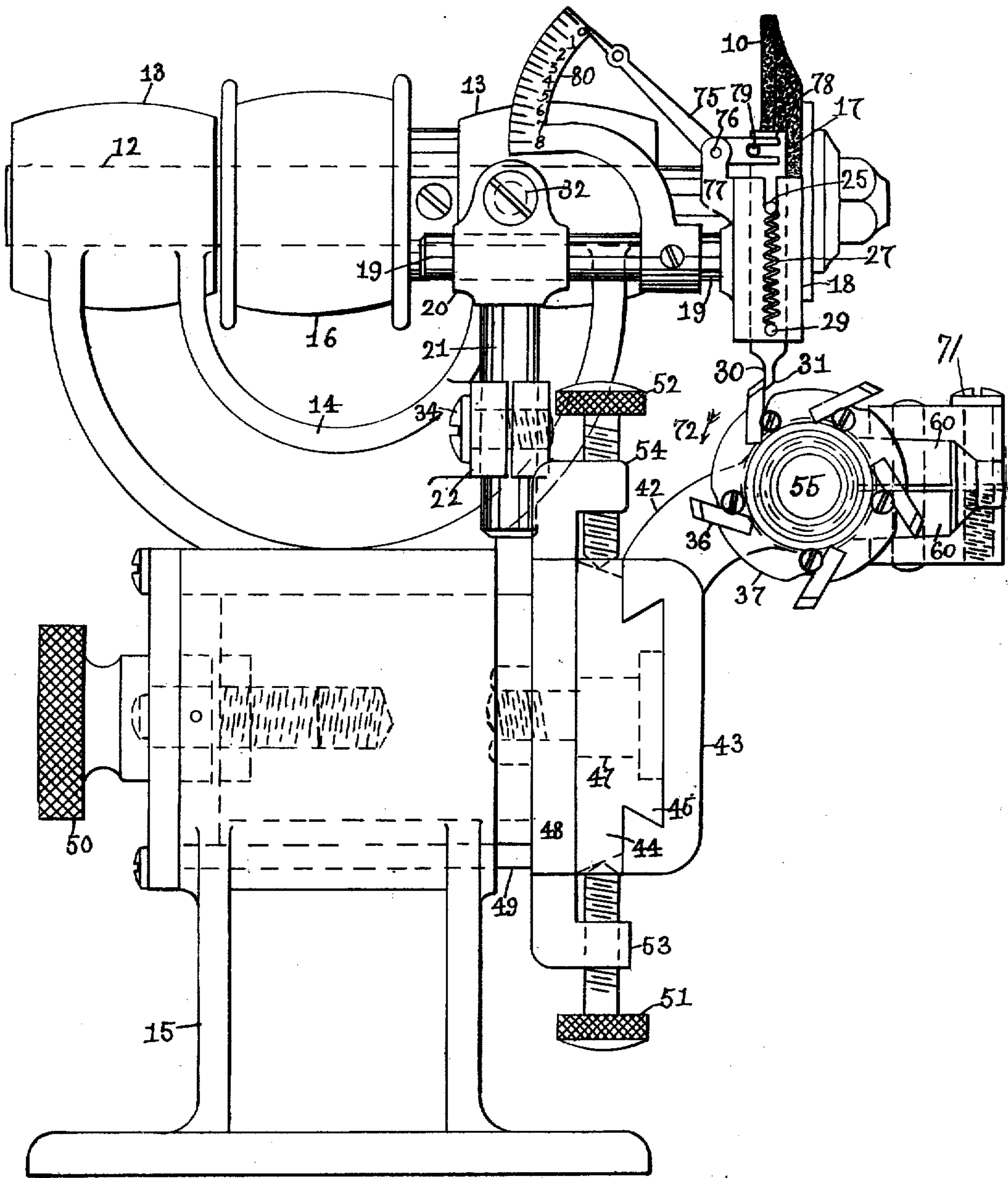


Fig. 1.

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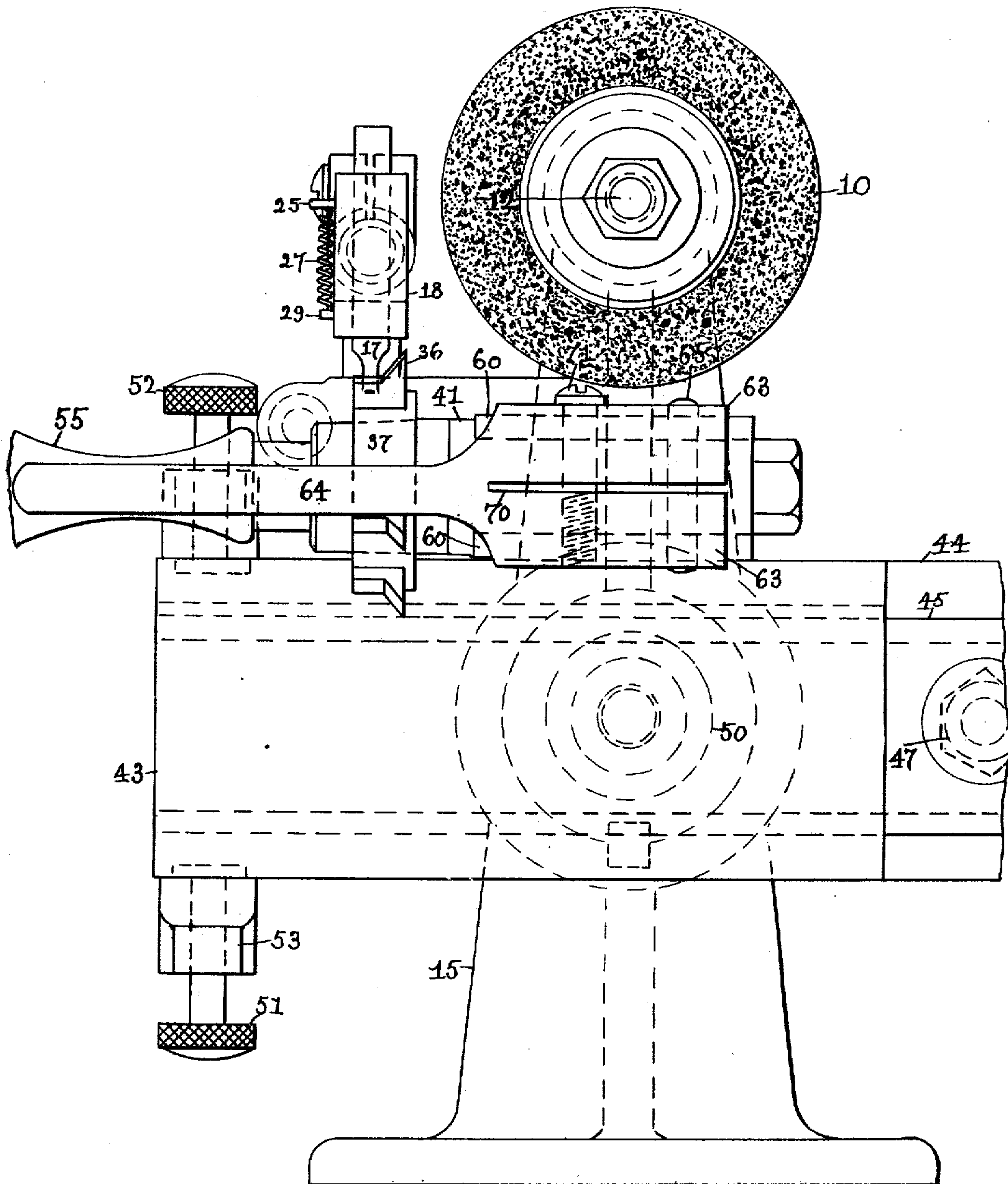


Fig. 2

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GRINDING MACHINE.

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4 SHEETS—SHEET 3.

908,639.



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4 SHEETS—SHEET 4.

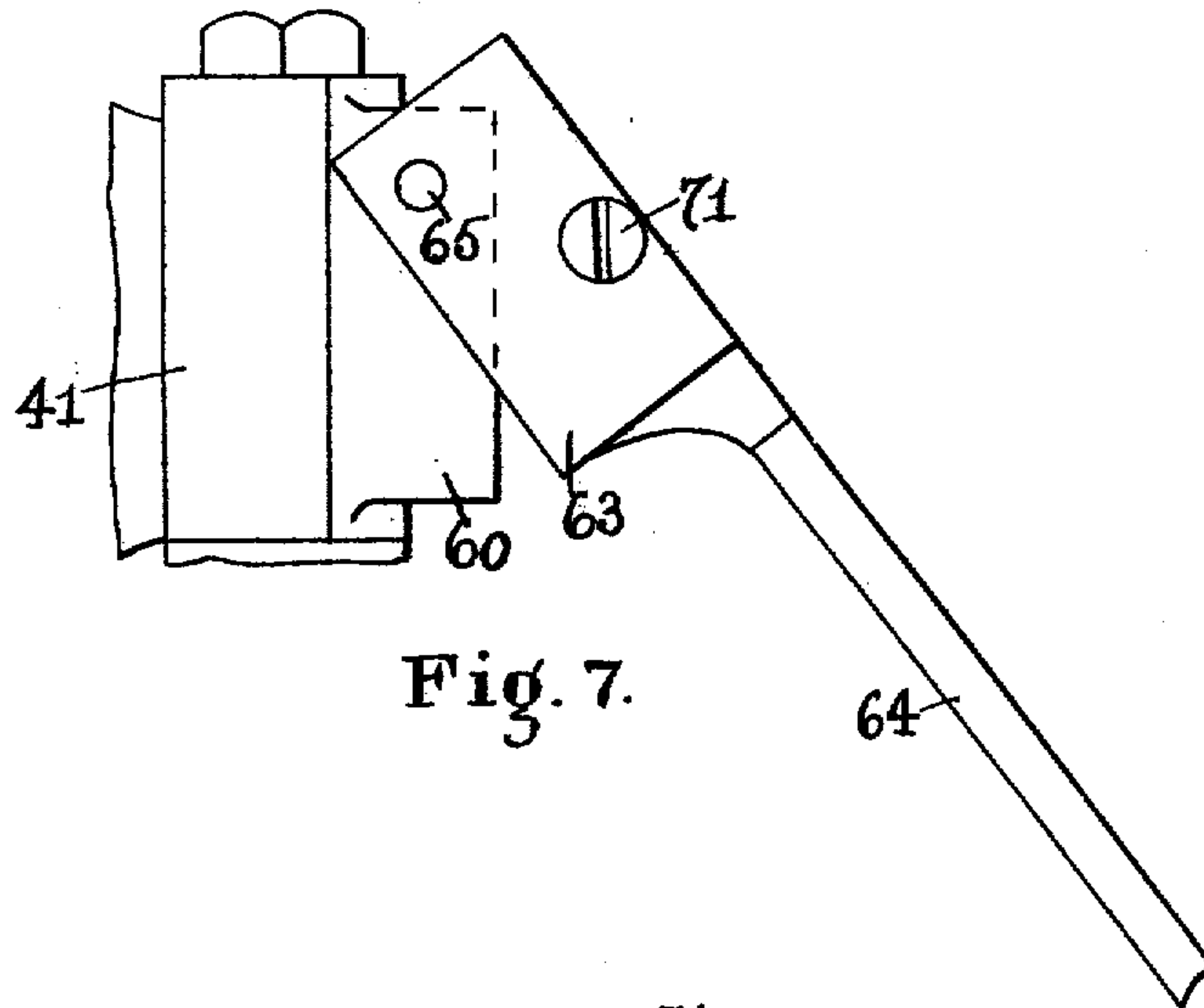


Fig. 7.

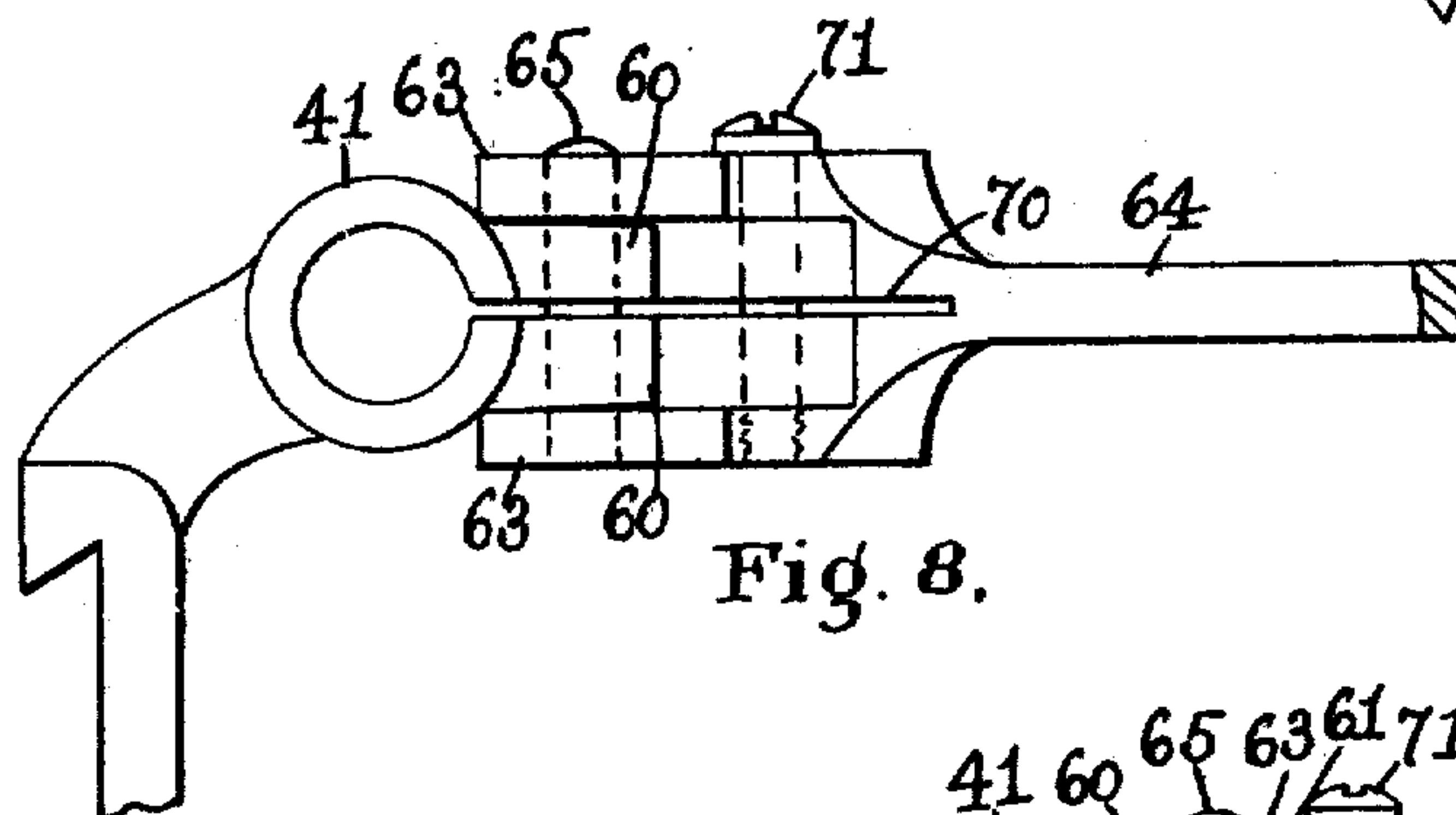


Fig. 8.

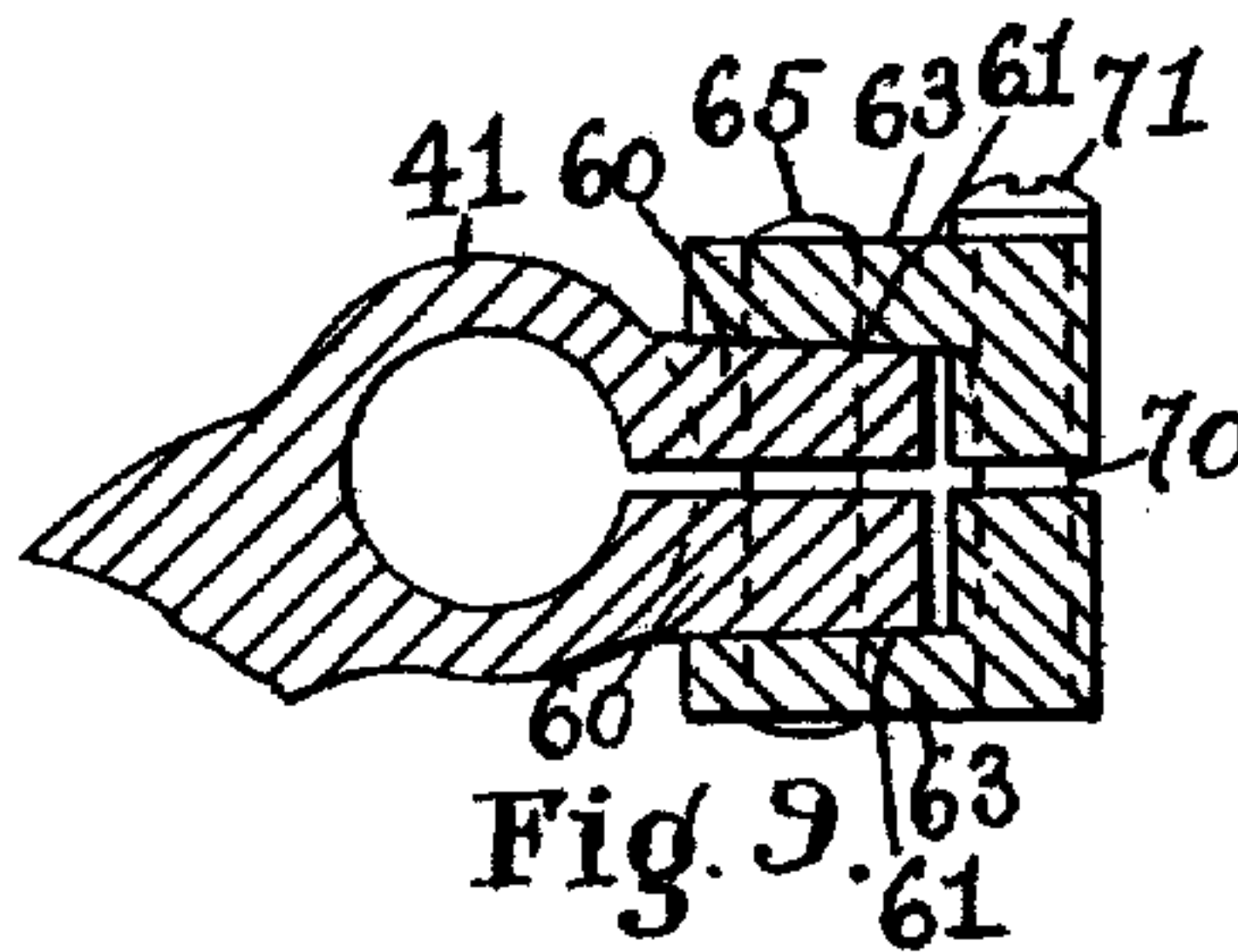


Fig. 9.

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UNITED STATES PATENT OFFICE.

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ASSIGNORS TO RUTH L. VOSE, OF BROOKLINE, MASSACHUSETTS.

GRINDING-MACHINE.

No. 908,639.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed May 18, 1906. Serial No. 317,622.

To all whom it may concern:

Be it known that we, ALBERT E. AYER, of Chelsea, county of Suffolk, State of Massachusetts, and AMBROSE S. VOSE, of Brookline, county of Norfolk, in said State, have invented an Improvement in Grinding-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to a grinding machine especially adapted among other uses to be employed for grinding the knives of a rotary cutter, such as is now commonly employed for trimming the edges of the soles and heels of boots and shoes.

The invention has for its object to provide a grinding machine with means, as will be described by the aid of which the cutters or knives may be accurately and uniformly ground. For this purpose, a gage is provided for accurately positioning the knives of the cutter with relation to a grinding wheel. Provision is made for locking the cutter against rotation after a knife thereon has been positioned for grinding and while said knife is being ground. Provision is also made for adjusting the gage and cutter with relation to each other for a purpose as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of a grinding machine embodying this invention. Fig. 2, a front elevation of the machine shown in Fig. 1 looking toward the left. Fig. 3, a plan view, Fig. 4, a detail of the cutter shaft, and Figs. 5 to 9, details of the clamp for the cutter shaft.

The grinding portion of the apparatus may be of any suitable or usual construction and consists as herein shown of a grinding disk or wheel 10 of emery or other suitable material, fast on a shaft 12, supported in bearings 13 of a yoke 14 attached to an upright 15, the said shaft being provided with a pulley 16. The grinding wheel 10 has cooperating with it a gage 17, preferably made as herein shown and consisting of a bar or slide movable in a guide 18, attached to a rod 19, horizontally adjustable in the split upper portion 20 of a rod 21, which is vertically adjustable in the split end 22 of a stud or post 23 extended from one of the bearings 13. The gage bar or slide 17 is herein shown

as substantially square in cross section and is vertically movable in its guide. The gage is provided with a pin or projection 25, movable in a slot 26 in the guide 18, and normally held against the bottom of said slot by a spring 27, attached at one end to the pin 25 and at its other end to a stud or pin 29 on the guide. The gage 17 is provided at its lower end with a nose piece having one side as 30 straight and its other side connected therewith by the beveled end 31. The guide 18 is capable of being adjusted in a horizontal direction by moving the rod 19 in its bearing 20, and is fastened in its adjusted position by a clamping screw 32. The guide 18 is also capable of being adjusted vertically by movement of the supporting rod 21 in its bearing 22, and is secured in its adjusted position by the clamping screw 34 (see Figs. 1 and 2). The purpose of these adjustments will be hereinafter pointed out.

The gage 17 is designed to properly position the knives 36 of a rotary cutter 37 of any suitable or desired construction, such as is now commonly employed on machines for trimming the edges of the soles and heels of boots and shoes. The rotary cutter 37 is secured to a shaft 40 supported to turn in a bearing 41, attached to an arm 42 projecting from a carrier 43, mounted to slide on a support shown as a bar 44 having a rib 45 upon which the carrier 43 is dovetailed. The bar 44 is vertically movable, and as shown is pivoted at 47 to a bar or plate 48, having extended from it substantially near its center a bar 49, which is mounted to slide in a guideway in the upright 15. The bar 49 may be adjusted by the thumb screw 50. The guide bar 44 may be turned on its pivot 47 by manipulating the set screws 51, 52, (see Fig. 1) extended through lugs 53, 54 on the bar 48. The cutter shaft 40 is designed to be rotated by the operator, and for this purpose, a handle 55 provided with a threaded stem 56 (see Fig. 4) is detachably secured to the shaft 40.

The knives 36 are arranged on the cutter head at an angle to a radial line through the shaft 40, and the said shaft is located with its center out of line with the gage and grinding wheel 10, so that the inner face of the knives or cutters 36 may be brought into a vertical plane in contact with the straight face 30 of the gage, after which the cutter shaft 40 is locked or held against rotation,

while it is being moved longitudinally so as to bring the inner face of the cutter thus positioned into engagement with the grinding wheel. The cutter shaft may be securely
 5 held or locked from turning in any suitable manner, and in the present instance, we have shown one construction of device for this purpose see Figs. 5 to 9, inclusive. To this end, the bearing 41 for the cutter shaft 40
 10 is split and provided with lugs or projections 60 which cooperate with inclined surfaces 61 on the inner faces of the jaws 63 of lever 64, pivoted at 65 to the lugs 60 and arranged to be turned into a position substantially parallel to and in close proximity with the
 15 handle 55, so that the clamping lever 64 may be gripped by the same hand which grasps the handle 55. The jaws 63 of the clamping lever are separated by the slot or space 70 and are capable of being moved toward and
 20 from each other to adjust them to the lugs 60, by an adjusting screw 71. The rotary shaft 40 is turned in the direction indicated by the arrow 72, Fig. 1, so as to bring each
 25 knife into its grinding position with its inner face in contact with the face 30 of the gage, and as the knife passes from the front to the rear side of the gage, the beveled or back side of the knife engages the beveled
 30 front side of the gage and raises the latter up in its guide against the action of the spring 27.

Provision is made for indicating the extent of movement of the gage by each knife, and to this end a lever 75 is pivoted at 76
 35 to an arm 77 on the guide box 18 and has a slotted arm 78, which engages a pin 79 on the gage 17, so that when the gage 17 is raised as above described, the lever 75, which
 40 constitutes a pointer, is moved over a scale 80 provided with graduations and as shown with figures from zero to eight. By this means, it will be seen that the length of each knife is made known to the operator, so that
 45 when the pointer registers with the same graduation for each knife, the operator knows that all the knives are of the same length and further grinding is unnecessary.

The operation of the machine herein shown may be briefly described as follows:—
 50 Assume the gage 17 to be set in proper position with relation to the grinding wheel. The rotary cutter 37 is placed on the shaft 40 and secured thereon by the handle 55.
 55 The clamping lever 64 is turned away from the handle 55 so as to release the shaft 40. The operator then turns the shaft 40 in the direction indicated by the arrow 72, Fig. 1, until a knife has been moved under and be-
 60 yond the gage 17. The knife on its passage from the front to the rear side of the gage moves the latter upward and the extent of movement of the gage is indicated by the pointer 75. After the knife has passed be-
 65 yond the gage, the shaft 40 is turned in the

reverse direction so as to bring the front or inner face of the knife into contact with the rear face 30 of the gage against which the knife is held, while the clamping lever is
 turned to cause its jaws to engage the lugs 70 60 of the bearing 41 and thereby clamp the shaft 40 against rotation. The clamping lever at such time is substantially parallel with the shaft 40 and substantially close to the handle 55, so that the operator can grasp 75 both with one hand. The now stationary cutter shaft 40 and its attached cutter are moved by the operator toward the grinding wheel, which engages the knife in line with it and removes a portion of its inner 80 face. The bodily movement of the cutter shaft is permitted by its carrier 43 sliding on its guide bar 44. After the shaft 40 has been moved until the knife clears the grinding wheel, said shaft is returned to its start- 85 ing position. The clamping lever 64 is then turned to release the cutter shaft, and the latter is turned in the direction indicated by the arrow 72 to bring the next knife into grinding position, after which the cutter 90 shaft is again locked against rotation and moved bodily toward and from the grinding wheel to grind this cutter or knife.

The above described operation is repeated for each knife, and the knives are ground 95 until all move the pointer to the same graduation or point on the scale, and when each knife moves the pointer to the same point, all the knives are of equal length.

The gage as herein shown is adjustable in 100 two directions substantially at right angles to the other, one of which is effected by moving the rod 19 so as to properly position the gage with relation to grinding wheel and to compensate for wear of said wheel, and the 105 other of which is effected by the rod 21 so as to compensate for wear of the knives and enable the gage to engage the short knives.

The carrier for the cutter shaft 40 is vertically adjustable so that the lowest part of 110 the knife will engage the grinding wheel. The carrier for the cutter shaft 40 is movable longitudinally of the grinder shaft 12, so as to maintain the knives in a vertical position, irrespective of the amount they are 115 worn or ground away, and as a result, the inner face of the knife is always straight and not inclined or beveled, which is desired.

We have herein shown one construction of machine embodying this invention, but 120 we do not desire to limit the invention to the particular construction shown.

Claims.

1. In a machine of the class described, in combination, a supporting frame, a rotatable shaft mounted therein, a grinding wheel mounted on said shaft, a rotatable cutter-car- 125 rying-shaft extended substantially at right angles to said grinder shaft and capable of having a cutter-head provided with a plu- 130

5 rality of knives or cutters extended there-
from mounted thereon, a gage arranged sub-
stantially in the plane of the grinding wheel
and in the path of rotary movement of said
knives and with which said knives coöperate
to position them with relation to the grind-
ing wheel, a pointer or index actuated by
said gage, means to hold said cutter shaft
from rotating, and a support or carrier for
10 said cutter shaft movable toward and from
said grinding wheel in a plane substantially
at right angles to the shaft on which said
grinder is mounted, substantially as de-
scribed.

15 2. In a machine of the class described, in
combination a supporting frame, a rotatable
shaft mounted therein, a grinding wheel
mounted on said shaft, a cutter-carrying-
shaft extended substantially at right angles
20 to said grinder shaft and capable of having
a cutter head provided with a plurality of
knives or cutters extended therefrom mount-
ed thereon, a gage arranged substantially in
the plane of the grinding wheel and in the
25 path of rotary movement of said knives and
with which said knives coöperate to position
them with relation to the grinding wheel,
means to hold said cutter-shaft from rotat-
ing, a carrier for said cutter shaft movable
30 toward and from the grinding wheel in a
plane substantially at right angles to the
shaft on which said grinding wheel is
mounted, and a support for said carrier
movable toward and from said grinding
35 shaft and longitudinally thereof, substan-
tially as described.

3. In a machine of the class described, in
combination a supporting frame, a rotatable
shaft mounted therein, a grinder mounted on
40 said shaft, a rotatable cutter-carrying-shaft
extended substantially at right angles to said
grinder shaft and movable transversely
thereof and capable of having a cutter at-
tached thereto, a gage substantially in the
45 plane of said grinder and in the path of
rotary movement of said cutter and with
which said cutter coöperates, and means to
lock said cutter-carrying-shaft from rotating
while it is being moved longitudinally, and a
50 carrier for said cutter shaft movable toward
and from the grinding wheel in a plane sub-
stantially at right angles to the shaft on
which the grinder is mounted, substantially
as described.

55 4. In a machine of the class described, in
combination, a cutter-carrying-shaft mount-
ed to rotate and move longitudinally and
capable of having a cutter attached thereto
to rotate therewith, a support for said shaft
60 a gage arranged in the path of rotation of
said cutter and movable thereby to permit
rotation of the cutter in one direction and
prevent its rotation in the opposite direc-
tion, an indicator actuated by said gage, and
65 a grinder arranged substantially in line with

said gage to act on said cutter when said
cutter-carrying-shaft is moved longitudi-
nally, substantially as described.

5. In a machine of the class described, in
combination, a rotatable grinder, and a ro- 70
tatable cutter-carrying-shaft arranged sub-
stantially at right angles to said grinder and
capable of having a cutter attached thereto
to rotate therewith, one of said parts being
movable bodily toward and from the other, 75
a support for the said grinder and a support
for said shaft and a gage arranged substan-
tially in line with said grinder and in the
path of rotation of said cutter and coöperat-
ing with said cutter to permit rotation of the 80
same and to position it with relation to the
grinder, substantially as described.

6. In a machine of the class described, in
combination, a rotatable grinder, and a ro- 85
tatable cutter-carrying-shaft arranged sub-
stantially at right angles to said grinder and
capable of having a cutter attached thereto
to rotate therewith, one of said parts being
movable bodily toward and from the other,
a support for said grinder and a support for 90
said shaft and a bodily movable gage ar-
ranged substantially in line with said grinder
and in the path of rotation of said cutter
and coöperating with said cutter to permit
rotation of the same and to position it with 95
relation to the grinder, and an index actu-
ated by said gage, substantially as described.

7. In a machine of the class described, in
combination, a rotatable grinder, and a ro- 100
tatable cutter-carrying-shaft arranged sub-
stantially at right angles to said grinder and
capable of having a cutter attached thereto
to rotate therewith, one of said parts being
movable bodily toward and from the other,
a support for said grinder a gage arranged 105
substantially in line with said grinder and in
the path of rotation of said cutter and co-
operating with said cutter to permit rotation
of the same and to position it with relation
to the grinder, and a carrier for said cutter 110
shaft adjustably mounted on a support to
move in one direction, and means to move
said support in a direction substantially at
right angles thereto, substantially as de-
scribed. 115

8. In a machine of the class described, in
combination, a rotatable grinder, and a ro-
tatable cutter-carrying-shaft arranged sub-
stantially at right angles to said grinder and
capable of having a cutter attached thereto 120
to rotate therewith, one of said parts being
movable bodily toward and from the other, a
support for said grinder, and a support for
said shaft a gage arranged substantially in
line with said grinder and in the path of 125
rotation of said cutter and coöperating with
said cutter to permit rotation of the same,
means for effecting movement of said gage
in one direction, and means for effecting
movement of said gage in one direction sub- 130

stantially at right angles to the first-mentioned direction, substantially as described.

9. In a machine of the class described, in combination, a grinding tool, and a rotatable
5 cutter-carrying-shaft capable of having a cutter attached thereto to rotate therewith, one of said parts being bodily movable toward and from the other, a support for said grinding tool, a support for said shaft and a
10 gage arranged substantially in line with the grinding tool and in the path of rotation of the cutter and cooperating with said cutter to permit rotation of the same in one direc-

tion and prevent its rotation in the opposite direction and thereby position the cutter with
15 relation to the grinding tool, substantially as described.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

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AMBROSE S. VOSE.

Witnesses:

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