

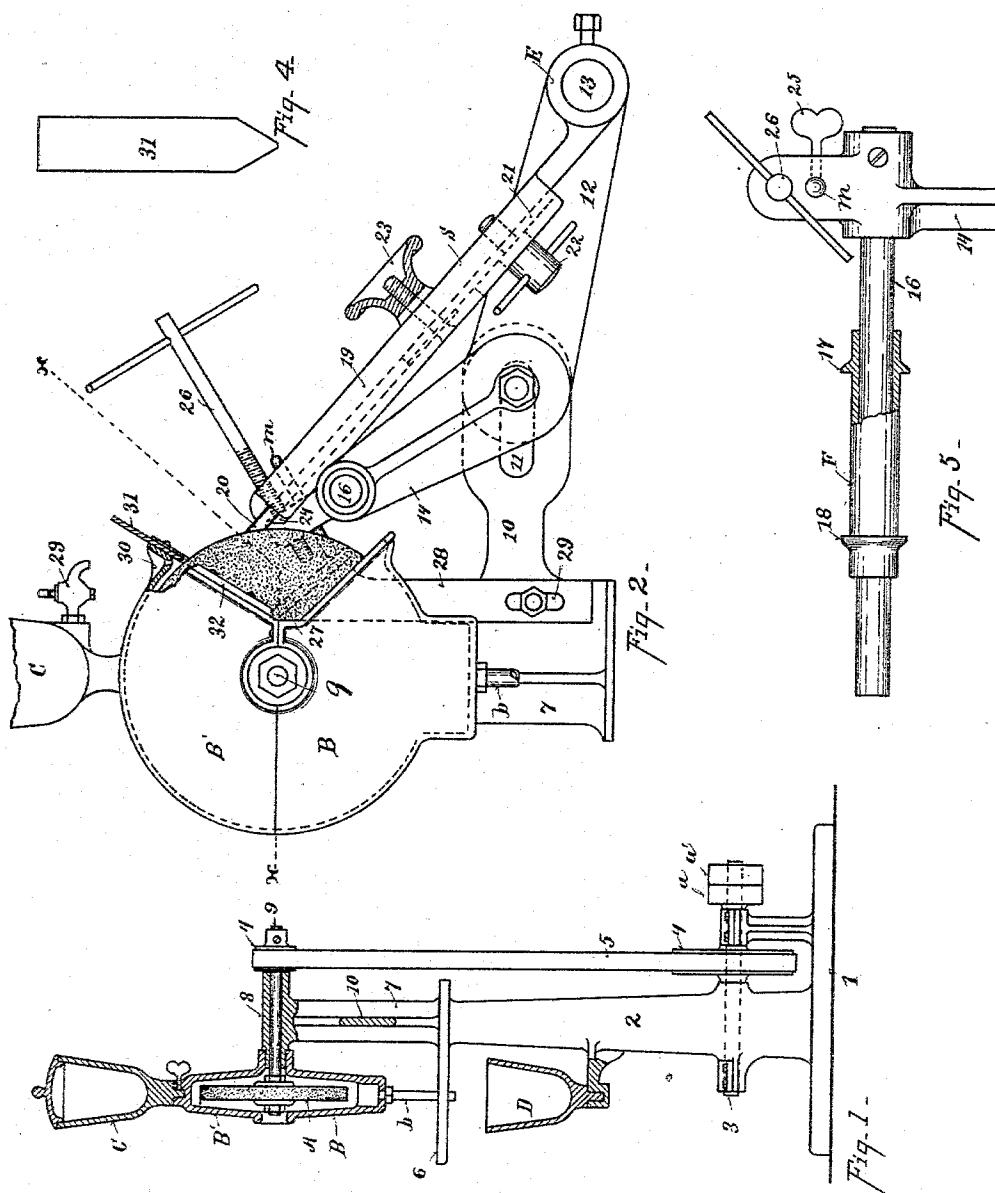
(No Model.)

2 Sheets—Sheet 1.

S. ROSS, Jr.  
GRINDING MACHINE.

No. 494,893.

Patented Apr. 4, 1893.



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C. Miles.

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Inventor—

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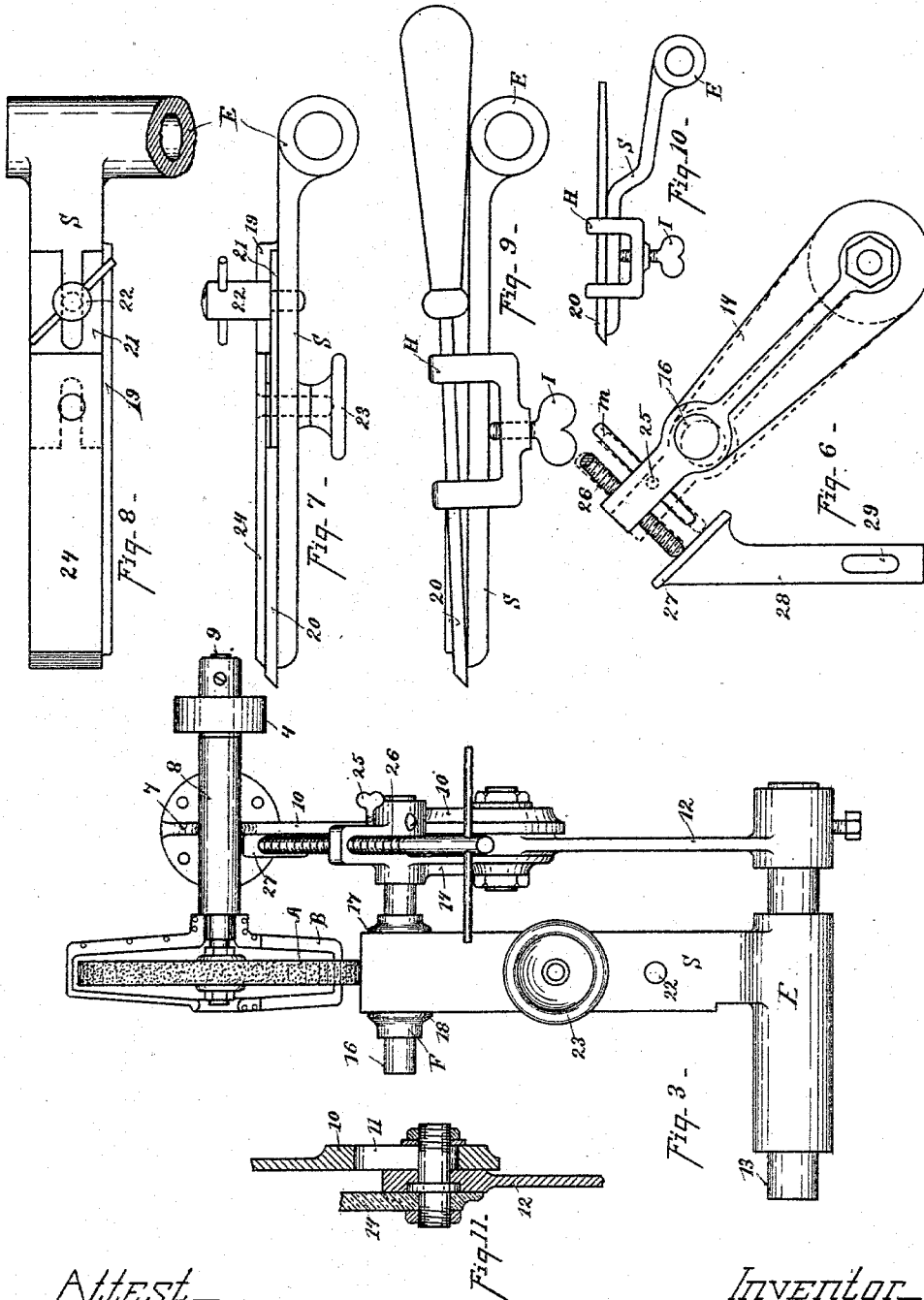
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# UNITED STATES PATENT OFFICE.

SIMON ROSS, JR., OF CINCINNATI, OHIO.

## GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,893, dated April 4, 1893.

Application filed May 14, 1892. Serial No. 433,047. (No model.)

*To all whom it may concern:*

Be it known that I, SIMON ROSS, Jr., a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

The object of my invention is to provide a grinding machine in which cutter bits, planes, chisels, and knives of various forms may be clamped and held and ground to any desired bevel.

Another object of my invention is to provide a holding stock for a tool, with suitable stops and regulating devices, so that a series of knives can be ground to the same length and bevel. In that class of machines which employ revolving cutter bits or knives it is desirable to have the knives of the same length when ground so as to not throw the cutter head out of balance; the use of my grinding machine allows this result to be positively obtained, and at the same time grind the cutters all to the same angle or bevel.

The various features of my invention are fully set forth in the description of the accompanying drawings making a part of this specification, in which—

Figure 1 is a front, sectional elevation of the grinding machine. Fig. 2 is a side elevation of the grinding device holding stock and supports. Fig. 3 is a top plan view on line *x, x*, Fig. 2. Fig. 4 is a plan view of the water guide. Fig. 5 is a detail view of the stock supporting shaft. Fig. 6 is a side elevation of the link supporting the parts shown in Fig. 5. Fig. 7 is a side elevation of the stock; Fig. 8 a bottom plan view of Fig. 7. Fig. 9 is a modification of the stock shown in Figs. 7 and 8; Fig. 10 another modification of the same. Fig. 11 is a detail showing the construction of the adjusting links.

1 represents the base of the grinding machine; 2 a pillar or post on which the same is supported; 3 the driving shaft; 4 the driving pulley; *a, a'* tight and loose pulleys on the shaft 3.

5 represents a driving belt.

6 represents a table supported on posts 2.

7 represents a post or column supporting the journal 8.

9 represents the arbor of the emery stone A.

B represents a housing covering the lower portion of the grinder A; B' the upper housing; on the top of this is supported a water tank C.

D represents a water tank below the table through which the water is carried by means of the pipe *b* from the curb of the housing B; so that the major portion of the water admitted on the grinder A is carried directly to the catch tank D, except such as is carried off by the tool in grinding, that falls upon the table 6 and also passes through a hole in the table to the catch tank D.

The following devices are employed for adjustment to hold, support and operate the tool presented to the grinder:

10 represents a bracket secured to the post 7 which is provided with a slot 11.

12 represents an arm rigidly secured to the bracket 10 by a clamping bolt; the slot 11 allowing said arm 12 to be adjusted.

13 represents a stud shaft projecting out from the arm 12.

14 represents a link arm secured to the bracket 10 and inclined forward to the grinder. The link arms 12 and 14 journal upon the clamping bolt and they may be adjusted to any angle operating as a rule joint when the clamping bolt is slackened. The lower link arm 12 supports the bearing shaft 13 of the lower portion of the stock, and the upper link 14 supports a stud shaft 16 on which the upper portion of the stock S rests and slides. Stock S is provided with the sleeve E which slides on shaft 13. The upper end of said stock S rests in the sliding sleeve spool F between the bosses 17 and 18; the stock S slides laterally freely on the stud shafts 13 and 16 so as to draw the blade of the knife across the face of the grinder.

In order that the tool may be ground at any desired angle the link arms 12 and 14 are adjusted to the desired angle. The stock S is preferably of the socket form.

19 represents a downwardly projecting ledge on the stock against which the knife 20 bears to form a proper alignment in the stock.

In order to support the heel of the knife I provide an adjusting plate 21 which is secured in position by means of the set screw 22.

Plate 21 is slotted so as to slide over this set screw and be clamped in any desired position to hold the knife forward against the tool. The forward end of said stop plate is also  
5 slotted so as to pass the shank of the set screw 23.

24 represents the opposite face of the tool stock. When the set screw 23 is turned two sides of the stock are firmly clamped upon the  
10 knife.

*m* represents a stop pin passing through the forward end of the arm 14. 25 represents a set screw for holding said pin in any desired position of adjustment. 26 represents another  
15 adjusting stop screw projecting through the forward end of said arm 14, the uses of which will be hereinafter explained.

The stock S shown herein is adapted to grind frizzer bits, plain bits, and other forms of plain  
20 shank knives; when, however, chisels or handle knives are to be ground I prefer only to employ the top portion of stock S, and have a removable clamp H with a set screw I for clamping the shank of the tool to the stock, as shown  
25 in Figs. 9 and 10.

29 represents a faucet for admitting water into the bowl 30, through which is pierced an orifice for the admission of water on to the grinder; interposed between the orifice and  
30 the grinder is a gate 31 which is pointed, as shown in Fig. 4, and it is adjustably secured to the front of the bowl by a set screw so that the water may be directed on this and drop off of the point on to the stone; this gate 31 is  
35 supported in gibs 32 so that it may be slid down as the stone wears away.

Mode of operation: When it is desired to grind a tool the screw 26 is turned up out of the way and the tool ground to the desired  
40 bevel and length; the stop pin *m* is then set in position so that the point just touches the rest 27, when the tool has been ground to the proper bevel and length; when a second tool is to be ground to the same bevel and length  
45 it is clamped in the stock and the set screw 26 is run down raising the supporting arm 14 on its journal; and the stock slides laterally on the shafts 13 and 16 carrying the edge of the knife across the face of the grinder; it is  
50 brought back and the set screw gradually raised until the knife is ground to the bevel limited by the stop *m*. By this means any desired length of bevel may be uniformly ground upon a series of knives. As the knife  
55 blades are shortened the plate 21 is moved up and adjusted in position to accommodate the stock and the length of knife. The bevel may be adjusted in two ways, first, by raising or lowering the bracket 28 on the top of  
60 which is formed the rest 27, and for this pur-

pose the slot 29 by which said bracket is attached may be made of any length; but the arm 12 may be adjusted up or down and thus vary the bevel. The bracket 10 is provided with a slot for moving inward the arms 12 and  
65 14, as the grinding wheel wears down, so as to maintain the proper angle of adjustment.

I have shown the slides 13 and 16 of the shaft formed with the sleeves F, E, journaling thereon respectively, and I deem this the preferred form of slide; but it is obvious that other forms of wheels or slides may be adopted.

Having described my invention, what I claim is—

1. In a grinding machine, the tool stock  
75 supporting way consisting of the arm 14, shaft 16, the arm 12, and shaft 13, upon which the stock S is journaled and moved, substantially as specified.

2. In a grinding machine, the combination  
80 of the supporting arm 14, loosely journaled to the frame of the grinding machine and forming the upper support and way for the tool stock, and the arm 12 adjustably secured to the frame forming the lower support for the  
85 tool stock sliding thereon, substantially as specified.

3. In a grinding machine, the combination of the arms 12 and 14, the shafts 13 and 16, the tool stock mounted on said shafts and  
90 moving laterally thereon, and the stop mechanism for limiting the angle of the supporting arm 14, substantially as specified.

4. In a grinding machine, the tool stock S supported and laterally moving on slides at  
95 the ends of the said stock, the stop plate 21 supported between the upper and lower plates of the tool-stock, and clamping mechanism for holding the tool in said stock, substantially as specified.

5. In a grinding machine, the combination with the bracket 10 upon which is loosely  
100 journaled the supporting arm 14, the vertical adjusting rest bracket 28, and the stock S supported and sliding laterally upon the arm 14  
105 across the face of the grinder, substantially as specified.

6. In a grinding machine, in combination with the forward supporting arm 14 loosely  
110 journaled upon the shaft, and provided with a stop mechanism engaging with the rest 27, the stock S hinged upon an axially adjustable shaft 13 and detachably supported upon the slide 16 and arm 14, substantially as specified.

In testimony whereof I have hereunto set  
115 my hand.

SIMON ROSS, JR.

Witnesses:

T. SIMMONS,  
C. W. MILES.