Nov. 17, 1931. J. BATH 1,832,684

WHEEL TRUING DEVICE

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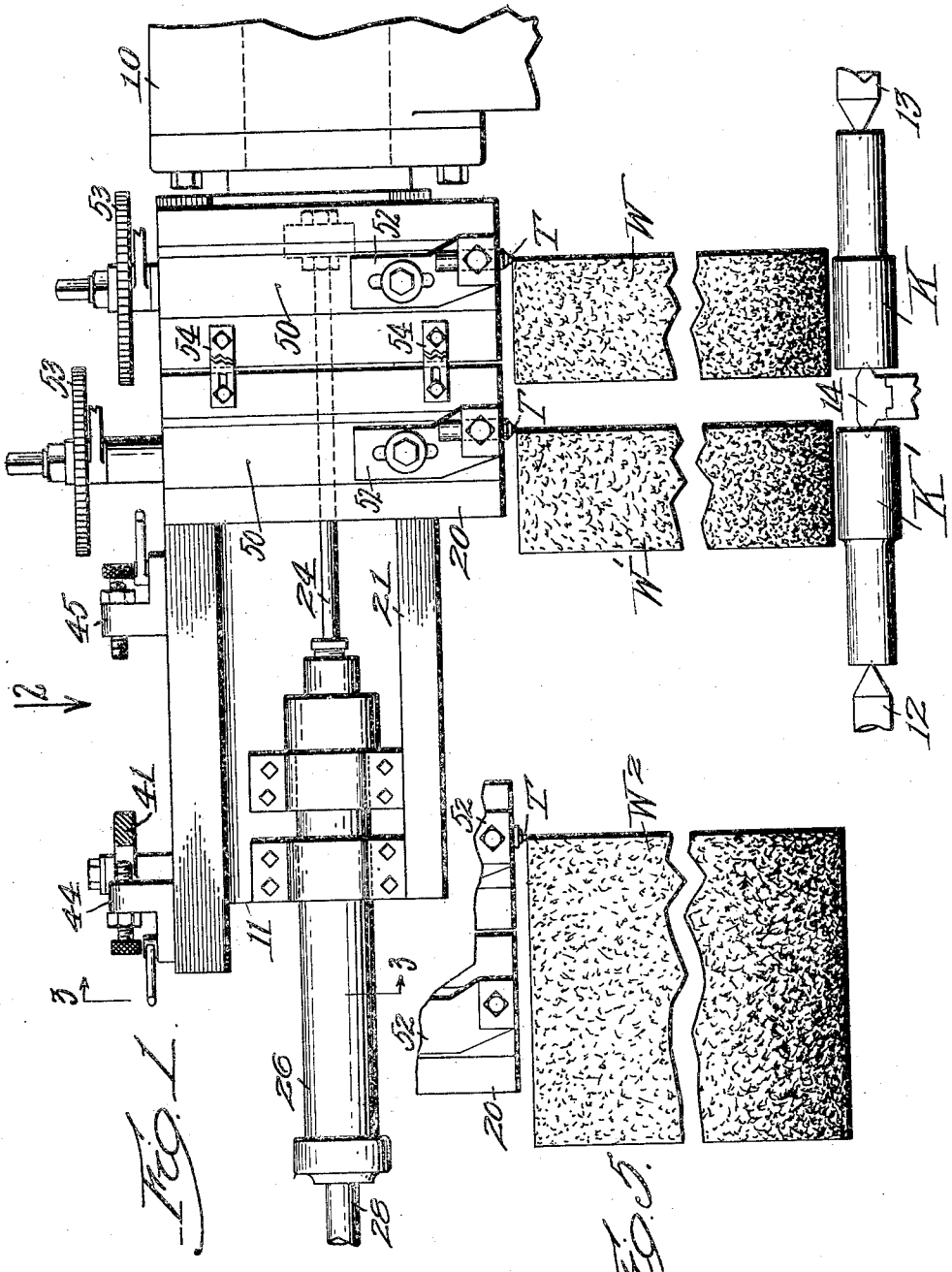


Fig. 1

Fig. 3.

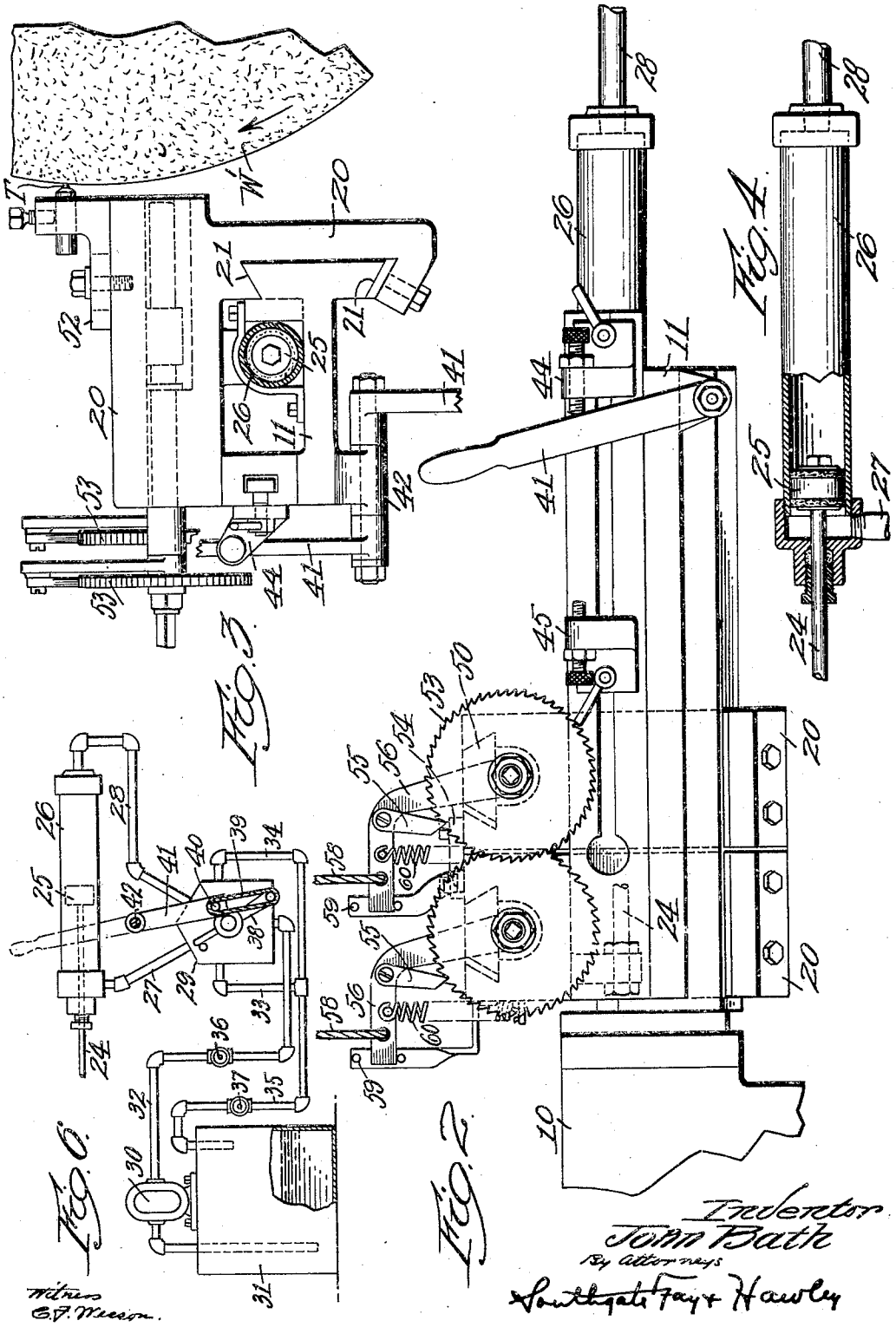
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UNITED STATES PATENT OFFICE

JOHN BATH, OF WORCESTER, MASSACHUSETTS

WHEEL TRUING DEVICE

Application filed January 10, 1925. Serial No. 1,703.

This invention relates to a device for dressing or truing the cutting face of a grinding wheel and more particularly to improved mechanism for supporting and actuating the diamond or other tools used for dressing the wheels.

One object of my invention is to provide a construction by which two or more wheel dressing tools may be supported and actuated to face off two or more wheels at a single operation.

Another object is to provide improved means for moving the tool across the face of the wheel at a uniform rate of speed, which speed may, however, be quickly and easily adjusted to existing conditions.

An important feature of my invention relates to the provision of improved mechanism for reciprocating a wheel dressing tool repeatedly across the face of a wheel and for automatically reversing the travel of the tool.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings in which

Fig. 1 is a partial plan view of a grinding machine having my invention applied thereto;

Fig. 2 is a rear elevation of the parts shown in Fig. 1;

Fig. 3 is a sectional end elevation, taken along the line 3—3 in Fig. 1;

Fig. 4 is a detail view, partly in section, of the hydraulic cylinder and piston for moving the wheel dressing tools;

Fig. 5 is a detail plan view to be described; and

Fig. 6 is a rear elevation of certain parts of the hydraulic actuating mechanism.

Referring to the drawings, I have shown a portion of a grinding machine frame 10 having attached thereto an arm or projection 11 extending therefrom in a direction substantially parallel to the axis of rotation of the grinding wheels W and W'. Pieces of work K and K' may be supported upon head centers 12 and 13 and upon a double tail center 14 (Fig. 1).

One or more carriages 20 (Fig. 3) are mounted upon dove-tailed guide-ways 21 on the side of the projection 11 and one carriage 20 is connected by a rod 24 (Figs. 1 and 4) to a piston 25 slidable in a hydraulic cylinder 26. Pipes 27 and 28 connect the ends of the cylinder 26 to a valve casing 29 (Fig. 6). Water, oil or other fluid is drawn by a pump 30 from a tank 31 and is delivered under pressure through a pipe 32 to the valve casing 29.

Exhaust pipes 33 and 34 connect the casing 29 to a return pipe 35 by which the fluid is returned to the tank 31. Valves 36 and 37 may be used to manually control the flow of fluid through the pipes to and from the valve casing 29.

A reversing valve (not shown) is provided in the casing 29 by which either of the pipes 27 or 28 may be connected to the pressure pipe 32, while the other pipe 27 or 28 is simultaneously connected through one of the exhaust pipes 33 or 34 to the return pipe 35.

An arm 38 on the reversing valve is connected by an extensible member 39 to a pin 40 on a reversing lever 41. The lever 41 is mounted on a fixed pivot 42 and acts to yieldingly reverse the lever 38 and the valve attached thereto, as the lever 41 is swung in one direction or the other by dogs 44 and 45 adjustably mounted on the rear face of the carriage 20.

As the carriage 20 approaches the desired limit of travel in either direction, one of the dogs 44 or 45 engages the lever 41 and swings it over until the center line between the stud 40 and the arm 38 is moved to the opposite side of the axis of the reversing valve, when the tension of the member 39 will act to quickly reverse the valve.

The pressure of the fluid may be controlled by regulating the speed of the pump 30 and also by various adjustments of the valves 36 and 37. For a more complete description of this type of hydraulic operating mechanism, reference is made to the prior application of Stanley W. Bath, Serial No. 730,326, filed August 5, 1924.

A cross slide 50 is mounted on each carriage 20 for feeding movement toward and from the face of the wheel to be dressed and a diamond or other wheel dressing tool T is preferably secured in a bracket 52 adjustable toward and from the wheel on each cross slide 50. The piston rod or link 24 is connected in one only of the carriages 20 and the other carriages are held in spaced relation therefrom by slotted links 54.

Each carriage and cross slide is provided with a screw and nut for transverse adjustment of its cross slide and each feed screw is provided with a ratchet wheel 53 fixed thereto near the rear end thereof. Pawls 55 (Fig. 2) are mounted upon feed levers 56 and engage the ratchet wheels 53.

When it is desired to dress two or more wheels, a number of wheel dressing tools T are mounted on a corresponding number of cross slides 50, each supported by a carriage 20. The several carriages 20 are secured in desired spaced relation by the slotted links 54.

The dogs 44 and 45 are then set to give limits of travel in proper relation to the width of the wheels. The pump 30 is started to provide liquid pressure in the cylinder 26 and the carriages 20 are thereafter reciprocated across the face of the wheels with an even and regular movement and at any desired speed, depending upon the speed of the pump 30 and the setting of the valves 36 and 37.

At the end of each single or double reciprocation, as desired, cords 58 may be pulled upward manually until the levers 56 engage stop pins 59. When the cords 58 are released the levers are drawn downward by springs 60, causing a single tooth feed of the ratchet wheels 53.

If a wide-face single wheel W^2 (Fig. 5) is to be dressed, it is obvious that all but one of the tools T may be removed and the remaining tool may be given a range of travel slightly exceeding the wide wheel face.

By providing two or more wheel dressing tools for narrow wheels, several wheels can be dressed at one and the same time and much time may be saved. It will also be noted that the different tools T are independently mounted for transverse adjustment, so that the wheels which are dressed thereby may be of different diameters if desired.

Having thus described my invention and the advantages thereof, it will be evident that changes and modifications can be made therein by those skilled in the art without departing from the spirit and scope of my invention as set forth in the claims, and I do not wish to be otherwise limited to the details herein disclosed, but what I claim is:—

1. A wheel truing device comprising a plurality of tool carriages, means to support said carriages for simultaneous reciprocating movement, means to mount a plurality of wheel dressing tools on said carriages, and means to hold said tool carriages and tools in adjusted spaced relation, said spacing means comprising adjustable links fixedly connecting said carriages.

2. A wheel truing attachment for grinding machines having a grinding wheel and a work support mounted on one side of said wheel, comprising a plurality of similar tool carriages attachable to said machine on the opposite side of said wheel from said work support, means supporting said carriages for simultaneous reciprocating movement transverse to the plane of rotation of the wheel, means to mount a wheel dressing tool on each of said carriages, and means to hold said tool carriages in adjusted spaced relation.

3. A wheel truing attachment for grinding machines having a grinding wheel and a work support mounted on one side of said wheel, comprising a plurality of similar tool carriages attachable to said machine on the opposite side of said wheel from said work support, means supporting said carriages for simultaneous reciprocating movement transverse to the plane of rotation of the wheel, means to mount a wheel dressing tool on each of said carriages, means to hold said tool carriages in adjusted spaced relation, comprising adjustable links fixedly connecting said carriages, and means to vary the rate of movement of said carriages.

4. A wheel truing device comprising a tool carriage, means to support said carriages for reciprocating movement, means to automatically reciprocate said carriage, means to adjust the tool toward the wheel a predetermined distance at each reciprocation of said carriage, comprising a feed shaft, a ratchet wheel fixed thereon, a crank rotatably mounted at one end on said shaft, a pawl intermediate the ends of said crank engageable with said ratchet wheel, manually operated means movable in one direction to initiate movement of said adjusting means comprising a cable connected to the other end of said crank, means to reverse said manually operated means to return same to its original position, and predetermined means to limit movement of said manually operated means in both directions, comprising a pair of stops located on said frame, and at opposite sides of said crank, adjacent the cable end.

5. A wheel truing attachment for grinding machines having a grinding wheel and a

work support mounted on one side of said wheel, comprising a plurality of similar tool carriages attachable to said machine on the opposite side of said wheel from said work support, means supporting said carriages for simultaneous reciprocating movement transverse to the plane of rotation of the wheel, means to mount a wheel dressing tool on each of said carriages, means to hold said tool carriages in adjusted spaced relation, and means to separately adjust each wheel dressing tool toward its associated wheel.

In testimony whereof I have hereunto affixed my signature.

JOHN BATH.