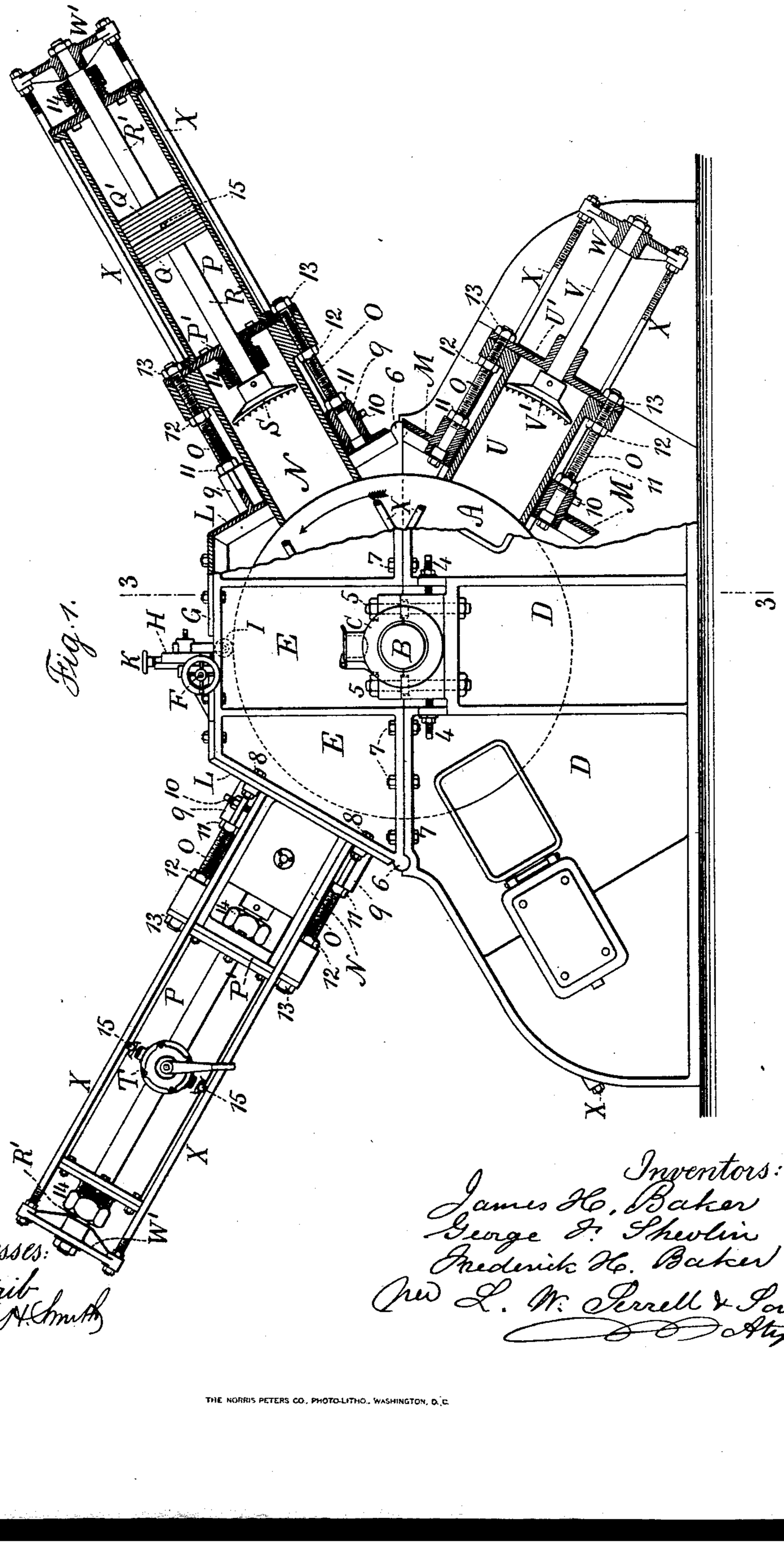
(No Model.) 2 Sheets—Sheet 1.

J. H. BAKER, G. F. SHEVLIN & F. H. BAKER.

WOOD PULP GRINDER.

No. 591,644. Patented Oct. 12, 1897.



Witnesses:
J Stair
Chas H Smith

Inventors:
James H. Baker
George F. Shevlin
Frederick H. Baker
per L. W. Serrell & Son
Attys

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Fig. 2.

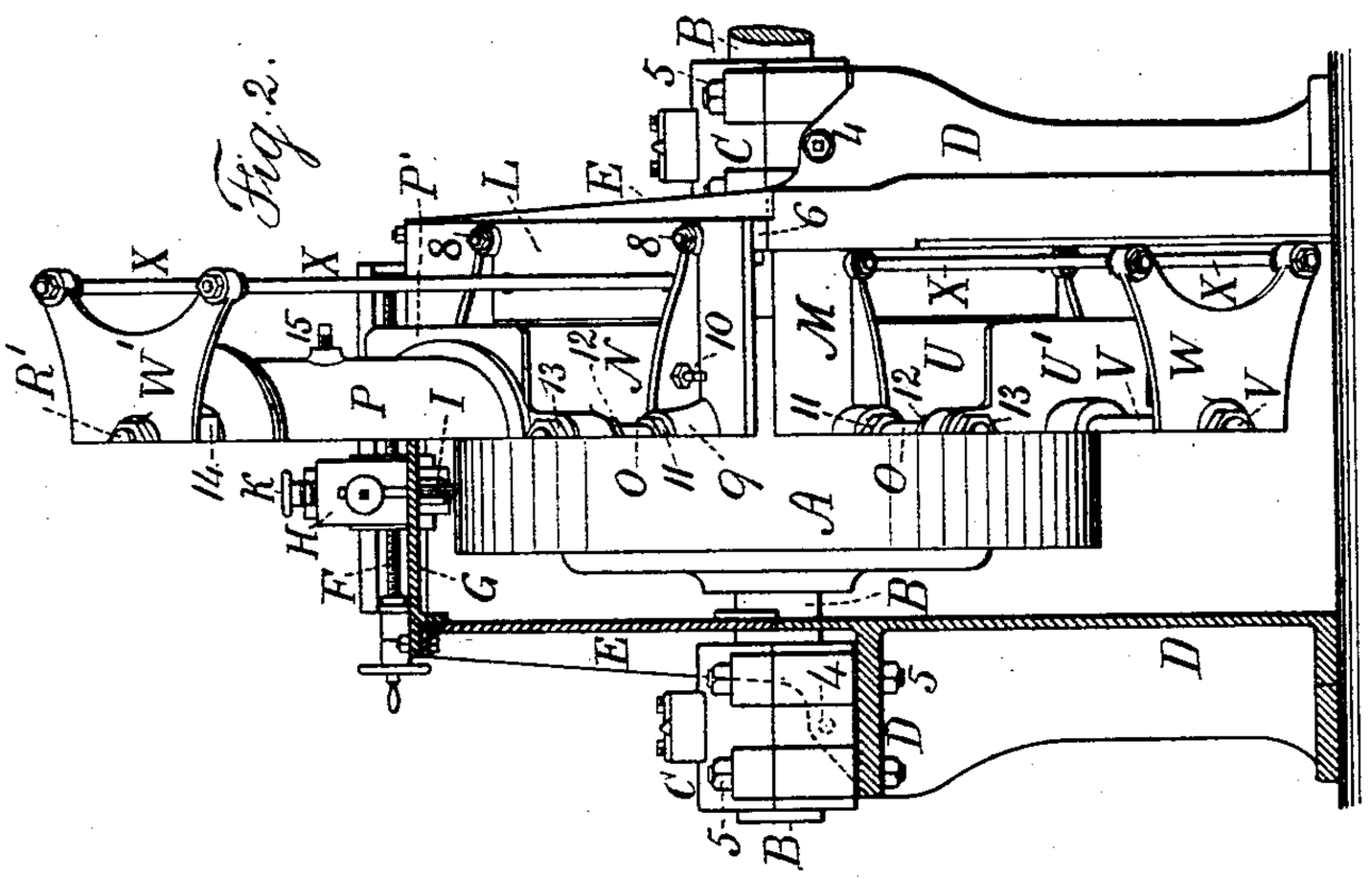


Fig. 3.

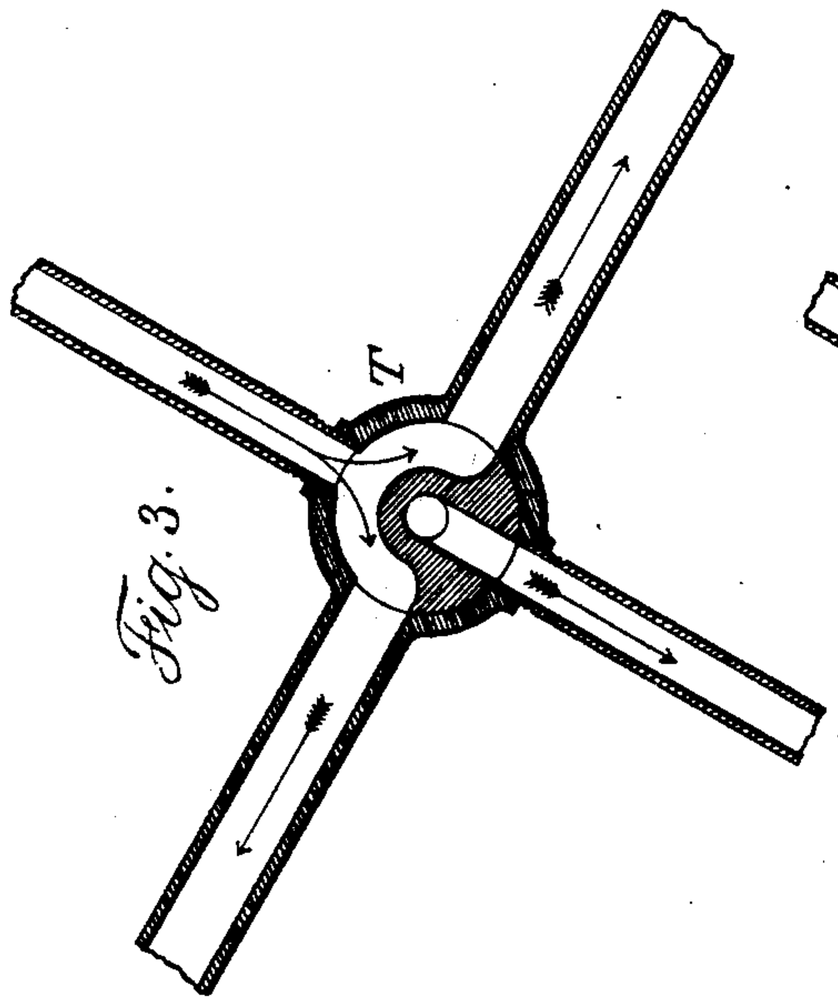
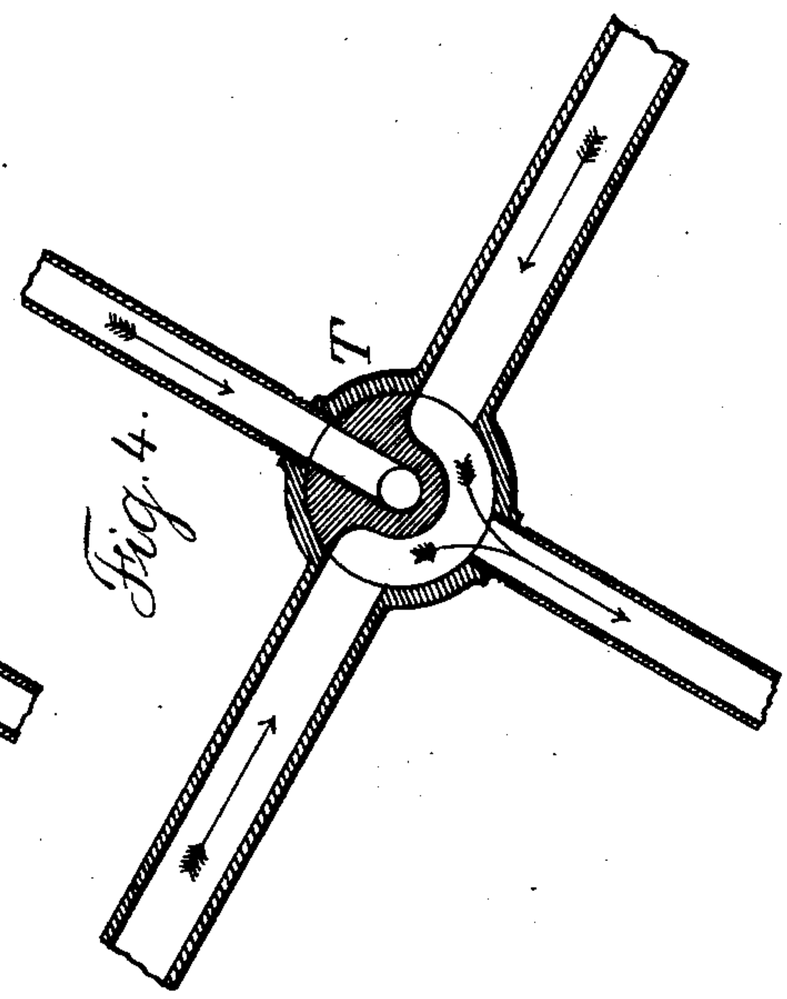


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES H. BAKER, GEORGE F. SHEVLIN, AND FREDERICK H. BAKER, OF SARATOGA SPRINGS, NEW YORK.

WOOD-PULP GRINDER.

SPECIFICATION forming part of Letters Patent No. 591,644, dated October 12, 1897.

Application filed March 5, 1897. Serial No. 625,922. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. BAKER, GEORGE F. SHEVLIN, and FREDERICK H. BAKER, citizens of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented an Improvement in Wood-Pulp Grinders, of which the following is a specification.

In the present invention the followers that act upon the blocks of wood are at opposite sides of the grinder, and equal pressure is applied to those followers, so that one pressure resists the other pressure and but little strain is thrown upon the shaft or bearings for the same. In this manner the grinding is effected with but little friction and the machine rendered more durable.

In carrying out this invention we connect the follower at one side to a cross-head and adjustable rods that extend to the other side of the machine, and the power is applied to move one follower in one direction and the other in the other direction, and we prefer to employ hydraulic power, the fluid-pressure acting in opposite directions against pistons in a cylinder to separate them and give motion to the followers and the blocks of wood, and when the blocks have been ground the water-pressure is employed to move the pistons toward each other and draw back the followers. We construct the parts in such a manner that they can be adjusted toward the axis of the grinder as the stone wears away.

In the drawings, Figure 1 is a side elevation, partially in section, showing the improved grinder. Fig. 2 is an end view, partially in cross-section, at the line 3 3, showing the device for dressing the stone to keep it true, and Figs. 3 and 4 show the valve for admitting pressure to the cylinder.

A represents the grindstone on a shaft B, and this is supported in bearings C, of any suitable character, that rest upon the side plates D, and can be adjusted by the screws 4 and held in position by the bolts 5. The upper side plates E are separable from the side plates D upon the horizontal line of the axis, and there are knuckles 6 at the corners of the upper side plates, resting in similar recesses in the lower side plates, to facilitate the bringing of the parts to the proper positions, and bolts 7 secure the parts together.

Above the grindstone A a cross-screw F is supported near its ends upon the top plate G of the grinder, and this cross-screw F can be revolved by a hand-wheel or otherwise, and it gives motion to a slide-rest H, which carries an adjustable bur or dresser I, which can be moved toward or from the stone by the screw and hand-wheel K, so as to dress off the surface of the stone, as the same may become necessary, from time to time. The peripheral inclosure around the stone and between the side plates is approximately hexagonal, there being plates L, that are bolted at 8 to the edges of the upper side plate E, and plates M, that pass in between the lower side plates D, are connected by flanges and bolts to such side plates D, and the devices connected to the plates L are similar, and hence it is only necessary to describe one set of such devices. The pocket N passes through an opening in the plate L, and such pocket has ears upon it, through which pass bolts O, that enter into sockets 9 upon the plate L, there being heads on the inner ends of these bolts and holding the nuts 11, and there are nuts 12 13 upon the bolts O, by which the pocket can be adjusted toward the grinding-stone, so that the inner end of the pocket may be brought closely adjacent to the grinding-stone as the latter wears away.

The hydraulic cylinder P has a head P′, which is held by the nuts 13 and bolts O, so that the parts are firmly connected, and in the cylinder are pistons Q Q′, with rods R R′ extending in opposite directions through packing boxes or glands 14, and the rod R is provided with a follower S within the pocket N, adapted to press the block of wood toward the grinding-stone, and we have represented screw-stops 15 as passing through the hydraulic cylinder and coming between the pistons to prevent them approaching too close to each other, and at T is a valve or four-way cock, of any suitable construction, and water under pressure is supplied by a pipe to one side of this cock, and a pipe at the other side carries away the waste water. When this valve T is turned in one position, the water-

pressure acts between the two pistons to force them apart, the waste water escaping from the outer ends of the hydraulic cylinder P. When the valve T is turned in the other direction, the water-pressure acts against the outer surface of the pistons to move them toward each other and the waste water passes away from between the two pistons.

Upon the plates M are pockets U, constructed similarly to the pockets N and provided with similar attaching and adjusting screws and nuts, and upon the pocket U is a a head U′, with a central opening for the passage of the rod V for the follower V′, and upon this rod V is a cross-head W, and upon the piston-rod R′ is a similar cross-head W′, and these cross-heads are connected by rods X, that cross over and advantageously pass through inside of the side plates and between such side plates and the grinder, and it will be observed in Fig. 2 that the plane in which one set of rods is contained is farther from the central line of the machine than the plane in which the other set of rods is contained, so that these rods pass clear of each other where they cross, and these rods X are provided with long screw-threads, so that adjustments can be made with facility, as the pockets may be brought nearer to the axis of the grindstone as the surface thereof is worn away.

The aforesaid devices being connected up in pairs, as represented, there are four pockets, and the pressure in the hydraulic cylinder of one pair acts upon the pistons to force the block of wood by one follower S directly against the surface of the grinder, and the same pressure acts against the other piston and through its piston-rod, cross-head, and cross-rods upon the cross-head of the opposite follower V′ to press such follower and the block of wood against the opposite side of the grinder with precisely the same force as the other block of wood in the pair is being pressed in the other direction. Hence the pressure of the blocks upon the grinder is balanced at opposite sides and there is little or no lateral strain, pressure, or wear of the shaft of the grinder in its bearings, and one pair of followers and blocks may be in operation while the followers in the other pair are being drawn back and fresh blocks introduced, it being understood that the action upon one pair is independent of the action upon the other pair, each pair being balanced in its action at opposite sides of the grinder. The bur or dresser I can be brought into action whenever desired, whether the other parts of the machine are in action at the same time or not. Access can be had to the grindstone for inserting another or for repairs to any part of the machine when necessary by disconnecting the cross-rods X at one or both ends and lifting the hydraulic cylinders and the upper side plates and connected parts from off the grinder. Screws may be provided at 10 to clamp the pockets and prevent vibration.

We claim as our invention—

1. The combination with the cylindrical grinder and its shaft and supporting-frames, of pockets at opposite sides of the grinder, followers in the pockets, a rod and cross-head connected with one follower, rods extending from said cross-head to the opposite side of the machine, a rod connected with the other follower and a piston thereon, a cylinder receiving such piston and a second piston therein, a rod and cross-head connecting this piston with the rods that extend across the machine, and nuts upon the rods for adjusting the parts as the grinder wears away, substantially as set forth.

2. The combination with the cylindrical grinder and its shaft and supporting-frames, of two pockets below the shaft, followers in the pockets, rods and cross-heads for the respective followers and crossing rods extending above the shaft, two hydraulic cylinders, two pistons in each of the same acting in opposite directions, a rod to one of the pistons in each cylinder and a cross-head to the same and nuts for connecting thereto the crossing rods, a second set of pockets above the shaft, followers therein and rods connecting to the second pistons in the respective hydraulic cylinders, substantially as set forth.

3. A hydraulic cylinder, two pistons therein and piston-rods extending out through the heads and in opposite directions, means for admitting a fluid under pressure to act between the pistons to move them apart or between the pistons and heads to move the pistons toward each other, a grinder and its supporting-shaft and frame, a pocket at one side of the grinder, a follower in the pocket connected to one of the piston-rods, a pocket at the other side of the grinder, a follower therein and a rod and cross-head therewith connected, crossing rods and adjusting-nuts connected with the said cross-head and a second cross-head upon the other piston-rod and nuts for adjusting the position of the cross-head to the crossing rods, substantially as set forth.

4. The combination with the cylindrical grinder and its shaft, of stationary supporting-frames below the shaft, pockets between the frames and means for adjusting the pockets toward and from the grinder, a separable upper frame and connection therefor with the lower frame, pockets upon the upper frame and means for adjusting the same, hydraulic cylinders connected with the upper adjustable pockets, followers in the respective pockets, rods connected with the followers, pistons in the hydraulic cylinders, piston-rods, cross-heads and connections extending at each side of the grinder-shaft whereby similar pressure is applied by the followers to the opposite grinders by the action of a fluid between the pistons, substantially as set forth.

5. The combination with the cylindrical grinder and its shaft, of stationary supporting-frames below the shaft, pockets between

the frames and means for adjusting the pockets toward and from the grinder, a separable upper frame and connection therefor with the lower frame, pockets upon the upper frame and means for adjusting the same, hydraulic cylinders connected with the upper adjustable pockets, followers in the respective pockets, rods connected with the followers, pistons in the hydraulic cylinders, piston-rods, cross-heads and rods extending at each side of the grinder-shaft and nuts upon the screws of such rods for adjusting the parts as the grinder wears away, whereby similar pressure is applied by the followers at the opposite sides of the grinder by the action of a fluid between the pistons, substantially as set forth.

Signed by us this 18th day of February, 1897.

JAMES H. BAKER.
GEO. F. SHEVLIN.
FREDK. H. BAKER.

Witnesses:
J. W. CRANE,
GEORGE A. SWART.