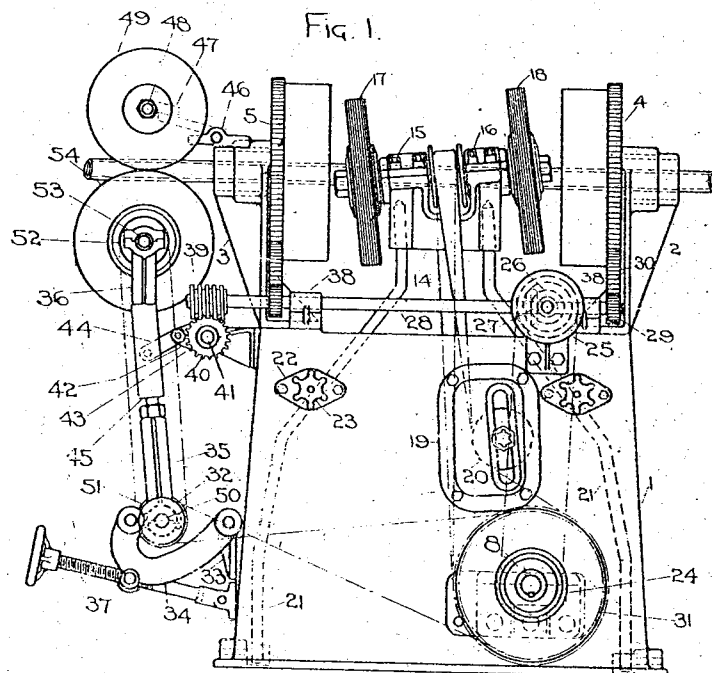


L. H. BRINKMAN.
POLISHING MACHINE.
APPLICATION FILED NOV. 28, 1911.

1,193,453.

Patented Aug. 1, 1916.
4 SHEETS—SHEET 1.



WITNESSES:
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BY

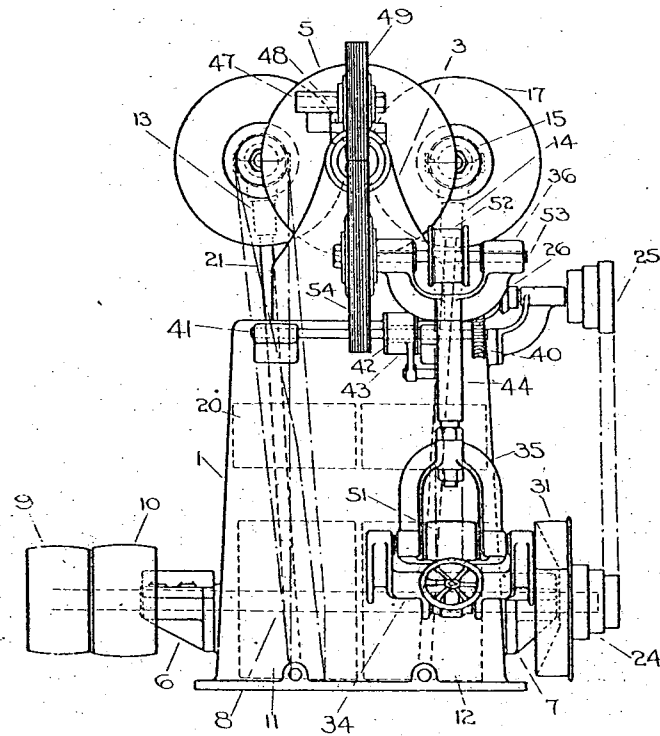
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Fig. 2.



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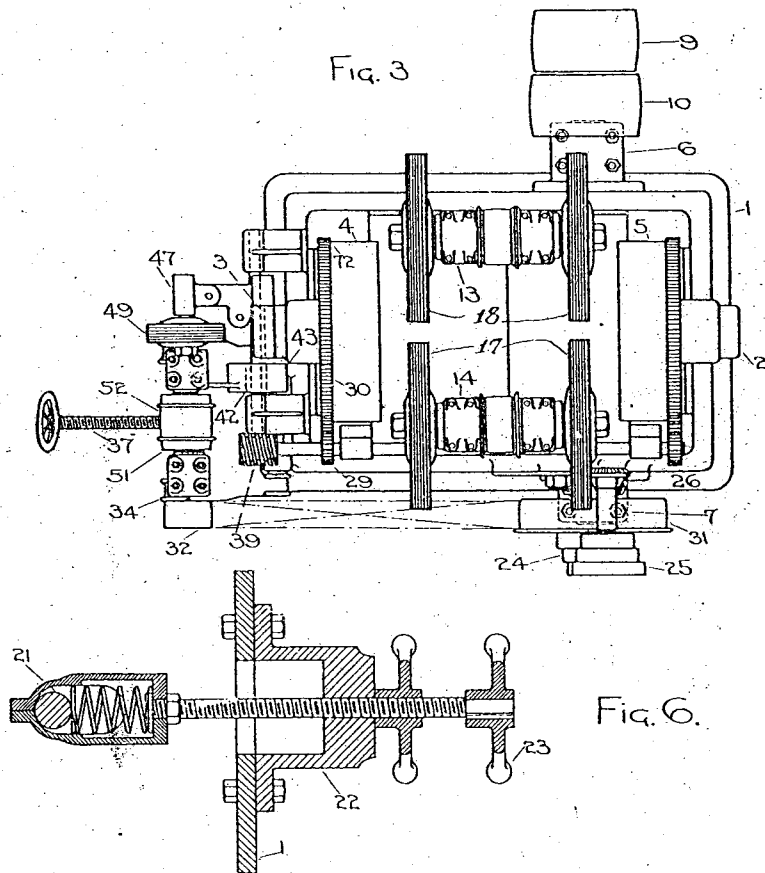
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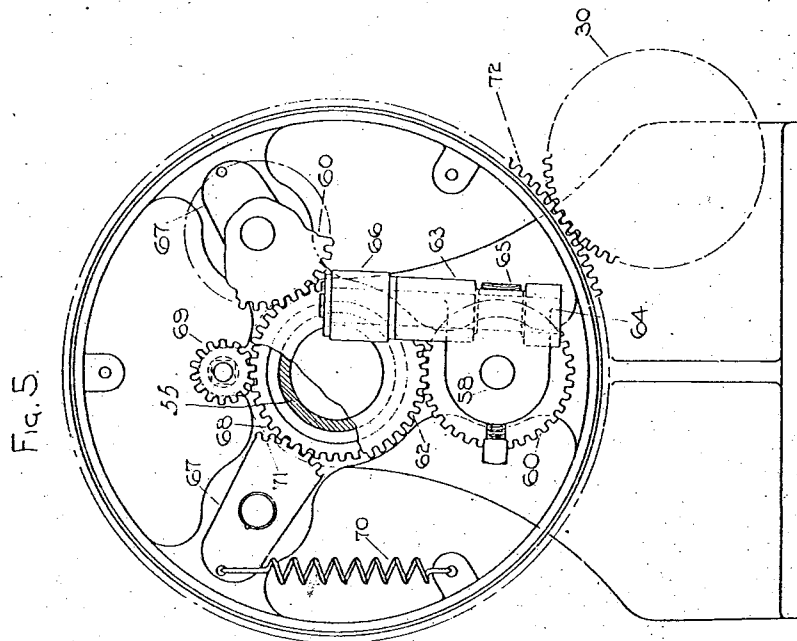
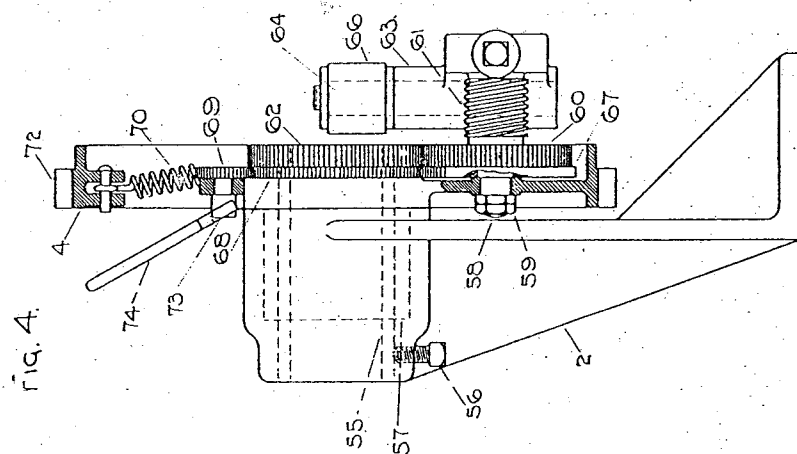
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4 SHEETS—SHEET 4.



WITNESSES:
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UNITED STATES PATENT OFFICE.

LOUIS H. BRINKMAN, OF GLEN RIDGE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BALTIMORE TUBE COMPANY, INCORPORATED, A CORPORATION OF VIRGINIA.

POLISHING-MACHINE.

1,193,453.

Specification of Letters Patent.

Patented Aug. 1, 1916.

Application filed November 28, 1911. Serial No. 662,875.

To all whom it may concern:

Be it known that I, LOUIS H. BRINKMAN, a citizen of the United States, residing at Glen Ridge, in the county of Essex and State of New Jersey, have invented a new and useful Polishing-Machine, of which the following is a specification.

My invention relates to improvements in polishing machines.

One of the objects of my improvement is, the providing of a polishing machine to automatically feed and polish regular or irregular bars, tubing and bends.

A further object of my invention is the providing of a machine having an automatic longitudinal feed for a rotating body both before and after a grinding or polishing process.

A further object of my invention is the providing in a grinding and polishing machine of grinders flexibly and adjustably mounted and driven to accommodate irregular surfaces and bends fed through said machine.

A further object of my invention is the provision of means of adjustment of the operative grinders and polishers, in a polishing machine, relative to work fed through said machine so that the cut or finish marks shall be longitudinal or at any other angle desired on said work.

A further object of my invention is the providing in a polishing machine of an improved automatic chuck and longitudinal feed for a rotating body, to accommodate different sizes of work or irregularities in the said body or piece operated upon.

A further object of my invention is the providing in a polishing machine of an improved automatic chuck and longitudinal feed for a rotating body, to accommodate different sizes of work or irregularities in the said body or piece operated upon, and means of simultaneously opening the various feed rolls to receive the said body.

A further object of my invention is the providing of a machine to give a mirror or granular polish as desired, to regular and irregular work fed through the same.

A further object of my invention is the providing of a polishing machine which will work automatically after having been set for the work to be operated on.

A further object of my invention is the

providing of a machine of extreme simplicity and ease of adjustment and capable of high speed in accomplishing the above desired results.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings Figure 1 is a view of the entire machine in side elevation; Fig. 2 is an end view in elevation of the entire machine taken at right angles to that shown in Fig. 1; Fig. 3 is a plan view of the entire machine; Fig. 4 is an enlarged view in elevation of the feeding chucks shown partly in section; Fig. 5 is a face view taken at right angles to that shown in Fig. 4; and Fig. 6 is detailed view of adjusting screw.

Similar numerals refer to similar parts throughout the several views.

1 designates the base to which are secured chuck bearings 2 and 3.

4 and 5 designate the chucks which rotate and feed the work and are mounted in chuck bearings 2 and 3.

Attached to base 1 are main bearings 6 and 7 in which works main shaft 8. On main shaft 8 is the main driving pulley 10 and loose pulley 9.

11 and 12 designate polishing wheel driving pulleys, which are secured to main shaft 8 within base 1, and over which operate the belts which drive the polishing wheels on each side of the machine.

13 and 14 designate the bearings which loosely fit on to supports 21, and as shown in the drawings are on an angle with the horizontal or center line of chucks and have secured thereto caps 15 and 16 forming bearings for the shafts upon which are mounted buffs or grinders 17 and 18, which revolve in opposite directions. It will be noticed in the drawings that buffs or grinders 17 and 18 work on an angle with the work going through the chucks, one above and one below the axis of the same which may be desirable in some work in buffing.

In work where it is desired that they run in the vertical plane or parallel with the chucks, bearings 13 and 14 may be lifted off and reversed on supports 21. Such a change might be desirable in grinding.

19 designates the idler shaft plate, one on each side of the machine and which has a slot in one edge to adjust and secure the idler shaft carrying idler pulley 20; this plate is reversed when the bearings 13 and 14 are reversed on the supports 21 to give the proper lead of belt.

21 designates the supports for the bearings, preferably round, especially at their ends, and loosely fulcrumed at their lower ends and loosely supporting the bearings at their upper ends.

22 designates a bracket through which operates an adjusting screw. This screw is adjusted by means of hand wheel 23. The other end of said screw is pivoted to supports 21. There is a spring between supports 21 and the end of the screw, which springs tend to keep the buffs or grinders up to their work. This spring is normally in compression.

A cone pulley 24 is placed on the main shaft 8 and is adapted to drive the cone pulley 25 on the operating shaft by means of a belt. A bevel pinion 26 is placed on the operating shaft and drives the bevel gear 27 on shaft 28 to which it is secured. Shaft 28 drives the chucks 4 and 5 by means of pinion 29 and intermediate gears 30.

On main shaft 8 is secured pulley 31 which drives pulley 32 by a belt. Pulley 32 drives shaft 50 on which shaft is secured pulley 51 which drives shaft 53 by means of a belt operating on the pulley 52 secured to said shaft 53. The shaft 53 carries the buff 54. A curved lever 34 is fulcrumed on base 1 at the point 33. The lower yoke 35 forms a bearing for the shaft 50 upon which pulley 32 is mounted, and is fulcrumed to curved lever 34.

36 designates the upper yoke, forming a bearing for the shaft 53 upon which buff 54 is mounted.

37 designates an adjusting screw operated by a handle for operating curved lever 34 thereby adjusting the position of buff 54 with reference to the work coming out.

The lower yoke 35 and upper yoke 36 are adjustably secured together by the member 45 by a screw-threaded connection. By reference to Fig. 2 it will be seen that the yoke 35 is adjusted to receive the member 45 which is screw-threaded thereon. There are lock nuts on the member 45 by which it is held securely in position when adjusted. When it is desired to change the angle of the buff 54 to the work the lock nuts are loosened and the buff may then be turned to the desired angle, and when in position may be fixed thereby tightening up the lock nuts.

The elevation of the buff can then be adjusted by means of the screw 37. This adjustment permits buff 54 to be adjusted at any desired angle to the work coming out which will produce a longitudinal grain on the work or to give a mirror finish.

38 designates bearings secured to base 1 through which operates shaft 28. On shaft 28 is secured worm 39, which worm drives worm wheel 40 mounted on shaft 41.

42 designates an eccentric secured to shaft 41, and operates eccentric casing 43, to which casing one end of connecting link 44 is adjustably secured; the other end of connecting link 44 being loosely pivoted to the member 45. Eccentric 42 causes buff 54 to move substantially longitudinally relative to the work coming from the machine, thus obliterating any circular marks which might be left on the work.

46 designates a fulcrum for carrying bearing 47, and is adjustably secured to chuck bearing 3. Bearing 47 carries shaft 48 upon which is buff 49, which buff runs idle on the work or is driven by coming in contact with buff 54, and is mainly used as a wiper and back rest of the work, and may be adjusted to any desired angle of the work by means of the adjustable securing of fulcrum 46 to chuck bearing 3. In chuck bearings 2 and 3 is secured sleeve 55 by means of set screws 56, see Figs. 4 and 5. The chucks at each end of the machine are similar, excepting as to the speed of the feed rollers, therefore the description of one will be sufficient.

57 is a sleeve formed on chuck 4 and operates in chuck bearing 2 around sleeve 55.

Three pin shafts 58 are journaled in the chuck as shown in Fig. 4, and are held in place by nuts 59. On shaft 58 is journaled pinion 60, to which pinion is secured worm 61. Pinion 60 is driven as the chuck rotates by stationary gear 62 which is integral with sleeve 55. Intermediate gear 30 drives the chuck by means of chuck gear 72 which is formed integral with the chuck.

On pin shaft 58 is secured roller bracket 63, which carries roller shaft 64. Worm wheel 65 which is operated by worm 61 drives roller shaft 64 to which it is secured. The rollers 66 are preferably made of vulcanized rubber and are secured to and operated by roller shaft 64. On pin shaft 58 is secured a sector lever 67, on the end of said lever is formed a segment of a gear 71 which is operated by gear 68. Gear 68 is mounted in the chuck behind stationary gear 62 and works on a bearing in said chuck.

69 is a pinion mounted on a projection of the hub of chuck 4, its shaft extending through said projection and being provided with a squared end at 73, to receive the wrench 74. Pinion 69 operates gear 68, simultaneously opening the chuck when it is desired to remove or introduce work, thus

varying the distance of the rollers from the center of the chuck as required by the work.

70 designates a spring secured to sector lever 67, operating to keep the rollers against the work going through the chuck.

The operation of the described embodiment of my invention is as follows: Work is introduced in chuck 4 by opening rollers 66 by means of wrench 74 operating against the tension of spring 70. The machine being started, the work is rotated by means of chuck 4 and at the same time is fed longitudinally by means of rollers 66. 17 and 18 may be grind stones, emery or other hard grinders, or may be soft buffs or other polishing surfaces as desired. They may be adjusted to work on an angle as shown in Fig. 1 when buffing, or they may be reversed to work parallel with the face of the chuck when grinding. Grinders 17 and 18 are adjusted by hand wheel-nuts 23, and are kept against the work by the springs operating in the spring brackets. As the work goes through the machine it is caught by chuck 5, the rollers of which work in the same direction but with a less speed than those in chuck 4, with the result that short pieces in being fed either on a mandrel or in short lengths connected by plugs in their ends are kept forced together while in the machine. As the work comes out of the machine it comes in contact with and is worked on by buff 54, which buff moves to and fro longitudinally of the work as well as revolving, and is adjusted to the work by adjusting screw 37 as to height, and may be given any angle to the work desired; this buff removes circular marks.

49 is an idle wiping buff, which may be adjusted to the work as desired, and also operating as a back rest for the buff under it.

In this specification and claims the term "work" refers to the material to be ground or polished; the term "polishing" refers to polishing or grinding or both; the term "polisher" refers to a polisher or grinder; the term "buff" refers to a polishing or grinding wheel.

Having thus described my invention what I claim and desire to secure by Letters Patent is—

1. In a polishing machine, in combination, means for longitudinally feeding work, and rotative polishing means automatically self adjustable relatively to and to irregularities in said work.

2. In a polishing machine, polishing means, a plurality of means for feeding work to said means, one on each side of said polishing means and operating at different speeds, whereby one of said feeding means tends to feed longitudinally in a direction toward the other of said feeding means faster than the last named means tends to feed in the same direction.

3. In a polishing machine, polishing means, a plurality of means for longitudinally feeding work rotatively to said means, one on each side of said polishing means and operating at different speeds, whereby one of said means tends to feed longitudinally in a direction toward the other of said means faster than the other of said means tends to feed in the same direction.

4. In a polishing machine, in combination, means for longitudinally feeding work rotatively, rotative polishing means automatically held against and adjustable to the irregularities of said work, and means for adjusting said rotative polishing means relative to the axis of the said work.

5. In a polishing machine, means for longitudinally and rotatable feeding work thereto and means for polishing said work consisting of a rotating buff oscillating longitudinally with reference to said work.

6. In a polishing machine, means for longitudinally feeding work rotatively thereto, means for polishing said work and a rotating buff oscillating longitudinally with reference to said work further to polish same.

7. In a polishing machine, means for longitudinally feeding work thereto, means for polishing said work consisting of a rotating buff oscillating longitudinally with reference to said work, in combination with a sustaining buff or wiper operating on the reverse side of said work.

8. In a polishing machine, means for longitudinally feeding work rotatively, means for polishing work so fed and further means for polishing work so fed consisting of a rotating buff oscillating longitudinally with reference to said work, in combination with a sustaining buff or wiper operating on the reverse side of said work.

9. In a polishing machine, a plurality of means for longitudinally feeding work rotatively thereto whereby one of said means tends longitudinally to feed in a direction toward the other of means faster than the other of said means tends to feed in the same direction, and a polishing means flexibly mounted between said feeding means.

10. In a polishing machine, a plurality of means for longitudinally feeding work rotatively whereby one of said means tends to longitudinally feed in a direction toward the other of said means faster than the other of said means tends to feed in the same direction, a polishing means flexibly mounted between said feeding means, and automatic means for keeping said polishing means operatively against irregular work.

11. A feeding mechanism comprising a rotating wheel or disk, a bearing block pivoted on said wheel or disk, a normally rotating feed roll supported by said bearing block with its axis substantially at right angles

with the axis of said wheel or disk, means to rotate said bearing block to move simultaneously the feed roll to or from the axis of the wheel or disk, and automatic means for maintaining said feed roll against irregular work fed by it.

12. In a polishing machine, the combination of a plurality of means for longitudinally feeding work rotatively to said machine, a polishing means flexibly mounted between said feeding means and a buff mounted beyond the said feeding means.

13. In a polishing machine, a plurality of means for longitudinally feeding work rotatively whereby one of said means tends to longitudinally feed in a direction toward the other of said means faster than the other of said means tends to feed in the same direction and a polishing means flexibly mounted between said feeding means in combination with a buff beyond the last of said feeding means operating on said work with a plurality of motions relatively to the motion of the work.

14. In a polishing machine means of feeding work to be polished past a rotating buff, and a rotating buff operating in a plane substantially coincident with the axis of the work so fed, in combination with means of rotating said buff, means of adjusting said buff to said work, and means of oscillating said buff.

15. Means of polishing consisting of relatively feeding work to be polished past a rotating buff operating in a plane substantially parallel with the axis of the work and oscillating in said plane in combination with means for adjusting said plane of rotation.

16. In a polishing machine, a plurality of means for longitudinally feeding work rotatively whereby one of said means tends to longitudinally feed in a direction toward the other of said means faster than the other of said means tends to feed in the same direction, and a polishing means flexibly mounted between said feeding means in combination with a buff beyond the last of said feeding means operating on said work with a plurality of motions relatively to the mo-

tion of the work, and means for adjusting said buff to or from said work.

17. In a polishing machine, a plurality of means for longitudinally feeding work rotatively whereby one of said means tends to longitudinally feed in a direction toward the other of said means faster than the other of said means tends to feed in the same direction, a grinding or polishing means flexibly mounted between said feeding means, in combination with a buff beyond the last of said feeding means operating on said work with a plurality of motions relatively to the motion of the work, means for adjusting said buff to or from said work, and means of adjusting said buff angularly with reference to the axis of said work.

18. In a polishing machine, means for relatively feeding work past a buff, means for operating a buff in contact with said work and means for changing the angle of the plane in which said buff operates with reference to the axis of the said work operated upon.

19. In a polishing machine, means of feeding work, means of polishing said work consisting of a rotating buff operating in a plane substantially coincident with the axis of the work being fed, in combination with means of simultaneously operating said feed and said buff.

20. In a polishing machine, means for longitudinally feeding work, means for polishing said work in combination with a buff operating in a plane angularly adjustable with reference to the longitudinal axis of said work.

21. In a polishing machine, the combination of means for rotatably feeding work thereto, means consisting of a plurality of buffs simultaneously operating upon said work, one of said means acting against and another operating with the turning of said work to grind or polish same.

LOUIS H. BRINKMAN.

Witnesses:

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