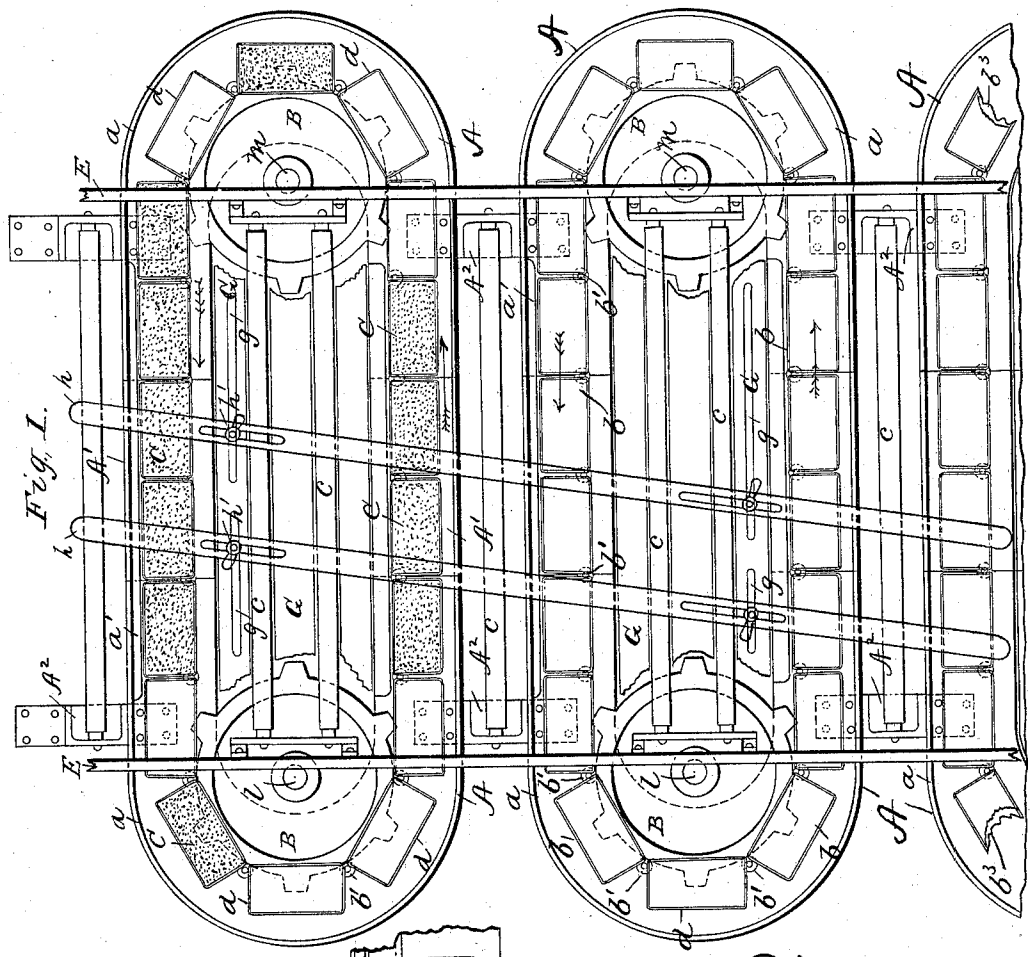
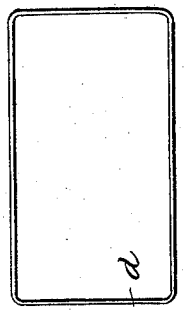
(No Model.) 3 Sheets—Sheet 1.

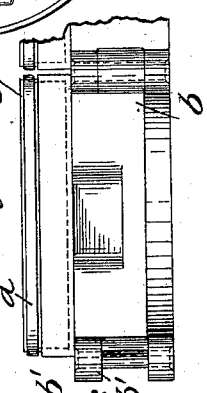
H. FLETCHER.

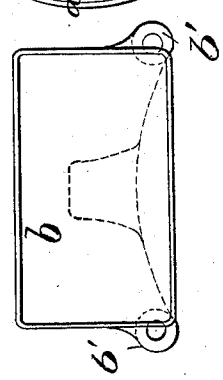
POLISHING MACHINE.

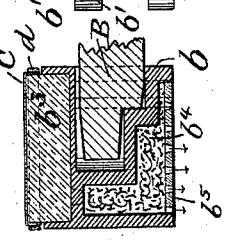
No. 590,059. Patented Sept. 14, 1897.











Witnesses.
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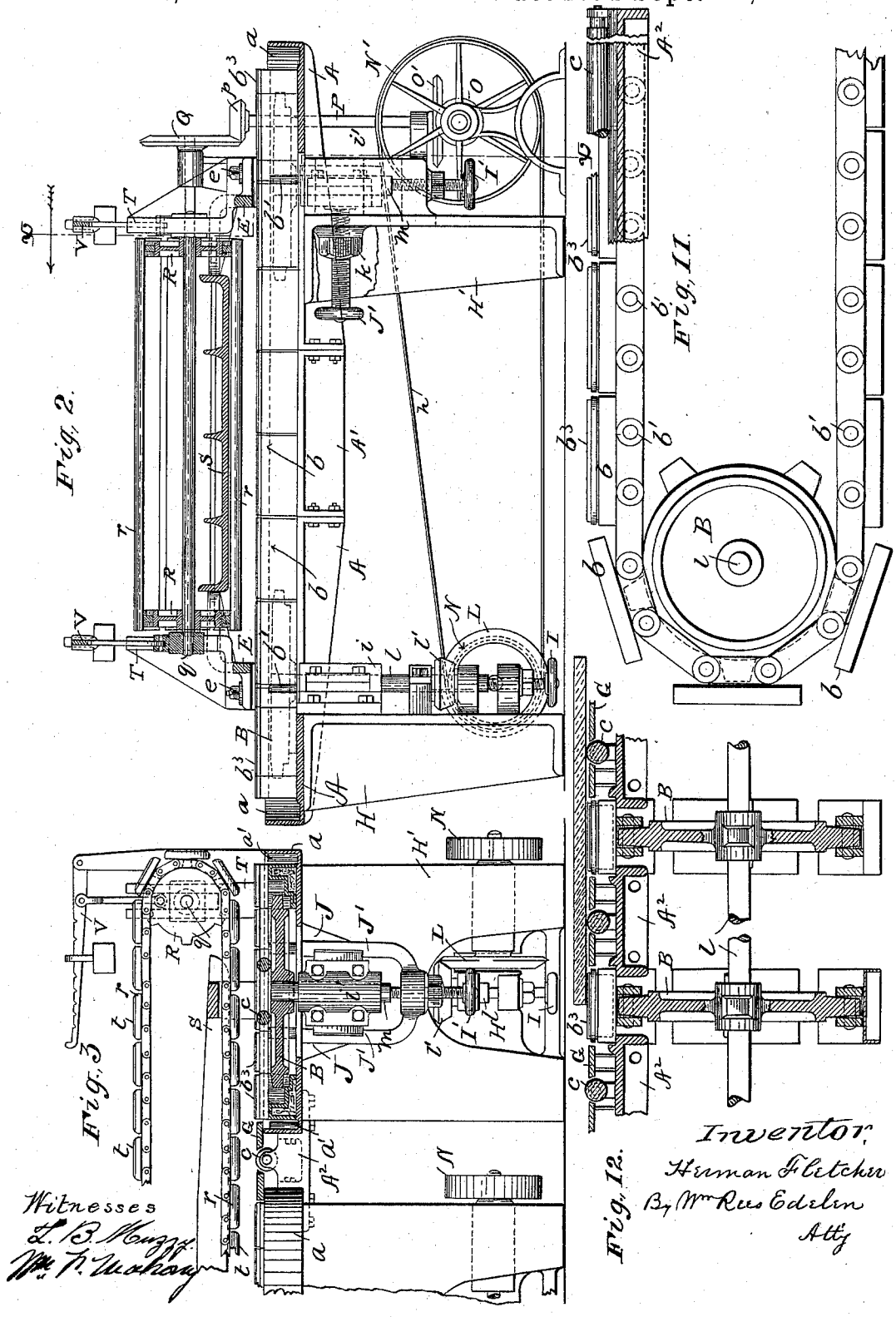
THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON D. C.

(No Model.) 3 Sheets—Sheet 2.

H. FLETCHER.

POLISHING MACHINE.

No. 590,059. Patented Sept. 14, 1897.



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(No Model.)

3 Sheets—Sheet 3.

H. FLETCHER.

POLISHING MACHINE.

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Fig. 10.

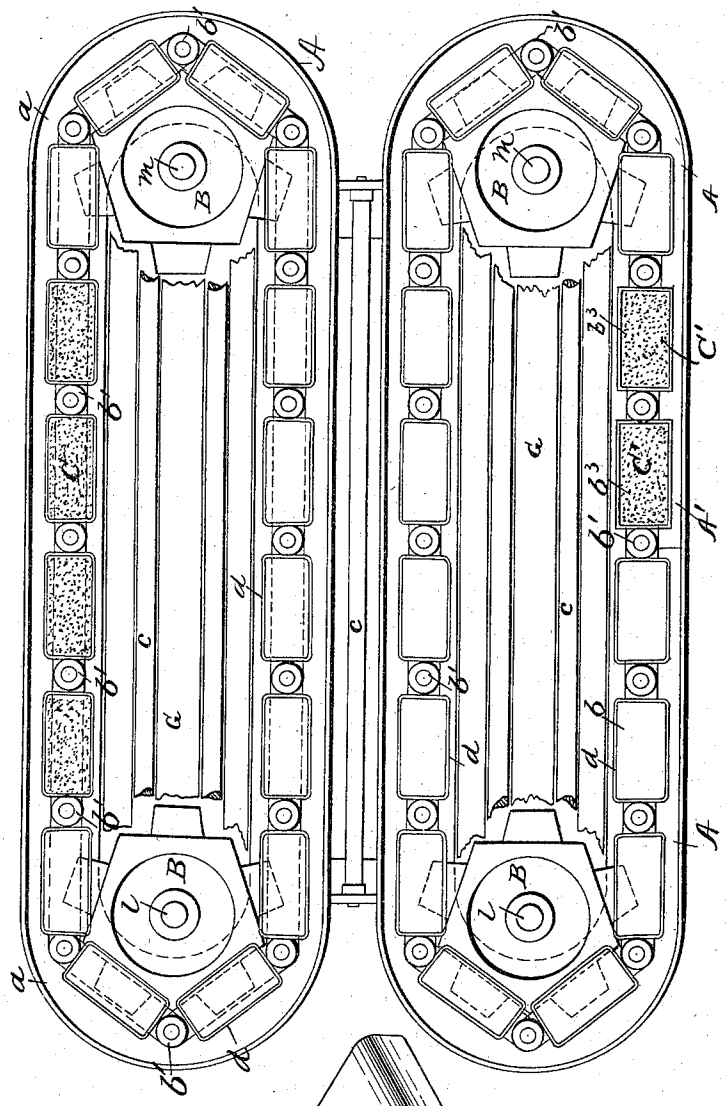


Fig. 8.

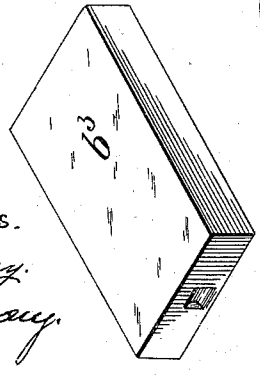
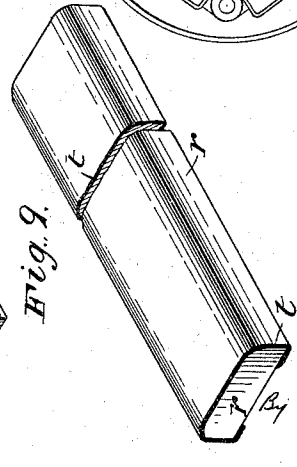


Fig. 9.



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UNITED STATES PATENT OFFICE.

HERMAN FLETCHER, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO ELIZA B. FLETCHER, OF SAME PLACE.

POLISHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 590,059, dated September 14, 1897.

Application filed December 5, 1895. Serial No. 571,136. (No model.)

To all whom it may concern:

Be it known that I, HERMAN FLETCHER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Polishing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to improvements in polishing-machines which can be adapted for operating upon any kind of material; and it consists of certain novel features of construction which will be hereinafter described, and pointed out in the claims.

The object of the present invention is to construct a polishing-machine the polishing-surface of which is composed of a series of bricks or blocks removably secured in a suitable receptacle and hinged or linked together, thus forming an endless chain or belt, which is operated by suitable sprocket-wheels or pulleys.

A further object of the invention is to provide means whereby the opposite sides of each alternate series or chain of polishing bricks or blocks act in opposite directions upon the material being polished.

A further object of the invention is to construct polishing-tables in sections in the direction of their polishing action or chain movement, thus constituting a continuous polishing-table.

A further object of the invention is to provide a suitable guard around the edge of each sectional polishing-table and also a guide-rail for keeping the polishing-block frames or receptacles in alinement.

A further object of the invention is to provide independent blocks or bricks, which may be homogeneous as a polishing medium, or have polishing paper or cloth clamped or bound upon the same by a suitable device for each brick or block.

A further object of the invention is to provide means for leveling up each table, so as to present a uniform polishing-surface for a series of machines or tables.

A further object of the invention is to provide, in combination with a polishing-table, a suitable feed mechanism having the operating portions of the same faced with rubber or other equivalent yielding material.

In the accompanying drawings, Figure 1 is a plan or top view of my improved polishing-table with some of the attachments broken off and the feeding device removed so as to more fully exhibit the operating mechanism constituting the polishing devices. Fig. 2 is a side elevation of my improved device with the table in section and some of the parts broken away, the feed device also being in section and the means for driving the same shown at the right of the machine. Fig. 3 is a transverse vertical section on line $x\,x$ of Fig. 2, showing the feed mechanism and the means for automatically adjusting the same, a portion of the machine to the left being in elevation. Fig. 4 is an edge view of one of the hinged receptacles or boxes and a brick within the same having a polishing-surface secured to said brick by a binding iron or clamp. Fig. 5 is a transverse vertical section taken centrally through Fig. 4, with a tooth of a sprocket-wheel therein. Fig. 6 represents a plan or top view of one of the hinged or linked boxes with the brick removed. Fig. 7 is a plan of the polishing-paper clamp. Fig. 8 is a perspective view of a brick or block. Fig. 9 is a perspective view of one of the rubber-covered feed-slats. Fig. 10 is a plan view similar to Fig. 1, with the hinging-points centrally located. Fig. 11 is a slight modification in side elevation, the driving-shaft acting horizontally. Fig. 12 is a transverse vertical section of Fig. 11.

Similar letters of reference in the various figures indicate like parts.

My invention consists of a series of tables, each consisting of the sections A A, between which one or more detachable sections A′ can be inserted, when desired, for the purpose of increasing the width of the tables, said tables being provided with legs or supports H and H′. Said sectional tables are tied in series side by side by suitable spreaders or irons A^2. Upon said spreaders are boxes for carrying rollers *c*. Also inclosed within each table are similar rollers *c c*. The objects of these rollers are to facilitate the passage of the

material over the series of polishing-surfaces and at the same time prevent irregular pressure upon the same. On the opposite sides of said rollers *c* are strips G, flush with the same for guiding short material from one set of polishing-blocks to a contiguous set through the medium of a suitable feed mechanism. Located near the opposite ends of tables A A are vertical shafts *l* and *m*, supported in suitable boxes *i* and *i'* and bearing sprocket-wheels B B, the right-hand sprocket-wheel acting as an idler and the left-hand wheel being driven by suitable gearing L and *l'* through the medium of pulleys N and belt *n*.

Operated by sprocket-wheels B and B are hollow boxes *b b*, having hinges or joints *b' b'*, thus forming an endless chain or belt for supporting rectangular bricks or blocks b^3 b^3, said blocks being adapted to receive a paper or cloth covering C, having any suitable polishing material secured to the same. The paper or cloth material is held securely on said blocks b^3 by clamping-irons D. In the modification shown in Fig. 10 blocks C', composed of any homogeneous material, are substituted for the cloth or paper covered blocks previously referred to. The bearing-surfaces of said linked or hinged boxes are recessed, as shown at b^4, (see Fig. 5,) for receiving waste or any other absorbent, and by means of the removable perforated bottom b^5 the lubricant used can percolate through said opening upon the tables A for the purpose of preventing undue friction of the parts.

Immediately under vertical shafts *l* and *m* are vertical adjusting-screws I and I' for keeping the grinding or polishing blocks of each independent table parallel with its contiguous table on the entire series of the tables. The right-hand sprocket-wheel is provided with devices for taking up the wear of the hinged pivots and also any undue slack in the tension of the chain of boxes *b*, which is accomplished by means of screw J', (having a lock-nut *k*,) forcing forward said movable box or bearing *i'* on the ways or guides formed in the bracket J, secured to leg H'. (See Figs. 2 and 3.) By this means the vertical shaft *m*, with its accompanying sprocket-wheel, is forced forward without in any manner interfering with the operating mechanism of the machine.

Each table is provided with a guard or vertical projecting flange *a* for preventing accidents in case a hinge, rivet, or box should become detached or broken. Inside of said guard or rail *a* is a guide-rail *a'* for preventing too much swinging movement to the series of blocks or bricks as they move rapidly around the periphery of their respective sprocket-wheels. These rails *a'* further act as stops for preventing any undue lateral movement which may be caused by the material being fed too fast across said polishing-blocks.

The object in making the tables sectional is to afford means whereby manufacturers can increase the size of their polishing-machines when wider stock is operated upon without incurring an additional expense in purchasing an entire new machine. By this means any number of sections A' can be put in a machine to suit the width of material to be polished; also, a number of tables can be joined together, as it is customary to use the coarsest polishing-surface upon the first machine, each succeeding machine having a finer polishing material, the last table using a mere buffing-pad secured to the bricks for polishing, or, if necessary, an entire machine can be employed for polishing oiled work, with suitable buffers, which is a slow and tedious task when performed by hand.

To prevent irregularity when polishing narrow strips, but more especially when necessary to feed them at an angle in the machine, I employ strips *h h*, (shown in dotted lines, Fig. 1,) which are slotted and provided with hand-nuts *h' h'* and which are adjustably secured through the slots *g g*, formed in the table-strips G. It will be obvious that the opposite sides of the series of polishing-blocks attached to each chain of boxes must of necessity move in opposite directions when acting horizontally, as indicated by the arrows in the plan view of Fig. 1, which is very essential, as by this means a machine will run much easier, as the action of the polishing-surfaces neutralizes the tendency of the material to be crowded against a fence or guide, which otherwise it would do if this counteracting device was not employed.

The feeding device is mounted upon bars E E, adjustably secured by nuts *e e*, and consists of slotted standards T T, for supporting sprocket-wheels R R, mounted on shafts *q* and operated in suitable boxes or bearings located within said slotted standards T and adapted to yield for various thicknesses of material passing through the machine by means of the mechanism connected with the weighted levers V. Secured to the endless chain surrounding the half of each sprocket-wheel are a number of rails or strips *r r* and which are faced with rubber *t* (see Figs. 9 and 3) or any other yielding material for feeding and holding down the stock to be polished. Immediately above the lower course of rails *r* is a rigid table S for receiving the thrust of said rails or strips when pressure comes upon them by means of the incoming stock to be polished. It is obvious that by my improved device of providing the rails with soft rubber less pressure will be required upon the work, thus making a much lighter running machine, as the friction of rubber is very considerable.

The feed device is operated by beveled gears O, O', *p*, and Q through the medium of shafts P and *q*, respectively. In Fig. 10 the polishing-chain is operated by polygonal sprocket-wheels, the pivotal points in the chain mechanism being centrally located, the operation being similar to that shown in Fig. 1. The modification shown in Figs. 11 and 12 has the

shafts running horizontally. The boxes *b* are kept from turning by means of the spreaders A^2 being provided with cheeks or flanges. I do not limit myself to sprocket-wheels, as flanged pulleys with suitable belts can have boxes *b* secured to the same and perhaps work equally as well.

I do not claim, broadly, the feeding device, as a similar device is shown, with a few exceptions, in the patent of J. DuBois, March 5, 1878, and others.

That which I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a polishing-machine a polishing device consisting of a series of polishing-sections removably secured on an endless chain and operated by a suitable mechanism for the purpose as described and specified.

2. In a polishing-machine a table and a polishing device consisting of a series of polishing-sections removably secured to an endless chain that is mounted transversely on a suitable table, and the means for driving the same, substantially as described.

3. In a polishing-machine a polishing device consisting of a series of removable bricks which are provided with removable flexible covers, and secured in receptacles or boxes provided with hinged joints or connections, adapted to constitute an endless-chain connection, in combination with sprocket-wheels for operating the same, substantially as described.

4. In a polishing-machine, a polishing device, consisting of a series of polishing-sections removably secured on an endless chain, in combination with sectional tables, for supporting said chains, and means for operating said polishing devices, as described and specified.

5. In a sectional polishing-machine, a polishing device, consisting of a series of removable polishing-sections, mounted on an endless chain, in combination with sprocket-wheels for actuating said chains, substantially as shown and described.

6. In a polishing-machine, a series of tables, each consisting of sections A, A, and having a detachable section A′, thus forming a complete table, and a number of said tables tied together laterally, in combination with an endless polishing device situated on each table, and means for operating said polishing devices as described.

7. In a sectional polishing-machine, a polishing device consisting of a series of polishing-sections removably secured to an endless chain, in combination with a table provided with a guard-rail around each table, and a guide-rail for keeping said endless chain in alinement, and means for operating said chain as described and specified.

8. In a polishing-machine, a table consisting of sections A, A and a detachable section A′ in combination with a polishing device consisting of polishing-sections mounted upon an endless sprocket-chain, sprocket-wheels for actuating said polishing device and adjustable bearings for supporting the sprocket-wheels and for taking up the wear in the chain, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN FLETCHER.

Witnesses:

WM. REES EDELEN,

J. ROSS COLHOUN.