(No Model.) 2 Sheets—Sheet 1.

H. C. BENSON.

Machine for Trimming the Ends of Lead Pencils.

No. 229,661. Patented July 6, 1880.

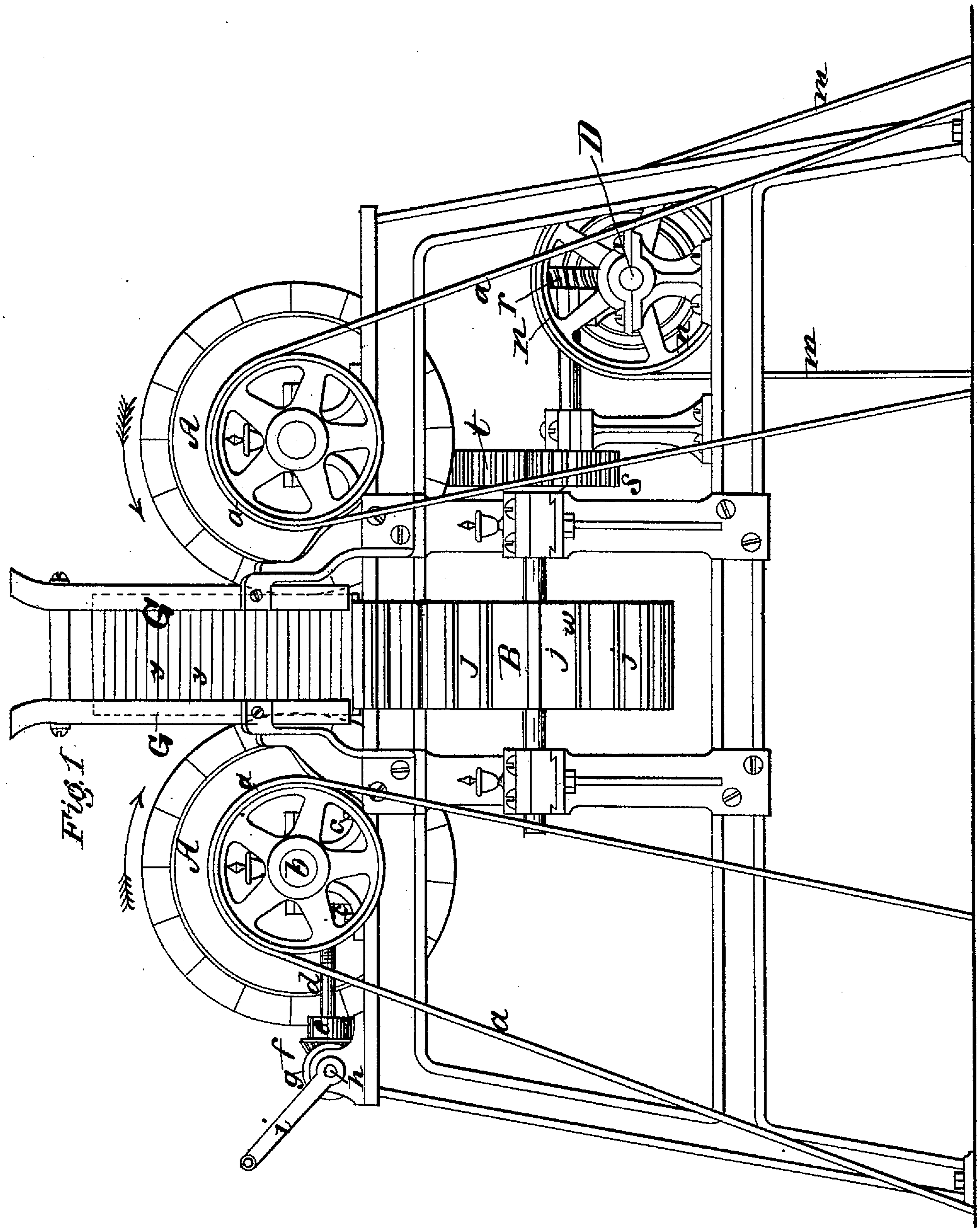


Fig. 1

Fig. 4

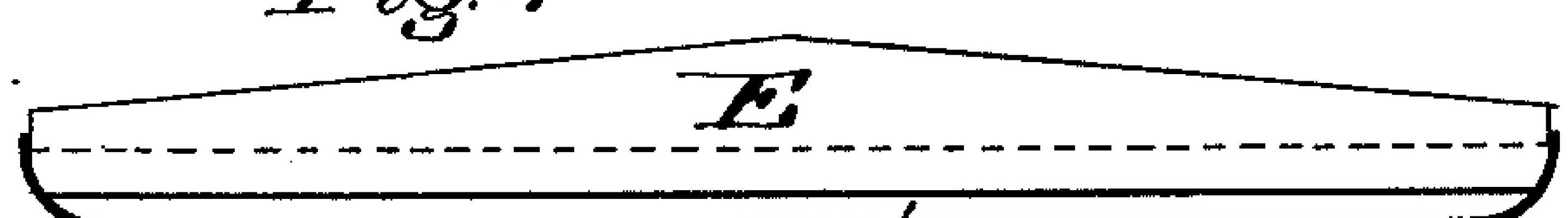
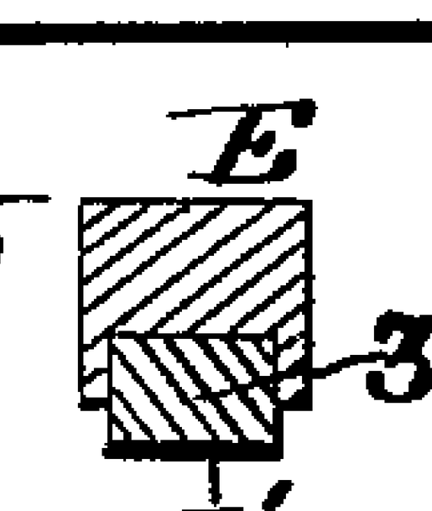


Fig. 5



WITNESSES

INVENTOR

Henry C. Benson
by M. Bailey
his ATTORNEY.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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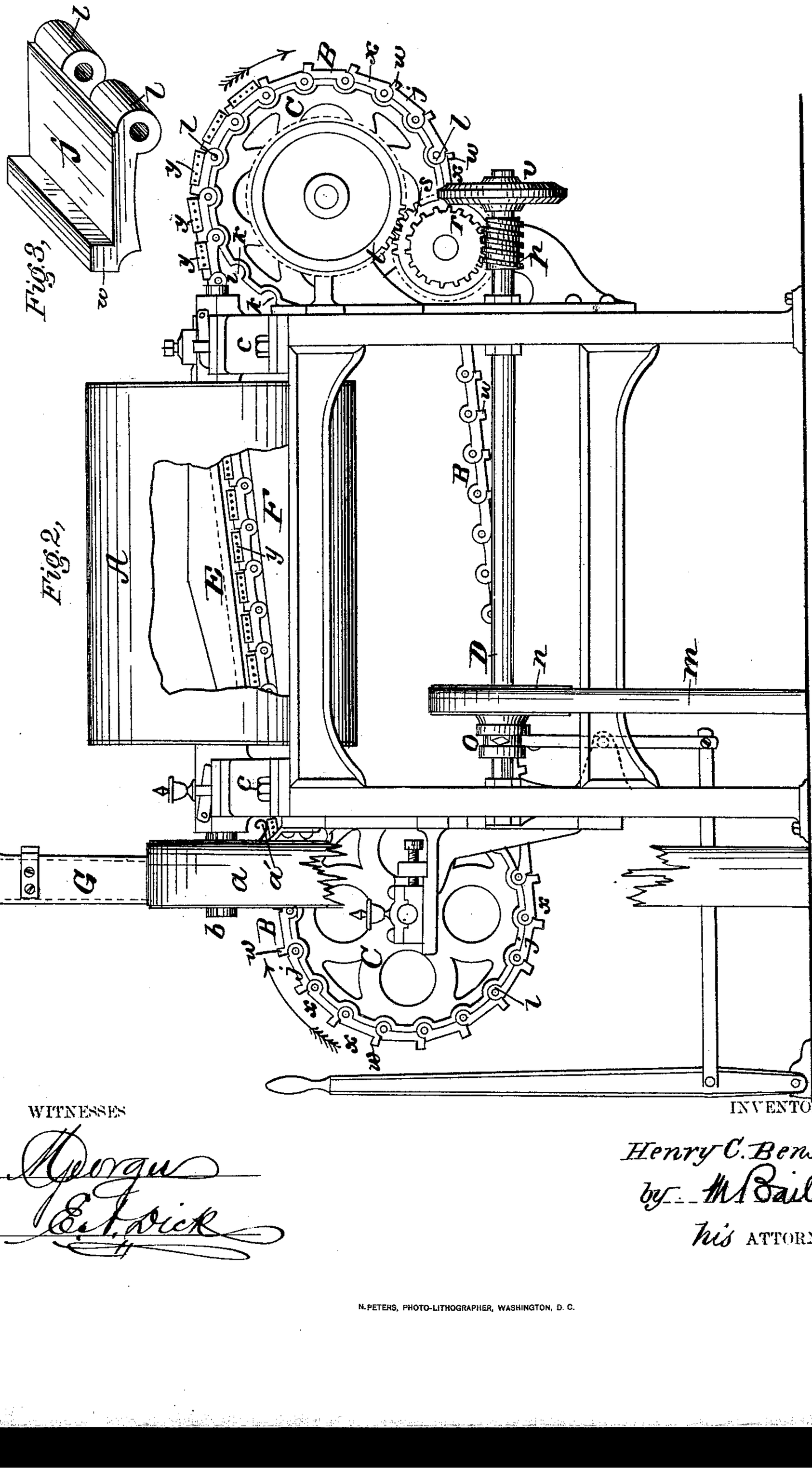

WITNESSES

Morgan

E. F. Dick

INVENTOR

Henry C. Benson

by Thos Bailey

his ATTORNEY.

UNITED STATES PATENT OFFICE.

HENRY C. BENSON, OF NEW YORK, N. Y., ASSIGNOR TO JOSEPH RECKENDORFER, OF SAME PLACE.

MACHINE FOR TRIMMING THE ENDS OF LEAD-PENCILS.

SPECIFICATION forming part of Letters Patent No. 229,661, dated July 6, 1880.

Application filed May 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. BENSON, of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Trimming the Ends of Lead-Pencils, of which the following is a specification.

In the manufacture of lead-pencils the leads are laid in between two wooden strips, grooved, one or both, on their contiguous faces for receiving these leads, and the two strips are then united by glue, forming a slab about from seven and one-fourth to seven and one-half inches long, a little over two inches wide, and three-eighths of an inch thick. The dimensions of the slab of course vary with the size of pencil to be produced. The above dimensions are those for the ordinary lead-pencil of commerce. Some six leads are usually contained in the slab, and the latter, by appropriate machinery, is cut up into six pencils. Preliminarily, however, to this the ends of the slabs are squared and smoothed and the slabs reduced all to a uniform length—say seven inches or a little over. Heretofore this operation, so far as I am informed, has been performed by hand, with the aid of a power-driven cylinder coated with sand-paper or other suitable abrading material.

The workman takes the slab in hand, and, placing it in a suitable guide and gage, pushes it up so that one end of the slab will be pressed up against the rapidly-revolving sand-papered cylinder. As soon as the slab at this end is sufficiently smoothed and ground away he reverses the slab and reduces it at the other end in a similar way. The operation thus conducted is open to considerable objection. It takes time, requires the employment of comparatively skilled labor, and, where the manufacture is on an extensive scale, necessitates the use of a number of machines or cylinders.

It has been my object to produce a machine for the purpose which will do the work automatically, requiring only to be fed from a hopper or otherwise, which will operate rapidly, reducing both ends of the slab simultaneously, and which requires no skilled workman to attend it. To this end I combine with two reducing or sand-papered cylinders, placed side by side, at the proper distance apart, to operate on the ends of a slab introduced between them, a carrier, which conveys the slabs to and between the cylinders, said slabs in their passage being ground off or reduced at each end simultaneously, so that by the time they pass beyond the cylinders they are of the proper length and have their ends smooth and substantially squared.

I combine with the parts above named elastic or yielding presser-bars, which bear on the slabs and hold them down in place in or on the carrier while they are being operated on. I further combine with the carrier, which has preferably the form of an endless belt partitioned off into compartments, each of which will contain a slab, a feed-hopper, from which the slabs are delivered automatically, one by one, to the carrier. I also form and arrange the cylinders and the carrier relatively to one another so that the passage for the slabs between the cylinders shall be wider at the entrance than at the exit end, the passage gradually narrowing up to the point where the slab is reduced to the ultimate length required. This result may be attained in various ways; but I prefer to attain it by arranging the cylinders parallel to one another, and slightly inclining the carrier-belt, so that, for instance, it shall enter between the cylinders at a point below a plane passing longitudinally through their axes, and thence extend upward so as to pass out beyond them at a point, say, in or above the said plane last mentioned. The same result, as above said, can proximately be attained otherwise—as, for instance, by arranging the cylinders in the same horizontal plane with slightly-diverging axes, the carrier passing between the two horizontally, or by making the sandpapering-rolls slightly tapering or conical instead of cylindrical, and arranging them horizontally and with parallel axes. I also arrange the cylinders so that they may be adjusted to and from one another to vary the length of slab, or for other purposes. These and other features of my invention can, however, best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of a machine

or apparatus embodying my invention in its preferred form. Fig. 2 is a side elevation of the same. Fig. 3 is a view of one of the links of the carrier chain or belt. Fig. 4 is a side elevation, and Fig. 5 is a transverse vertical section of one of the elastic presser-bars.

The working parts of the machine are supported in a frame of suitable form and construction.

The main elements of the machine are the two drums or cylinders A, the one the counterpart of the other, and the carrier-belt B.

Each drum or cylinder A has a periphery coated or provided with an abrading material, usually sand-paper, which is applied to and caused to adhere closely to the surface of the drum. The drums are arranged parallel to one another in the same horizontal plane, and each is separately and independently driven by a belt, *a*, passing around pulleys on the main or engine shaft of the works and on the drum. They revolve in opposite directions, the direction of their movement being indicated by the arrows in Fig. 1. In order to increase or decrease the distance between them, I make one of them adjustable to and from the other. To this end the arrangement shown in Fig. 1 can be employed. The two end bearings, *b*, of one of the cylinders (but one bearing is shown in the figure) are made capable of sliding back and forth relatively to the other cylinder on or in guides carried by the frame, and when adjusted are held by bolts *c*, which pass into the frame through slots in the feet of the bearings.

Into the front bearing is screwed an adjusting screw-rod, *d*, held in a bearing, *e*, and provided at its outer end with a bevel-pinion, *f*, meshing with a like pinion, *g*, on shaft *h*, provided with the handle *i*. Shaft *h* extends to the other end of the cylinder, and there, through a like system of bevel-gearing, connects with a similar adjusting screw-rod engaging the other sliding bearing of the drum.

By loosening the bolts which hold the bearings and then turning the handle *i*, the cylinder or drum can readily be moved to or from the other cylinder, and when adjusted can be held in place by tightening the bolts *c*.

Between the cylinders or drums extends the carrier-belt B, composed of links *j*, one of which is shown detached in Fig. 3, hinged or pivoted together so as to form an endless chain or belt, which is stretched around pulleys C, provided on their peripheries with recesses *k*, for receiving the joint-knuckles *l* of the belt, which in this way is caused to engage its pulleys.

The rear pulley, C, is power-driven, obtaining its motion from the revolving shaft D, which is driven from the main shaft of the works by its own independent belt *m*, which passes around a loose pulley, *n*, on the shaft, said pulley being engaged, whenever motion is to be imparted to the shaft, by a friction-clutch, *o*, on the shaft.

Shaft D carries a worm, *p*, which engages an intermediate worm-gear, *r*, having a pinion, *s*, meshing with a spur-wheel, *t*, fast to pulley C. The shaft is also provided with a hand-wheel, *r*, by which the shaft may be revolved in an opposite direction if for any reason it may become necessary or desirable to set or move back the belt.

It is preferred to set the chain or belt B at a slight inclination, as shown in Fig. 2. It enters between the drums A at a point below the level of their axes, and thence extends along between them upwardly until it passes out beyond them at a point level with or above their axes. Under this arrangement each blank or slab enters between the drums at a point where, in the path traveled by the belt, there is sufficient distance between their peripheries to accommodate the full length of the slab, and thence, passing gradually upward as it moves onward, it travels in a path which gradually narrows, so that by the time it passes out from between the drums it has been reduced at its ends to the desired extent, both drums acting simultaneously on the slab.

The belt in all cases must be formed with recesses or pockets, or their equivalent, in which successive slabs or blanks are received and carried to and through between the drums. To this end I provide the belt in the present instance with partitions or ledges *w*, which divide the belt into compartments *x*, each of which is of a slightly greater width than the width of the slab, *y*, which it is to carry. These ledges are formed one on each link, and of less height than the thickness of the slab, so that as the slabs pass along through the machine and are operated on by the sandpapering-drums they may, at or near each end, be held down firmly in place by a presser-bar, E. There is one of these bars on each side of the belt. They are arranged above and so as to bear on the slabs. They exert a yielding pressure in order to accommodate themselves to variations in the thickness of slabs. One convenient way of obtaining this result is to recess each bar longitudinally on its under edge, as shown in Figs. 4 and 5, placing in this recess a strip of india-rubber or other elastic body, *z*, which is faced by a thin steel ribbon or strip, *z'*, secured at its ends to the ends of the bar. Vertically beneath each bar E is a bearing bar or bed, F, below the chain-belt, to uphold the belt under the pressure of the bars E.

Above the belt, in front of the drums, is the guide-hopper G, in which the slabs are placed one on top of the other, as indicated in Fig. 1. As one compartment *x* after the other comes beneath the hopper a slab will drop from the hopper into said compartment. Spring-fingers *a'*, attached to the hopper, bear on each slab as it passes to the drums and force it back against the ledge *w* of its compartment, so as to assure it in position.

The belt is of less width than the slabs are long, so that the slab at each end may project beyond the sides of the belt.

All that is needed for the continuous and uninterrupted operation of the machine is to

keep the hopper supplied with slabs. The slabs, after being operated on, drop from the belt as the latter passes around its rear pulley, and are carried away by an attendant.

In case it should be desired to finish one end only of the pencil, or to finish first one end and then the other, a single cylinder could be used, in which event the carrier chain or belt should have its slab containing pockets or recesses closed at the end farthest removed from the drum.

The machine shown in the drawings is the preferred embodiment of my invention. It is manifest, however, that the construction and relative arrangement of the several parts thereof can be modified and changed to a great extent without departure from my invention. I therefore do not restrict myself to what is herein shown; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, substantially as hereinbefore set forth, of the two reducing-drums and the endless carrier belt or chain passing between said drums and arranged and operating to present both ends of each of the slabs or blanks which it carries simultaneously to the abrading action of the drums.

2. The combination of the two reducing-drums and the endless carrier belt or chain passing between said drums in a gradually-narrowing path, substantially as and for the purposes hereinbefore set forth.

3. The combination of the two reducing-drums and the inclined endless carrier belt or chain passing between said drums, these parts being arranged relatively to one another for joint operation, substantially as hereinbefore set forth.

4. The combination, substantially as hereinbefore set forth, of the reducing-drums, the endless carrier belt or chain, the presser bar or bars, and the bed or bar for upholding the chain against the presser-bars.

5. The combination, substantially as hereinbefore set forth, of the reducing-drums, the endless carrier belt or chain, and the hopper arranged and adapted to deliver the slabs or blanks one by one to the said carrier.

6. The combination, substantially as hereinbefore set forth, of the reducing-drums, the endless carrier belt or chain, the hopper, the presser bar or bars, and the upholding-bed.

7. In combination with the endless carrier belt or chain, the reducing-drums, adjustable to and from one another to vary the distance between them, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 15th day of May, 1880.

HENRY C. BENSON.

Witnesses:

LEOPOLD AUSBACHER,

GEO. H. RICHARDS,

JOE W. SWAINE.