(No Model.) 3 Sheets—Sheet 1.

T. HARPER.

MACHINE FOR BUFFING METAL TUBES.

No. 505,221. Patented Sept. 19, 1893.

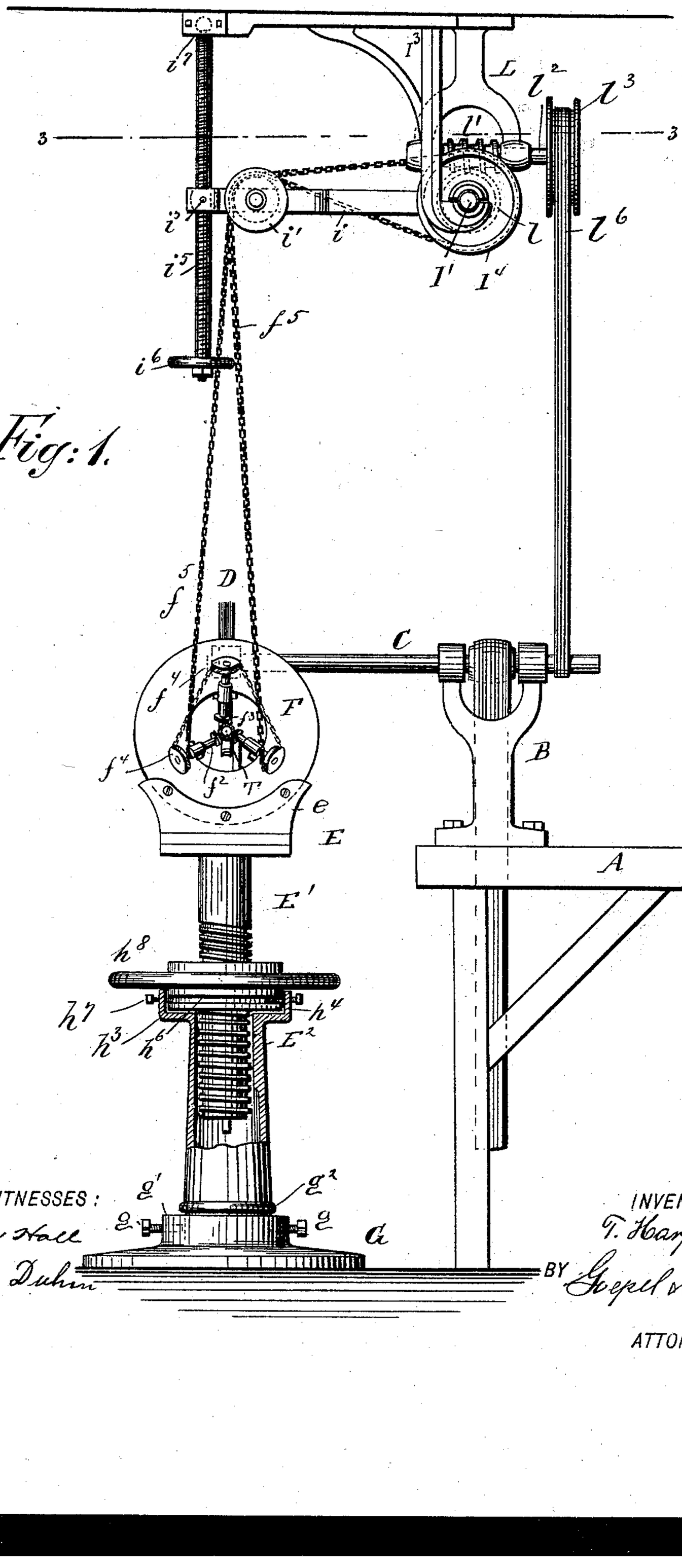

Fig: 1.

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(No Model.)

3 Sheets—Sheet 2.

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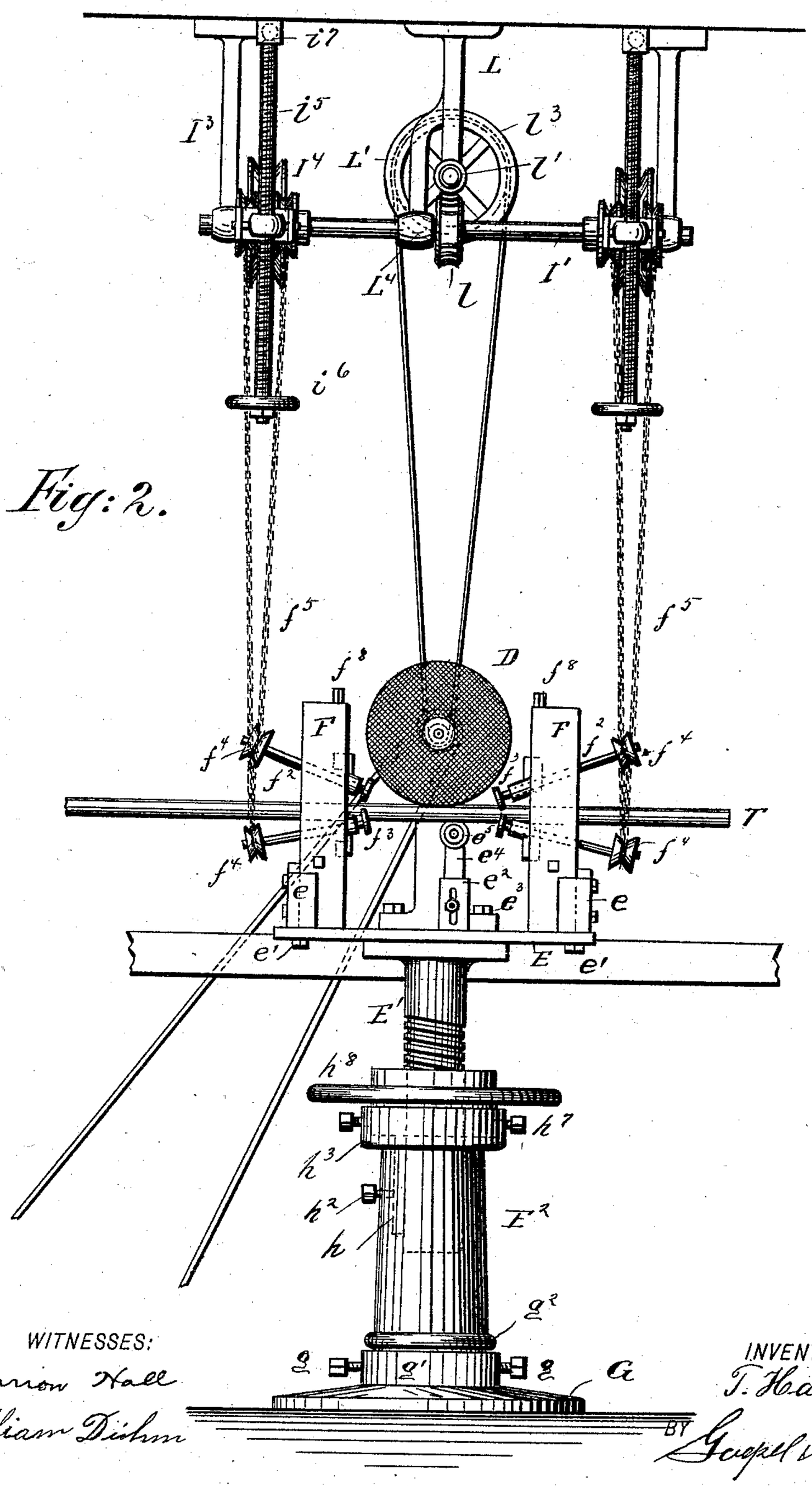

Fig: 2.

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3 Sheets—Sheet 3.

T. HARPER.

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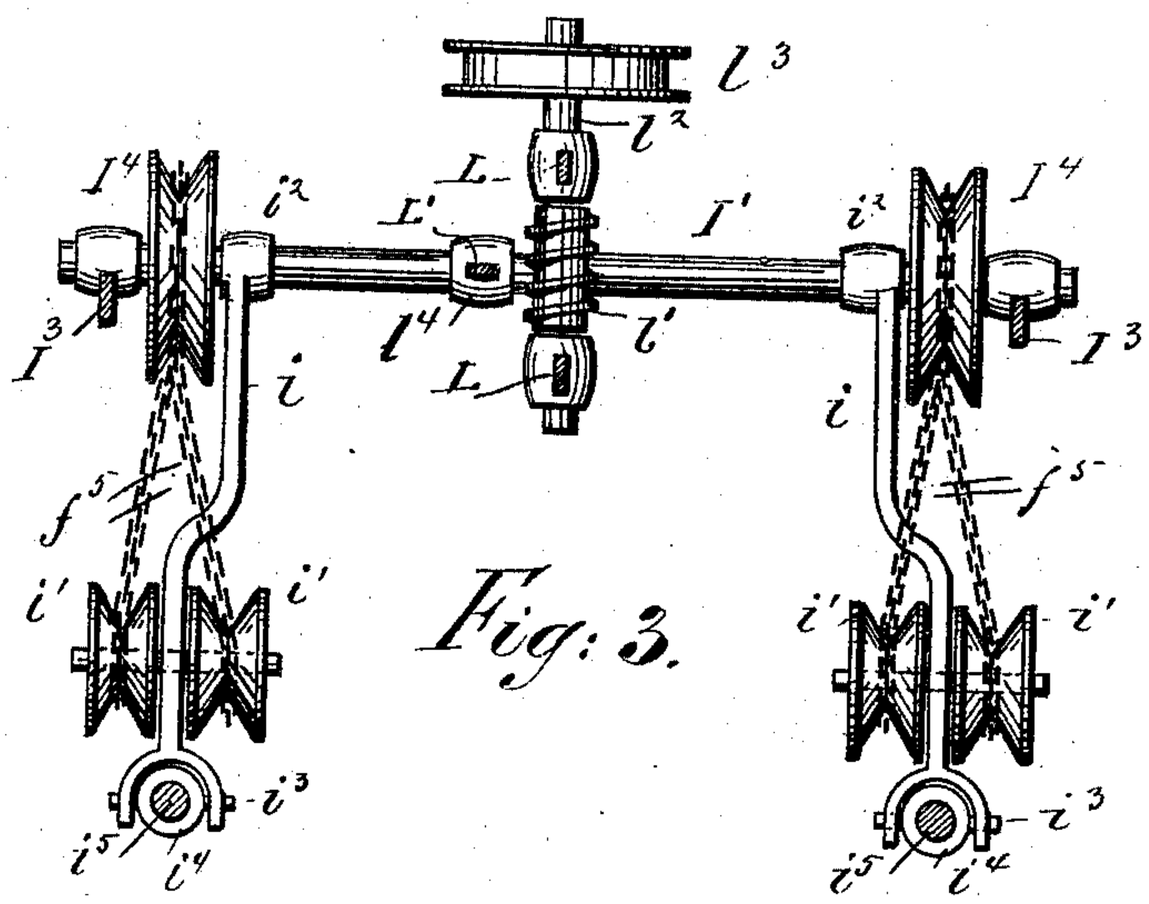

Fig: 3.

Fig: 4.

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UNITED STATES PATENT OFFICE.

THOMAS HARPER, OF BROOKLYN, NEW YORK, ASSIGNOR TO WILLIAM S. HURLEY AND DAVID ALEXANDER, OF SAME PLACE, AND ASA P. MEYLERT, OF NEW YORK, N. Y.

MACHINE FOR BUFFING METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 505,221, dated September 19, 1893.

Application filed July 5, 1892. Serial No. 439,009. (No model.)

To all whom it may concern:

Be it known that I, THOMAS HARPER, a citizen of the United States, and a resident of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Buffing Metal Tubes, of which the following is a specification.

This invention relates to certain improvements in machines for buffing metal tubes in a continuous, reliable and effective manner, so that larger quantities of metal tubes can be buffed at a considerable saving of time and labor; and the invention consists in a machine for buffing metal tubes, which comprises a rotary buffing-wheel, chucks supported on a table at each side of the buffing-wheel, means for adjusting said table, feed-wheels attached to converging spindles supported in suitable bearings of the chucks, means for imparting rotary motion to the feed-wheels and a vertically-adjusted supporting device between the chucks for holding the tube in position in relation to the buffing-wheel.

The invention consists, further, in the construction of the motion-transmitting mechanism by which rotary motion is transmitted from the spindle of the buffing-wheel to the pulleys of the spindles of the feed-wheels by means of driving-chains and means by which said chains are slackened or tightened, as will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side-elevation, and Fig. 2 a front-elevation of my improved machine for buffing metal tubes. Fig. 3 is a plan-view, drawn in horizontal section, on line 3 3, Fig. 1, of the motion-transmitting mechanism for the spindles of the feed-wheels, and Fig. 4 is a side-elevation, drawn on a larger scale, of a set of feed-wheels, their converging spindles and the supporting-chuck of the same.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the bench of an ordinary buffing-lathe, on which is fixed a standard B, in the forked upper end of which is supported the horizontal spindle C of the buffing-wheel D. Rotary motion is imparted to the spindle C by belt and pulley transmission from a suitable counter-shaft.

On the table E that is arranged on or about the same level with the bench A are supported by holders *e*, which are attached by bolts *e'* to the table E, the chucks F, which may be of any approved construction, preferably in the nature of the well-known self-centering pipe-cutting or threading chucks. The chucks F are provided with jaws *f*, to which are applied inclined bearings *f'*, which serve to support the converged spindles f^2 that carry at their lower ends the feed-wheels f^3 and at their upper ends the pulleys f^4 over which is passed the driving-chain f^5, by which rotary motion is imparted to the spindles f^3. Each chuck F supports a set of three spindles, which are rotated by the driving-chain f^5, one set in one direction and the other set in the opposite direction, so that the tube T that is passed through the center of the chucks F and below the buffing-wheel D is fed forward by the feed-wheels in the direction of the arrow on Fig. 2, while being simultaneously turned slowly on its axis by the motion of the feed wheels f^3. The feed-wheels f^3 are made of felt, leather, rubber or other suitable material, and are firmly retained on the ends of the spindles by tightening the nuts f^6, so that the feed-wheels are rotated with their spindles f^2. The jaws of the chucks F are adjusted by means of a threaded shaft f^8, that is provided with a square head, said shaft engaging one of the jaws and by suitable transmissions the other jaws *f* of the chucks, so as to adjust them closer to or farther away from the axis of the chucks and produce thereby the firm grasping of the tube by the feed-wheels f^3.

To the table E is attached a slotted socket e^2 by means of bolts e^3, said socket supporting the shank e^4 of a grooved wheel e^5, which supports the lower part of the tube T below the buffing-wheel D, said wheel taking up the pressure of the buffing-wheel on the tube T and preventing it from bending. The table E is supported on the standard E', the lower threaded end of which telescopes into a tubular socket E^2, which is supported at the lower

end by means of set-screws g of a socket g' of the base-plate G that is bolted to the floor. An annular shoulder g^2 near the lower end of the tubular socket E^2 rests on the socket of the base-plate G and permits the axial turning of the tubular standard E^2 in the socket g', as required for setting the supporting-table of the chucks in proper relative position to the buffing-wheel D according to the style or pattern of tube or rod to be polished. When the tubular standard E^2 is properly adjusted, it is firmly held in position in the socket of the base-plate by tightening the set-screws g.

In the upper part of the tubular standard E^2 is arranged a feather or spline h that fits into the longitudinal groove of the threaded standard E'. The feather h is tightened or the lower end of the same taken up by the set-screw h^2.

At the upper end of the standard E^2 is arranged a larger socket h^3, in which is located the nut h^4 provided at its outer surface with a circumferential groove h^6 into which project the points of set-screws h^7, which serve to prevent the head from rising out of the socket h^3 when the latter is turned by its hand-wheel h^8. The nut h^4 and the threaded shank E' serve to raise or lower the supporting-table of the chucks and feed-wheels so as to bring the tube or rod to be polished into proper relative position toward the buffing-wheel.

Rotary motion is imparted to each set of feed-wheels f^3 by the driving-chain f^5, which passes around the pulleys at the upper ends of the spindles of the feed-wheels, as shown clearly in Fig. 1, and which passes over grooved idlers i' on a short transverse shaft that is attached to the arms i, the front ends of which are forked while the rear ends are provided with sleeves i^2 that are placed on a shaft I', which is supported in bearings of hangers I^3, which are attached to the ceiling or other suitable support. The forked front ends of the arms i are provided with recesses for supporting the gudgeons i^3 of a nut i^4 through which passes a threaded shaft i^5, which is provided at its lower end with a hand-wheel i^6, while the upper end is made ball-shaped and supported in a ball-shaped socket i^7. By turning the hand-wheel i^6 in one or the opposite direction the forked front end of the arm i is raised or lowered, so as to tighten or loosen the endless driving-chain f^5.

On the shaft I' intermediately between the arms i is arranged a worm gear-wheel l that meshes with a worm l' on a shaft l^2, which is supported in a hanger L attached to the ceiling at right-angles to the shaft I'. The arm L' extends in downward direction from the hanger L and is provided with a tubular sleeve or bearing l^4, by which the shaft I' is supported near the worm-gear wheel l so as to hold the latter reliably in gear with the worm l'. To the rear end of the shaft l^2 is applied a pulley l^3, to which motion is imparted by a belt l^6 from the spindle C of the buffing-wheel D, as shown clearly in Figs. 1 and 2, said belt and pulley transmission imparting rotary motion to the worm and worm gear-wheel l and thereby by the shaft and grooved chain-pulleys I^4 that are keyed to the shaft I' rotary motion to the driving-chains f^5 and by the same to each set of feed-wheels.

The operation of my improved buffing machine is as follows:—Supposing the machine is at rest and the driving-belt on the loose pulley of the counter-shaft, the jaws of the chucks F are opened. The tube T is next passed through the center of the jaws and the latter closed on the same, so that the feed-wheels firmly grasp the tube T. The hand-wheel h^8 on the threaded standard E' is next turned and thereby the threaded standard E' adjusted until the tube T is pressed slightly against the buffing-wheel D. The slack of the driving-chains f^5 is next taken up by turning the hand-wheels i^6 at the lower end of the threaded rods i^5, so that the forked ends of the swinging pivoted arms i are raised with their idlers i', whereby the driving-chain is tightened. The attendant next turns the hand-wheel h^8 and brings thereby the tube with a firm pressure against the buffing-wheel D. From time to time the attendant supplies the buffing-wheel with a suitable polishing composition either by hand or by any approved mechanical means, as desired. Into the end of the tube which is slowly passed below the buffing-wheel and buffed over its entire surface as rotary motion is imparted simultaneously with the forward feed-motion is placed a small plug of wood, metal or other suitable material, which has a central collar, so that the opposite end can receive the end of the next tube to be buffed, so as to form thereby a continuous length of tube which passes below the buffing-wheel without stopping the machine, the tubes being fed forward and turned automatically by the driving mechanism hereinbefore described, so that a uniform and effective buffing of metal tubes or rods is produced.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a rotary buffing wheel, two sets of axially rotating feed-wheels, each set being composed of three wheels the spindles of which are supported at opposite inclinations to the rod or tube to be buffed, chucks for supporting the spindles of said feed-wheels, means for adjusting said chucks to the rod or tube to be buffed, a table on which the chucks are supported, and means by which the table is adjusted so as to bring the rod or tube to be buffed in proper relative position toward the buffing wheel, substantially as set forth.

2. The combination with a rotary buffing-wheel, of two sets of rotary feed-wheels arranged adjacent to the buffing-wheel, chucks for supporting the inclined shafts of said feed-

wheels, a table for supporting said chucks, a threaded standard attached to said table, an interiorly-threaded nut engaging the threaded standard and a tubular standard attached on the base-plate, said tubular standard supporting the adjusting-nut of the threaded standard, substantially as set forth.

3. The combination with a rotary buffing-wheel, of two sets of rotary feed-wheels, inclined spindles for said feed-wheels, chucks provided with bearings for supporting said inclined spindles, a vertically-adjustable table to which said chucks are attached, a threaded standard attached to the under side of the table, a tubular standard into which the threaded standard telescopes, means for adjusting the threaded standard into the tubular standard and a base-plate having a socket provided with set-screws for receiving the tubular standard and for adjusting the same on its axis, substantially as set forth.

4. The combination with a rotary buffing-wheel, of two sets of inclined feed-wheels, inclined spindles to which the feed-wheels are attached, grooved wheels at the upper ends of said spindle, driving-chains passing over said grooved wheels, a pivoted arm provided with idlers for said driving-wheels, means for adjusting said pivoted arm higher or lower so as to take up the slack of the driving-chain, a shaft having driving-pulleys for the driving-chain, a worm gear-wheel on the shaft of the driving-chain and a transmitting shaft to which rotary motion is imparted by suitable belt transmission provided with a worm for meshing with said worm-gear, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

THOMAS HARPER.

Witnesses:

CHARLES KACHLMEIER,

CHARLES SCHROEDER.