(No Model.) 2 Sheets—Sheet 1.

C. W. ABBOTT.

MECHANISM FOR SMOOTHING SURFACES OF WOOD.

No. 437,911. Patented Oct. 7, 1890.

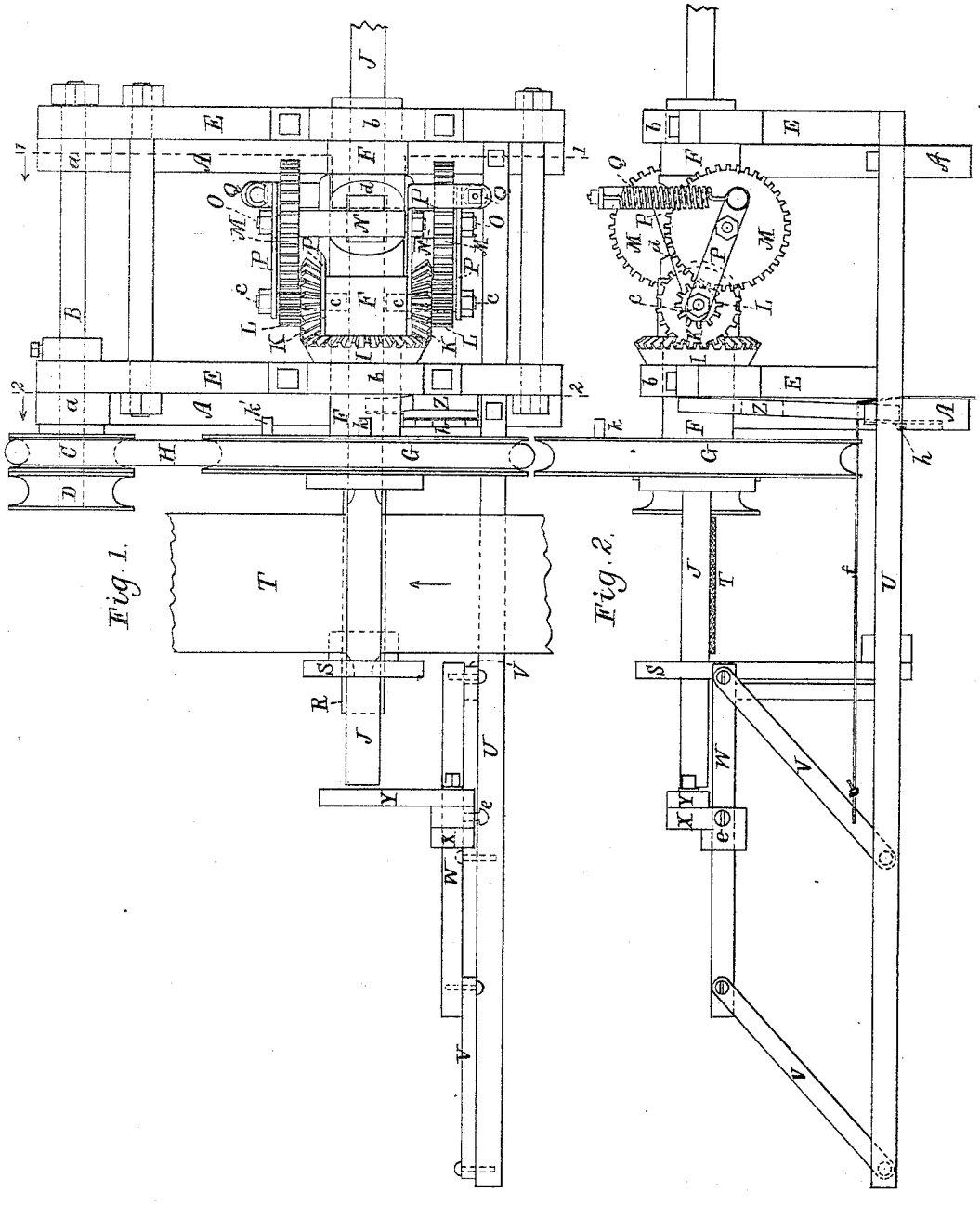


Fig. 1.

Fig. 2.

Witnesses.
W. E. Piper
A. F. Piper

Inventor.
Chas. W. Abbott.
by S. N. Piper, atty.

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

(No Model.) 2 Sheets—Sheet 2.

C. W. ABBOTT.

MECHANISM FOR SMOOTHING SURFACES OF WOOD.

No. 437,911. Patented Oct. 7, 1890.

Fig. 6.



Fig. 3.

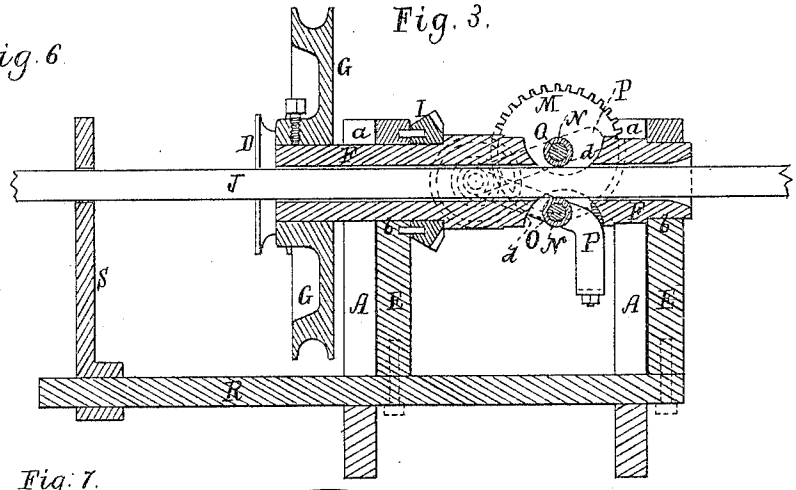


Fig. 7.



Fig. 8.



Fig. 4.

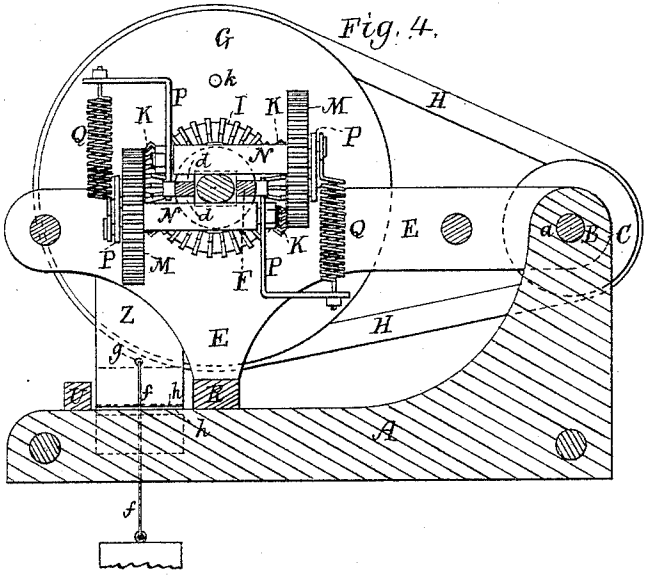


Fig. 9.



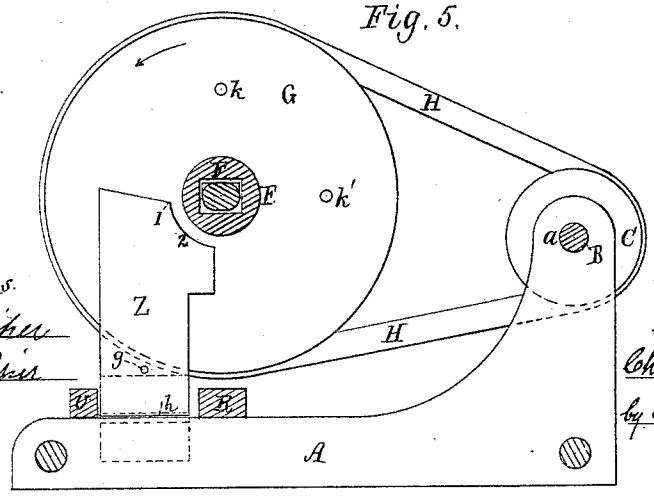
Fig. 10.



Fig. 11.



Fig. 5.



Witnesses.
W. E. Piper
A. F. Piper

Inventor.
Chas. W. Abbott.
by S. N. Piper, atty.

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

UNITED STATES PATENT OFFICE.

CHARLES W. ABBOTT, OF RUMNEY, NEW HAMPSHIRE.

MECHANISM FOR SMOOTHING SURFACES OF WOOD.

SPECIFICATION forming part of Letters Patent No. 437,911, dated October 7, 1890.

Application filed May 31, 1890. Serial No. 353,718. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. ABBOTT, a citizen of the United States, residing at Rumney, in the county of Grafton and State of New Hampshire, have invented certain new and useful improvements in mechanism for facilitating the smoothing of a piece of wood or material, parts of which are circular and parts of which are rectangular in transverse section; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 is a plan or top view, Fig. 2 a side elevation, Fig. 3 a longitudinal, median, and vertical section, and Fig. 4 a transverse section, on line 1 1 of Fig. 1, of a mechanism of my invention for simultaneously revolving transversely and also moving in a longitudinal direction a piece of wood or material while being subjected to the action of an abrading-surface, as hereinafter explained. Fig. 5 is a transverse section of the same on line 2 2 of Fig. 1. Fig. 6 is an elevation of a piece of wood as formed to apply to said machine to be smoothed or finished; and Figs. 7 and 8 are transverse sections of said piece, the former taken on line 3 3 and the latter on line 4 4 of said Fig. 6. Figs. 9, 10, and 11 are transverse sections of said piece, to be hereinafter explained.

The object of my invention is to facilitate the smoothing of a piece of wood some portions of which are circular or oval in transverse section and other portions of it rectangular in transverse section, the smoothing of said piece being performed during a continuous rotary and longitudinal movement of it against an abrading-surface, which also moves in a plane at an angle to the longitudinal movement of said piece.

The nature of my invention is defined in the claims hereinafter presented.

In the drawings, A denotes the main frame of the machine, supported in bearings *a a*, in which is a shaft B, having fixed to it pulleys C and D. Pivoted on the said shaft B is a frame E, adapted to swing thereon in a vertical plane, said frame sustaining in bearings *b b* a tubular shaft F. Fixed to said shaft F is a pulley G, about which and the pulley C a band H runs, motion being imparted to the pulley C by a band running around the pulley D. Encircling the shaft F is a stationary bevel-gear I, fixed to the frame E. Engaging the said gear I are bevel-gears K, sustained on journals *c*, projecting from the said tubular shaft F, and fixed to the bevel-gears K, so as to revolve therewith, are pinions L, which engage gears M, secured to feed-rolls N, the latter supported on shafts O, sustained at their ends in arms P, said arms adapted to swing on the journals *c* of the bevel-gears K and allow the said rolls N to adjust themselves to the thickness of the piece arranged between them and within the tubular shaft F, said shaft being provided with openings *d d* to admit of the said rolls N coming in contact with said piece.

The arms P are connected at their outer ends by springs Q, which draw the feed-rolls toward each other and cause them to bear with sufficient friction against opposite sides of the said piece to move the latter along when the feed-rolls are in revolution. Projecting from the swing-frame E is a rod R, which sustains a guide S, the latter arranged near to the edge of a sand-belt T, that is farthest from the pulley G, said guide adapted to support the piece while being acted on by said belt. The belt T, a portion of which is represented in Fig. 1, is arranged between the pulley G and the guide S, and moves horizontally, or thereabout, against the under side of the piece which is being smoothed, the outer surface of said belt being coated with sand or other abrading material.

Fixed to the frame A is a rod U, pivoted to which are two links V V, the latter connected at their upper ends to a bar W, parallel to the rod U. On the bar W a slide X is arranged, it being confined in position thereon by a set-screw *e*, and to said slide is pivoted a gage Y, which when desired can be turned down into the pathway of the piece that is being acted upon by the said belt. A cord or line *f* is attached to one of the links V, which after passing through a hole *g* in an arm Z, hinged at *h* to the frame A, extends downward and is attached to a weight. The said

arm Z is to operate with studs k k', projecting from one face of the wheel G, as hereinafter described.

The operation of the machine may be thus explained: The piece to be smoothed (which is represented at J in Fig. 6, and also in the several views of the machine) being introduced into the flaring end or mouth of the tubular shaft F and between the feed-rolls N N, the machine is then set in motion, which will cause said piece to be simultaneously advanced longitudinally through the shaft, and also revolved on its axis. As the said piece passes out of the said shaft it will be revolved against the moving abrading-surface of the belt T, and also at the same time moved across said surface. The gage Y being set in the proper position on the bar W and turned down in front of the advancing piece or bar, said piece or bar as it brings up against the gage will still continue to advance and move the said gage and bar along with it; also the links V V will be moved on their pivots and will carry the bar W upward, and as the said links rise the cord f will swing the arm Z into the pathway of the studs k, projecting from the adjacent face of the pulley G and suitably arranged to operate against the arm Z, as hereinafter explained, the said cord continuing to hold the said arm in the pathway of the studs as long as the gage Y is engaged with the said piece. On the foremost stud k striking on the top of the arm Z, and the pulley G continuing to revolve, the frame will be turned upward on its pivot, and will carry the piece J out of contact with the belt T, the said piece at the time it begins to move away from the belt being in the position shown in Fig. 9, with its face w against the abrading-surface. As the stud k, in contact with the arm Z, moves along its top, on passing the point 1 of said arm (see Fig. 5) said stud will slide down the curve 2 of the arm Z, and the piece J will be turned on its axis ninety degrees of a circle, or into the position shown in Fig. 10, as the frame E descends and carries the face x of said piece into contact with the abrading-surface. The stud k' will now be in contact with the top of the arm Z, and the frame E will be raised, as before, and carry the said piece J away from the abrading-surface, the said piece while the stud k' is moving against the arm Z being turned on its axis ninety degrees of a circle, or into the position shown in Fig. 11, its face y being brought into contact with the abrading-surface on the fall of the frame E. This operation of swinging the frame E is repeated until that portion of the piece having the angular corners is past the abrading-surface, or until the gage Y is released from the end of the said piece, at which moment the bar W will fall and the cord f will draw the arm Z out of the pathway of the studs k, after which the piece will be kept continuously in contact with the abrading-surface while the circular or oval part of it is being smoothed and until it again becomes necessary to swing the frame E for the purpose, as hereinbefore explained.

The piece J (shown in Fig. 6) represents one of the uprights of a crutch, for finishing which the machine hereinbefore described is specially adapted; but the spokes of wheels or any similar piece can be smoothed to advantage in a machine provided with my invention, it being understood that there are to be as many studs k to the pulley G as there are corners on the piece to be smoothed.

What I claim is—

1. The machine substantially as described, it consisting of the frame A, the shaft B, supported therein and provided with pulleys, the frame E, adapted to swing on said shaft, the tubular shaft F, supported by frame E and provided with the journals c, openings d, and pulley G, the latter having studs k, the stationary gear I, and the feeding mechanism engaging therewith, said mechanism consisting of the gears K, the pinions fixed to the latter, the gears M, feed-rolls N, fixed to said gears M, the arms P and shafts O, supporting said rolls, and the springs Q, the arms Z, hinged to frame A, and mechanism connected to said arm for moving it at the proper time into the pathway of the studs on the pulley G to cause the frame E to rise, as and for the purpose explained, in combination with an abrading-surface.

2. The feeding mechanism substantially as described, it consisting of the stationary bevel-gear I, the bevel-gears K, engaging the latter, the pinions L, fixed to gears K, the gears M, engaging said pinions, the feed-rolls fixed to gears M, the arms P and shafts O, supporting said feed-rolls, and the springs Q, in combination with the tubular shaft F, having the journals c and openings d, said shaft connected to mechanism for revolving it, as and for the purpose explained.

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

CHARLES W. ABBOTT.

Witnesses:
S. N. PIPER,
WM. H. PRESTON.