

(No Model.)

3 Sheets—Sheet 1.

F. CHALLONER.

MACHINE FOR GRINDING SAW COLLARS, SAWS, &c.

No. 560,688.

Patented May 26, 1896.

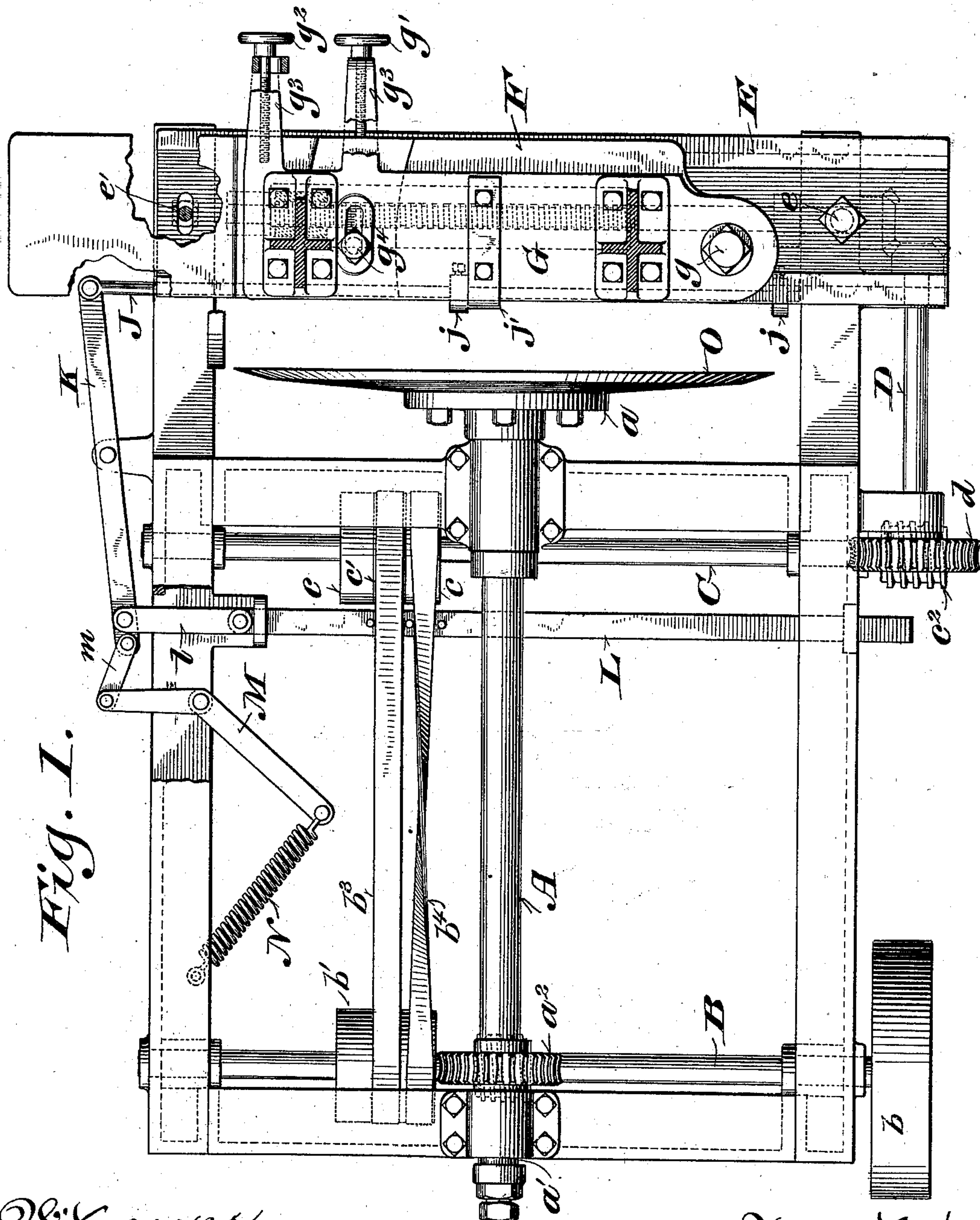


Fig. 1.

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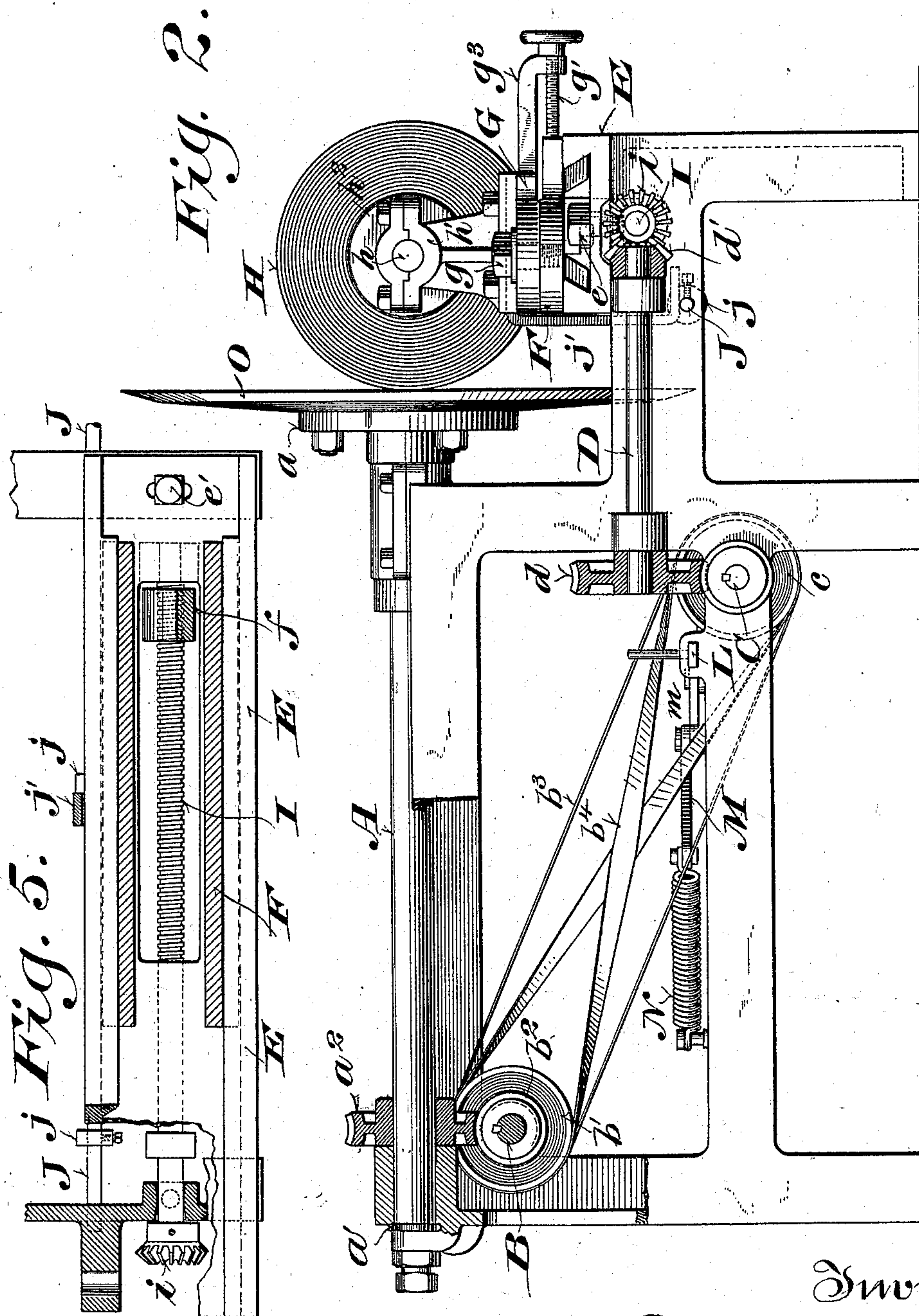
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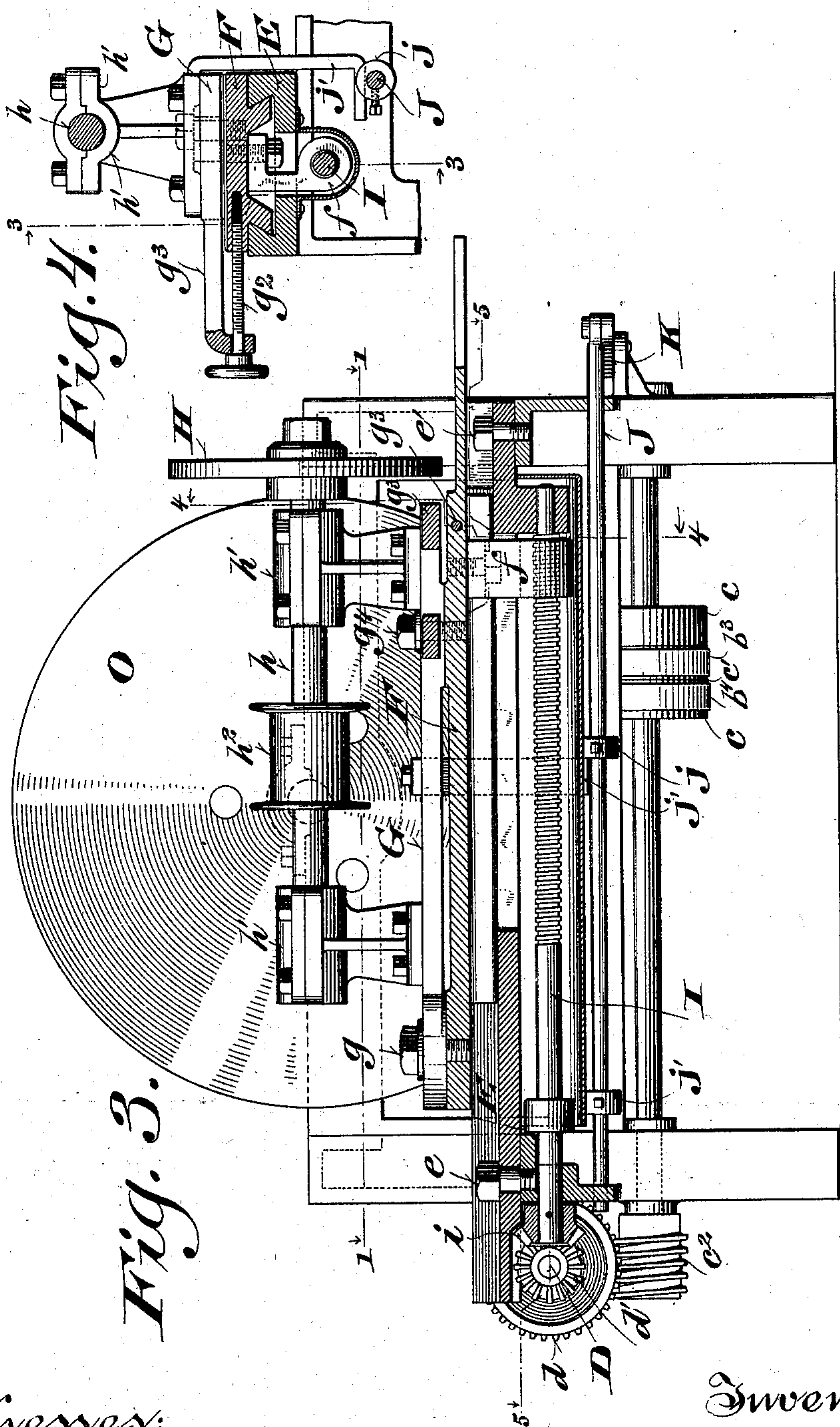
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UNITED STATES PATENT OFFICE.

FRANK CHALLONER, OF OSHKOSH, WISCONSIN.

MACHINE FOR GRINDING SAW-COLLARS, SAWS, &c.

SPECIFICATION forming part of Letters Patent No. 560,688, dated May 26, 1896.

Application filed December 14, 1894. Serial No. 531,818. (No model.)

To all whom it may concern:

Be it known that I, FRANK CHALLONER, of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Machines for Grinding Saw-Collars, Saws, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main objects of my invention are to automatically grind saws, saw-collars, or similar articles true, and to give them any desired degree of dish or bevel.

It consists of certain peculiarities in the construction and arrangement of the component parts of the machine, as hereinafter particularly described, and defined in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a plan view and horizontal section, on the line 1 1, Fig. 3, of a machine embodying my invention. Fig. 2 is a side elevation and vertical section of the machine as viewed from the left with reference to Fig. 3. Fig. 3 is a front elevation and vertical section on the line 3 3, Fig. 4. Fig. 4 is a vertical section on the line 4 4, Fig. 3, showing the grinder-carriage, its supporting-bed, and associated parts of the machine; and Fig. 5 is a horizontal section on the line 5 5, Fig. 3, showing the carriage in section and its supporting-bed in plan view.

The machine herein shown and described is specially designed for grinding and truing shingle-saw collars, which are usually made somewhat dishing or conical; but with little or no change it may be employed for grinding shingle-saws to the required bevel or for grinding and truing like or similar articles, either with plane or more or less dishing or beveled surfaces.

A designates a rotary work-supporting arbor mounted at or near its ends in suitable bearings provided therefor on cross-pieces of a frame, which may be of any suitable construction and material for the purpose. It is provided at its front end with a flange *a* for

the attachment of a saw-collar, saw, or other article thereto, and at its rear end with an adjustable end-thrust bearing *a'* for taking up wear and for slightly adjusting said arbor endwise toward the grinder-carriage.

B is a counter-shaft supported by bearings provided therefor on said frame, preferably below and transversely to arbor A. It is provided with pulleys *b* and *b'* and with a worm *b²*, which engages a worm-gear *a²* on arbor A.

C is a shaft supported by the frame of the machine parallel with shaft B and provided with tight pulleys *c c* and an intermediate loose pulley *c'* and with a worm *c²*.

D is a short horizontal shaft parallel with arbor A and provided at its rear end with a worm-gear *d*, which engages with the worm *c²*, and at its front end with a bevel-gear *d'*.

E is a carriage-supporting bed mounted upon an extension of the frame below and transversely to the arbor A. It is formed in its upper side with dovetailed or undercut grooves or ways, as shown in Figs. 2 and 4, and is pivoted at or near one end to the frame by a shoulder-bolt *e* and adjustably secured to the frame at or near its opposite end by a bolt *e'*, passing through a transverse slot therein, as shown in Figs. 1 and 5.

F is a slide formed or provided on the under side with longitudinal tongues or guides adapted to the grooves or ways in the upper side of bed E, upon which it is mounted and adapted to move back and forth.

G is a plate pivoted at one end by a bolt *g* to the slide F, and provided at or near the opposite end on the front side of the machine with adjusting-screws *g'* and *g²* in overhanging arms *g³ g³*, one screw, *g'*, being threaded in the overhanging end of one of said arms and bearing at its end loosely against the front edge of slide F, and the other screw, *g²*, being threaded in said slide and passing loosely through an opening in the overhanging end of the other arm, as shown in Figs. 1, 2, and 4. A bolt *g⁴*, passing through a transverse slot in said plate and threaded in the slide F, serves to hold said plate in place when adjusted upon said slide. The slide F and plate G constitute what may be conveniently designated the "grinder-carriage."

H represents an emery or abrading wheel of any suitable substance mounted upon one

end of a horizontal shaft h , which is supported in bearings h' h' provided therefor on the upper side of the plate G. It is furnished between said bearings with a flanged pulley h^2 , by which it is connected with any convenient or suitable driving-shaft. The shaft h is preferably arranged in the same plane with the arbor A.

I is a screw-shaft provided at one end with a bevel-gear i , which meshes with the gear d' and has a bearing as close as practicable thereto in the frame of the machine. At its opposite end it is supported in a bearing depending from the under side of bed E. Sufficient play is allowed in the bearing next to the gear i to permit of the required adjustment of said bed without causing said shaft to bind. The threaded portion of said shaft passes through and engages with a nut f , extending from the under side of slide F through the longitudinal slot in bed E, as shown in Figs. 3 and 5. This screw and the traveling nut f may be inclosed, as shown, by a sheet-metal guard attached to the under side of bed E.

J designates a sliding rod supported in the frame of the machine approximately parallel with the screw-shaft I, and provided with tappets or blocks j j , adjustably fastened thereon, on opposite sides of the arm j' , extending downwardly into range therewith from the grinder-carriage. This rod is pivoted at one end, as shown in Fig. 1, to a lever K, which is fulcrumed to the frame of the machine, and connected at or near its opposite end by a link l with a sliding bar or belt-shifter L.

M is an elbow-lever, one end of which is connected by a link m with lever K, while the opposite end is connected by a spring N with the frame or other suitable support. One of the tight pulleys c and the loose pulley c' of shaft C are connected by straight and cross belts b^3 and b^4 with the pulley b' on shaft B, and the pulley b of said shaft B is belted to any convenient driving-pulley.

My improved machine operates as follows: A shingle-saw collar O, or other similar article to be ground, being bolted, as shown, or otherwise secured to the flange a of arbor A, is slowly turned through the connection of said arbor hereinbefore described with the driving-shaft B. The bed E is adjusted by loosening the bolt e' and turning it upon the pivot-bolt e to give the desired dish or bevel to the face of the saw-collar or other article, and is then secured in place by tightening said bolt e' . The face of the emery or other abrading wheel H is set to properly engage with the face of the collar O or other article by means of the adjusting-screws g' and g^2 , and is rigidly secured in place when so adjusted by tightening the bolt g^4 . As the collar is slowly turned the grinding-wheel, rapidly rotated, is caused to slowly traverse its face back and forth between the center and periphery by means of the connections between the grinder-carriage and the driving-

shaft B hereinbefore mentioned. As said carriage approaches either limit of its reciprocating movement the arm j' engages with one of the blocks or tappets j , and moves the rod J with it until the pivot connection between lever K and link m passes a straight line joining the pivot connection between said lever and rod J and the pivot connection between link m and lever M. When this occurs, the spring N, acting through the elbow-lever M, completes the movement of lever K, carrying the bar L to the extreme limit of its movement and shifting the belts b^3 and b^4 upon the pulleys c and c' , so as to reverse the movement of said carriage. The function of the lever M and spring N is to complete the movement of the belt-shifter and render its action quick and certain. By changing the position of the tappets j j on rod J the reciprocating movement of the carriage and of the grinding-wheel may be adjusted and limited at the desired points for grinding collars or other articles of different diameters or for grinding a circular belt of any desired width at and of any desired diameter or distance from the center of arbor A.

Various changes in minor details of construction may be made within the intended scope of my invention.

I claim—

1. In a machine for grinding saw-collars, saws and similar articles, the combination with a rotary work-supporting arbor, of a reciprocating carriage movable transversely to said arbor and provided with a rotary abrading-wheel, a screw engaging a nut on said carriage and provided with a bevel-gear, a driving-shaft connected with said arbor by a worm and worm-gear, a counter-shaft provided with tight and loose pulleys which are connected by straight and crossed belts with a pulley on said driving-shaft, a shaft transverse to said counter-shaft connected therewith by a worm and worm-gear and provided with a bevel-gear meshing with the bevel-gear on said screw, a belt-shifter arranged to engage and guide said belts, and a tappet-rod connected therewith and arranged to be actuated by said carriage, substantially as and for the purposes set forth.

2. In a machine for grinding saw-collars, saws and similar articles, the combination with a rotary work-supporting arbor, of a reciprocating carriage movable transversely thereto and provided with a rotary abrading-wheel, a screw engaging a nut on said carriage and provided with a bevel-gear, a driving-shaft connected with said arbor by a worm and worm-gear, a counter-shaft provided with tight and loose pulleys which are connected by straight and crossed belts with a pulley on said driving-shaft, a shaft transverse to said counter-shaft connected therewith by a worm and worm-gear and provided with a bevel-gear meshing with a bevel-gear on said screw, and an adjustable reversing device for reversing the movement of said carriage at dif-

ferent points comprising a reciprocating rod provided with tappets adjustable thereon in the path of an arm or projection on the carriage, and a shifting device connected with said rod and arranged to automatically and instantly complete its movement in either direction, substantially as and for the purposes set forth.

3. In a machine for grinding saw-collars, saws, and similar articles, the combination with a rotary work-supporting arbor, of a reciprocating carriage provided with a rotary abrading-wheel, carriage-feeding mechanism comprising a driving-shaft and a counter-shaft geared with said carriage and having tight and loose pulleys connected by straight and cross belts with a pulley on the driving-shaft, and carriage-reversing mechanism comprising a belt-shifter, a tappet-rod connected by a lever with said belt-shifter, and a spring connected by a lever and link with said belt-shifter so as to automatically complete its movement in either direction, substantially as and for the purposes set forth.

4. In a machine for grinding saw-collars, saws, and similar articles, the combination with a rotary work-supporting shaft, of a carriage-supporting way arranged transversely to said arbor and capable of angular adjustment, a reciprocating carriage mounted thereon and consisting of a slide and a plate pivoted thereto and carrying a rotary abrading-wheel, adjusting-screws connecting said plate and slide so as to adjust said abrading-wheel toward and from its work, a screw supported by and adjustable with the carriage-way in engagement with a nut on said carriage, and

automatic feeding and reversing mechanism geared with said screw, substantially as and for the purposes set forth.

5. In a machine for grinding saw-collars, saws, and similar articles, the combination with a rotary work-supporting arbor, of a reciprocating carriage movable transversely thereto, and provided with a rotary abrading-wheel, a screw engaging a nut on said carriage and provided with a bevel-gear, a driving-shaft connected with said arbor by a worm and worm-gear, a counter-shaft provided with tight and loose pulleys connected by straight and crossed belts with a pulley on the driving-shaft, a shaft connected with said counter-shaft by a worm and worm-gear and provided with a bevel-gear meshing with the bevel-gear on said screw, and an automatic belt-shifter comprising a sliding bar provided with pins or guides engaging with said belts, a tappet-rod provided with blocks or tappets in the path of an arm or projection on the carriage, a lever and link connecting said tappet-rod and belt-shifting bar, and a spring connected by a lever and link with the belt-shifting mechanism so as to complete its movement when it passes the center in either direction, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

FRANK CHALLONER.

Witnesses:

E. R. HICKS,
W. W. KIMBALL.