

(No Model.)

2 Sheets—Sheet 1.

G. W. BARIAN.  
MACHINE FOR GRINDING HORSESHOE CALKS.

No. 428,878.

Patented May 27, 1890.

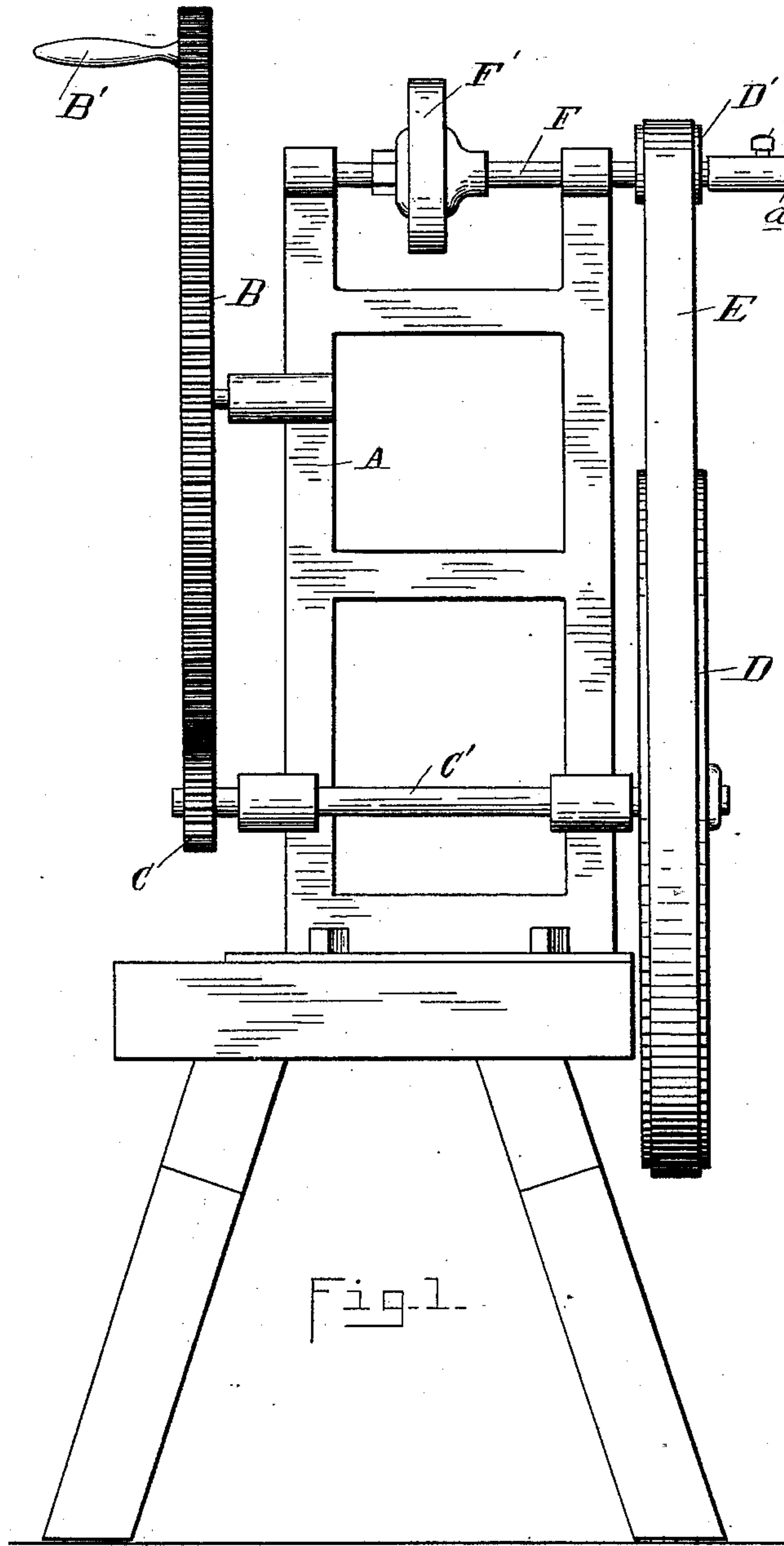


Fig. 1.

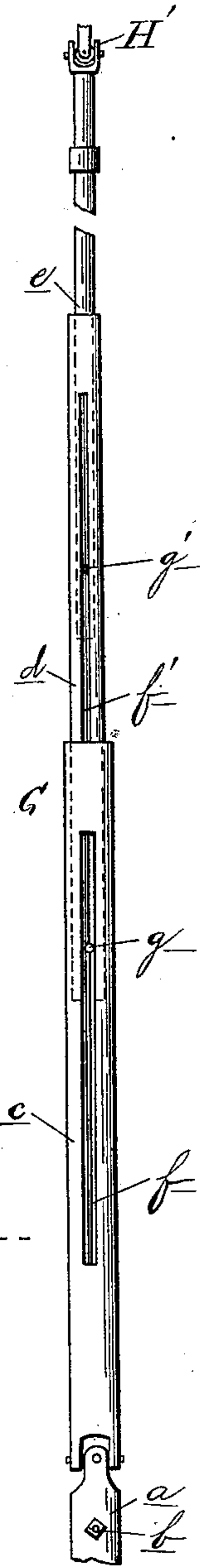


Fig. 2.

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James Whittemore  
Att'y.

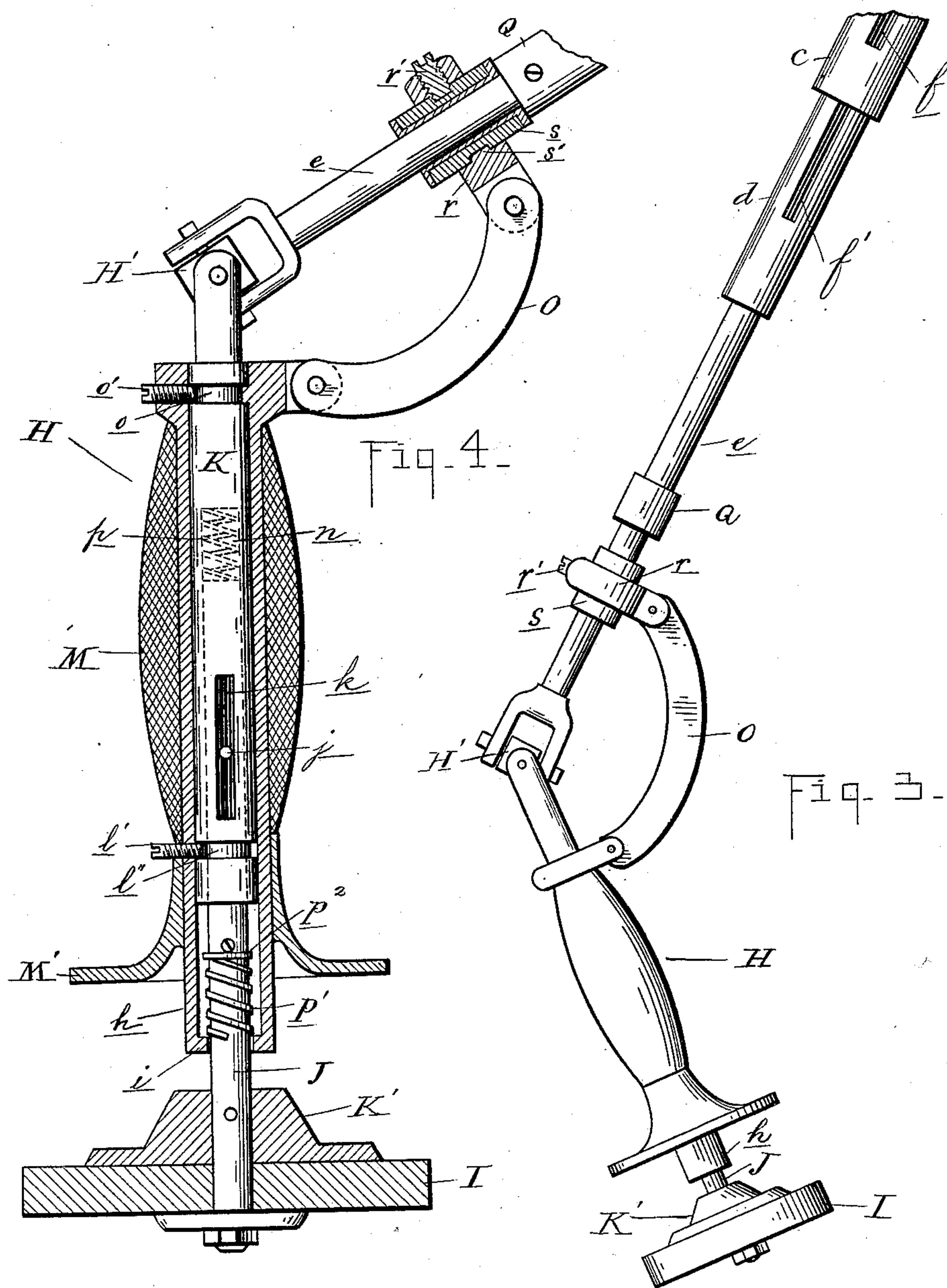
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# UNITED STATES PATENT OFFICE.

GEORGE W. BARIAN, OF FOWLERVILLE, MICHIGAN.

## MACHINE FOR GRINDING HORSESHOE-CALKS.

SPECIFICATION forming part of Letters Patent No. 428,878, dated May 27, 1890.

Application filed January 22, 1890. Serial No. 337,770. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. BARIAN, a citizen of the United States, residing at Fowlerville, in the county of Livingston and State of Michigan, have invented certain new and useful Improvements in Machines for Grinding Horseshoe-Calks, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in machines for grinding horseshoe-calks; and the invention consists in the peculiar construction of a machine having a frame-actuating mechanism driving a shaft 15 which is extensible and flexible, carrying at its outer end an emery-wheel or other grinding or buffing wheels, so that the grinding may be applied at any desired angle to the article to be ground; and, further, in the construction of a stationary grinding-wheel in combination with said frame, and, further, in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

25 In the drawings which accompany this specification, Figure 1 is an elevation of my improved machine with the shaft withdrawn. Fig. 2 is an enlarged plan view of the shaft extended. Fig. 3 is an enlarged plan view of 30 the outer end of the shaft as extended with the grinding-wheel, &c. Fig. 4 is a horizontal section through the outer section of the shaft shown in Fig. 3.

A is the frame of my machine, which may 35 be of any suitable construction to carry the driving mechanism, which preferably consists of the gear-wheel B, journaled in the frame upon a suitable shaft and provided with a suitable crank-handle B'. This gear 40 meshes with the pinion C, secured at one end of the shaft C', journaled in the lower part of the frame. The other end of this shaft carries the wheel D, which is connected to the smaller wheel D' by means of a belt E. The 45 wheel D' is secured upon a suitable shaft F in the top of the machine and carries the stationary grinding-wheel F', a suitable cut-away portion being provided in the top of the frame for the movement of this wheel. The 50 shaft F extends some distance to the right of the wheel D', forming a stub-shaft, upon

which to secure my flexible and extensible shaft G. This extensible shaft consists of the sleeve a, designed to be slipped over the end of the stub-shaft and secured thereto by 55 means of a suitable set-screw b, the hollow shaft c, the hollow shaft d, and the shaft e.

The parts c d e form a sliding extension and are secured to the sleeve a by a gimbal-joint. The hollow shaft c is provided with 60 the slot f, running the greater part of its length, in which the feather or pin g, secured in the shaft d, slidingly engages. The shaft d is provided with a similar slot f', in which the pin or feather g' on the shaft e slidingly 65 engages. The outer end of the shaft connects with the hand portion by means of a gimbal-joint H'. The portion H consists of a sleeve h, centrally apertured and provided at its forward end with the annular flange i, 70 in which is formed a bearing for the shaft J. The other end of this shaft J is secured in the hollow shaft K and has a sliding motion therein, being held from displacement by means of the pin j in the shaft J engaging 75 into a slot k in the shaft K.

p is a spring secured in the recess n and abutting against the inner end of the shaft J. The spring p' bears against the washer p'', secured upon the shaft J, and with its outer 80 end against the flange i. The shaft K is held within the sleeve by means of set-screws l' and o' engaging into annular grooves l'' and o in the shaft K. The shaft J at its outer end carries a suitable clamping-collar—such 85 as K'—to which is secured the grinding or buffing wheel I. In order to make a convenient hand-hold for the operator upon this hand-piece, I place a suitable handle M, preferably of soft material, around the sleeve h, 90 securing it therein in any suitable manner, and I also provide an annular flange or guard M'.

Q is a flange secured near the end of the shaft e. 95

O is a curved link secured at its forward end to the sleeve h, and at its rear end slidingly engaging with the shaft e between the gimbal-joint and the flange Q. The link is pivotally connected at both ends. 100

The connection of the link to the shaft is made as follows: r is a collar having suitable



ears to which to secure the link, and within this collar is secured the sleeve *s*. This sleeve *s* is loosely secured within the collar *r* by means of the set-screw *r'* engaging into the annular recess *s'*. The gimbal-joint at the ends of the shaft between the end portion and the shaft of the machine is of known construction, and may be varied to suit the purpose for which the machine is to be used or its size.

The parts being thus constructed, they are intended to operate as follows: The operator turns the gear-wheel B by means of the crank, transmitting motion, through the pinion C, shaft C', and wheels D D', to the shaft F, which in turn gives a rapid rotary motion to the extensible shaft G. To extend this shaft, the operator takes hold of the link O and draws out upon it, when it is evident that the parts will slide one upon the other, at the same time being turned by the engagement of the feather or pin of one shaft into the corresponding slot of another. Thus while the machine is turning the operator may extend or withdraw the shaft to any desired length. Through the shaft K and the shaft J and the feather or pin *j* engaging into the slot *k* it is evident that the shaft J has a limited play against the spring *p* and the spring *p'*—that is, it is backed by a spring in its motion in either direction, forward or back. This makes a spring-bearing for the grinding-wheel, which is a very desirable quality in an emery-wheel, so that the friction may be gradually applied.

The link O serves the purpose of a handle for one hand of the operator to sustain the weight of the shaft, leaving his other hand free to guide the hand portion H in applying the wheel to the device to be ground. The link O also acts as a stop to prevent injury to the gimbal-joint by turning the hand portion out to too great an angle to the shaft.

In order that a rotary motion may not be given to the hand portion when it is stopped by the link engaging the sleeve Q, I loosely secure the sleeve *s* upon the shaft, so that the rotary motion of the shaft *e* and the sleeve Q will be imparted to the sleeve *s*, which is free to turn in its bearing within the collar *r*.

It is evident that by means of the gimbal-joint between the driving-shaft of the ma-

chine and the flexible connection between the shaft *e* and the shaft K the shaft is taken at any desired direction from the machine to its work, and the grinding-wheel is applied to the surface to be ground in any desired angle.

What I claim as my invention is—

1. In a machine for grinding horseshoe-calks, the combination, with an extensible flexible shaft formed in sections, of a loose sleeve mounted on the shaft, a grinding-wheel on the outer end of the shaft, a spring within the sleeve, a bearing on the shaft with which the spring engages, and a spring between the outer sections of the shaft, substantially as described.

2. In a machine for grinding horseshoe-calks, the combination, with an extensible flexible shaft formed in sections, of a hollow shaft universally joined to the end of the shaft, a hand-sleeve surrounding the shaft, having an inner flange on its end, a shaft in said hollow shaft having a grinding-wheel on its end and springs within the sleeve, and a hollow shaft forming yielding bearings for the wheel-supporting shaft, substantially as described.

3. The combination, with the flexible extensible shaft having a reduced outer member, of a shaft universally connected with said member, a grinding-disk shaft yieldingly held on said latter shaft, and a curved hand-piece slidingly connected with the wheel-bearing shaft, and the outer member of the flexible shaft on the respective sides of their connections, substantially as described.

4. The combination, with the hollow outer shaft having circumferential grooves formed near its ends, of the wheel-bearing shaft slidingly secured therein, a hand-sleeve surrounding the shafts, set-screws passing through the sleeves into said grooves, and a shield on the end of the sleeve, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 19th day of December, 1889.

GEORGE W. BARIAN.

Witnesses:

M. B. O'DOHERTY,  
GEO. A. GREGG.