

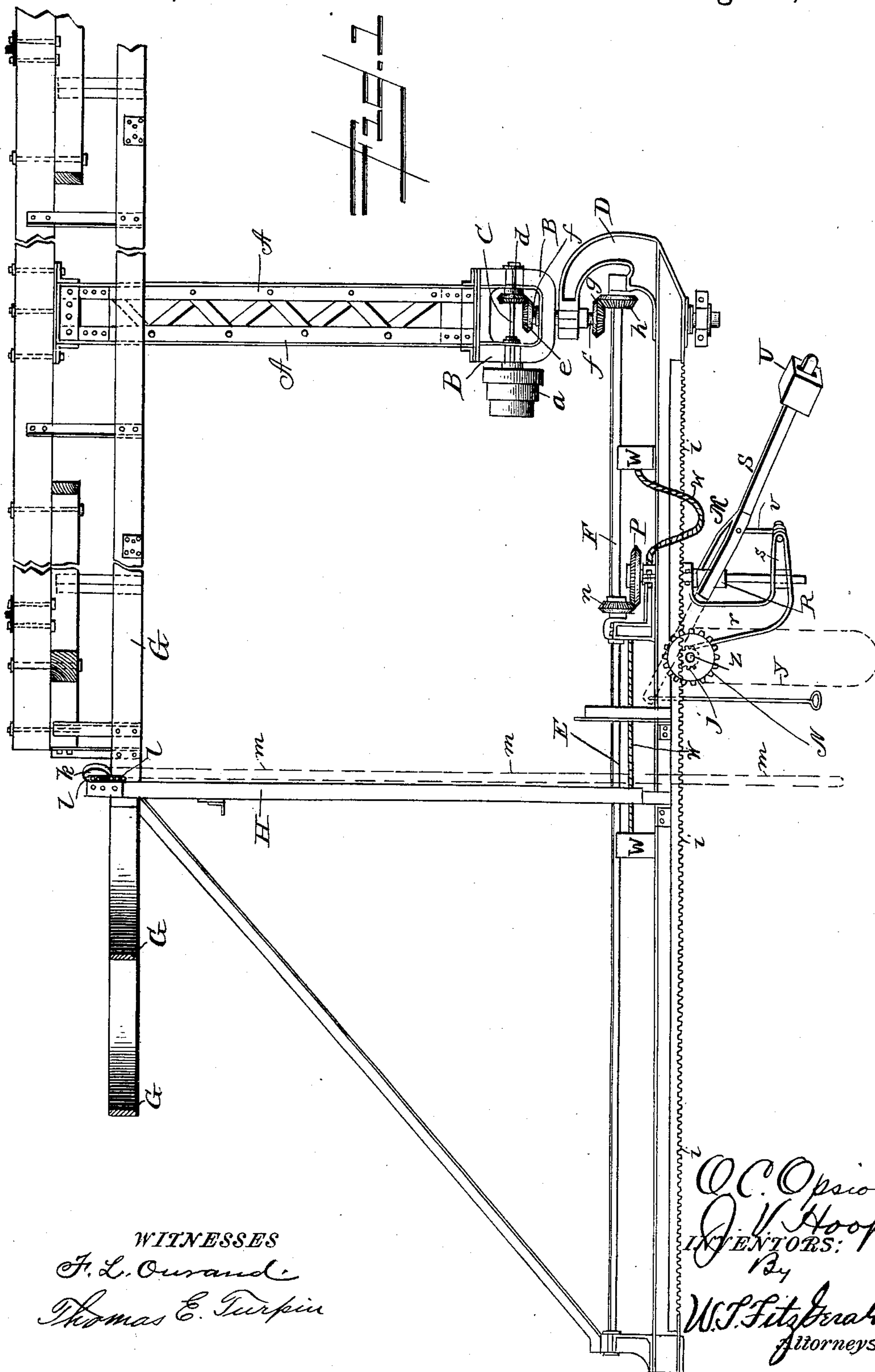
(No Model.)

3 Sheets—Sheet 1.

O. C. OPSION & J. V. HOOPER.  
REAMING AND DRILLING MACHINE.

No. 481,418.

Patented Aug. 23, 1892.



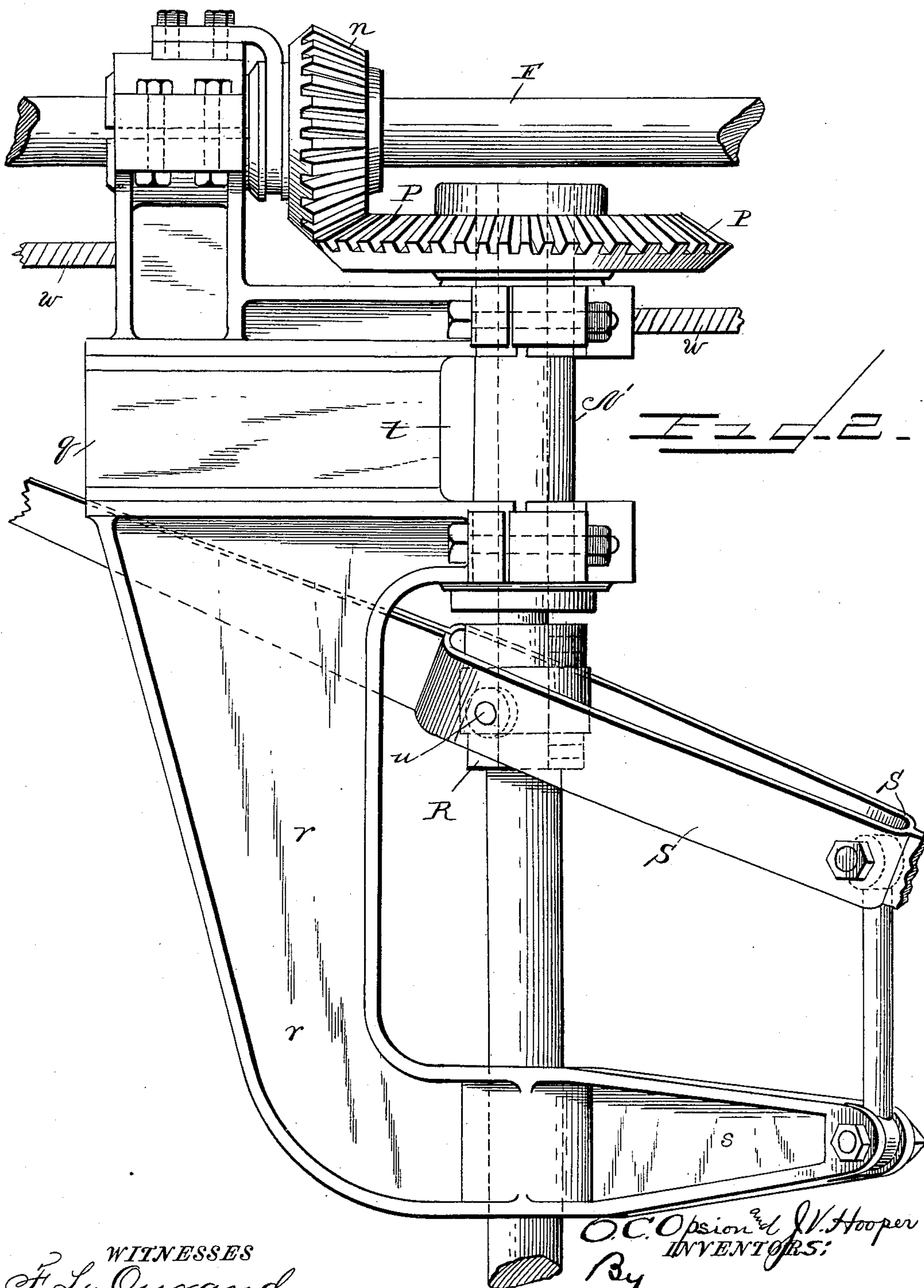
WITNESSES  
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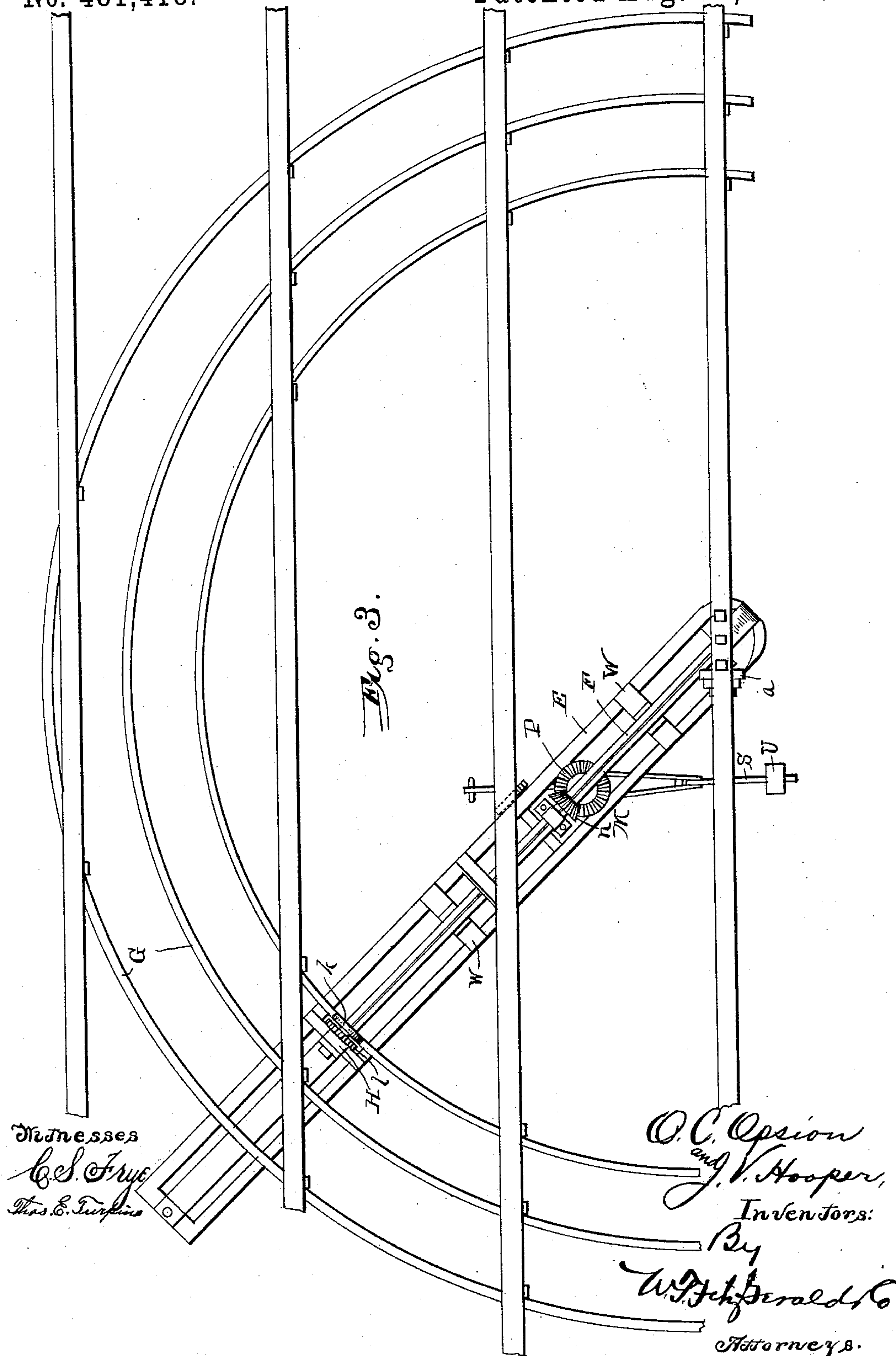
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# UNITED STATES PATENT OFFICE.

OLE C. OPSION AND JUDSON V. HOOPER, OF PITTSBURG, PENNSYLVANIA.

## REAMING AND DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,418, dated August 23, 1892.

Application filed November 13, 1891. Serial No. 411,823. (No model.)

*To all whom it may concern:*

Be it known that we, OLE C. OPSION and JUDSON V. HOOPER, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Reaming and Drilling Machines; and we do hereby 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.

Our invention has relation to improvements in drilling and reaming machines; and it consists in the peculiar construction, a certain novel combination, and the adaptation of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation of our improved machine. Fig. 2 is an enlarged view of the drill-carriage, together with the drilling or reaming spindle and the devices for adjusting and rotating the same; and Fig. 3 is a plan view of our improved machine.

In the said drawings similar letters of reference designate corresponding parts in the several views, referring to which—

A indicates the main pivot-hanger of our improved machine, to the lower end of which is fixedly connected a bearing-casting B, in which is journaled the drive-shaft C, upon the extended end of which are fixed band-wheels *a* to receive the belt for driving the shafting of the machine.

Fixedly mounted upon the drive-shaft C intermediate the bearings thereof is a beveled gear-wheel *d*, which meshes with a similar horizontal gear-wheel *e*, fixed upon the upper end of the vertical shaft *f*, which takes through the bottom of the casting B and through the curvilinear arm D at the inner end of the sweep E.

Fixed upon the lower end of the vertical shaft *f* is a beveled gear-wheel *g*, which meshes with a similar gear-wheel *h*, fixed upon the inner end of a shaft F, which preferably extends the full length of the sweep E and is journaled at its ends in suitable bearings thereon.

Arranged at various distances from the main or pivot hanger A are the approximately-

semicircular hanger-tracks G, which are suitably hung from a roof or other point of a shop and are designed to assist in the support of the radial sweep E.

Adjustably connected to and extending upwardly from the sweep E, as better shown in Fig. 1 of the drawings, is a hanger-arm H, which is provided at its upper end with a wheel *k*, designed to travel upon the hanger-tracks G.

Fixedly connected with the traveling wheel *k* of the hanger H is a sprocket-wheel *l*, around which takes an endless chain *m*, which is preferably of such a length as to extend down to within convenient reach of the operator, whereby it will be readily seen that the wheel *k* may be turned, and the sweep can be readily swung upon its pivot.

By the provision of the series of hanger-tracks G at various distances from the main or pivot hanger A it will be readily seen that the hanger H, which is adjustably connected to the sweep E, may be hung from the tracks at various distances from the pivot-hanger A, whereby the rim of the drill-carriage upon the sweep may be increased or diminished when desirable. By the provision of the series of tracks G it will be further perceived that the hanger H may be connected to the sweep E at various points, so as to be adjacent to the movable drill-carriage and prevent undue strain upon said sweep and its connection to the main or pivot hanger.

Formed on the under side of the sweep E, adjacent to the sides thereof, as better shown in Fig. 1 of the drawings, are longitudinal racks *i*, which are designed to be engaged by vertical pinions *j*, mounted on a transverse shaft *z*, journaled in the drill-carriage M beneath the sweep E.

Keyed or feathered upon the transverse shaft *z* of the drill-carriage is a sprocket-wheel N, around which takes a chain belt *y*, which extends down from the sweep to a point within convenient reach of the operator, whereby it will be seen that the drill-carriage may be readily moved along the sweep when desired.

As better illustrated in Fig. 1 of the drawings, the rotatable shaft F is keyed or feathered throughout its length, and keyed on said



shaft is a longitudinally-adjustable beveled gear  $n$ , which is suitably connected to the upper end of the drill-carriage M, which carriage is loosely mounted on the shaft F. The drill-carriage M, which is preferably of the approximate form illustrated, comprises the main-body portion  $q$ , the depending hanger  $r$ , and the lateral arm  $s$ , extending from the lower end of said hanger.

10 Journaled in suitable bearings in the main body portion of the carriage M is a vertical tubular shaft  $N'$ , upon the upper end of which is fixed a horizontal beveled gear P, which meshes with the gear  $n$  upon the shaft F. 15 The tubular shaft  $N'$  is provided on its inner side with a longitudinal feather  $t$ , designed to engage a longitudinal groove in the vertical shaft or spindle Q, which spindle extends down and takes through the lateral arms  $s$  of the carriage. This spindle or shaft Q is provided at its lower end with a key seat or socket, as illustrated, to receive the reaming or drilling tool, and is provided at an intermediate point in its length with a peripheral 20 groove to receive the lugs of a collar R, which is loosely mounted thereon. The collar R is provided at diametrically-opposite points with lateral trunnions  $u$ , upon which is pivoted the spindle-governing lever S, which is provided with a middle opening and straddles the collar R, as shown. 25

Pivottally connected at one end to the end of the lateral arm  $s$  of the carriage-body is a link  $v$ , which is pivottally connected at its opposite end to the lever S, which it serves to 30 fulcrum.

Adjustably mounted upon one end of the lever S is a weight U, which serves in practice to normally hold the drill or reaming 40 spindle Q up out of an operative position, and loosely connected to and depending from the opposite end of said lever is a handle V, which extends down so as to be within convenient reach of the operator, who, by pulling said 45 handle, is enabled to move the spindle Q down into an operative position.

Adjustably mounted on the sweep E, on opposite sides of the drill-carriage M, are the movable bearings W of the shaft F, which 50 bearings are connected with the drill-carriage by wire ropes  $w$  or the like, whereby it will be seen that they will be pulled and pushed by said carriage when the same is adjusted, and will prevent downward sagging of the 55 shaft at the point where the drill-carriage is stopped.

In a machine such as described it will be readily perceived that the sweep E may be readily swung upon its pivot by an attendant 60 standing upon the floor or ground, and by the provision of the series of tracks G, in conjunction with the hanger H, it will be seen that said hanger may be placed at various distances from the main or pivot hanger A, 65 so as to increase or diminish the run of the drill-carriage, as described. For instance,

should it be desired to have the drill-carriage run the full length of the shaft F, the hanger H would be connected to the outer end of the sweep E so that the wheel  $k$  would travel 70 upon the extreme outer hanger-track G. By mounting the drill-carriage M upon the shaft F and sweep E, as described, it will be seen that said carriage may be readily adjusted with respect to said shaft and sweep by an 75 attendant upon the ground, and, through the medium of the depending handle V, it will be seen that the spindle Q, which is normally held up out of operation by the weighted lever S, may be readily pulled down into oper- 80 ation.

Although we have specifically described the construction and relative arrangement of the several elements of our invention, yet we do not desire to be confined to said construction, 85 as such changes and modifications may be made as fairly fall within the scope of our invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is— 90

1. In a drilling and reaming machine, the combination, with a pivot-hanger, the sweep pivottally connected thereto, and the carriage adjustably mounted on said sweep, of a series 95 of approximate semicircular hanger-tracks arranged at various distances from the pivot-hanger and a hanger carrying a traveling wheel at its upper end, adapted to engage the hanger-tracks and adjustably connected at 100 its lower end to the sweep, substantially as and for the purpose set forth.

2. In a drilling and reaming machine, the combination, with a pivot-hanger, the sweep pivottally connected thereto, the carriage adjustably mounted on said sweep, and the series of approximate semicircular hanger-tracks arranged at various distances from the pivot-hanger, of a hanger adjustably connected to the sweep and carrying a traveling 110 wheel adapted to engage the hanger-tracks, a sprocket-wheel connected with said traveling wheel, and an endless chain taking around said sprocket-wheel and depending therefrom, substantially as specified. 115

3. In a drilling and reaming machine, the combination, with the sweep, the longitudinal feathered shaft mounted thereon, and the beveled gear keyed on said shaft, of the drill-carriage loosely mounted on the shaft and 120 loosely connected to the gear thereon, the tubular shaft journaled in the carriage-body and carrying a beveled gear at its upper end, meshing with the gear on the shaft, the spindle keyed or feathered in the tubular shaft 125 and having a key-seat at its lower end, a suitable means for normally holding the spindle up out of an operative position, and a suitable means for throwing said spindle down into an operative position, substantially as 130 specified.

4. In a drilling and reaming machine, the



combination, with the sweep, the longitudinal shaft mounted thereon, and the movable drill-carriage loosely mounted on said longitudinal shaft, of the movable bearings mounted on  
5 the sweep and supporting the longitudinal shaft and ropes or chains connecting said bearings with the drill-carriage, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

OLE C. OPSION.  
JUDSON V. HOOPER.

Witnesses:

W. A. MEANS,  
A. H. LESHÉ.