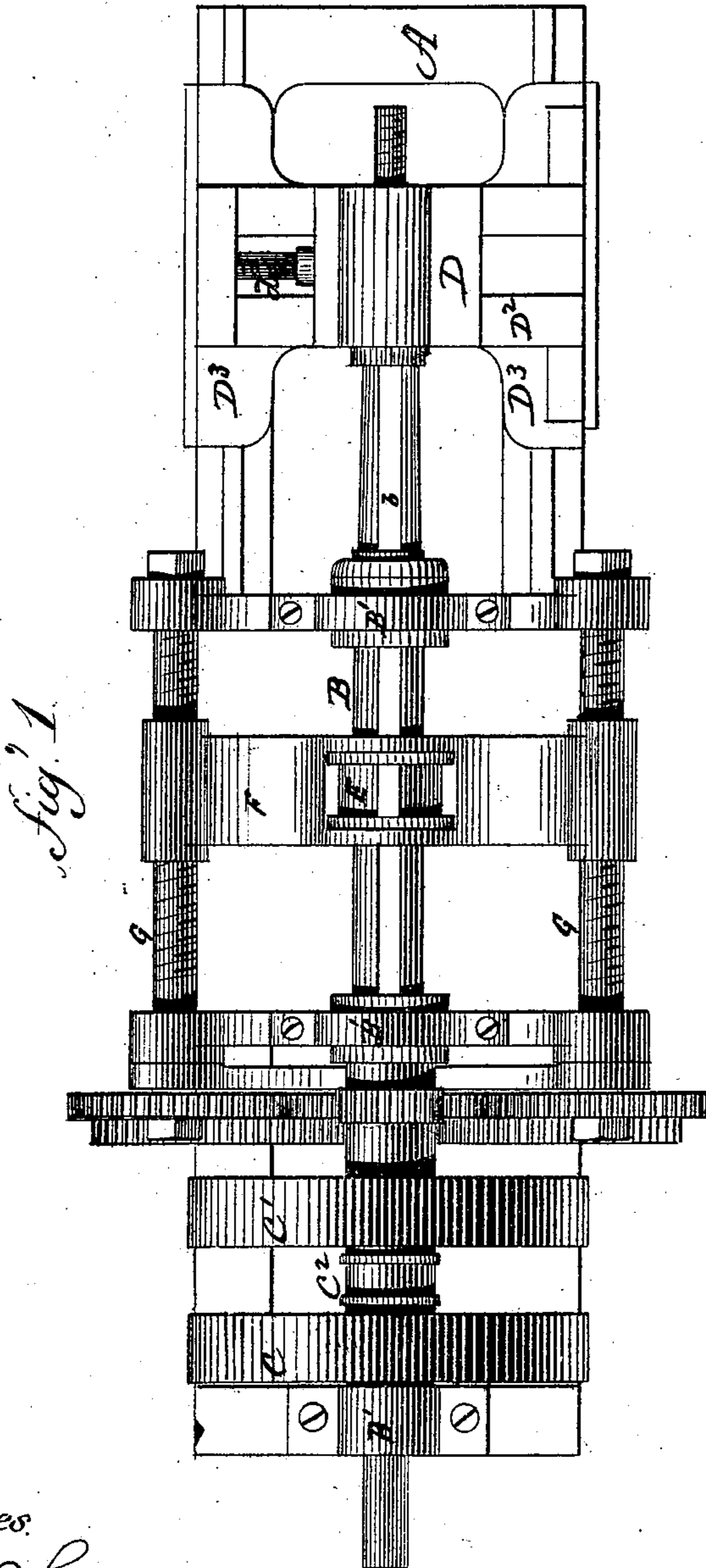


H. KELLOGG.

Machines for Lining Carriage Axle-Boxes.

No. 133,449.

Patented Nov. 26, 1872.



Witnesses:

J. W. Shumway
A. J. Tibbitts

Henry Kellogg
Inventor

By his Atty^y

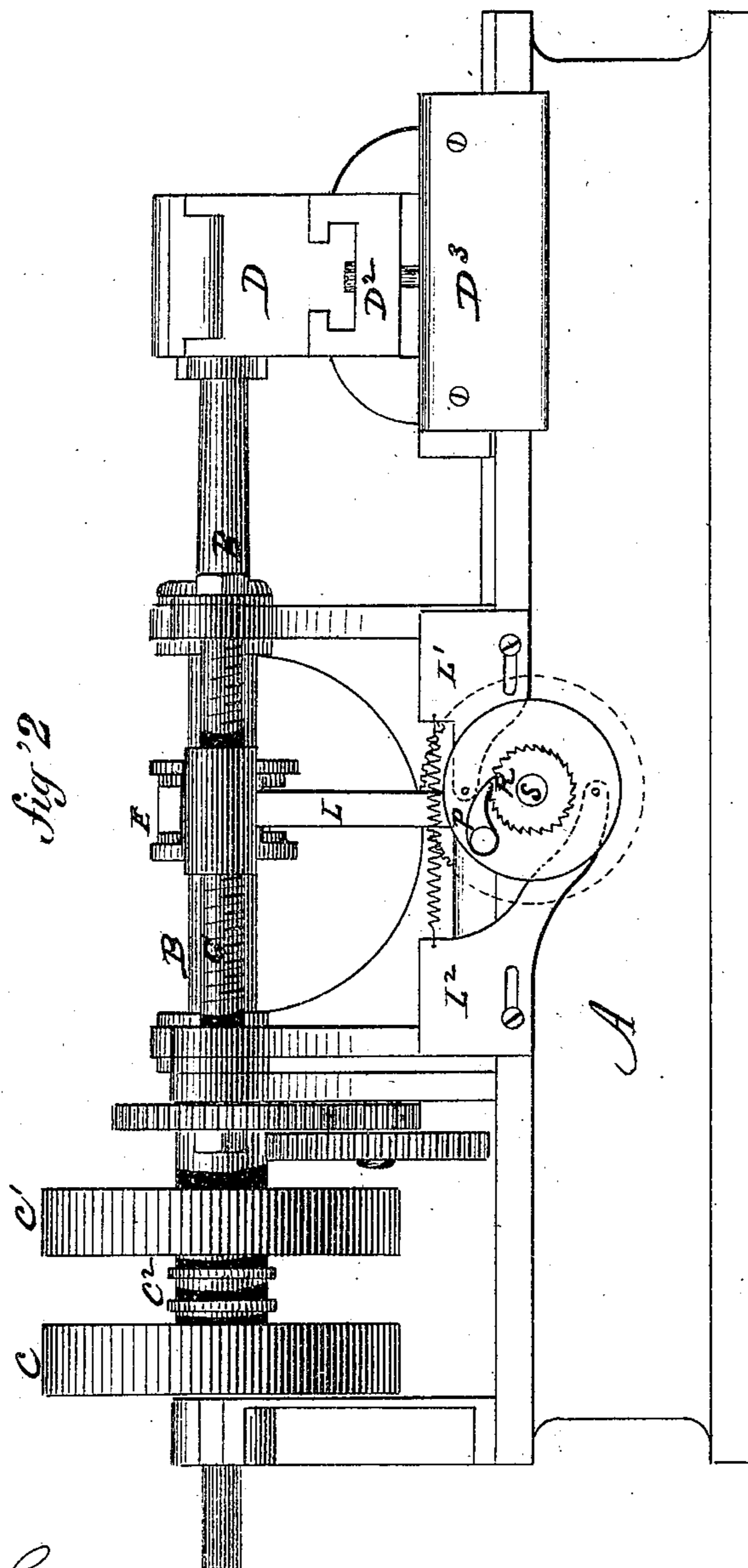
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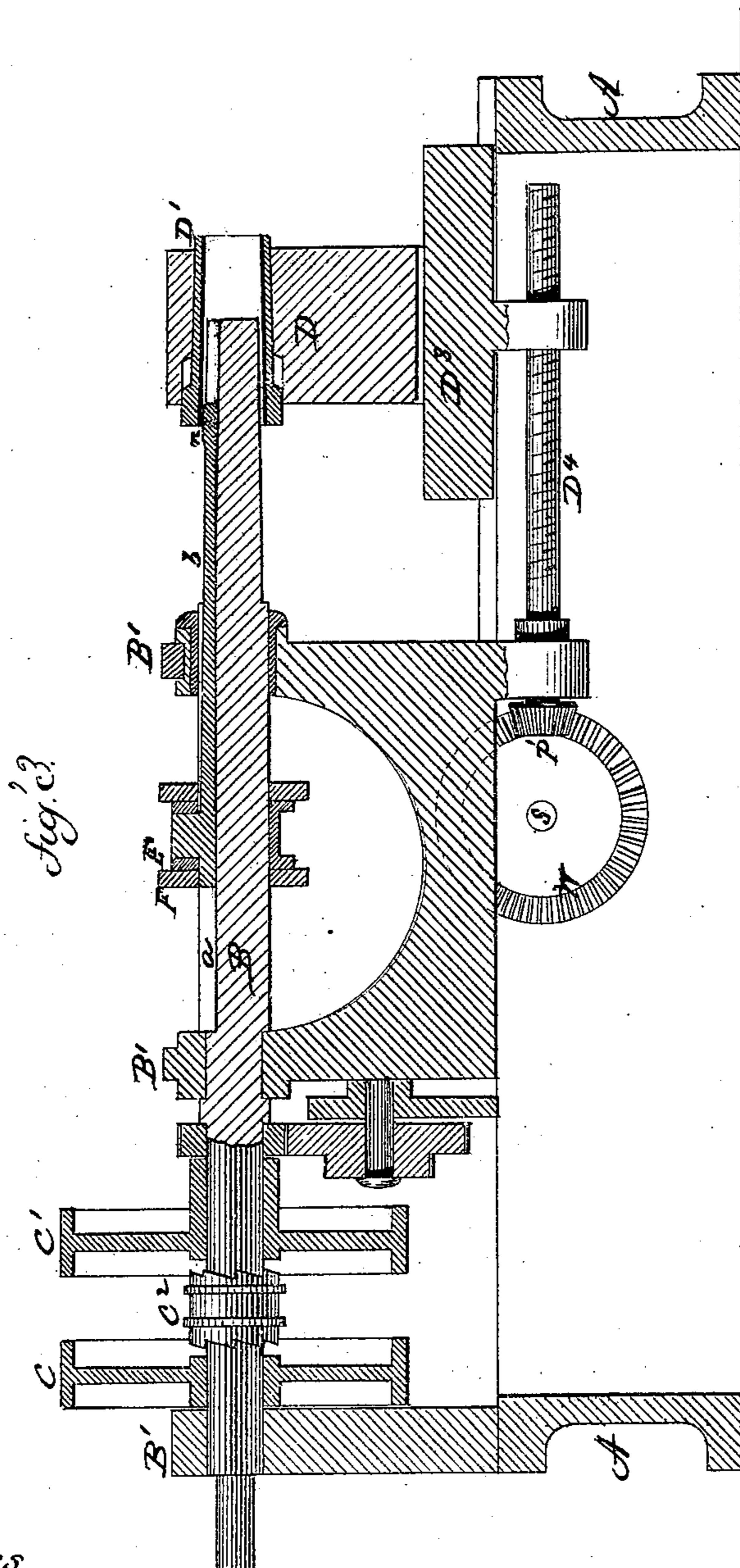
Thos. G. Earle

H. KELLOGG.

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Witnesses.

J. H. Chumway
A. J. Rabbitts

Henry Kellogg.

Inventor

By his Atty.

Wm. S. Earle

H. KELLOGG.

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fig. 4

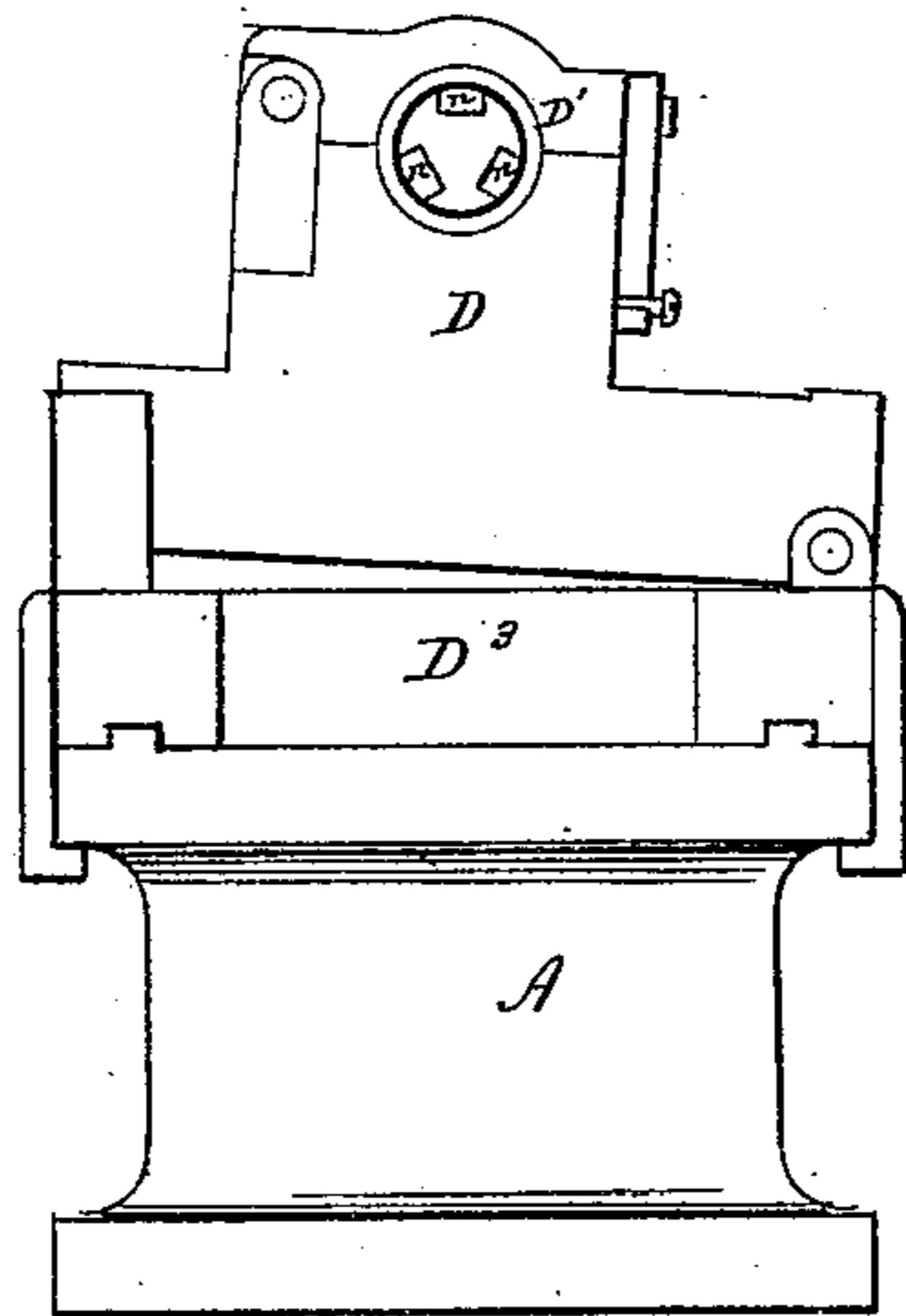
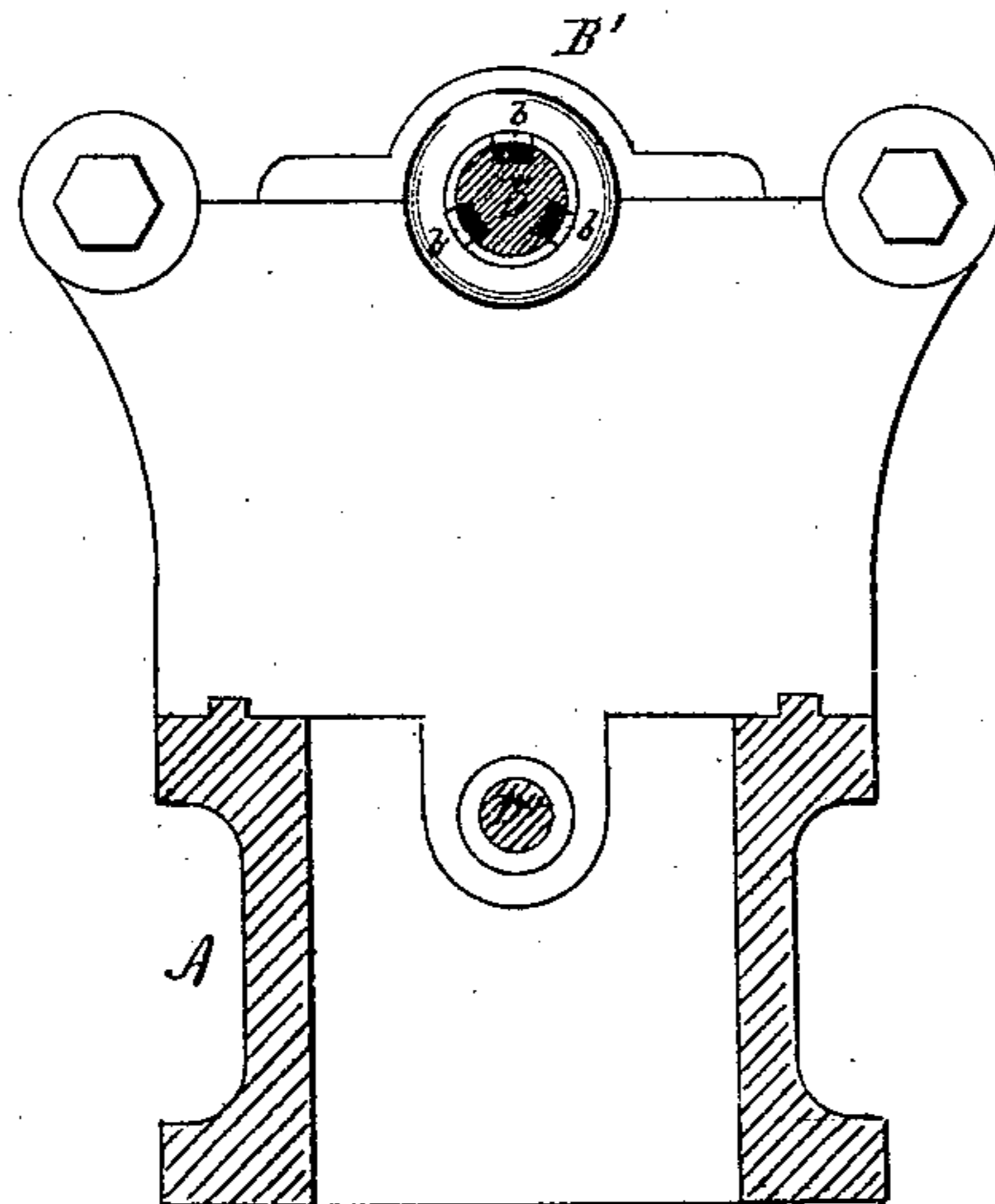


fig. 5



Witnesses

J. H. Shumway
A. J. Roberts

Henry Kellogg

Inventor

By his Atty.

John E. Earle

UNITED STATES PATENT OFFICE.

HENRY KELLOGG, OF MILFORD, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR LINING CARRIAGE-AXLE BOXES.

Specification forming part of Letters Patent No. 133,449, dated November 26, 1872.

To all whom it may concern:

Be it known that I, HENRY KELLOGG, of Milford, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machine for Lining Carriage-Axle Boxes; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents, in—

Figure 1, a top view; Fig. 2, a side view; Fig. 3, a longitudinal central section; Fig. 4, an end view; and in Fig. 5, a transverse section.

This invention relates to the construction of a machine for lining carriage-axle boxes, and may be used for the lining of tubes for other purposes.

Axle-boxes are usually formed from common cast-iron bored out and the inner surface ground to fit the axle. The box, being naturally soft and porous, wears by use to no inconsiderable extent, and very freely absorbs the lubricating material applied to the axle.

The object of this invention is to line a cast-metal box with a finer-grained wrought metal, producing a more durable and less porous surface in the box; and it consists in the arrangement of a revolving mandrel carrying one or more longitudinally-sliding tools for spinning or burnishing, in combination with a head which receives and holds the box in a line axially with the said mandrel, and so that the lining inserted into the said box and the box onto the mandrel, the mandrel, revolving, causes the burnishers to run around upon the inside of the box, the longitudinal movement of the burnishers at the same time drawing them through so as to dress or draw the metal down onto the metal of the box, at the same time, to perfectly finish the inner surface.

A is the bed upon which the operative mechanism is arranged. A mandrel, B, is supported in bearings B', and receives a rapid rotary movement from any suitable power applied to either of the pulleys C C', the arrangement being such that one pulley causes the movement to be in one direction and the other in the reverse, accordingly as a clutch, C², upon the mandrel between the pulleys, is engaged

with either the one or the other in substantially the usual manner for reversing the motion of the shaft in other machines. D is the holder, constructed to receive and hold the axle-box D¹, as shown in the drawing. The lugs which are formed upon the outside of the box prevent the box from turning in the holder. This holder is arranged upon a transverse carriage, D², and the said carriage D² upon another carriage, D³, arranged to move longitudinally on the bed. The transverse carriage is provided with an adjusting-screw, d, by means of which the holder D may be adjusted transversely across the bed, so as to bring the bore of the box into a line axially with the mandrel B. The carriage D³ is connected to a leading-screw, D⁴, by means of which, as hereinafter described, a longitudinal movement is given to the said carriage to move the holder to or from the mandrel in a line parallel with the axis of the said mandrel. The mandrel is constructed with one or more grooves, a, (see Fig. 5,) into which are fitted bars b, as seen in Figs. 1 and 3. These bars are in connection with a sleeve, E, on the said mandrel, as seen in Fig. 3, so that the said sleeve, moving longitudinally on the said mandrel, will impart to the said bars a corresponding movement. Such corresponding movement is imparted to the sleeve by means of a cross-head, F, in connection at each side with a leading-screw, G, and to both of these screws an equal revolution is given by a suitable chain of gearing from the mandrel or otherwise, as seen in Figs. 1 and 2; therefore, as the mandrel revolves in one direction the screws will be turned to force the cross-head forward or toward the holder D, and, revolving in the other direction, will draw the cross-head back; and this cross-head being in connection with the sleeve E will move the bars correspondingly toward or from the said holder. The outer end of each of these bars is made a little thicker, as at n, Fig. 3, and this may be made of hardened steel or other hard metal, or of any suitable stones—as diamonds—or any material which, by a rapid movement, will impart to the metal a spinning or burnishing effect.

The operation of a machine thus constructed is as follows: The lining which is to be inserted into the box is first cut from a suitable metal—as annealed sheet-steel, iron, brass, or

other metal—capable of extension by a spinning or burnishing process, and rolled into tubular form by the process substantially such as described in an application for patent for “forming the lining of axle-boxes” filed in even date herewith, or by any other process which will work the sheet metal into cylindrical form, so as to nearly fit the axle-box to be lined. This lining is inserted into the box and the box secured in the holder, as seen in Fig. 3. The cross-head is set at the greatest distance from the holder, and the box passed onto the mandrel; then a rapid revolution is given to the mandrel, carrying what I term the burnishers n , and these burnishers are slowly moved into the box by the screws G G. The burnishers, as they revolve, run down toward the smaller end of the box, the inclination of the groove in which the burnishers run corresponding to the tapering diameter of the box, so that they run over the surface of the lining throughout its length. As the cross-head approaches the extreme movement toward the holder an arm, L, in connection with the cross-head, comes in contact with a slide, L^1 , and moves the said slide, which slide, being in connection with a pawl, P, causes the said pawl to act on a ratchet, R, and turn the transverse shaft S, and thus, through a bevel-gear, W, on the said shaft working in a pinion, P' , on the leading-screw D^4 , will cause the holder to move a short distance onto the mandrel. The motion of the mandrel is now reversed, and the burnishers return through the box; consequently the movement of the holder carrying the tapered box onto the tapered mandrel lessens the distance between the mandrel and surface of the box, causing the burnishers on their return to dress, spin, or burnish, as when they first pass through. Returning to the other extreme, the arm L comes in contact with a second slide, L^2 , which is in connection with the said pawl P, and causes a second movement of the holder onto the mandrel. The burnishers again pass

through the box, working down the surface of the lining, and return, as before, and, so continuing, spin the lining down by degrees until the requisite diameter is attained. The metal of the lining works down onto the metal of the box, so that when complete they are practically inseparable, and the interior of the box is most perfect in its finish, and the machine, being adjusted to continue its operation until the requisite diameter is attained, (which is done by disengaging the pawl P at the completion of the work,) each successive box will be precisely the same diameter throughout as the preceding; hence the usual grinding is avoided, and the time consumed in lining is less than that now required for boring the cast metal.

I have described the operation as commencing at the larger end of the box and working toward the smaller, but it will be evident that this operation may be reversed.

The number of burnishers employed is immaterial; but there should be at least two, and these opposite each other, in order to take the strain from the mandrel, which would be unavoidable in the use of a single burnisher; and so if more than two are used they should be arranged so as to sustain each other.

Claims.

1. The holder D and mandrel B, provided with one or more burnishers, n , combined with a mechanism for imparting a longitudinal movement to the said burnishers, and at the same time to revolve the said mandrel, substantially as described.

2. In combination with the subject-matter of the first clause of claim, I claim the leading-screw D^4 , substantially as and for the purpose specified.

HENRY KELLOGG.

Witnesses:

J. H. SHUMWAY,
A. J. TIBBETS.