

H. HAMILTON.  
Journal-Box for Rolling-Mill Pinion.

No. 206,319.

Patented July 23, 1878.

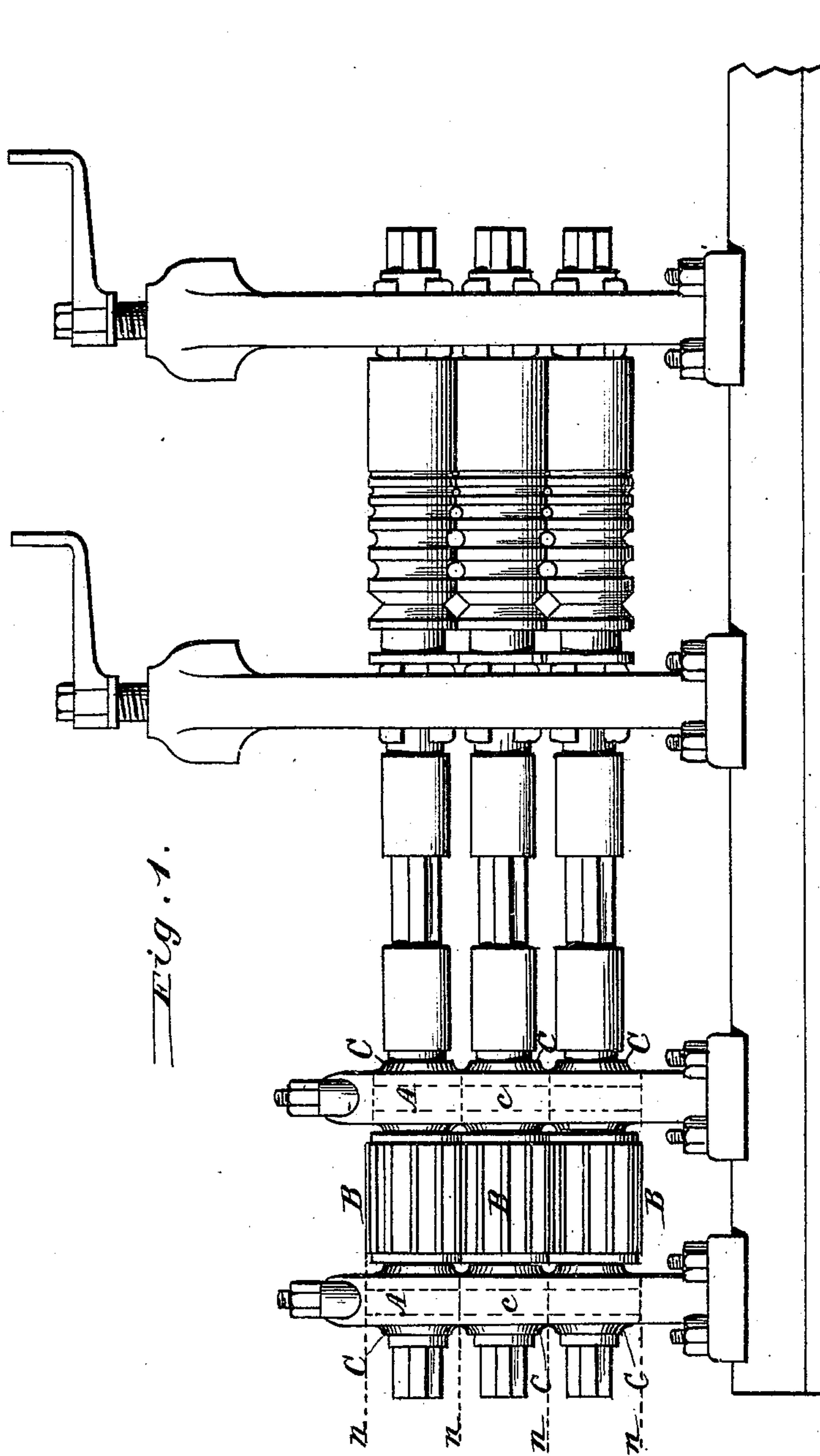


Fig. 1.

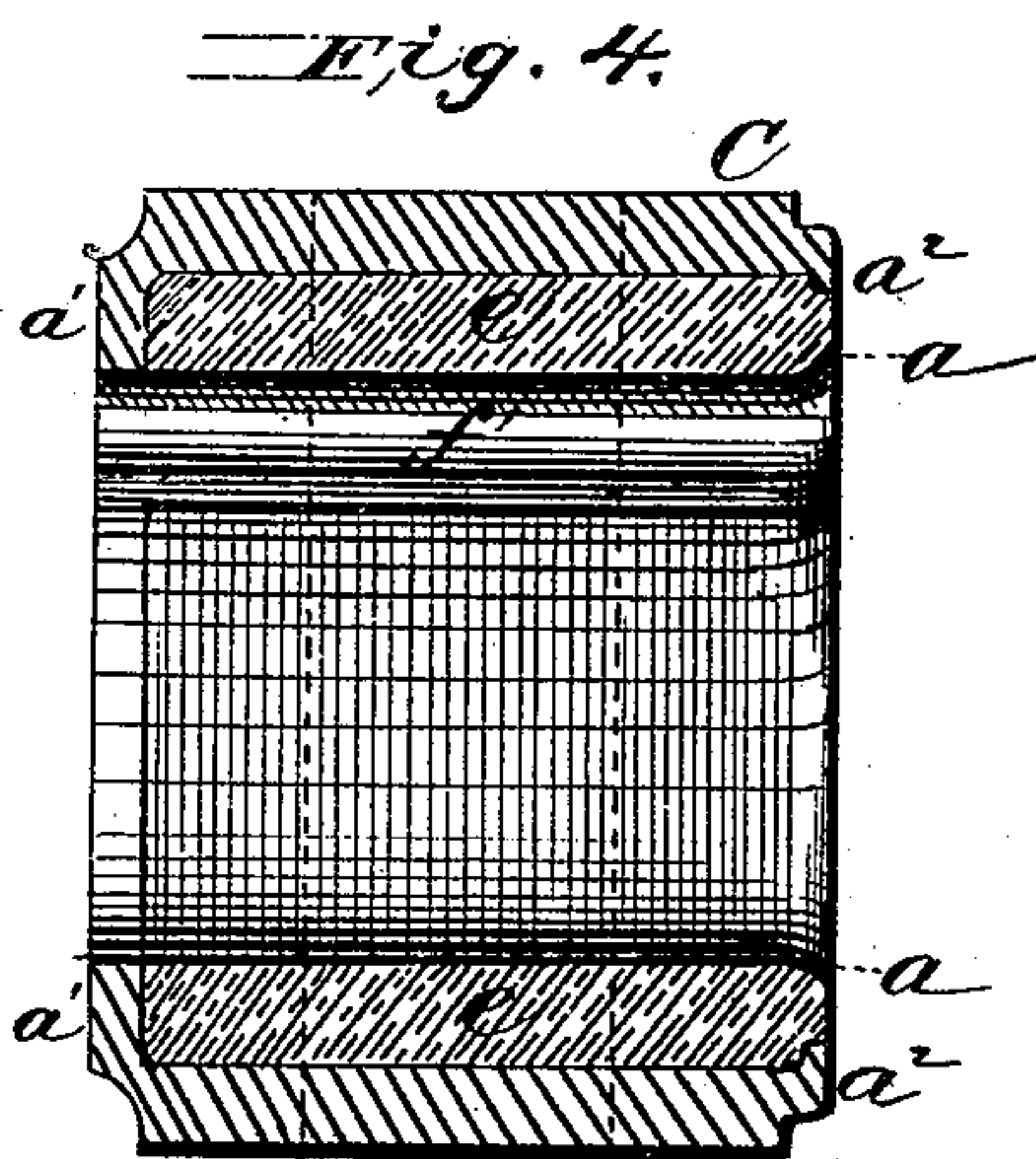
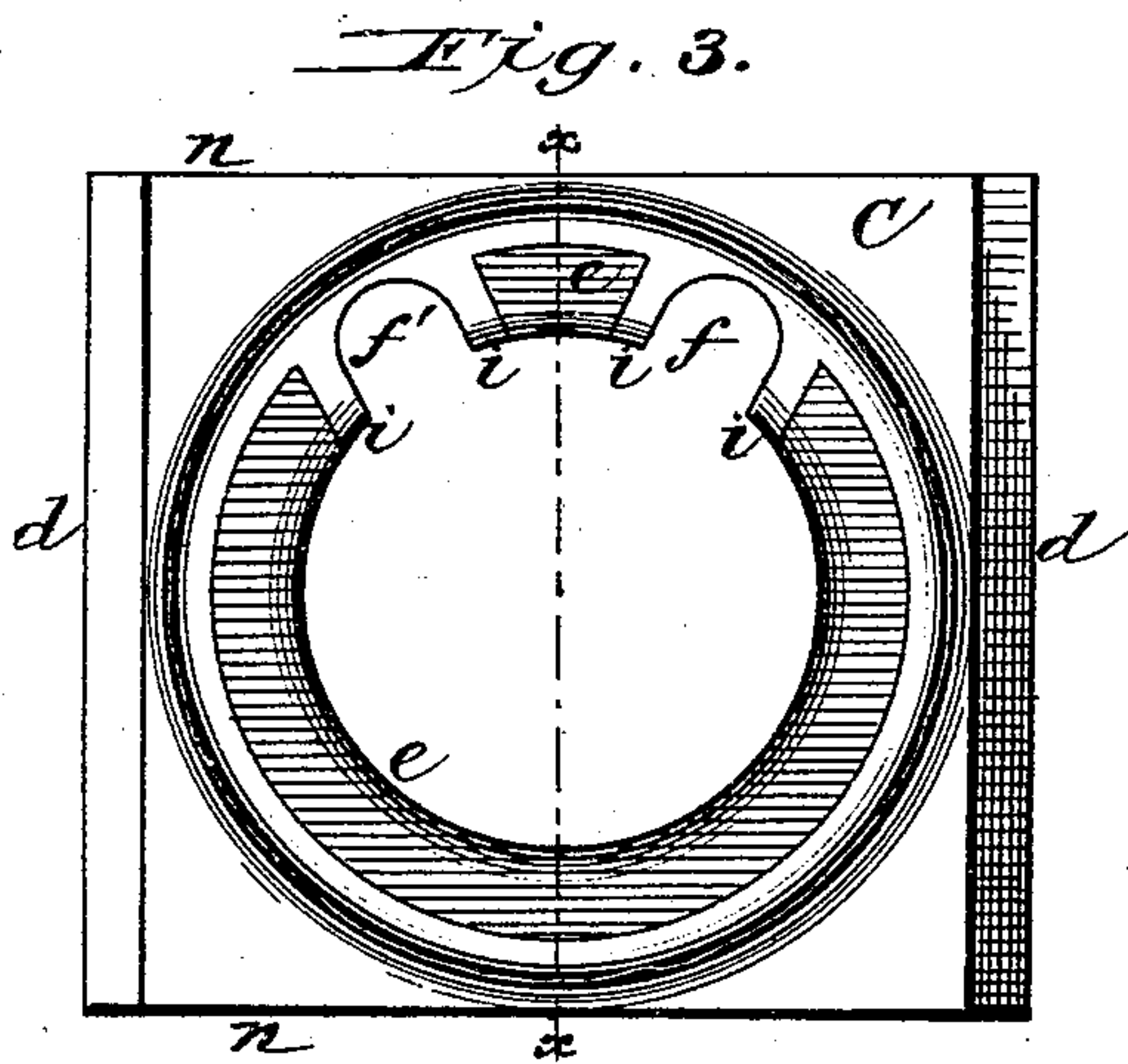
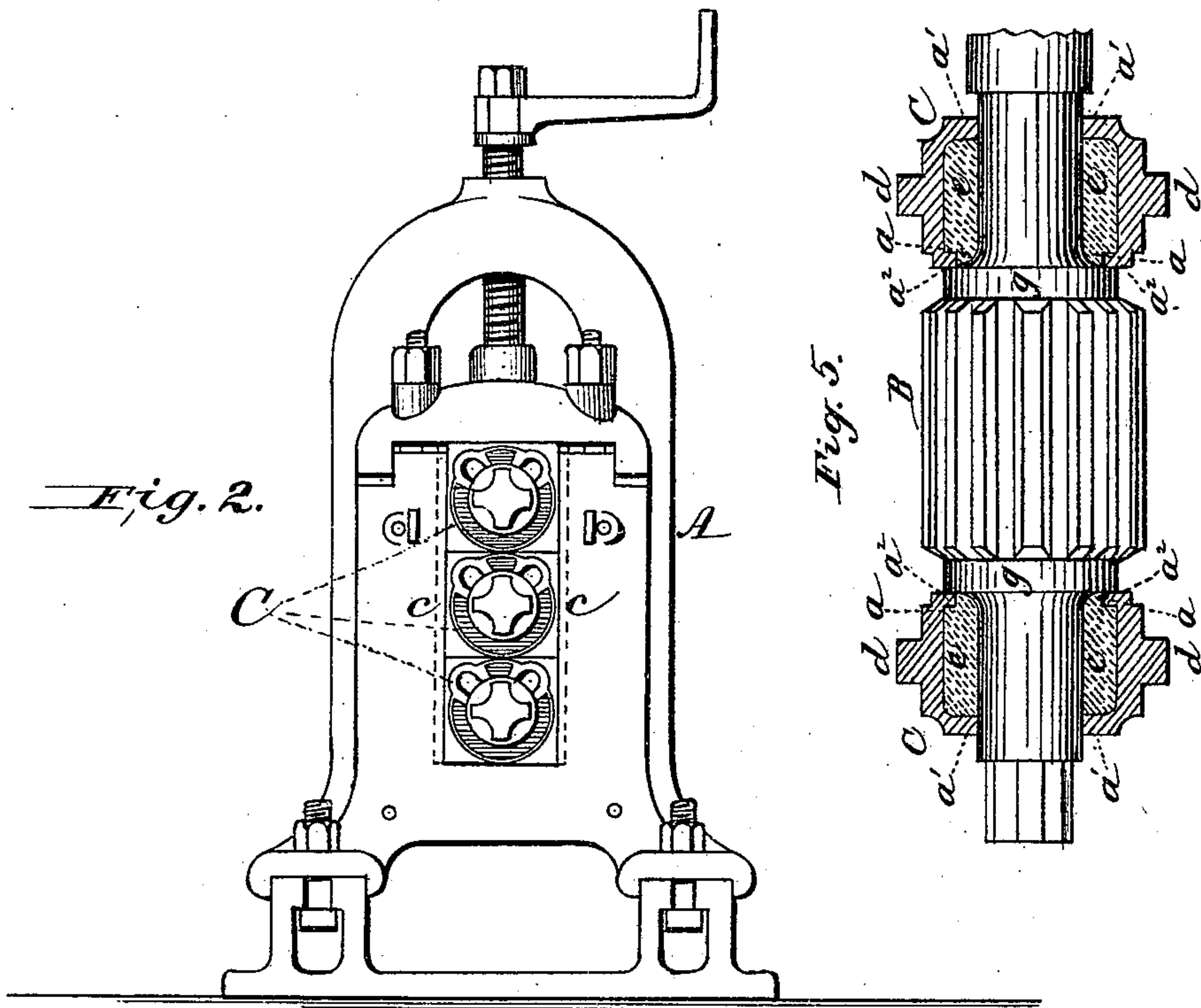
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# UNITED STATES PATENT OFFICE.

HOMER HAMILTON, OF YOUNGSTOWN, OHIO, ASSIGNOR, BY MESNE ASSIGNMENT, OF ONE-HALF HIS RIGHT TO BROWN, BONNELL & CO., OF SAME PLACE.

## IMPROVEMENT IN JOURNAL-BOXES FOR ROLLING-MILL PINIONS.

Specification forming part of Letters Patent No. 206,319, dated July 23, 1878; application filed May 23, 1878.

*To all whom it may concern:*

Be it known that I, HOMER HAMILTON, of Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Journal-Boxes for Rolling-Mill Pinions and other Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, which 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 letters of reference marked thereon, which form a part of this specification.

My object is to produce an economical and simple journal-box for rolling-mill pinions, and that is not so liable to get out of order as those now in use.

The invention consists of a single casting of iron or brass, with Babbitt-metal lining, made slightly larger than the pinion-journal. It is provided with tongues on each side, which fit into the grooves of the pinion-housing, and on its inside upper it is provided with one or more slots or depressions, one of which is intended for suet and the other for oil or water, for lubricating the journal.

Heretofore the pinion-journal bearing consisted of a number of brass or Babbitt-metal lined pieces, held in place and adjusted by screw or wedges. The rapid rate at which the pinions revolved and the power transmitted by them produced so much jar or vibration that it was almost impossible to keep the pinion-journals in practical running order without constant attention. The brass or bearings would also wear out very rapidly by reason of the constant change of position and the forming of new bearings on the brasses.

Referring to the drawings, Figure 1 represents an elevation of pinions, rolls, and housings, to the pinion-bearings of which my improved journal-box is especially applicable; Fig. 2, the pinion-housing with my improved journal-box; Fig. 3, the pinion-journal box enlarged; and Fig. 4, a cross-section of the same, taken at the line *xx* of Fig. 3. In Fig. 5, I have shown a top view of one of the roll-pinions, with the journal-boxes in section, to illustrate the rounded ends of the metal lining for the shoulders *g* of said pinion.

The housing A is of the ordinary construction for rolling-mill pinions. The journal-boxes C are arranged in the housing in the usual manner by being inserted in the grooves *c*, (shown in dotted lines,) into which the tongues *d* of the boxes C fit loosely.

The boxes are cast in one piece, of brass, iron, or other suitable metal, and recessed on the inside for the reception of the Babbitt metal *e*, the recess at the inner end of the box being open, as shown in Fig. 4. In the upper part of the box are arranged two grooves or depressions, *ff'*, one being intended for suet and the other one for oil or water, for constantly lubricating the pinion-journals, which are inserted in the boxes, and these, being of one piece, have a much firmer and steadier bearing than those now in use, in which new irregular bearings are made in a short time by the heavy strains caused by the sudden jarring when the iron is introduced, as also by the great rapidity with which the pinions revolve and impart motion to the rolls, and also the backlash occasioned by the sudden reduction of the power when the iron has passed through the rolls, and the resistance is not so great.

The advantages of my improved pinion-journal box are, that it is much more simple in its construction by being in one piece, and can be easier turned out to its proper diameter and finished on its outside. It prevents the cutting of the pinion-journals by being rounded at the inner edges *a*, as shown in Fig. 4, where the boxes now in use come in contact with the journals. It is much more economical, and, being merely a plain casting of iron or brass, with a Babbitt-metal lining, it is much more durable, having a greater wearing-surface than the boxes now in use; and the box, being fitted loosely in the housing, accommodates itself to the pinion-journal; and the perpendicular height being equal to the pitch of the pinion, it is impossible to misplace or misuse it by persons who lack skill or judgment. It constantly lubricates the journals of the pinions by the suet or oil or water in the top grooves.

The single-casting box with the Babbitt bearing and the grooves may be used with machinery in general.

The slots for the lubricants I always use at



the top, so that they are kept in contact with the pinion-journal better than they could be if placed at the bottom of the box.

My improved box is not adapted for rolling-mill rolls, for the reason that the perpendicular height of the box is made equal to the diameter of the pinions when properly in gear, and admits of no adjusting, as the pinions are not adjustable; consequently it would not answer for rolls, as they have to be constantly adjusted for different thicknesses of iron. While all the rolls are adjustable, the pinions cannot be, because, for a twelve-inch train, the pinions are made twelve inches at pitch-line, and when in gear they are just twelve inches between centers, and the perpendicular height of my box when in place will be just twelve inches. My journal-box is therefore designed with special reference to rolling-mill pinions and their housings, and in this particular the latter differs from a roll-housing in this, the space between in the pinion-housing is made narrow, just wide enough to admit the pinion journals or necks and room for the side bearing required, and the top is open, with a cap held down by two bolts, while roll-housings are made wide, so that the needed side chucks for adjusting can be got in, and also that the rolls may be taken out by taking off the top boxes and pulling the body endwise through the housing, and a tap-screw is used for adjusting them.

It will be seen that the recess in the box for the metal lining *e* forms end inward projections *a*<sup>1</sup> *a*<sup>2</sup>, the inner one, *a*<sup>2</sup>, being of less depth than the outer one, *a*<sup>1</sup>, as shown in Figs. 4, 5, for the purpose of exposing a metal-lining end bearing, *a*, for the shoulder *g* of the pinion B, as shown in Fig. 5, to wear against, which is very important, as there is considerable end-thrust to the pinions when in operation, and it saves the cutting out of the journals. These end shoulders *a*<sup>1</sup> and *a*<sup>2</sup> serve to retain the metal lining from endwise movement, while longitudinal ridges *i i i*, (shown in Fig. 3,) by which the top grooves *f f'* for the lubricants are formed, serve also to prevent said lining *e* from turning with the journal.

In Fig. 1 the dotted lines *n* show the pitch-

line of the pinions B to be equal to the perpendicular height of the box, so that any one of the boxes can be used with any one of the pinions, so that no misplacement is possible, and maintain the pinions always at the proper distance between centers.

I am aware that a journal-box has been made in one piece and lined with Babbitt metal, and that such lining has been locked to the box by being extended into grooves that prevent it from turning or moving endwise under the action of the journal, and therefore I make no claim, broadly, to such construction; but my improvements are specially adapted for use with the journals of the pinions of rolling-mills, and in such connection not only embrace new features of construction, but are new in such combination.

I claim—

1. A journal-box in one piece of metal, lined as described, having the grooves *f f'*, the end shoulders *a*<sup>1</sup> *a*<sup>2</sup>, and the rounded lining-bearing *a* at the inner end for the shoulder of the pinion B, as herein set forth.

2. A journal-box constructed substantially as herein described, having a perpendicular height equal to the diameter of the pinion B of a rolling-mill, whereby the several boxes when in place will be equal in height to the pitch-line of the several pinions, to obtain the advantages stated.

3. A journal-box in one piece of metal, lined as described, having the top interior grooves *f f'* formed by the longitudinal box-ridges *i i i*, in the manner and for the purpose set forth.

4. A journal-box of one piece of metal, lined, and having the top grooves *f f'* formed as described, in combination with the housings and the pinions of rolling-mills, all constructed substantially as and for the purpose described.

In testimony that I claim the foregoing I have affixed my signature in presence of two witnesses.

HOMER HAMILTON.

Witnesses:

FRED. R. HARRIS.

MASON EVANS.