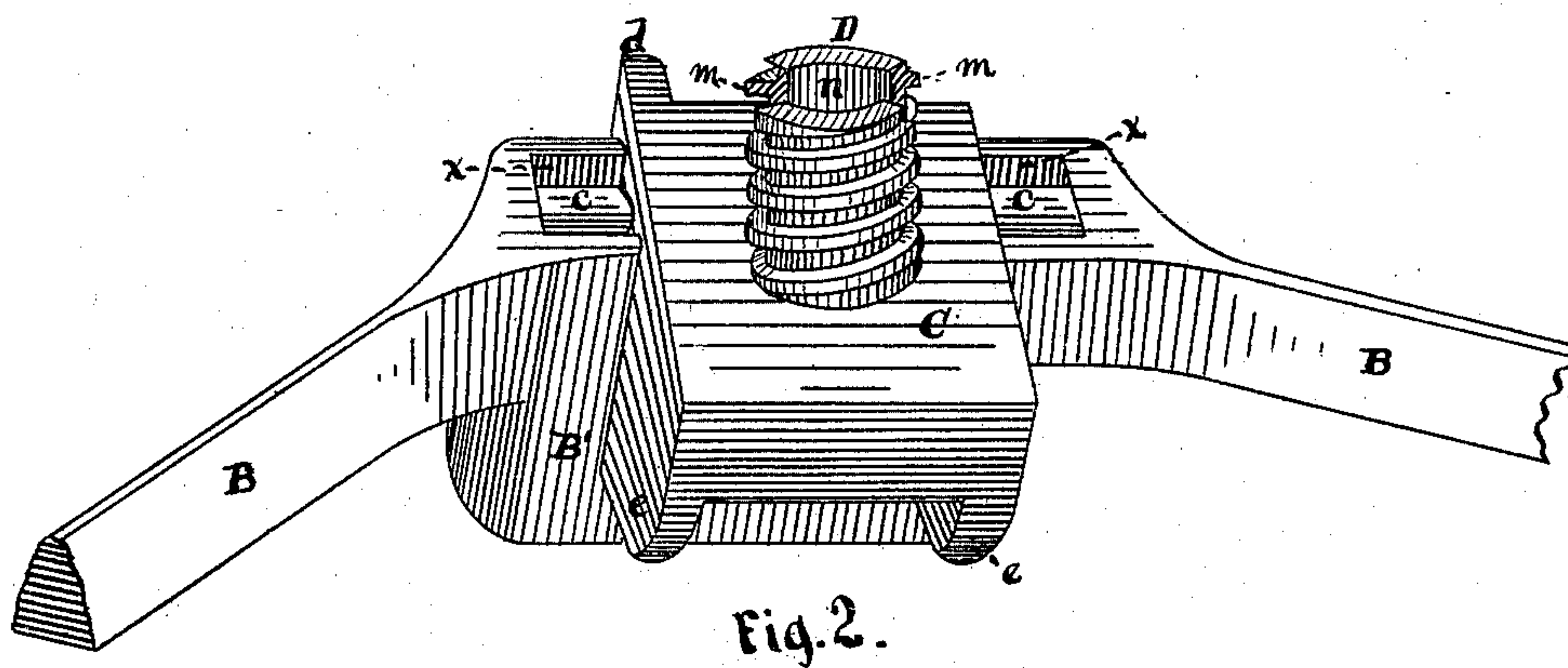
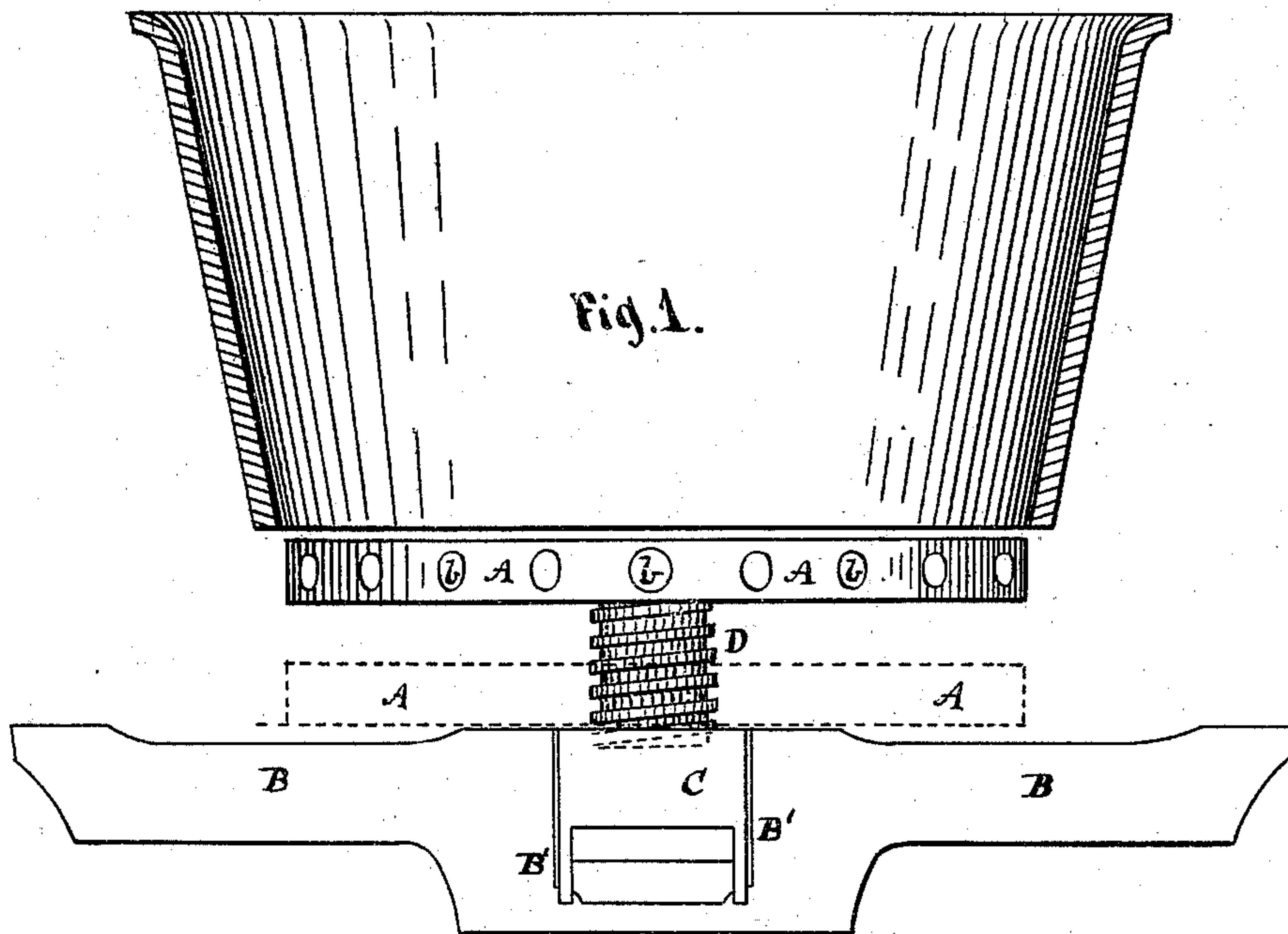


W. MORAND.  
GRATE.

No. 173,805.

Patented Feb. 22, 1876.



Witnesses: *Emmanuel Andrus*  
*Of Britain*

*William Morand*  
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Inventor.

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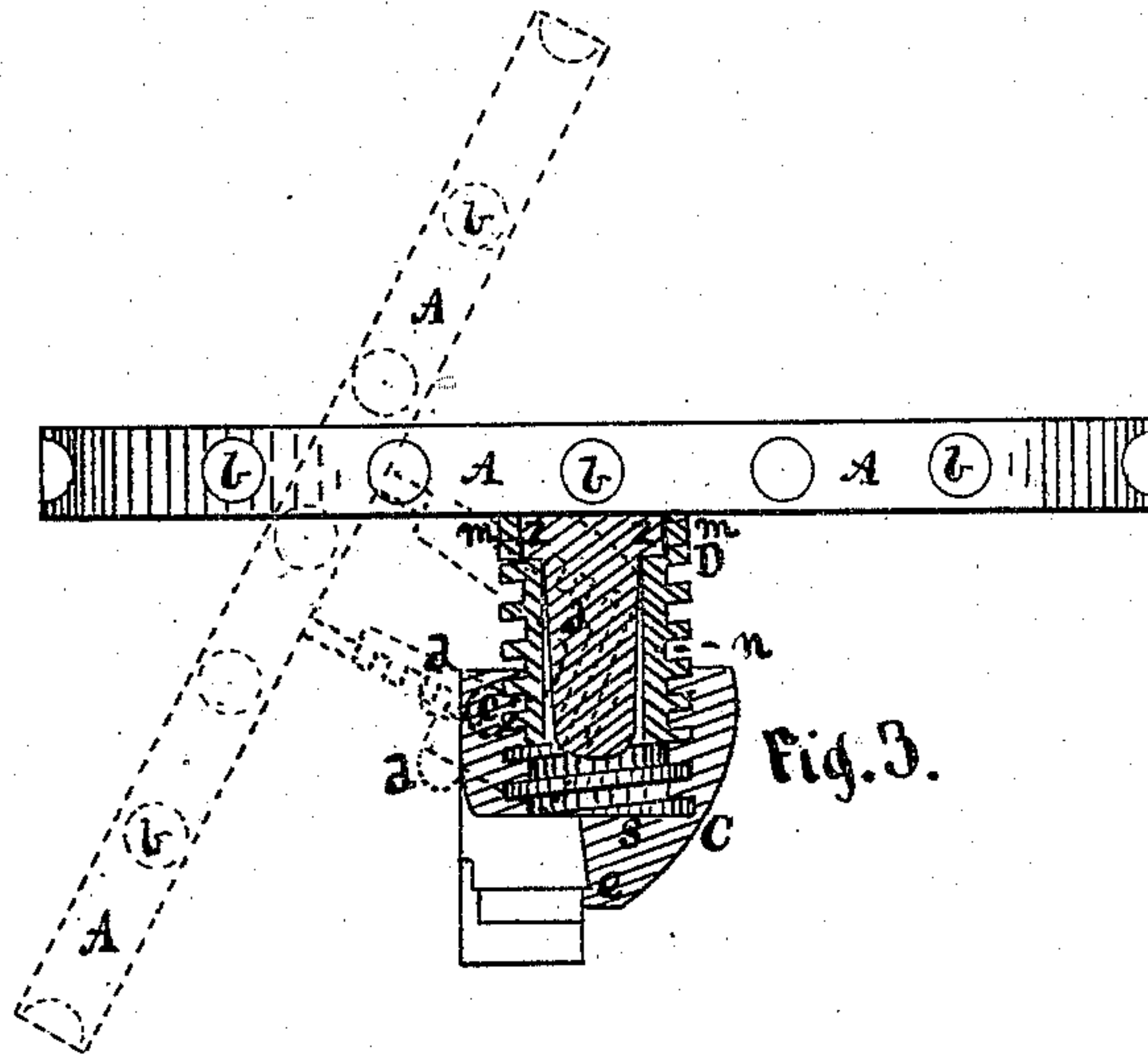


Fig. 3.

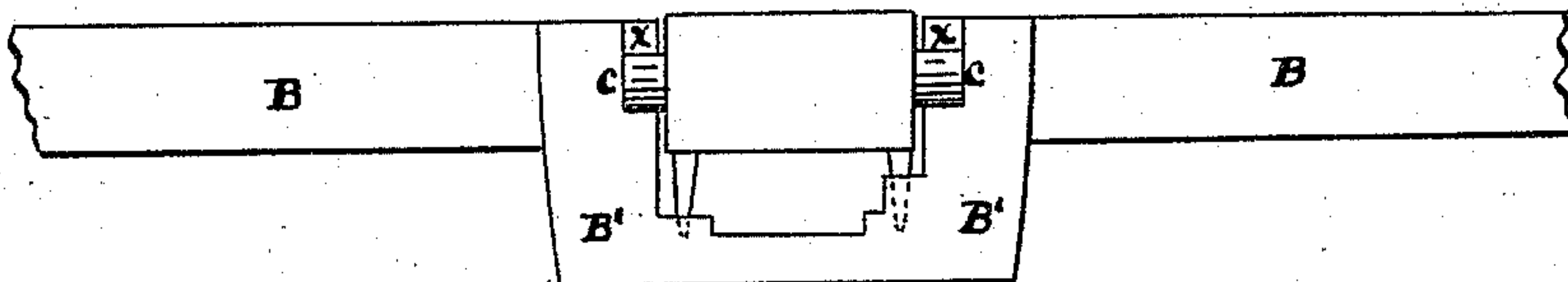


Fig. 4.

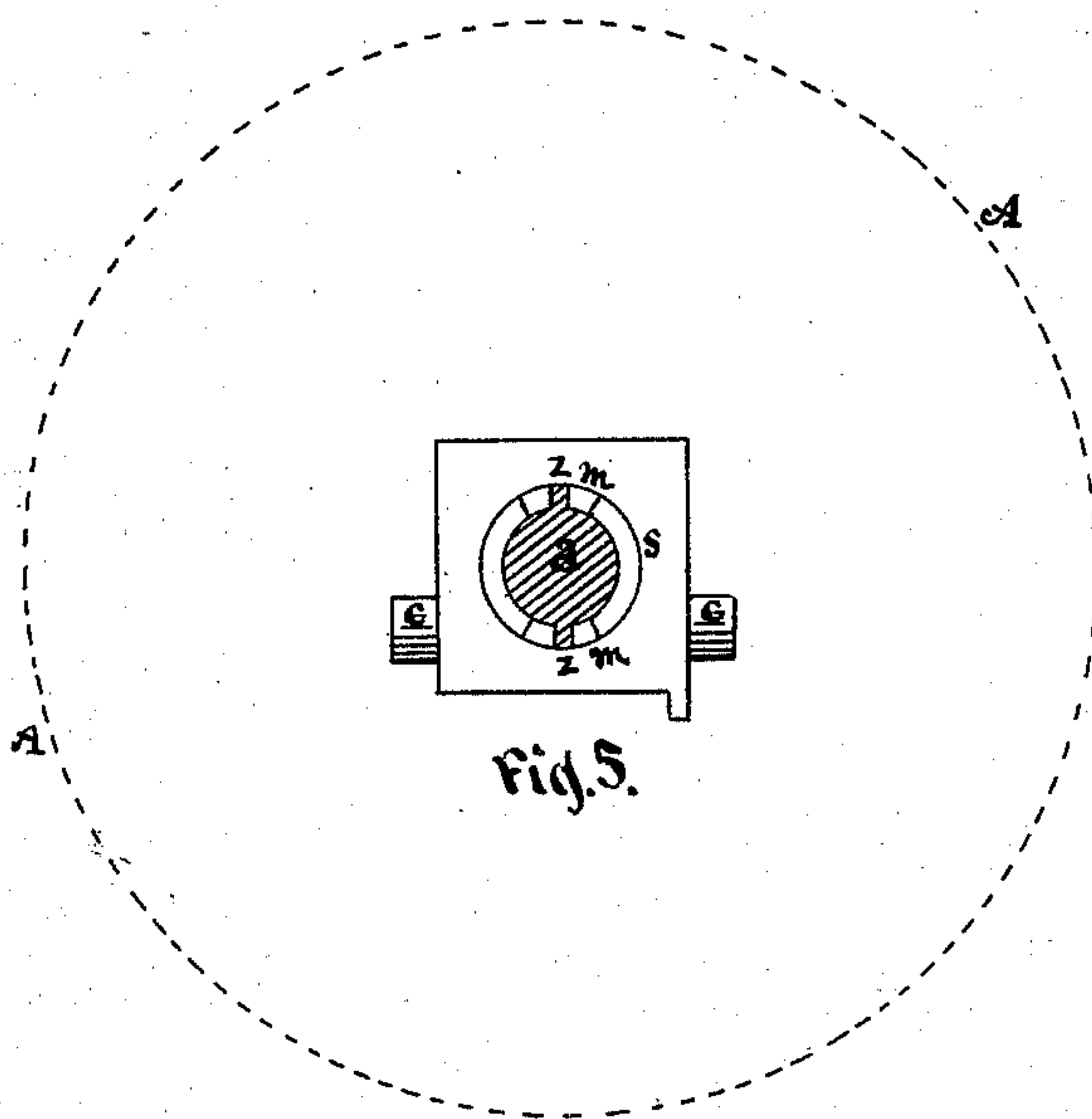


Fig. 5.

Witnesses.  
Samuel Andrews  
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# UNITED STATES PATENT OFFICE.

WILLIAM MORAND, OF TROY, NEW YORK, ASSIGNOR TO SWETT, QUIMBY & PERRY, OF SAME PLACE.

## IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **173,805**, dated February 22, 1876; application filed January 31, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM MORAND, of the city of Troy, county of Rensselaer, State of New York, have invented certain new and useful Improvements in Grates for Stoves; and I do hereby declare that the following is a description thereof, reference being had to the accompanying drawings, in two sheets, forming a part of this specification, in which—

Figure 1 represents a fire-pot with the improved grate applied. Fig. 2 is a perspective view of the supporting-bar of the grate, and illustrates a part of the improvements in this invention. Fig. 3 is a cross-sectional view of the grate and its supporting-bar, illustrating the manner in which the improvements operate. Fig. 4 is a sectional transverse view. Fig. 5 is a horizontal view at line No. 1 in Fig. 3.

My invention relates to a grate capable of being rotated, dumped, elevated, and depressed in the several combinations of devices hereinafter described.

The object of this invention is to render the grate capable of being elevated from the bar, to lessen the depth of the fuel in the fire-pot, and reduce the supply of air supporting combustion, or to lower the grate down toward the supporting-bar, to increase the depth of the fuel, permit a greater supply of air to the fuel in combustion, and to permit the upper surface of the grate to be brought below the plane of the lower end of the fire-pot for a free and ready removal of the clinkers and slate from the base of the fire-pot, while at the same time, in any of the above conditions, the grate may be rotated and dumped.

To enable others skilled in the art to make and use my invention, I will proceed to describe it in reference to the drawings and letters of reference marked thereon, the same letters indicating like parts.

In the drawings, A represents the grate. B is the supporting-bar, having bearings at its ends from the walls of the stove, or an adjunctive piece projecting inward from the said walls. The grate may be made in any form ordinarily or generally used by the trade.

The said grate is made with central pivot *a*, on which it may be rotated or revolved when desired. Made with the said pivot are the narrow radial feathers *z z*, the use of which will be hereinafter described. Made in the outer periphery of the grate are the series of holes *b b*, the use of which will be hereinafter described. The supporting-bar B has made central in the same the stirrup B', Fig. 4, and in the sides thereof are made the bearings *x x*. Suspended in the said stirrup is the pivot-block C, provided with the pivots or pintles *c c*, setting in the bearings *x x*, on which said pivot-block may turn, and the lips *e e* bearing on the edge of the stirrup, to support said pivot-block horizontally, as shown in Fig. 3. Made with said pivot-block, also, is the lip *d*, intended to bear on the rear of the stirrup when said block is tipped up, as shown by dotted lines in the same figure. The said stirrup is provided with a central screw-threaded hole, *s*, set forward of the bearings *c*, and receives the short screw-threaded central bush D, which may be revolved, so as to be raised or lowered in said pivot-block, as indicated by full and dotted lines in the drawings. The upper end of said screw-threaded bush is made with radial horizontal recesses, *m m*, in its side walls, opposite each other, as shown in Figs. 2 and 5, and are intended to receive the radial feathers *z z*, attached to the central pivot *a*, of the grate. The central hole *n* is intended to receive the pivot *a* of the grate, and permit its being partially turned within to a distance permissible by the feathers *z z*, Fig. 5, operating in the recesses *m m* of the bush D. The screw-threaded hole of the pivot-block receiving the screw-bush D is made on one side of the axis of the trunnions or pintles *c c*, working in the bearings *x* of said pivot-block. Made with the rear side of the pivot-block are the stops *e e*, which bear against the rear edge of the stirrup B' when said pivot-block is in a horizontal position in its upper surface. On the front edge of the said pivot-block is also made the stop *d*, which, when said pivot-block is tipped, as shown by dotted lines in Fig. 3, bears on the side of the



stirrup and prevents said pivot-block from further tipping, and holds the same at an angle that may prevent the pivot of the grate from slipping out of the bush carried by said pivot-block.

The several parts of this invention, being thus constructed and arranged, are capable of securing several desirable results from their several operations; for it is readily seen that by reason of the recesses *m m* in the screw-bush *D* being made each with a horizontal extension vastly greater than the width of the radial feathers *z z* on pivot *a* of the grate, the said grate may be vibrated or rotated in a reciprocating manner to a distance in either direction equal to the distance grates are generally shaken or vibrated without in the least disturbing the relative position of the screw-bush in the pivot-block, and the grate in its vibrating movement will not be elevated or depressed in the least, but will be preserved substantially in the same plane. It is further seen that by the grate being supported from the screw-bush working in the pivot-block *C*, and the said pivot-block being supported by trunnions working in bearings from the stirrup *B'* the grate may be dumped, as shown in dotted lines in Fig. 3, while by the screw-bush being past the axis of the bearing of the trunnions of the pivot-block, the grate will be preserved from accidental tipping, the stops *e e* operating to preserve the grate horizontal by their bearing against the stirrup. It is also readily seen that by the several holes or recesses *b b* made at intervals in the periphery of the grate the said grate may be revolved in either direction to full revolutions by means of any suitable instrument operating with said holes or recesses, and when revolved in one direction the feathers *z z* of pintle *a* will engage each with a side of the recess *m* of the screw-bush, and work said screw-bush upward, so as to elevate the grate from the supporting-bar toward the base of the fire-pot, while operations with the instrument to effect revolutions of the grate in an opposite direction will carry said screw-bush downward and permit the grate to be lowered, as shown by dotted lines in Fig. 1.

When the grate has been carried upward, as shown by full lines in Fig. 1, the depth of the fuel in the fire-pot will be decreased, and the opening for the admission of air to the fire-pot will be materially lessened in capacity, while, when the grate is carried down, as shown by dotted lines in Fig. 1, the depth of the fuel will be increased in the fire-pot, and the opening for

admission of air to the fire-pot will be increased in their aggregate capacity, so as to permit a greater supply of air for a greater combustion in the fire-pot.

Radial projections from the rim of the grate, or vertical projections from the same, at intervals apart, may be employed as substitutes for the holes or recesses *b b* for revolving the grate.

When the grate is lowered to the plane shown by dotted lines in Fig. 1, the top surface of the grate or bed of the fuel may be removed by a suitable hook or equivalent instrument.

By reason of the grate being supported from its pivot *a* at a distance back from the trunnions *c c* of the block *C*, when the grate is dumped, the lower edge of the grate, when thrown to a dumping position, as by dotted lines in Fig. 3, will be carried up from the bottom of the ash-pan or ash-pit to a considerable distance greater than it would be were the pivoted grate supported at the center of the axis of the trunnions of the pivot-block, which is of great advantage in stoves having a limited vertical distance between the bottom of the fire-pot and the bottom of the ash-pit.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the supporting-bar *B*, of the stirrup *B'* and pivot-block *C*, supported by trunnions from said stirrup, and having a central hole for supporting a grate, substantially as and for the purpose set forth.

2. The supporting-bar *B*, screw-thread bush *D*, supported from said bar directly or indirectly, and having a central opening, *n*, for the pivot of the grate, and recesses *m m*, permitting a play of feathers *z* of the pivot of the grate, combined for operation as set forth.

3. The grate *A*, having a central pivot for its rotation, and radial feathers *z z*, and with holes or recesses *b*, or their described equivalents, made with its outer rim, screw-threaded bush *D*, provided with recesses *m*, pivot-block *C*, supported by trunnions from the supporting-bar *B*, combined to operate substantially as and for the purpose set forth.

4. The combination, with the pivot-block *C*, pivoted stirrup *B'*, of the stops *e e*, substantially as and for the purpose set forth.

WILLIAM MORAND.

Witnesses:

SAMUEL ANDRUS,  
O. F. BURTIS.