

No. 644,320.

Patented Feb. 27, 1900.

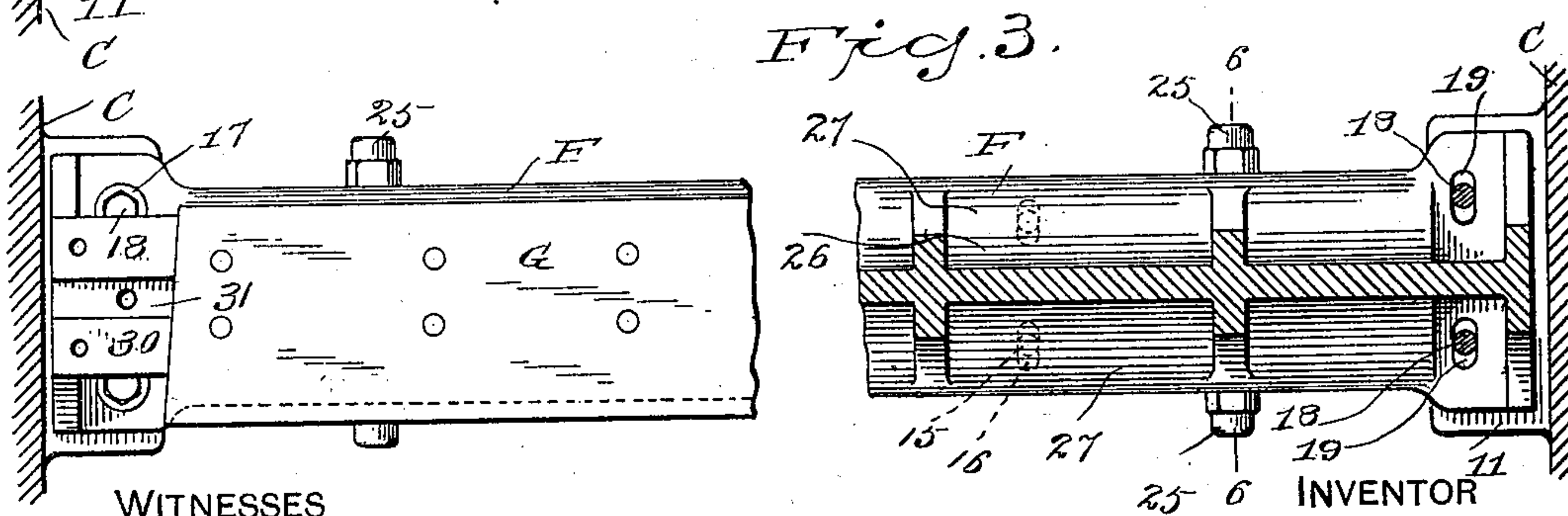
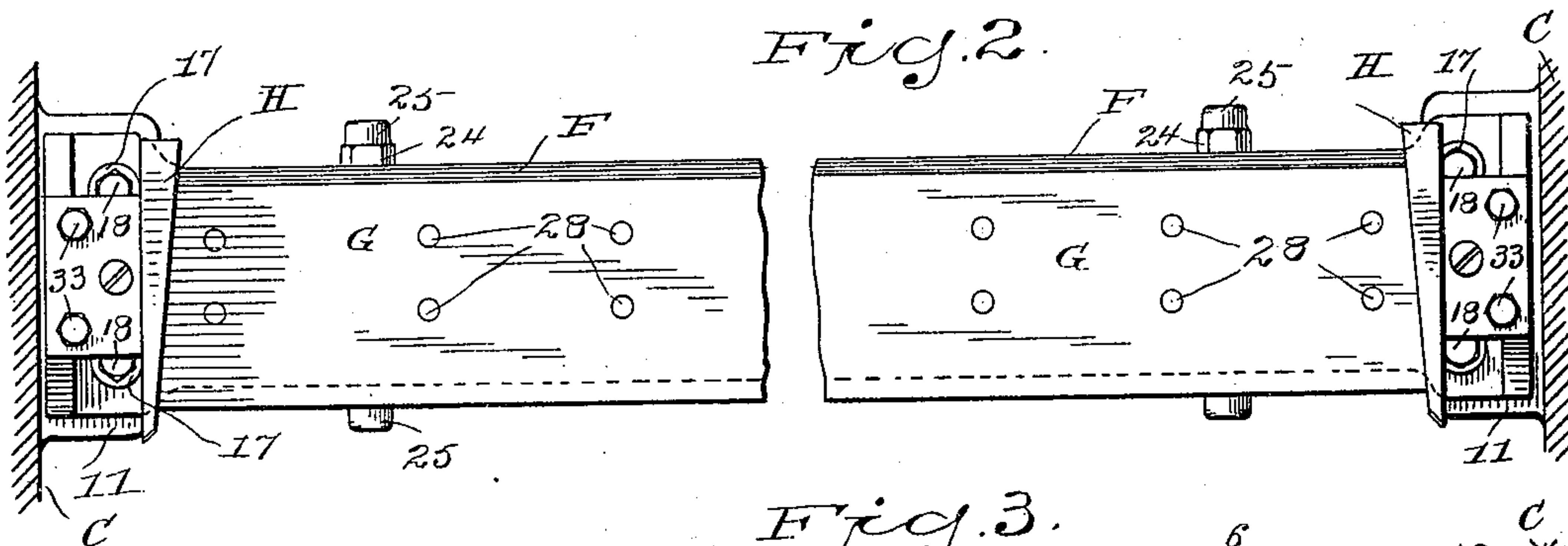
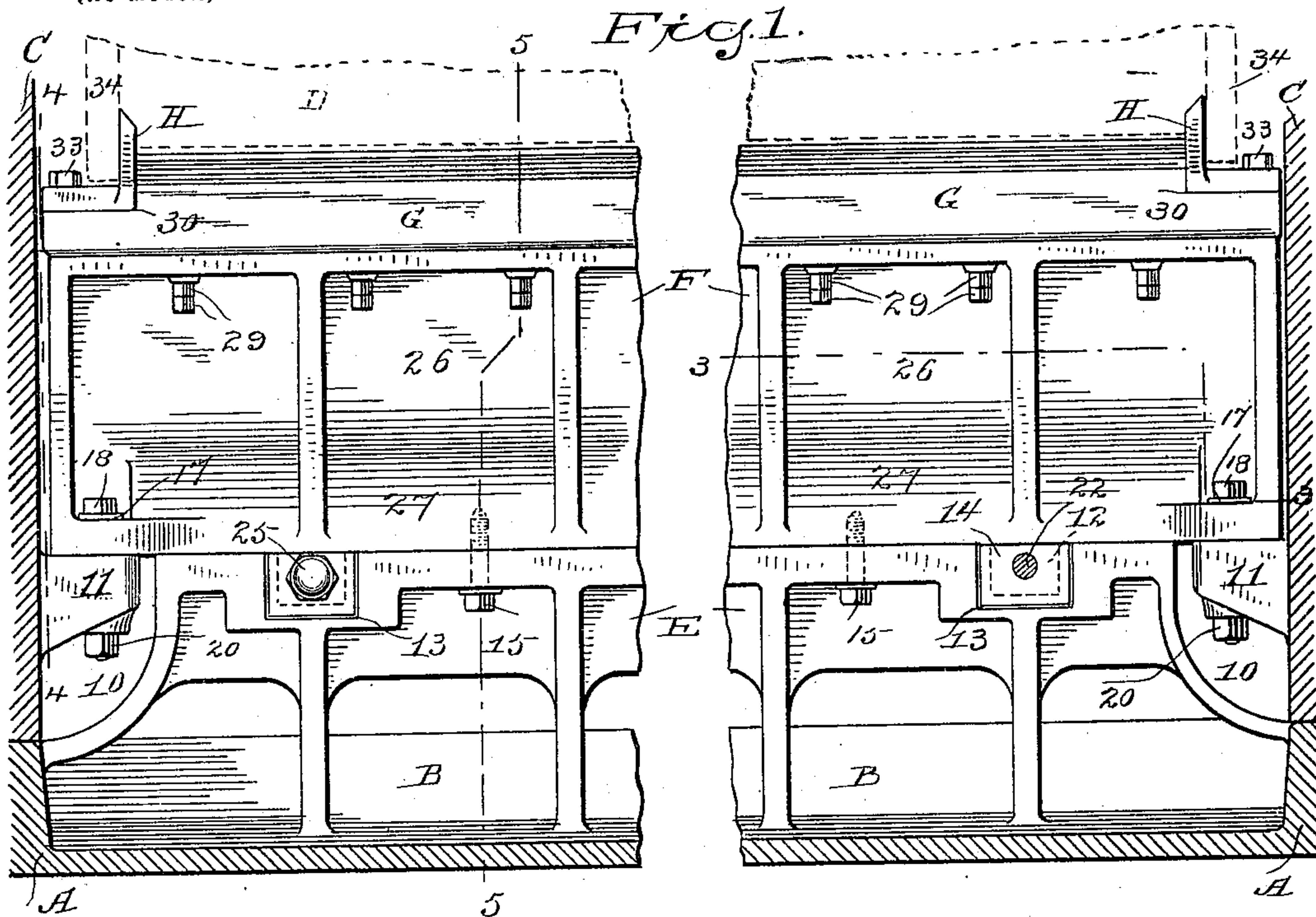
A. B. CLEMENS.

ADJUSTABLE KNIFE BAR FOR SUGAR MILLS.

(Application filed Dec. 16, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

H. A. Sams
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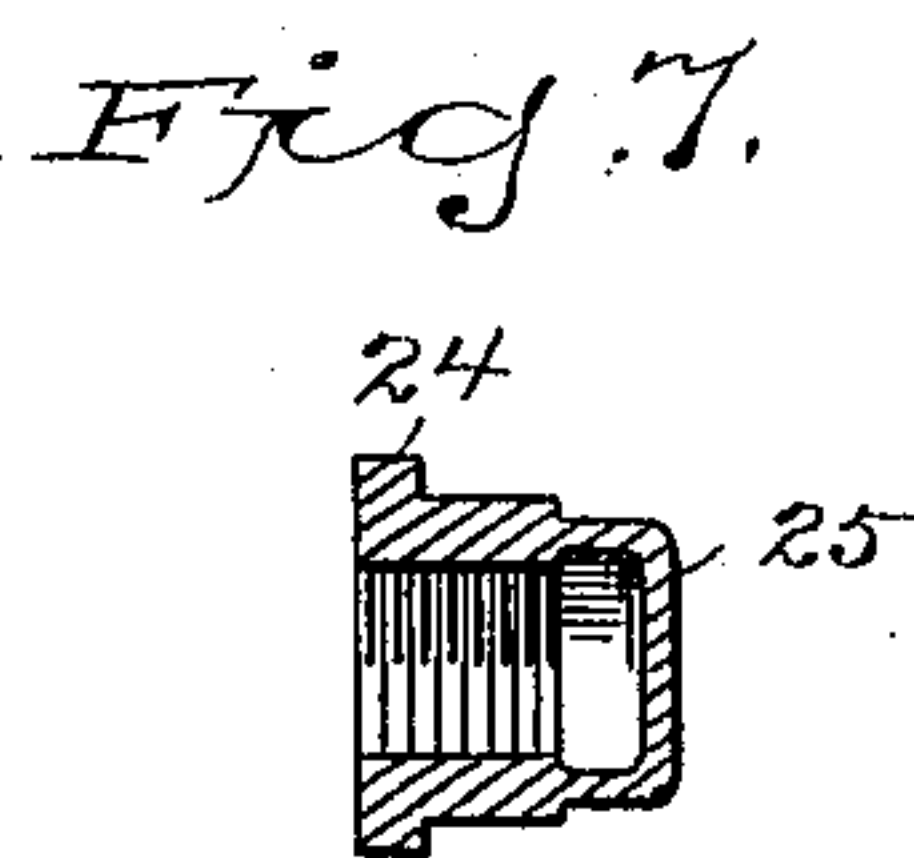
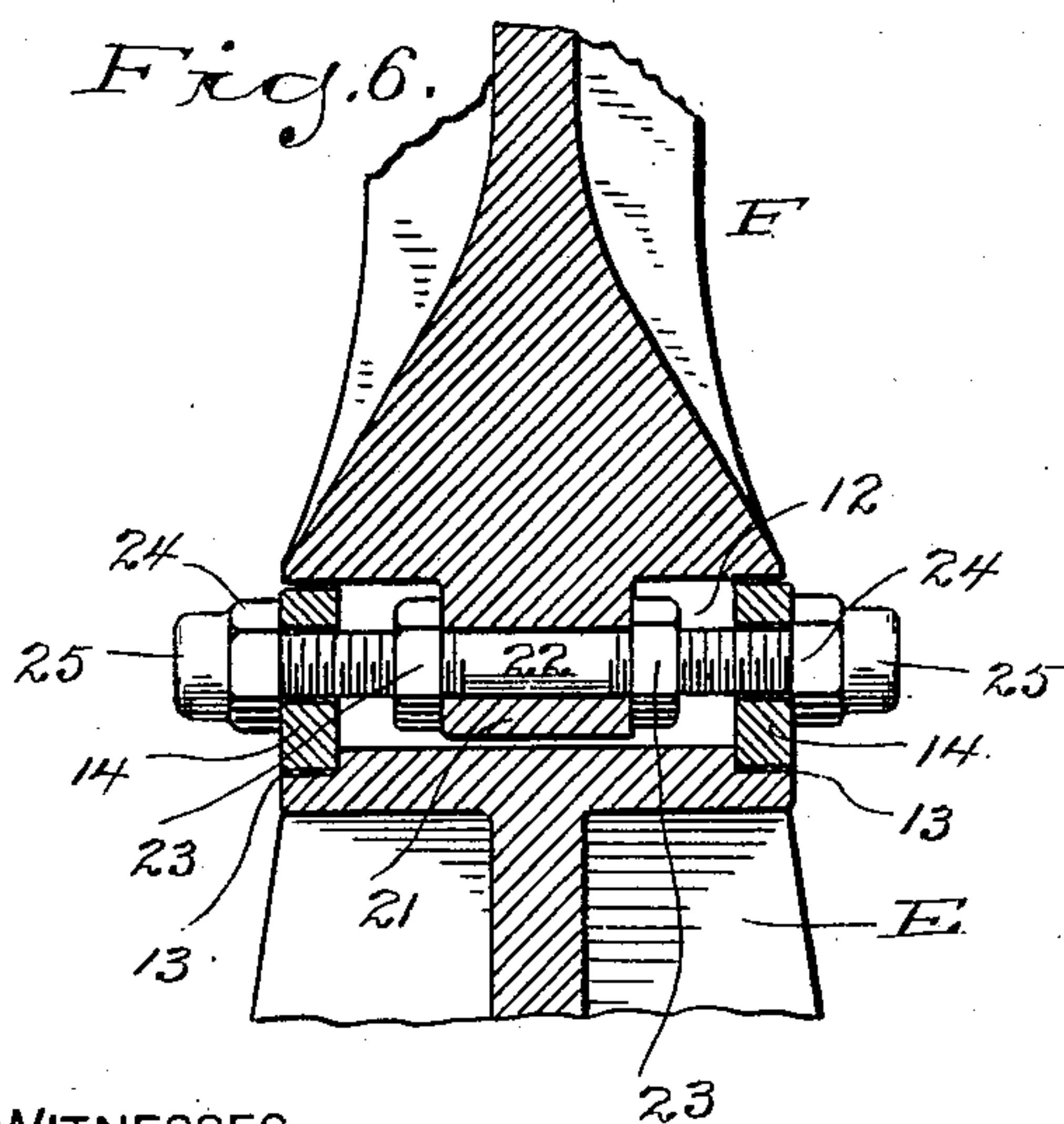
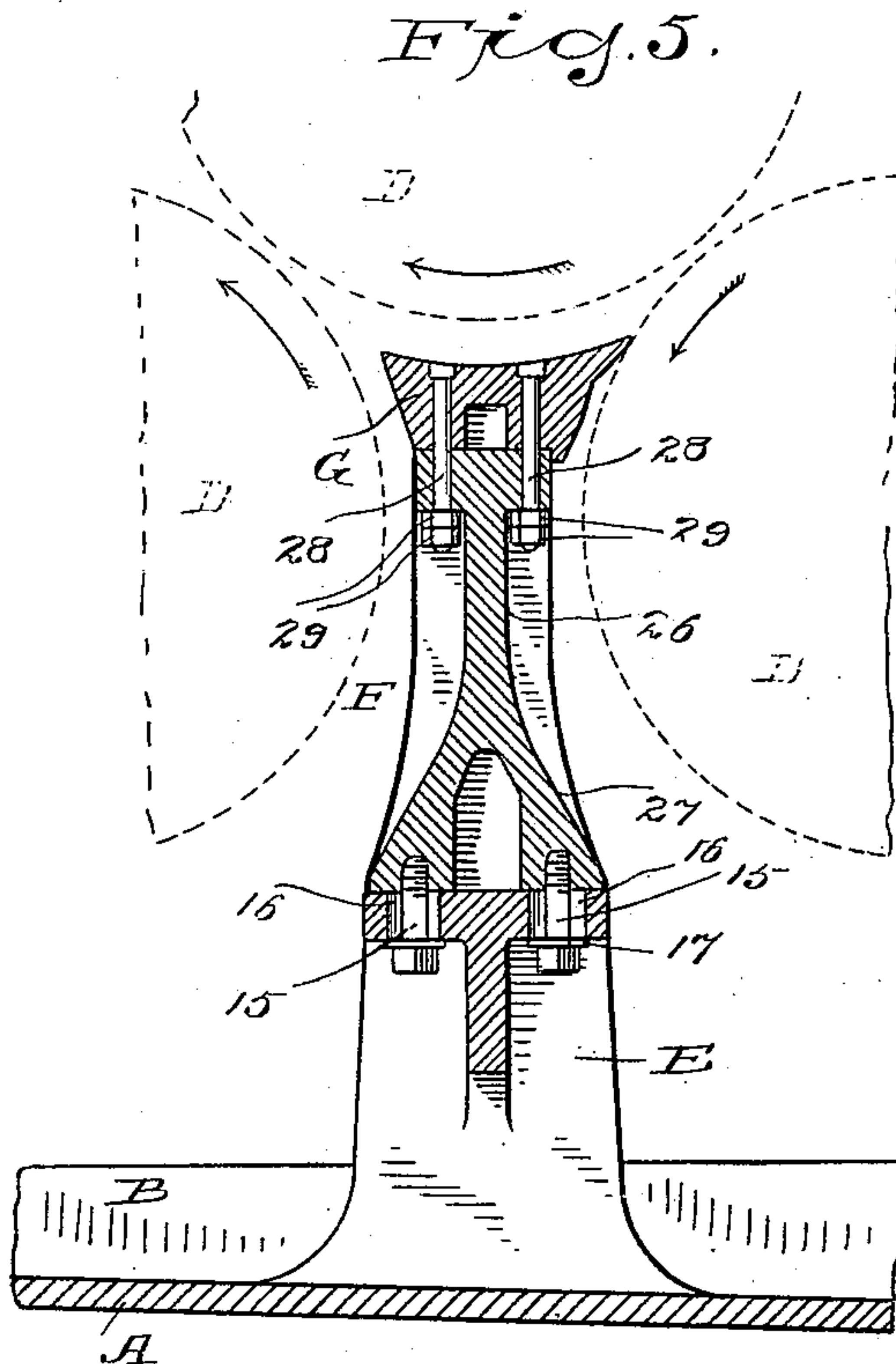
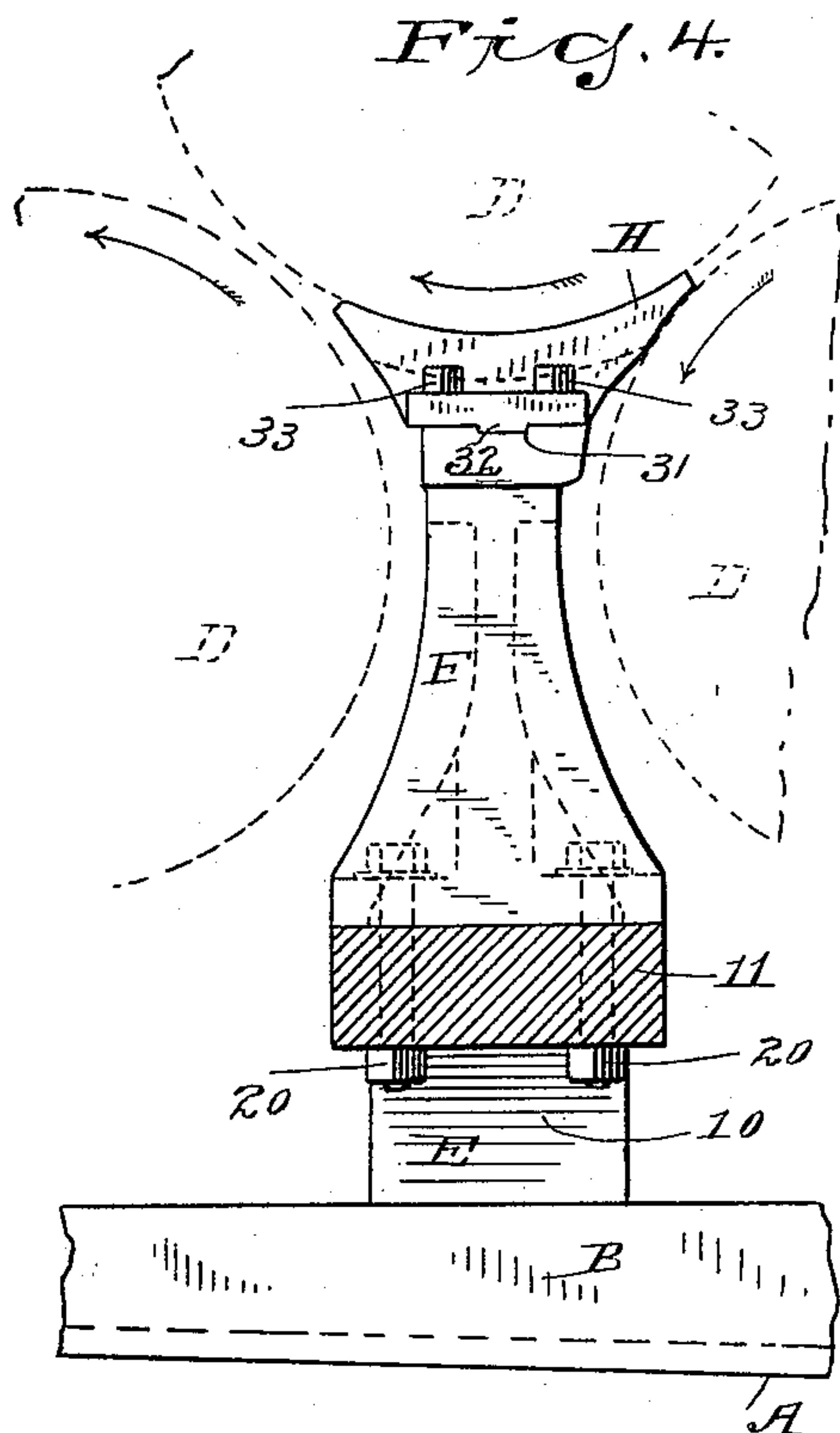
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2 Sheets—Sheet 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW B. CLEMENS, OF ANSONIA, CONNECTICUT, ASSIGNOR TO THE
FARREL FOUNDRY AND MACHINE COMPANY, OF SAME PLACE.

ADJUSTABLE KNIFE-BAR FOR SUGAR-MILLS.

SPECIFICATION forming part of Letters Patent No. 644,320, dated February 27, 1900.

Application filed December 16, 1899. Serial No. 740,531. (No model.)

To all whom it may concern:

Be it known that I, ANDREW B. CLEMENS, a citizen of the United States, residing at Ansonia, county of New Haven, State of Connecticut, have invented a new and useful Adjustable Knife-Bar for Sugar-Mills, of which the following is a specification.

My invention has for its object to provide a bar or carrier for the "knife," so called, or cane-guide in sugar-mills which shall be so constructed as to support the knife its entire length, except the ends, which rest upon the usual lugs extending from the housings, which shall be laterally adjustable on an abutment, carrying the knife with it, to compensate for wear of the knife in use, and which shall be so constructed as to avoid any angles or projections that could catch and retain fine bagasse.

It has been a source of serious difficulty in sugar-mills as heretofore constructed that the knife-bar, which was supported at the ends only, would spring or sag in use and, furthermore, that the construction of the bar was such that fine bagasse could collect and harden to such a degree as to frequently render the adjustment of the knife a very difficult matter, bagasse that collected between the knife-bar and roll acting to prevent the knife-bar from being brought up to the roll and quite frequently requiring to be chipped away with a hammer and chisel before the knife-bar could be moved. In order to overcome these objections, I have devised a novel laterally-movable knife-bar and abutment therefor which supports the knife for practically its entire length, thereby preventing springing or sagging of the knife at the center, and whose sides are so shaped as to adapt them to serve as conductors for conveying any bagasse that may leak from the knife into the pan. I furthermore provide adjusting-nuts the outer faces of which are closed by caps, so that the threads of the bolts are protected from the cane-juice, and the nuts may be rotated at any time without difficulty to adjust the knife-bar and knife in use.

In the accompanying drawings, forming part of this specification, Figure 1 is a longitudinal section of the bed, pan, and housings of a sugar-mill, showing the knife and my

novel knife-bar and abutment in elevation, one of the adjusting-nuts being removed and the adjusting-bolt appearing in section; Fig. 2, a plan view showing the knife and side guides in position, the housings appearing in horizontal section; Fig. 3, a view corresponding therewith at the left except that the side guide is removed, the right half of said view showing the knife-bar in horizontal section on the line 3 3 in Fig. 1; Fig. 4, an end view of the knife-bar and a side guide, the housing-lug being in section on the line 4 4 in Fig. 1; Fig. 5, a vertical section of the knife and knife-bar on the line 5 5 in Fig. 1 and showing, partly in section and partly in elevation, a portion of the abutment on which the knife-bar rests; Fig. 6, a detail sectional view, on an enlarged scale, on the line 6 6 in Fig. 3, showing the adjusting-bolt and adjusting-nuts and the mode of adjusting the knife-bar; and Fig. 7 is a section of one of the capped adjusting-nuts removed.

A denotes the bed; B, the pan, which is cast in the bed; C, the housings; D, (appearing in dotted lines only,) the rolls; E, the abutment as a whole, upon which the knife-bar rests; F, the knife-bar; G, the knife, and H the side guides.

The special design of the abutment is not of the essence of my invention, the requirements being simply to provide ample strength to support the knife-bar and knife practically its entire length and at the same time to make the structure as light as is possible without depriving it of necessary strength. In practice the bed, pan, and abutment may be a single casting or a plurality of castings rigidly secured together, as may be deemed best by the manufacturer or may be best adapted to meet the requirements of any special use. The housings in which the rolls are journaled rest upon the bed. At each end of the abutment is a recess 10, which gives clearance to heavy lugs 11, which extend inward from the housings.

12 denotes transverse recesses in the top of the abutment, at the ends of which are larger recesses 13, which receive blocks 14. The knife-bar rests upon the abutment and upon the heavy lugs 11, which extend inward from the housings, and is secured to the abutment

by means of bolts 15, which pass through slots 16 in the top of the abutment and engage the knife-bar, washers 17, placed between the bolt-heads and the surface of the abutment, permitting lateral movement of the bolt in the slot when the bolts are loosened, as in adjusting the knife-bar and knife. The knife-bar is secured to lugs 11 by means of bolts 18, which pass through slots 19 in the knife-bar and through the lugs, washers 17 being provided between the bolt-heads and the knife-bar and the nuts 20 upon the bolts engaging the under side of the lugs.

21 denotes heavy lugs upon the under side of the knife-bar, which lie in the transverse recesses 12.

22 denotes headless bolts threaded at both ends, which extend through the lugs 21 and the blocks 14, as clearly shown in Fig. 6. These bolts, which for convenience I will term "adjusting-bolts," are secured to and held central in lugs 21 by means of nuts 23, which engage the opposite sides of the lugs. At each end of each adjusting-bolt is an adjusting-nut 24. The peculiarity of construction of these nuts is that they are provided on their outer faces with caps 25, which receive the ends of the bolt freely, giving ample room for the nuts to be turned down on the bolts in adjusting the knife-bar, but completely covering and protecting the ends of the bolts, so that it will be impossible for cane-juice and bagasse to get to the bolt-threads and set the nuts thereon by oxidation, which has been a serious cause of difficulty in sugar-mills as heretofore constructed.

An important feature of construction of the knife-bar is that the vertical surfaces 26 run into inclines 27, so that the fine bagasse that sometimes leaks from the knife is conducted off and caused to drop into the pan, and there will be no place for bagasse to collect and harden, so as to interfere with the adjustment of the knife-bar and knife.

As indicated in Figs. 4 and 5, the cane is fed in at the right and passes first between the right roll and the upper roll and is then conducted by the knife forward and upward, so that it will pass between the upper roll and the left roll, so that the cane is acted upon twice by the three rolls. In practice the knife is set up close against the right roll, so that it will be impossible for any cane to follow the right roll, and thus escape passing between the upper roll and the left roll. As there is constant and appreciable wear upon the knife, it follows that the knife not infrequently requires to be moved slightly nearer to the right roll. It is to permit this adjustment to be made in a simple and convenient manner that I have devised this improved knife-bar and abutment.

The knife is rigidly secured to the knife-bar by means of bolts 28, whose heads are countersunk in the operative surface of the knife, as clearly shown in Figs. 2, 3, and 5, and which pass through a portion of the knife-

bar and are locked in place by nuts and set-nuts, which I have indicated by 29. At each end of the knife is a recess 30 and groove 31, which receive the side guides H. These side guides are provided on their under sides with ribs 32, which engage the grooves and prevent the possibility of lateral displacement of the side guides. The side guides are secured in place by means of bolts or screws 33, which pass through the side guides and engage the knife. In practice the sides of the guides H taper inward and forward, so as to prevent the mass of cane that has been crushed by the right and upper rolls from spreading outward and to insure that the entire mass passes between the upper and the left rolls. The upper roll is provided with a flange 34, (see dotted lines, Fig. 1,) which lies outside of the guide and in connection therewith insures the passage through the rolls of all the cane that is fed to the mill.

The means of attachment of the side guides to the knife and of the knife to the knife-bar do not require to be disturbed in use. In order to adjust the knife-bar and knife, it is simply necessary to slightly loosen bolts 15, which secure the knife-bar to the abutment and which pass through slots in the abutment, and bolts 18, which secure the knife-bar to the housing-lug and which pass through slots in the knife-bar, and then to tighten one or the other, as may be, of the adjusting-nuts on the adjusting-bolts (ordinarily, of course, the left nuts, as seen in Fig. 6) to move the knife-bar sufficiently to place the knife in the desired position relatively to the first roll—i. e., the right roll—as seen in the drawings. After adjustment the other adjusting-nut is of course tightened up to lock the adjusting-bolts, and with them the knife-bar and knife, in position after adjustment.

Having thus described my invention, I claim—

1. In a device of the character described the combination with an abutment having transverse recesses 12 and recesses 13, of a knife-bar having lugs lying in recesses 12, blocks lying in recesses 13, headless double-threaded adjusting-bolts carried by the knife-bar and passing through the blocks, and nuts engaging the ends of the adjusting-bolts whereby the knife-bar may be moved laterally.

2. In a device of the character described the combination with an abutment having transverse recesses 12 and recesses 13, of housings having lugs 11, a knife-bar having lugs lying in recesses 12 and slots 19, blocks lying in recesses 13, headless double-threaded adjusting-bolts carried by the knife and passing through the blocks, nuts engaging the ends of the adjusting-bolts, and bolts 18 which pass through slots 19 and engage the lugs.

3. In a device of the character described the combination with an abutment having transverse recesses 12, recesses 13, and slots 16, of a knife-bar having lugs lying in recesses 12, bolts which pass through slots 16 and engage

the knife-bar, blocks lying in recesses 13, headless double-threaded adjusting-bolts carried by the knife-bar and passing through the blocks, and capped nuts engaging the ends
5 of the adjusting-bolts.

4. In a device of the character described the combination with an abutment, E, of a knife-bar, as F, having lugs 21, blocks 14, headless double-threaded adjusting-bolts rigidly se-
10 cured in lugs 21 and passing through the blocks, and nuts engaging the ends of the adjusting-bolts and bearing on the blocks.

5. In a device of the character described the combination with the bed and abutment E
15 having transverse recesses, of knife-bar F having lugs lying in said recesses, blocks at

the ends of said recesses, headless double-threaded adjusting-bolts passing through said lugs and blocks, nuts on opposite sides of said lugs, and nuts 24 engaging the blocks. 20

6. In a device of the character described the combination with the bed, abutment E and knife-bar F laterally movable thereon, of knife G, having recesses 30 and grooves 31, and side guides H rigidly secured in said re-
25 cesses and grooves.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW B. CLEMENS.

Witnesses:

DAVID R. BOWEN,
CHAS. B. FOSTER.