

No. 883,459.

W. J. HAGMAN.
CYLINDER BORING MACHINE.
APPLICATION FILED JAN. 18, 1908.

PATENTED MAR. 31, 1908.

2 SHEETS—SHEET 1.

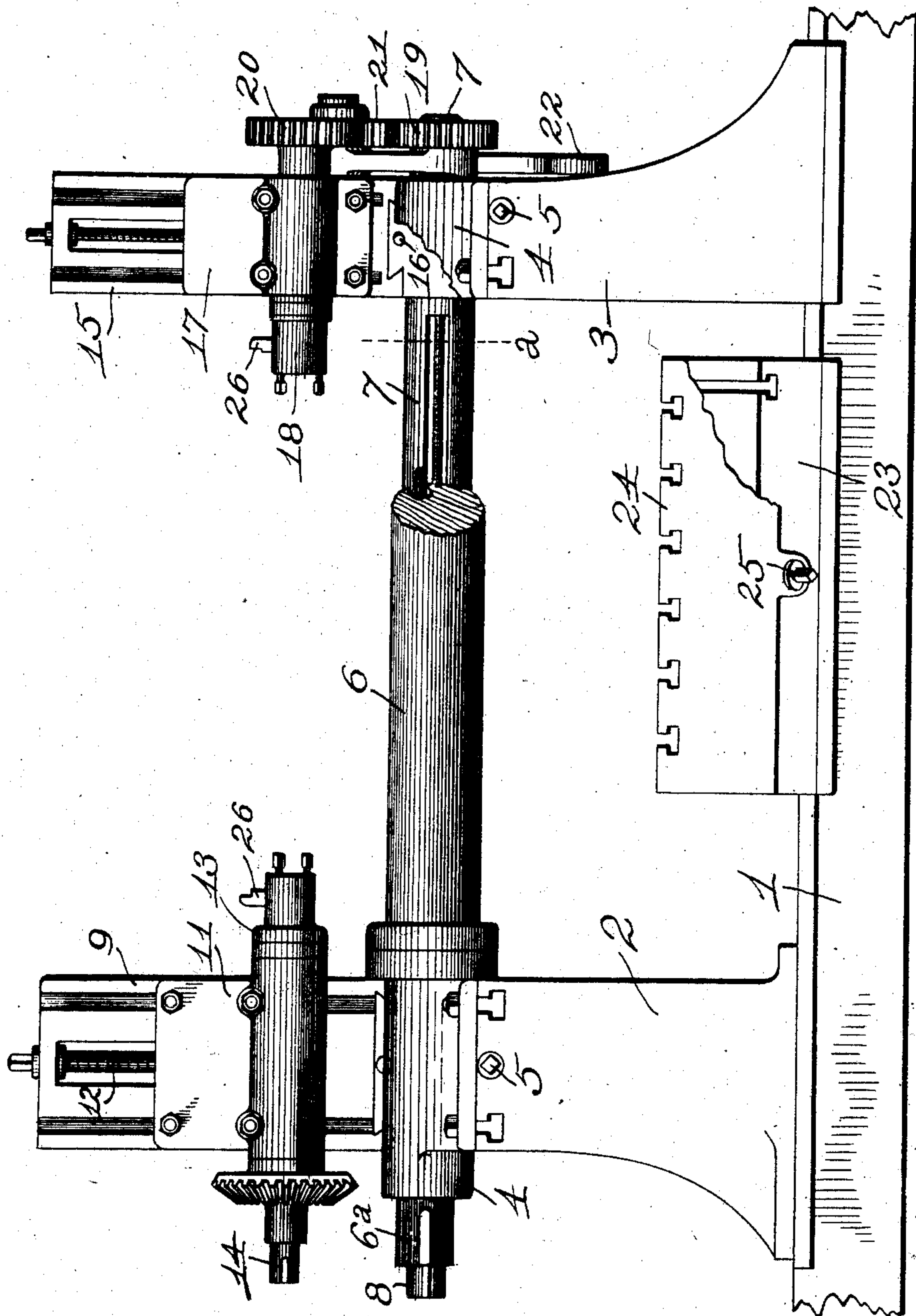


Fig. 1.

Witnesses:
Elmer R. Shipley.
M. S. Belden.

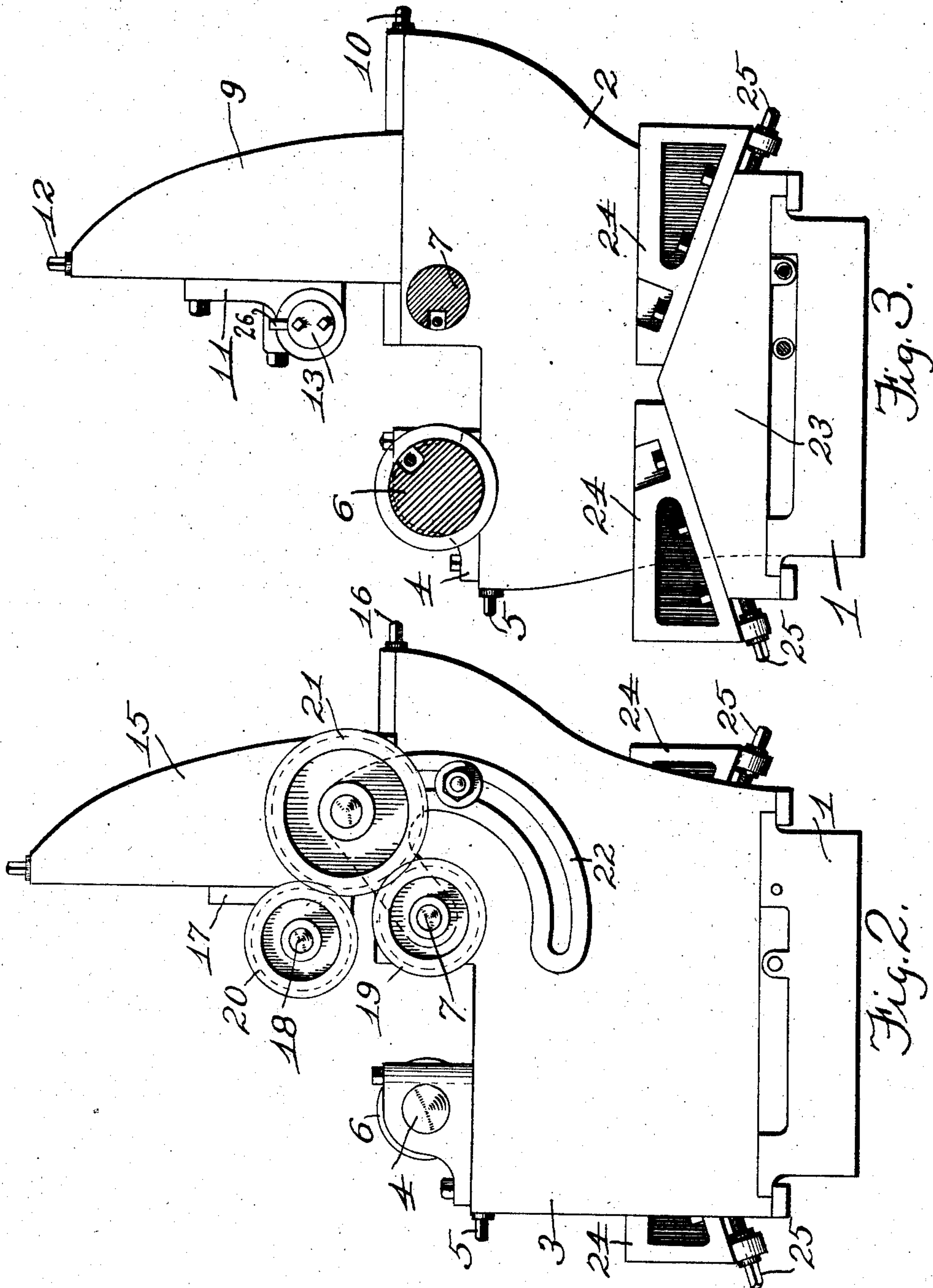
William Joseph Hagman
Inventor
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UNITED STATES PATENT OFFICE.

WILLIAM JOSEPH HAGMAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NILES
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CYLINDER-BORING MACHINE.

No. 883,459.

Specification of Letters Patent.

Patented March 31, 1908.

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To all whom it may concern:

Be it known that I, WILLIAM JOSEPH HAGMAN, a citizen of the United States, residing at Philadelphia, Philadelphia county, Pennsylvania, have invented certain new and useful Improvements in Cylinder - Boring Machines, of which the following is a specification.

This invention pertains to improvements in machines for boring steam engine cylinders, such as cylinders of locomotives having a cylindrical steam chest disposed parallel with the cylinder and having pipe connections presenting their ends at the ends of the cylinder and having their axes parallel with the axis of the cylinder these pipe connections not extending through from one to the other.

The improvements will be readily understood from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a front elevation of a cylinder boring machine exemplifying my invention, the driving mechanism being omitted, and the main boring bar being broken away to show the secondary bar in its rear: Fig. 2 an end elevation of the same, showing the end appearing at the right of Fig. 1: and Fig. 3 a similar end elevation with the right-hand housing omitted and the main and secondary boring bars appearing in vertical transverse section in the plane of line *a* of Fig. 1.

In the drawings:—1, indicates the bed-plate of the machine: 2, one of the housings projecting upwardly therefrom: 3, the other housing, shown as arranged for adjustment longitudinally on the bed-plate: 4, a bearing mounted for adjustment on each housing in a horizontal path at right angles to the axes of the boring bars: 5, screws in the housings for adjusting these bearings: 6, the main boring bar, journaled in the bearings 4, this bar to have the construction and provision usual in the boring bars of cylinder boring machines: 6^a, a projection from one end of this main boring bar for the reception of the usual driving gear: 7, the secondary boring bar having its ends journaled in the two housings parallel with the main boring bar, this secondary boring bar having a diameter less than that of the main boring bar so as to adapt it to deal with the cylindrical steam-chest of such a cylinder as has been referred to: 8, the pro-

jecting end of the secondary boring bar 7 for the reception of the usual driving gear for driving this bar: 9, a super-housing provided with a vertical face and mounted for sliding motion horizontally on the upper portion of housing 2: 10, a screw for adjusting the super-housing 9 in a direction to and from the axis of the main boring bar 6: 11, a bearing-bracket mounted for vertical sliding motion on the vertical face of super-housing 9: 12, a screw for vertically adjusting this bearing-bracket: 13, a tool-bar journaled in the bearing-bracket 11: 14, the projecting outer end of this tool bar for the reception of a driving gear: 15, a super-housing mounted for horizontal adjustment on the top of housing 3: 16, a screw for horizontally adjusting this super-housing: 17, a bearing-bracket mounted for vertical adjustment on the super-housing 15 by means of a screw after the manner of bearing bracket 11: 18, a tool-bar journaled in bearing-bracket 17: 19, a gear fast on an end of secondary boring bar 7 projecting outwardly beyond housing 3 in which that bar is journaled: 20, a gear fast on the outer end of tool-bar 18 and disposed in the vertical plane of gear 19: 21, an intermediate gear engaging gears 19 and 20: 22, an adjustable tumbler carrying gear 21 and serving in adjusting that gear for engagement with gear 20 in the varying vertical positions of the latter: 23, a table-base mounted for sliding motion longitudinally on the bed-plate between the two housings and having its upper surface sloping downwardly in opposite directions from the transverse center of the table-base: 24, super-tables having their bases resting on the sloping upper surfaces of the table-base, the upper surfaces of these two super-tables being horizontal, and the super-tables being mounted for adjustment up and down the sloping surfaces on which they rest: 25, screws for adjusting the super-tables up and down the slopes of the table-base: and 26, facing cutter secured at the inner ends of tool-bars 13 and 18.

The cylinder to be bored is secured to the upper surfaces of the super-tables, those two tables having their levels adjusted relative to the boring bars and relative to each other by being adjusted upon the slopes of the table-base, thus permitting the general work-holding table to adapt itself to the under side of a cylinder casting whose main

body has one size and its steam-sheet a somewhat different size. Some of the adjustments of the cylinder-casting will be made by blocks or saddles upon the tables but the independent adjustment of the two tables provides for a nice adjustment of the axes of the cylinder and the steam-chest into coincidence with the horizontal plane of the two boring bars.

The casting is to be so adjusted transversely of the machine that the axis of the steam-chest will coincide with the axis of secondary boring bar 7, and the bearings of main boring bar 6 are to be adjusted to or from the secondary boring bar so as to bring the main boring bar concentric with the cylinder. Under these conditions the two boring bars may act upon the casting, the main boring bar boring and facing the cylinder while the secondary bar bores and faces the steam-chest, it being understood that these two boring bars will be provided with the usual boring and facing accessories.

The facing of the ends of the pipe-connections of the casting cannot be done by means of a single bar, owing to the fact that there is no passage extending axially from one of these pipe connections to the other. Housings 9 and 15 are to be adjusted transversely of the machine to bring tool-bars 13 and 18 into the vertical planes of the ends of the pipe-connections to be faced, and bearing-brackets 11 and 17 are to be adjusted vertically upon their housings to bring the tool-bars into the horizontal planes of the ends of the pipe connections which they are to face. The ends of the pipe-connections are then to be faced by means of the facing tools 26. The gearing arrangement causes motion to be transmitted from the secondary boring-bar to tool-bar 18, and the gears 19, 20 and 21 in connection with the tumbler provide for the varying position of the axis of tool-bar 18. The gearing arrangement illustrated for getting motion to tool bar 18 represents the best that has thus far come within my contemplation.

I claim:—

1. A cylinder boring machine comprising, a bed-plate, a pair of housings mounted thereon, a bearing mounted for horizontal adjustment on each housing, a main boring-bar journaled in said bearings, a secondary boring-bar journaled in the housings parallel with the main boring-bar, a super-housing mounted for adjustment on one of the housings transversely of the bed-plate, a bearing-bracket mounted for vertical adjustment on

the super-housing, a tool-bar journaled in said bearing bracket and adapted to carry a facing tool at its inner end, and means for transmitting rotation to said boring bars and tool-bar, combined substantially as and for the purpose set forth.

2. A cylinder boring machine comprising, a bed-plate, a pair of housings mounted thereon, a bearing mounted for horizontal adjustment on each housing, a main boring-bar journaled in said bearings, a secondary boring-bar journaled in the housings parallel with the main boring-bar, super-housings mounted for adjustment on the housings transversely of the bed-plate, bearing brackets mounted for vertical adjustment on the super-housings, tool-bars journaled in said bearing brackets and adapted to carry facing tools at their inner ends, and means for transmitting rotation to said boring bars and tool-bars, combined substantially as and for the purpose set forth.

3. A cylinder boring machine comprising, a bed-plate, a pair of housings mounted thereon, a bearing mounted for horizontal adjustment on each housing, a main boring-bar journaled in said bearings, a secondary boring-bar journaled in the housings parallel with the main boring-bar, super-housings mounted for adjustment on the housings transversely of the bed-plate, bearing-brackets mounted for vertical adjustment on the super-housings, tool-bars journaled in said bearing brackets and adapted to carry facing tools at their inner ends, a gear fast on the outer end of one of the boring-bars, a gear fast on one of the tool-bars, an intermediate gear engaging said two gears, and an adjustable tumbler carrying said intermediate gear, combined substantially as and for the purpose set forth.

4. A cylinder boring machine comprising, a bed-plate, a pair of housings mounted thereon, a main boring-bar and a secondary boring-bar supported by said housings, a table-base mounted for adjustment on the bed-plate between the housings and having sloping upper surfaces, super-tables secured to said sloping surfaces over the table-base and having horizontal upper surfaces, and means for adjusting the super-tables up and down said sloping surfaces, combined substantially as and for the purpose set forth.

WILLIAM JOSEPH HAGMAN.

Witnesses:

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R. RAYMOND PORTER.