

No. 656,304.

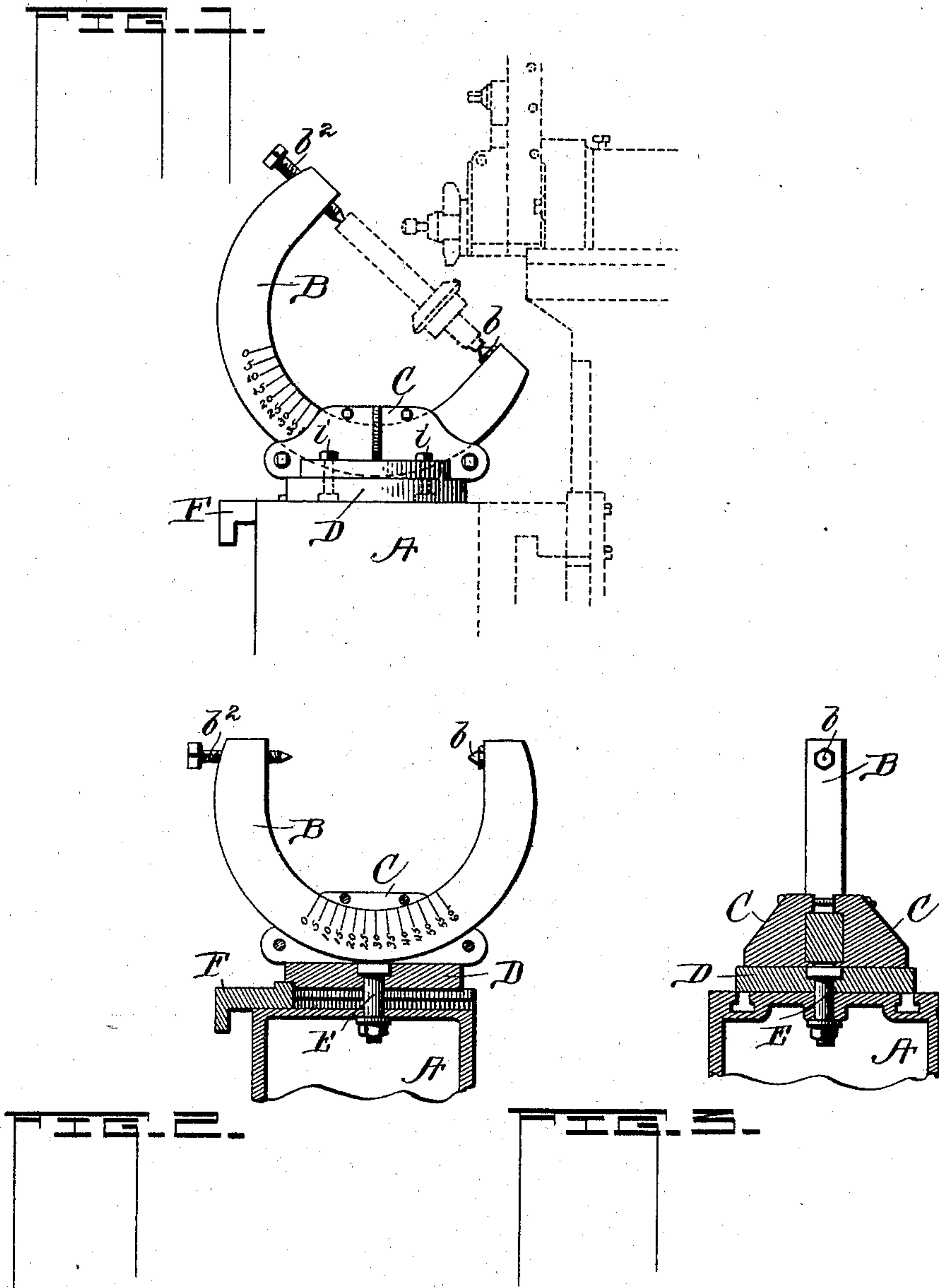
Patented Aug. 21, 1900.

J. SOMMER.
GEAR CUTTING MACHINE.

(Application filed Aug. 26, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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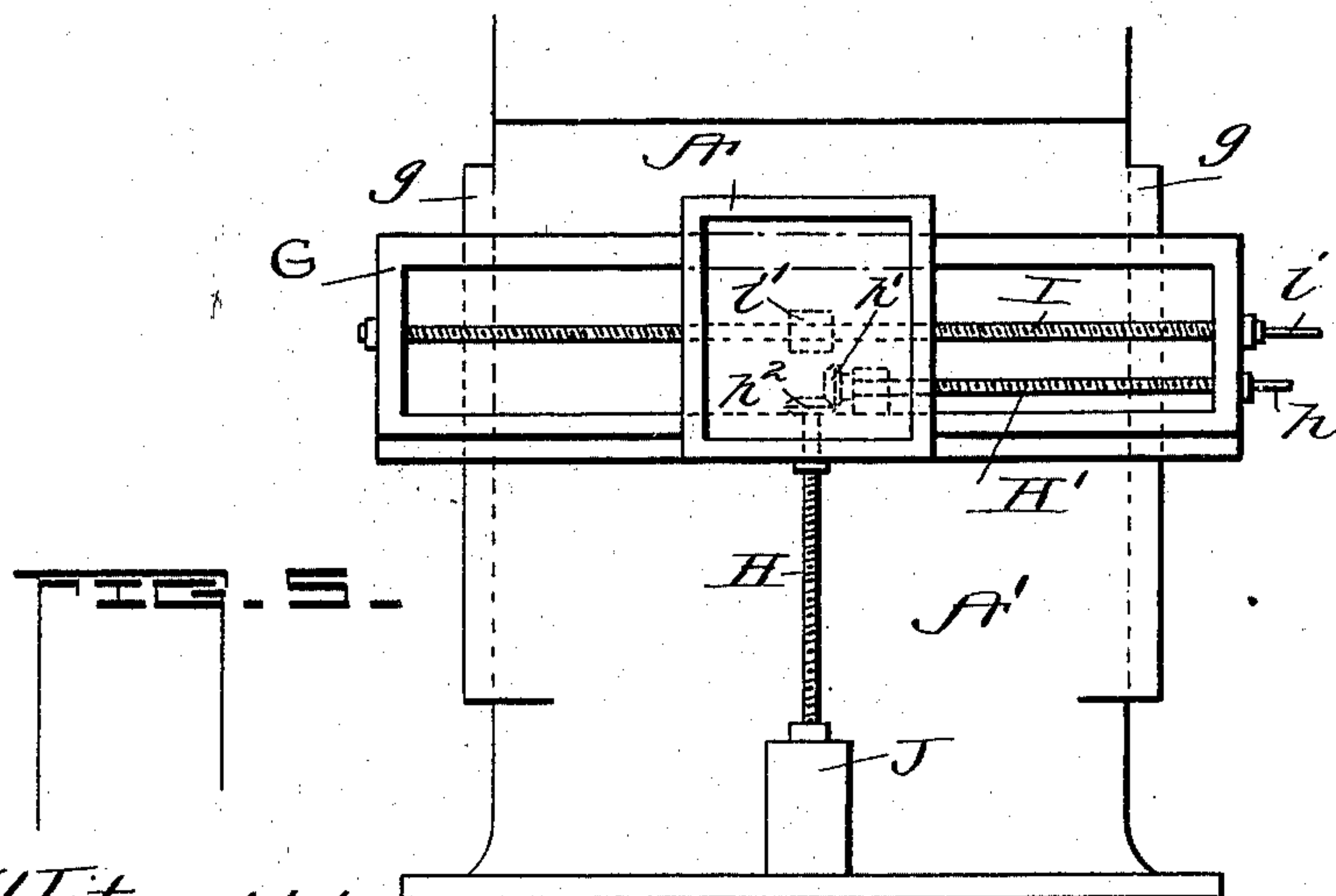
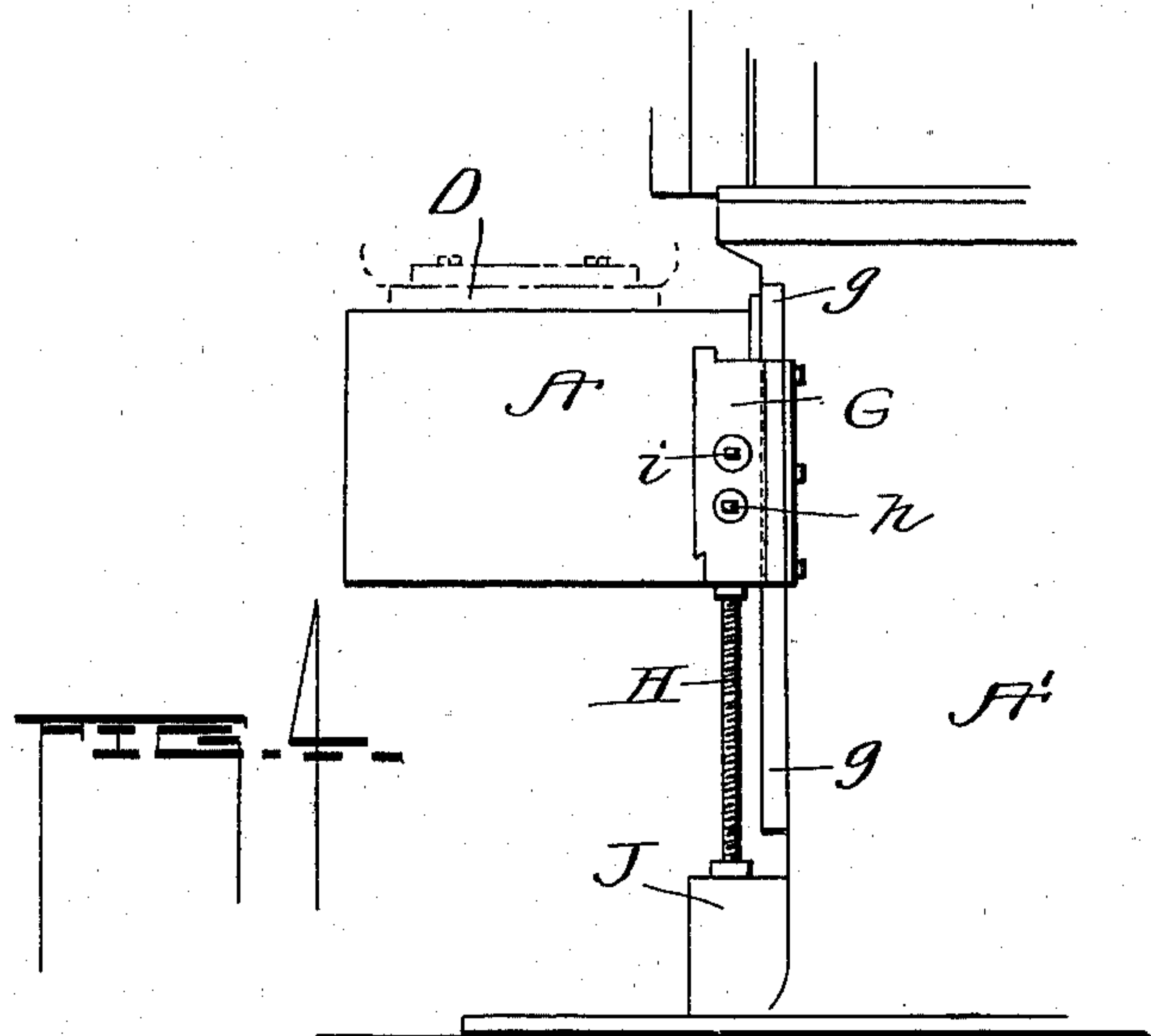
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOHN SOMMER, OF PEORIA, ILLINOIS.

GEAR-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 656,304, dated August 21, 1900.

Application filed August 26, 1899. Serial No. 728,545. (No model.)

To all whom it may concern:

Be it known that I, JOHN SOMMER, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have
5 invented certain new and useful Improvements in Gear-Cutting Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to
10 which it appertains to make and use the same.

My invention relates to new and useful improvements in gear-cutting machines by means of which a simple device is provided that materially adds to the accuracy of the
15 work and also simplifies it materially.

More particularly my invention relates to a means for supporting the gear-wheel in proper position to be worked upon by a cutting-tool in the machine and to accommodate
20 ready and easy adjustment of a gear-wheel to obtain the proper angles in cutting bevel-gears.

My invention consists principally of an adjustable arc-formed support for the gear-wheel, the gear-wheel fixed upon a shaft, and the shaft purposed to be engaged at its respective ends by engaging means located at or near the ends of the arc-support.

Incidentally my invention relates to a gage upon the arc-formed piece, to the means provided for supporting the said arc-formed piece to accommodate an adjustment of the same within the support, and to various details of construction that will hereinafter be described, and pointed out in the claims.
35

That my invention may be more fully understood reference is had to the accompanying drawings, in which—

Figure 1 is a side elevation of my device, the figure also showing part of a planer in dotted lines for the purpose of illustrating the application of my device thereto. Fig. 2 is also a side elevation of the arc-formed part of the device, the figure showing also a vertical section of supporting and other minor parts. Fig. 3 is a vertical cross-section of the same. Fig. 4 is a side elevation of the forward front portion of an ordinary planing-machine and showing the adjustable table
45 on which the gear-cutter is mounted. Fig. 5 is a front elevation of that portion of the machine shown in Fig. 4.

A' is the main framework of an ordinary planing-machine, upon which the working parts of my device are mounted. 55

A is a vertically horizontally adjustable table.

g represents flanges on the sides of the main frame A', and G is a rectangular frame arranged to have a dovetail connection with the flanges *g*, to be vertically adjustable and is further arranged to have a dovetail connection with the table A that the table may be adjusted horizontally on the frame G. 60

I refers to a threaded shaft journaled, as shown, in the frame G and has the reduced square end portion *i* and is arranged to engage the nut *i'* on the inner face of the table A, as shown in Fig. 5. 65

H' is a short threaded shaft similar to the shaft I and is journaled, as shown, in the frame G and provided with the square end portion *h* on its outer end and with the beveled pinion *h'* on its inner end, which is arranged to engage the beveled pinion *h²* on the upper end of the threaded shaft H, which passes down through the frame G and engages the nut J at the base of the forward part of the frame A'. Thus it will be seen that by applying suitable means for rotating the shaft I a horizontal movement will be imparted to the table A, and if it is desired to adjust the same vertically the shaft H' may be rotated, imparting motion to the shaft H, which will cause the frame G, with the table A attached thereto, to be adjusted vertically. 70 75 80 85

The dotted lines in Fig. 1 show the usual and ordinary parts of a planing-machine, which consists of a stationary bed-frame, upon which a reciprocating frame is mounted, that carries the cutting-tool. 90

A is a vertically and horizontally adjustable frame part of the machine adapted to support mechanism for holding gear-wheels or other articles being worked upon in proper position to be cut by the reciprocating cutting-tool. 95

B is a semicircular protractor and support for gear-wheels or other articles being worked upon and is provided with a scale upon one of its faces, as shown in the drawings. 100

b is a spur on the protractor for engaging one end of a bar supporting a gear-wheel, and *b²* is a screw-bolt supported in a threaded

perforation in the protractor and is provided with a spur-point for engaging the opposite end of the bar that supports the gear-wheel to be screwed down upon the end of the bar to hold it in a fixed position and to be unscrewed for the purpose of turning the bar or for removing it entirely.

C C are clamping jaws or plates adapted to engage the protractor and maintain it in any desired position and to release it for the purpose of obtaining other adjustments. I have shown these jaws or plates connected by bolts, but they may be connected in any suitable manner to facilitate in the engagement or released thereby of the protractor. D is a plate to which the jaws C C are fixed by means of bolts, as *i i*, said bolts bearing through perforations in flanges at the base of the respective jaws and connecting with plate D in the manner shown in Fig. 1. Plate D has a central perforation which matches with an opening in the bed-frame A, and E is a bolt connecting the parts and adapted to secure plate D upon frame A.

F is a key, and a keyway is provided in the top of the frame part A and in the bottom part of plate D, whereby when the key F is inserted in the keyway thus formed the plate D will be held from lateral displacement on the frame part A.

In applying my device for practical operation a bar supporting a wheel upon which gears are purposed to be cut is securely fixed between the fixed and movable spurs *b b*², and the protractor is adjusted so as to give the wheel the proper pitch to insure the cutting of the gear at the desired angles, and the bed-frame A is then adjusted to bring the wheel in proper position to be acted upon by the reciprocating cutting-tool, and the reciprocating frame being set in motion and the bed-frame A being gradually fed up to the tool and likewise moved laterally, which movement may be obtained either automatically through the action of parts of the machine provided for that purpose or by the operator. The operation being continued, the periphery of the wheel will be gradually cut away to provide the space between the teeth, and the wheel may then be turned to the next step in the cutting process, and so on until the gear-wheel is fully formed.

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

1. In a gear-cutting machine, the combination, with the plate D, and the clamping-jaws C C, of the semicircular protractor provided with the fixed spur *b*, and the adjustable spur *b*², carrying a revoluble spindle adapted to receive and hold a gear-blank, all substantially as described and shown.

2. In a gear-cutting machine, the combination, of the following elements, namely: a re-

ciprocating tool-head mounted to slide in a suitable frame and suitably driven and carrying a cutting-tool, a peripherally-supported semicircular protractor marked with a scale on one side and provided with suitable spurs at its ends purposed to engage and hold a revoluble spindle adapted to receive and hold a gear-blank in the path of movement of the said cutting-tool, a pair of clamping-jaws adapted to engage and hold the protractor at the desired angle, all substantially as described and shown.

3. In a gear-cutting machine, the combination, with the jaws C C, mounted upon the horizontally-adjustable plate D, of the semicircular peripherally-supported adjustable protractor B, having at one end the fixed spur *b*, and at the other end the adjustable spur *b*², whereby a revoluble spindle is held between the ends of the protractor at any desired angle adapted to receive and hold a gear-blank in the path of movement of a cutting-tool, all substantially as described and shown.

4. A gear-cutting machine, consisting, of a vertically-adjustable bed-frame A, the horizontally-adjustable plate D, the jaws C C, the semicircular, adjustable protractor B, supported at its rim portion in jaws C C, and provided with the fixed spur *b*, and the adjustable spur *b*², adapted to hold a revoluble spindle at any desired angle upon which is purposed to be supported a gear-blank, and a reciprocating tool-head mounted to slide in a suitable frame, all substantially as described and shown.

5. In a gear-cutting machine, the combination, of the horizontally-adjustable plate D, mounted upon the vertically-adjustable bed-frame A, and provided with the locking-key F, the jaws C C, pivotally supported upon plate D, by means of bolt E, the semicircular, adjustable protractor B, provided with a scale on the side and also provided with the fixed spur *b*, and the adjustable spur *b*², adapted to support a revoluble spindle-carrying gear-blank, and a reciprocating tool-head mounted to slide in a suitable frame and carrying a cutting-tool, all substantially as described and shown.

6. In a gear-cutting machine, the combination, with a vertically and horizontally adjustable plate D, and a reciprocating tool-head carrying a tool, of the clamping-jaws C C, and the semicircular protractor B, provided with spurs adapted to engage a gear-blank-carrying spindle, substantially as specified.

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

JOHN SOMMER.

Witnesses:

W. V. TEFET,

P. W. SOMMER.