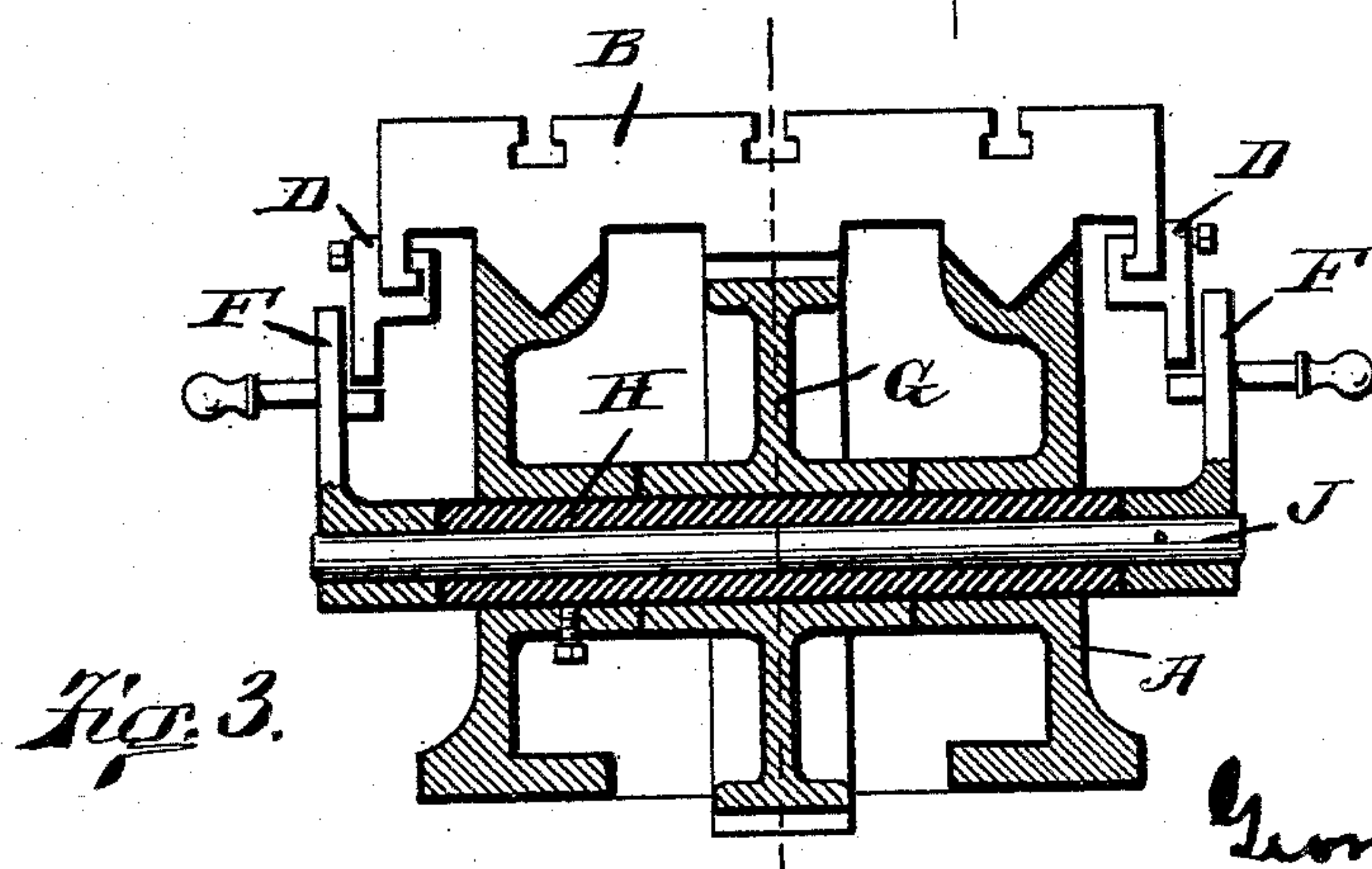
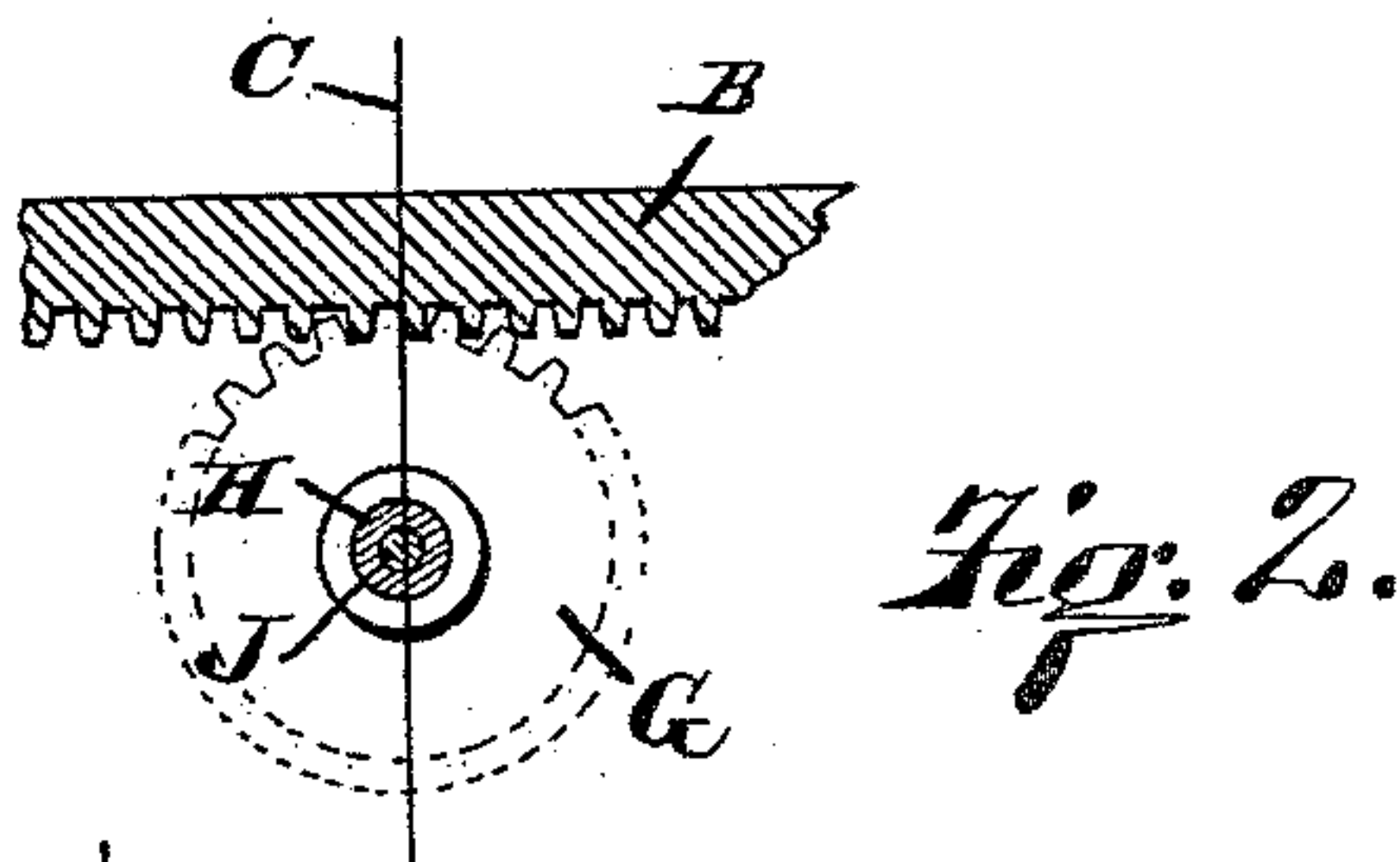
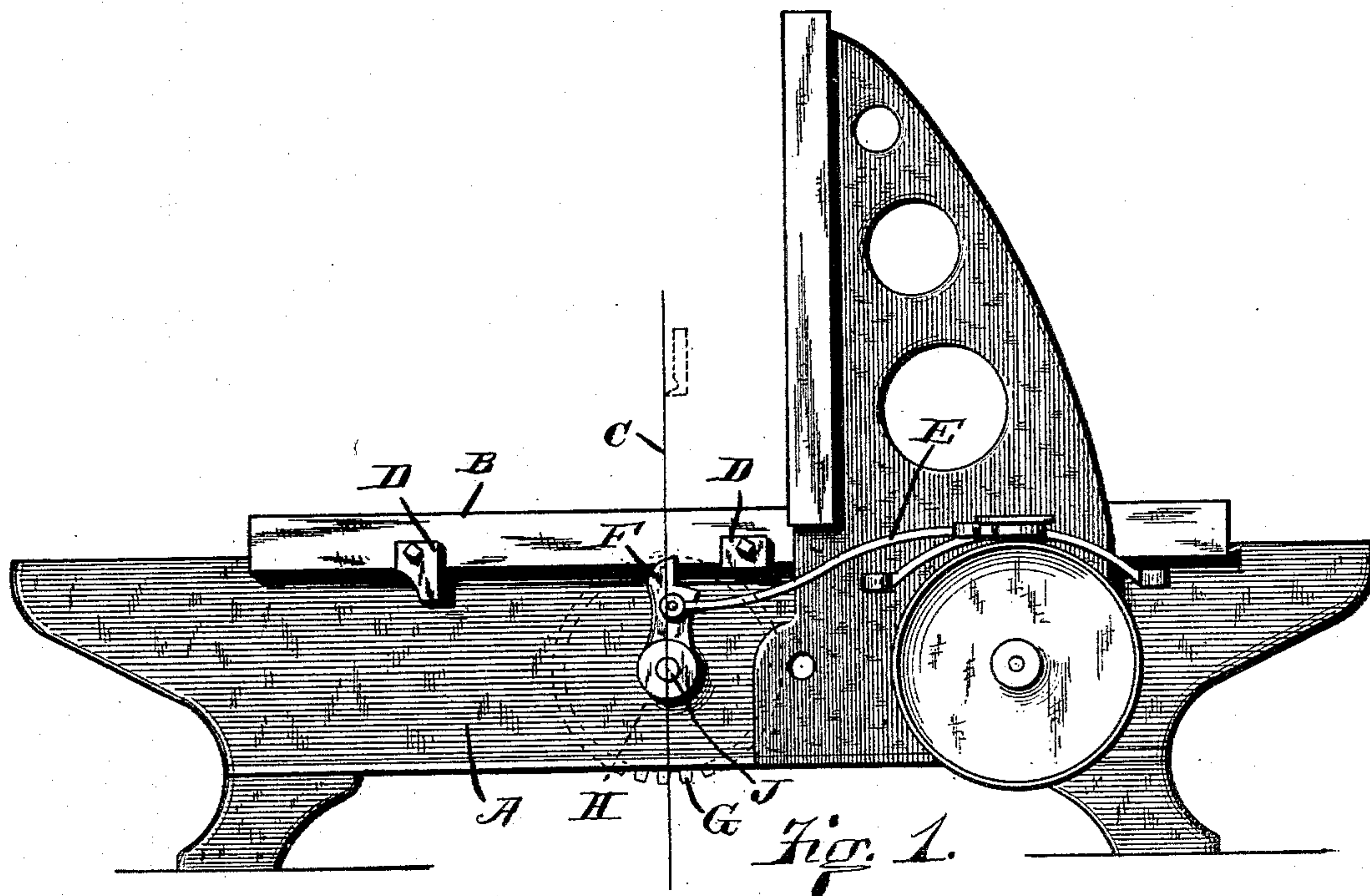


(No Model.)

G. A. GRAY.  
METAL PLANING MACHINE.

No. 401,267.

Patented Apr. 9, 1889.



Witnesses:  
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A. Myers.

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# UNITED STATES PATENT OFFICE.

GEORGE A. GRAY, OF COVINGTON, KENTUCKY, ASSIGNOR TO THE G. A. GRAY COMPANY, OF CINCINNATI, OHIO.

## METAL-PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 401,267, dated April 9, 1889.

Application filed January 17, 1889. Serial No. 296,646. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. GRAY, of Covington, Kenton county, Kentucky, have invented certain new and useful Improvements in Planing-Machines, of which the following is a specification.

This invention pertains to metal-planing machines, and has reference particularly to the device through which the belt-shifting motion is imparted.

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

Figure 1 is a side elevation of a planing machine, or the major parts thereof, illustrating my improvements; Fig. 2, a vertical longitudinal section of a portion of the table, showing its engagement with the bull-wheel; and Fig. 3 a vertical transverse section of the bed upon line C.

In the drawings, A indicates the bed of a planer; B, the usual table of the planer; C, a vertical line, which I will call the "cut-line," this line representing the vertical plane in which the cutting-tool of the planer acts; D, the usual dogs upon the edges of the table, adjustable, as usual, along the table, and serving as a means for determining the stroke of the table or the length of the cut, the dogs at the ends of the stroke actuating the tumbler mechanism which shifts the belts and reverses the direction of motion of the driving mechanism, there being in the illustrations a pair of these dogs upon each edge of the table, so that the workman may adjust his stroke while standing upon either side of the machine, it being understood, of course, that when the dogs upon one edge of the table are in use the dogs upon the other edge are moved so far toward the ends of the table as to be out of action; E, the belt-shifting connection, illustrated as a rod reaching from the tumbler into engagement with belt-shifting device, this rod being constructed and performing its duty in the usual manner; F, the tumblers, which are oscillated by the dogs in the usual manner, and through which oscillations the motion is imparted to the belt-shifting connection, there being in the exemplification one of these tumblers upon each side of the machine, one

for each pair of dogs, the axis of oscillation of the tumblers being in the vertical plane of the cut-line C; G, the usual toothed bull-wheel gearing into the usual rack on the table of the planer and adapted to be operated by the belt-driving mechanism in the usual manner and by the usual means, the axis of this bull-wheel being coincident with the axis of oscillation of the tumblers F; H, the bull-wheel shaft housed in the planer-bed and carrying the bull-wheel, this shaft being illustrated as tubular and of uniform diameter from end to end, and carried in bearings in the planer-bed and capable of endwise adjustment in these bearings; J, a tumbler-shaft axially disposed within the bull-wheel shaft and projecting at each end thereof and having the tumblers fixed to its ends.

In the illustrations the bull-shaft is assumed as a stationary shaft, around which the bull-wheel revolves, the shaft being prevented from rotation or other motion by the usual set-screw, which holds it in fixed relation to its supporting-bearings.

The dogs upon either side of the table will actuate their appropriate tumbler, and either tumbler, being thus actuated, will, through the medium of the tumbler-shaft, oscillate the other tumbler. The belt-shifting connection may be attached to either tumbler, according to which side of the machine carries the belt-shifter and driving-pulleys. Fig. 1 illustrates the planer as having its driving-pulleys upon the front of the machine, the belt-shifting connection being accordingly attached to the front tumbler. Should the machine be constructed with its pulleys or belt-shifter upon the rear of the machine, or after construction of the front arrangement should it be desired to place them upon the rear of the machine, the belt-shifting connection will be transposed to the rear tumbler. Each tumbler has the usual operating-handle, and the workman can thus shift the belt while standing upon either side of the machine.

It is well known to the constructors of planing-machines driven through a bull-wheel that the table at maximum stroke can only move so far in one direction as will bring the extreme end of the rack over the center of the bull-wheel. The center of the bull-wheel



should, therefore, be in the vertical plane of the cut-line, as should also be the axis of oscillation of the tumbler.

The construction and operation of the tumblers for planing-machines involve many of the problems incident to the designing and construction of escapements, and the location of the axis of oscillation of the tumbler is a matter of vast importance, and having been once determined should not be varied. In constructing a number of planing-machines the greatest care and skill are called for in locating the tumbler-axis for each machine, a systematic mode of manufacture involving expensive separate templates for the purpose. In my improved construction the axis of the bull-shaft is the axis of the tumbler, and the constructive location of the axis of the bull-shaft at once effects the location of the tumbler at a proper distance outward from the edge of the table and is a matter of considerable nicety in order to secure the proper side clearance of the dogs. Ordinarily this distance is fixed by a dressed hub-surface or boss upon the side of the planer-bed. Any departure from contemplated dimensions in the facing of this boss upon a half-bed casting, or in the dressing of the planer-table, or that portion of it which receives the dogs, will interfere with the accuracy of the work. In my improved construction there are no fixed surfaces on the bed to control the endwise position of the tumbler-shaft. The bull-shaft may be adjusted endwise to bring the tumblers into proper relationship with the dogs.

I claim as my invention—

1. In a metal-planing machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, and a bull-wheel and an oscillating tumbler having a common axis.

2. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a bull-

wheel, a tubular shaft therefor supported by the bed, a tumbler-shaft journaled axially in the bore of the bull-wheel shaft, and a tumbler on said tumbler-shaft.

3. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a bull-wheel shaft mounted in bearings in the bed of the planer and adjustable endwise therein, and a bull-wheel and tumbler carried thereby upon an axis common to both.

4. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a tubular bull-shaft supported by the bed of the planer, and a bull-wheel at the center of length of said shaft and a tumbler at each end of said shaft, said bull-wheel and both said tumblers having an axis in common.

5. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a tubular bull-wheel shaft supported in bearings in the bed of the planer and adjustable endwise therein, a bull-wheel thereon, a tumbler-shaft axially disposed in the bore of the bull-wheel shaft, and a tumbler secured to each end of the tumbler-shaft.

6. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a bull-wheel shaft, a bull-wheel thereon, a tumbler at each side of the planer adapted to receive a belt-shifting connection alternatively, the axis of oscillation of said tumblers coinciding with the axis of said bull-wheel, and a shaft uniting said tumblers and serving to impart oscillatory motion from one tumbler to the other.

GEORGE A. GRAY.

Witnesses:

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