

T. F. ROWLAND.
 DRILLING BOLT HOLES IN TURRETS OF GUNBOATS.
 No. 38,605. Patented May 19, 1863.

Fig. 1.

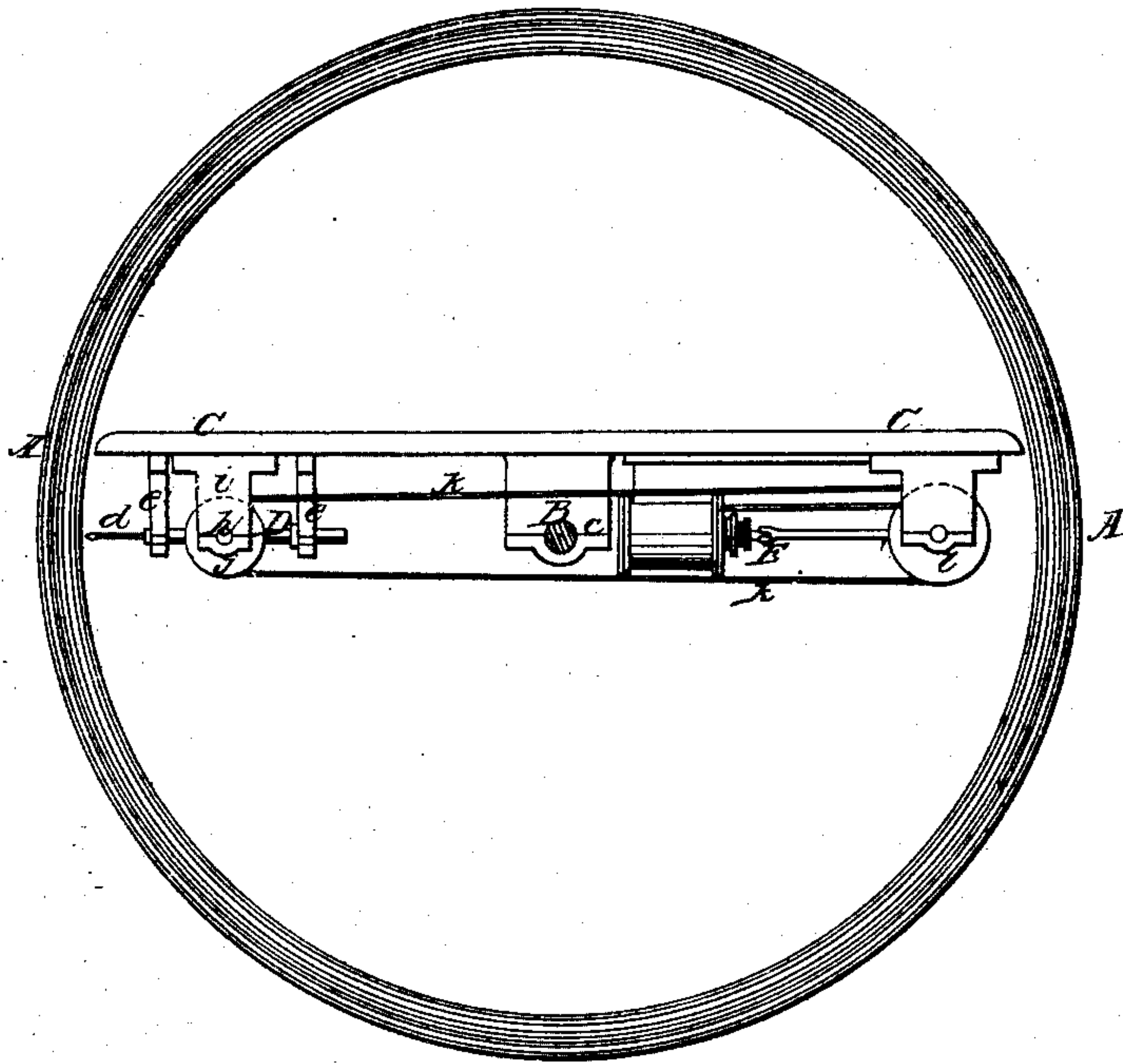
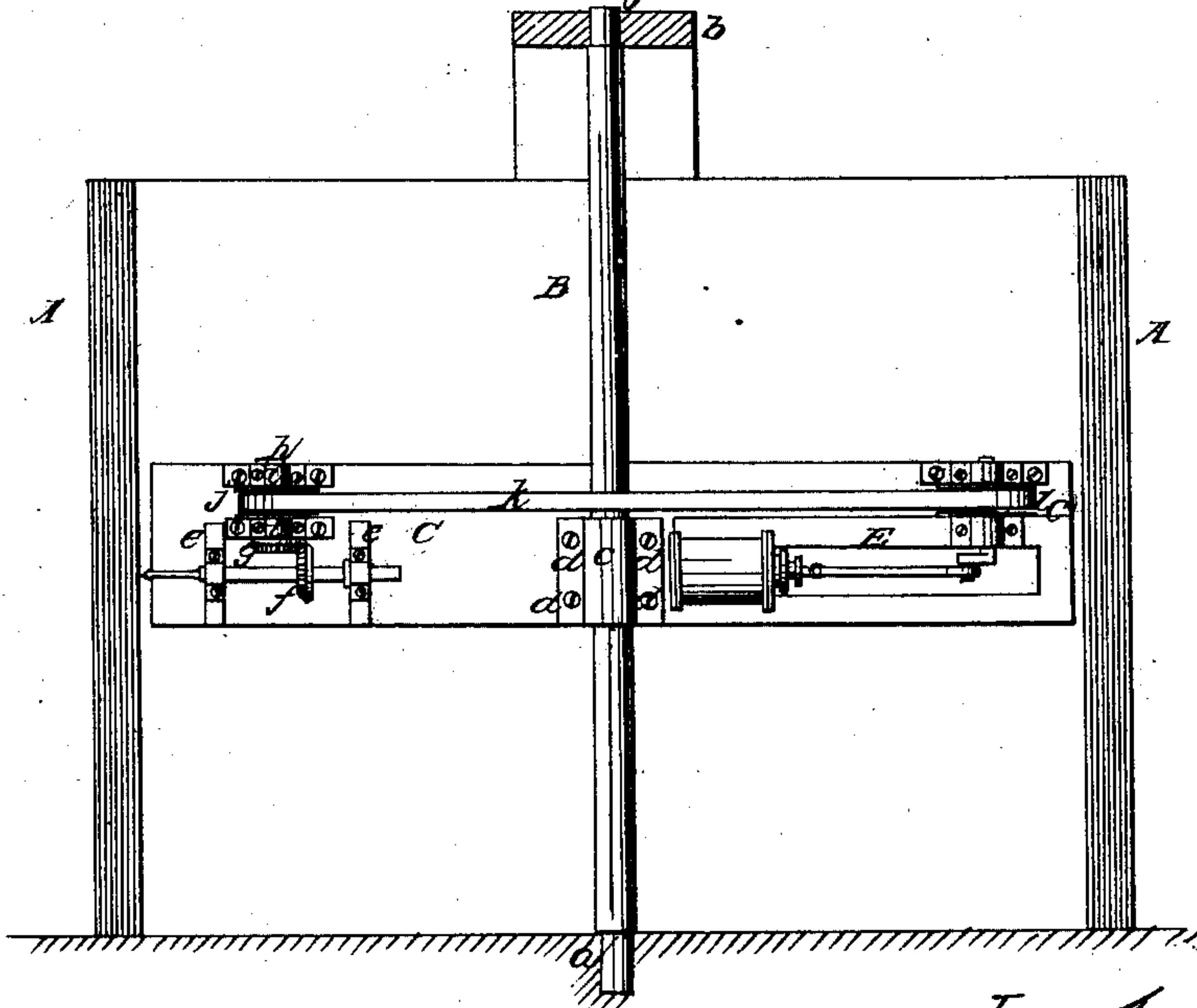


Fig. 2.



Witnesses:
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THOMAS F. ROWLAND, OF GREENPOINT, NEW YORK.

IMPROVEMENT IN DRILLING BOLT-HOLES IN TURRETS OF GUN-BOATS.

Specification forming part of Letters Patent No. 38,695, dated May 19, 1863.

To all whom it may concern:

Be it known that I, THOMAS F. ROWLAND, of Greenpoint, in the county of Kings and State of New York, have invented a new and Improved mode of Drilling or Reaming Bolt-Holes in the Turrets of Gun-Boats and other Circular Structures; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 exhibits a horizontal section of a gun-turret and a top view of the machine employed to drill or ream the holes therein. Fig. 2 exhibits a vertical section of the turret and a front view of the machine.

Similar letters of reference indicate corresponding parts in the two figures.

The object of my invention is to drill the bolt-holes or other holes in a gun-turret or circular structure perfectly radial to the center, and to ream out holes which have been drilled or punched in the plates previously to their being set up, and bring such holes in lapping plates exactly opposite to each other, and radial to the center of the structure.

The invention consists, principally, in the employment for the above purpose of a machine for drilling or reaming, attached to a shaft, which is arranged concentrically to the axis of the turret or structure in bearings above and below it, and which has the axis of the rotating drill or reamer stock perpendicular and radial to the axis of the said shaft, such machine being adjustable upon the shaft lengthwise of the latter, to operate upon the structure at any height, and the shaft being capable of turning to present the drill or reamer in any radial direction.

To enable others skilled in the art to apply my invention to use, I will proceed to describe it with reference to the drawings.

A represents the turret or structure to be operated upon set in an upright position. B represents the central shaft which carries the machine, supported and arranged to turn freely in a step-bearing, *a*, below the turret and in a guide, *b*, above it, the said guide being secured to and supported on the turret itself, or having an independent means of support. C is the frame of the machine, secured rigidly to the shaft B by means of a clamp, *c*, and screws *d d*, or by any other means which

permit of its being raised and lowered upon the said shaft to permit the holes to be drilled at the different heights required. D is the stock which holds the drill or reamer *d*, arranged to work in bearings in brackets *e e*, which are rigidly secured to the frame C, in such a position that the axis of the said stock is perpendicular and radial to the shaft B. The said stock is fitted with a bevel-gear, *f*, which gears with a bevel-gear, *g*, on a short upright shaft, *h*, which works in bearings *i i* secured to the frame, and which is furnished with a pulley, *j*, round which runs a belt, *k*, which runs also on a pulley, *l*, on the crank-shaft of a small steam-engine, E, which is secured rigidly to and carried by the frame C on the opposite side of the shaft B to that on which the tool stock and shaft *h* are arranged. This steam-engine is to be supplied with steam by a flexible pipe from a boiler at a convenient distance, for the purpose of giving rotary motion to the tool-stock D through the agency of the pulleys *j l*, belt *k*, shaft *h*, and bevel-gears *f g*. The bevel-gear *f* is not fast on the tool stock, but fitted to it with a feather and groove to cause it to turn the stock, while permitting the latter to slide longitudinally through it, for the purpose of feeding the drill or reamer. The feeding movement of the stock may be produced by a screw, spring, weight, or other means. By the arrangement of the steam-engine upon the frame, or on the opposite side of the shaft to the drill-stock, and the shaft *h* and their bearings, the frame C is balanced upon the shaft B, so that its weight has no tendency to strain the shaft. This frame should be long enough to reach nearly across the interior of the turret or other structure.

The machine is managed by persons inside of the turret. The operation may be commenced at any elevation by adjusting the machine to the proper height on the central shaft, B, and all the holes on that elevation may be drilled or reamed one after another by turning the machine to the required positions, the shaft B turning freely, and thus allowing the machine to be turned all round the turret. When all the holes at one elevation, or in one horizontal row, have been drilled or reamed, the machine is raised on the shaft and those in another row proceeded with, and so on until all the holes have been finished, and the holes

drilled or reamed in this way cannot fail to be radial to the axis of the turret, which is of great importance. By this mode of reaming the holes in turrets for vessels of war composed of several thicknesses of iron plate, the holes being punched or drilled in the separate plates before they are set up, and the process of reaming being to bring the holes in the lapping plates opposite to each other, and radial to the axis of the turret, a very great saving of labor is effected. With the labor of two men I have in this way reamed all the holes in a turret in two days. The reaming of the holes in a similar turret by hand had previously occupied ten men for fourteen days, and the work could not be so accurately done. The drill or reamer might be worked by other means than by the attachment of a steam-engine directly to the frame of the machine, but the use of the steam-engine so applied for the purpose is, for reasons of convenience and economy, preferable.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The employment for drilling or reaming

holes in the turrets of war-vessels, or in other circular structures radial to the center thereof, of a drilling or reaming machine secured to and adjustable on a shaft, which is arranged centrally within the turret or structure, with the axis of the drill or tool stock perpendicular to the axis of said shaft, substantially as herein described.

2. The driving of the drill or tool stock of a machine so applied upon a central shaft within a turret or other circular structure by means of an engine attached directly to the framing of the machine, substantially as herein specified.

3. The arrangement of the so-applied engine upon the frame of the machine on the opposite side of the shaft to that on which the drill or tool stock is applied for the purpose of balancing the frame upon the shaft, substantially as herein set forth.

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Witnesses:

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