J. B. Eads.

Sheet 1. 2 Sheets.

Turrets.

No. 46223

Fig. 1. Patented Feb. 7. 1865

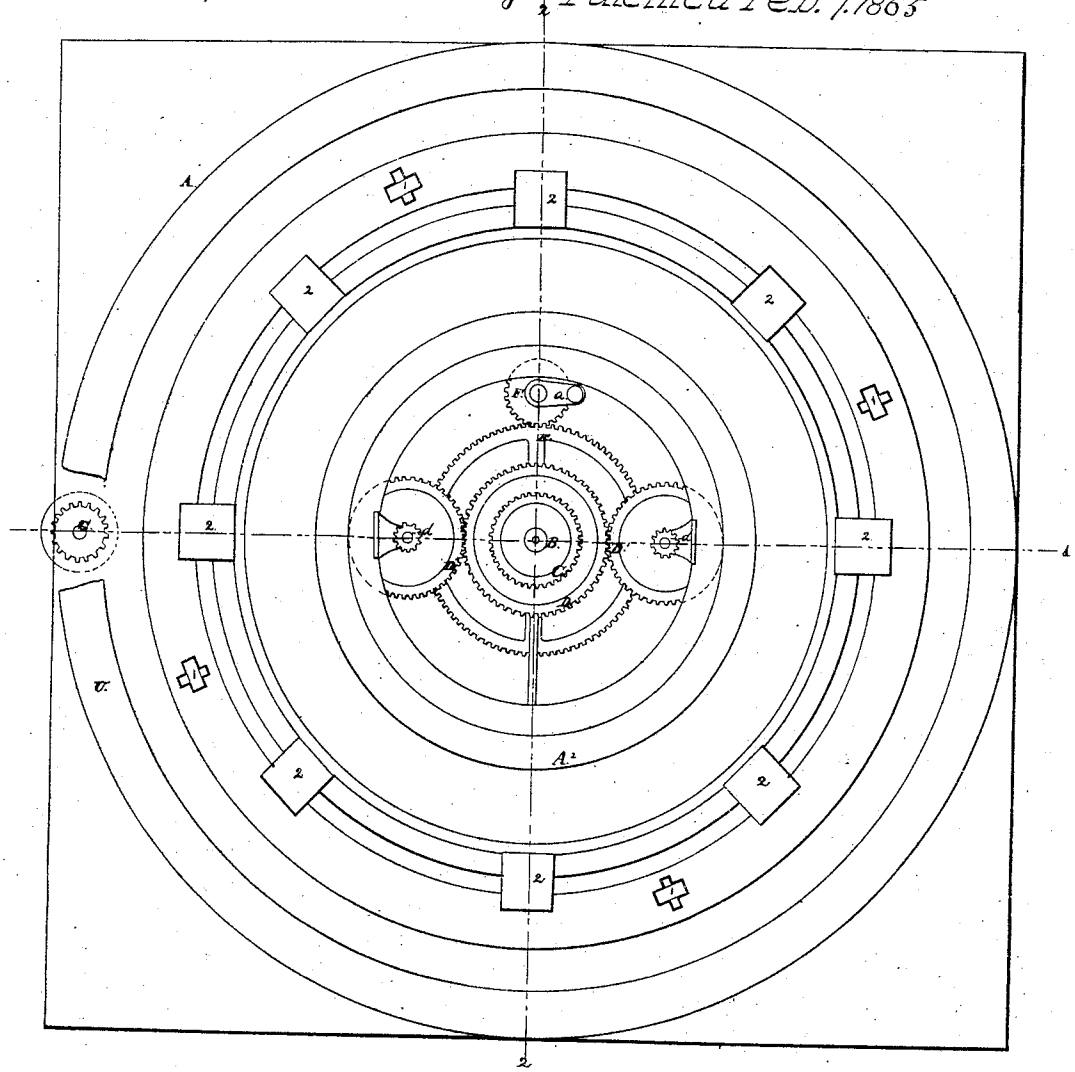
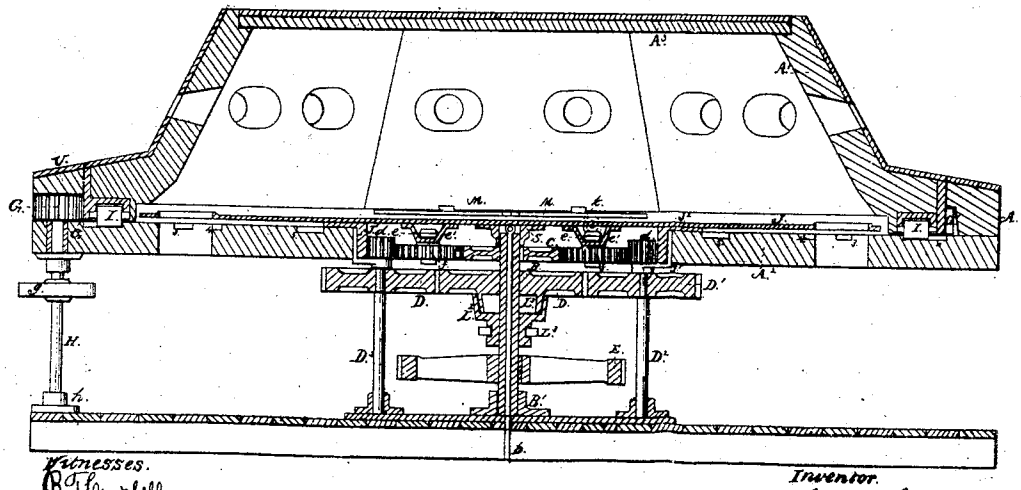


Fig. 2.



Witnesses.
B. F. Campbell
H. Locke

Inventor.
James B. Eads
By Munn & Co Attys

J. B. Eads.

Sheet 2 2 Sheets.

Turrets.

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Patented Feb. 7, 1865.

Fig. 3.

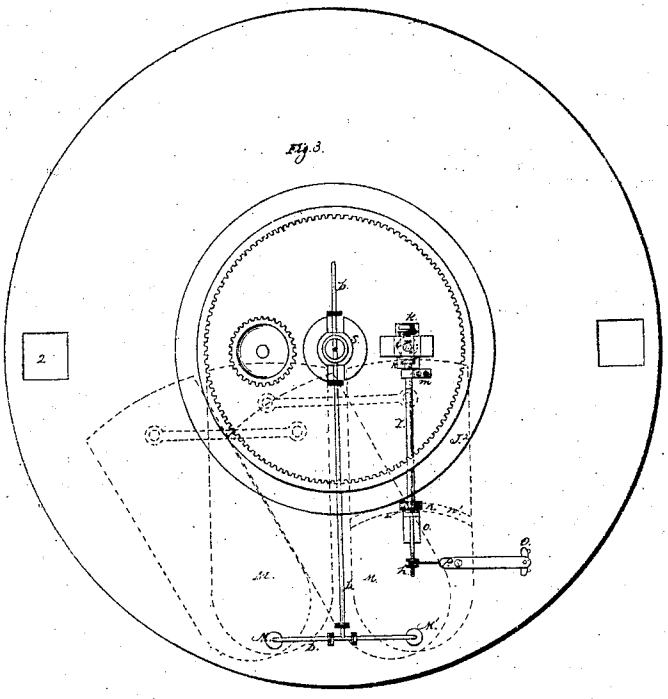


Fig. 4.

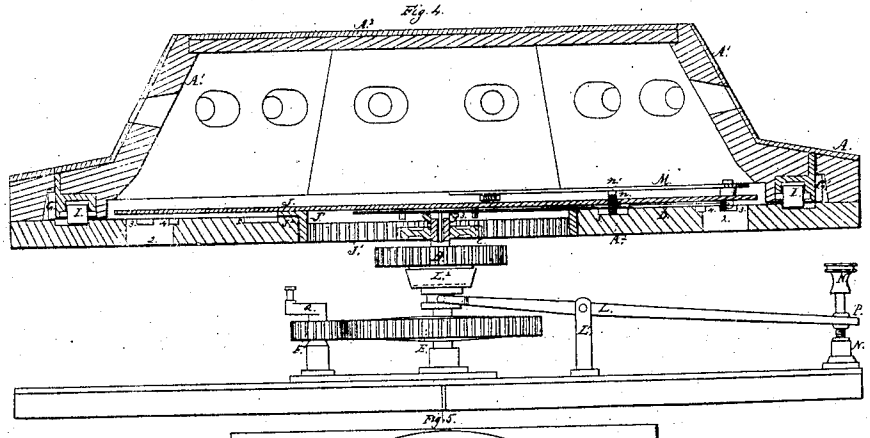
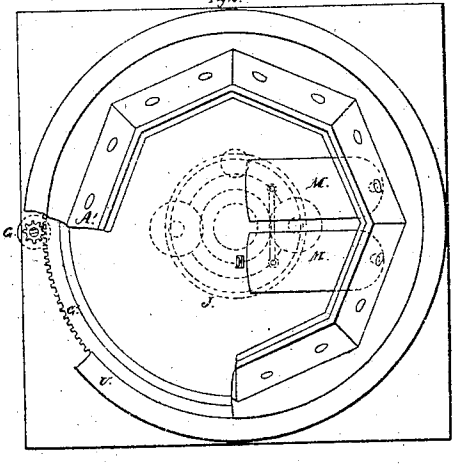


Fig. 5.



Witnesses.
R. T. Campbell
H. L. Ocker

Inventor.
James B. Eads
By Munn & Co. Attys

THE ECKERT LITHOGRAPHING CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES B. EADS, OF ST. LOUIS, MISSOURI.

OPERATING GUNS AND GUN-TURRETS.

Specification of Letters Patent No. 46,223, dated February 17, 1865.

To all whom it may concern:

Be it known that I, JAMES B. EADS, of St. Louis, in the State of Missouri, have invented new and useful Improvements in Operating Turrets and Ordnance; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to fully understand and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of a part of the interior of a turret exposing the top of the bed A″ of the structure, the top A′ and the revolving platform J being removed, and the rim U being broken away to show the pinion G, of the vertical shaft H, by which the turret is rotated. Fig. 2 is an elevation in section of the turret taken on the line 1, 1, of Fig. 1, the parts removed and not shown in that figure being in place here. Fig. 3 is a plan of the revolving platform J, inverted. Fig. 4 is a sectional elevation of the turret taken on the line 2, 2, of Fig. 1, and Fig. 5 is a plan of the turret with its top A^3, removed, exposing the revolving platform J, the gear wheels beneath being seen in dotted outline, and part of the side A′, of the turret, and of the rim U, being also broken away to show the pinion G, and the gear G′, upon the periphery of the lower part of the turret. This figure is drawn to a reduced scale.

Similar letters of reference indicate like parts.

The parts shown in the drawings are only those that are necessary to illustrate my invention.

The tower A, revolves upon the bed A^2, their points of contact being numerous friction rolls I, set within a groove, in the lower face of the circumference of the turret. A gear G′ is formed upon the periphery of the base of the tower, which meshes with a pinion G, of a vertical shaft H, stepped in a bearing *h*. This shaft carries a pulley *q*, which is driven by a belt or other mechanical means from some driving power not shown. The bed A^2 has four or more friction rolls 1, set in its face for the purpose of sustaining the rotating gun platform, which revolves upon them. It has also circular grooves 3, 4, 5, cut upon its face to make room for the free passage of the steam pipe *b*, and the pinion *n*, and the other parts, that are attached to the lower face of the gun platform J. Hatchways 2, eight in number in the bed here represented, are cut through it, coinciding, as the platform rotates with hatchways cut through it. A flanged collar J′, with teeth cut upon its inner periphery, is secured to the lower face of the platform J, by its flange J^2. Pinions *d*, two in number, on the top of the vertical shafts D^2, mesh with the teeth or the collar J′, at points opposite to each other for the purpose of rotating the platform J. These vertical shafts are properly stepped in bearings upon the ship's floor or other structure and are driven by means of gear wheels D′ secured upon them which take into a driving gear-wheel D, at opposite points of its circumference.

The gear D runs loosely upon a hollow vertical shaft B, stepped in a perforated bearing B′, through which and the shaft B, runs a steam pipe *b*, as shown in Fig. 2. The shaft B, is driven through a crank *a*, of a short shaft and pinion F, which engages the large gear E, on shaft B. The upper half L^3 of a conical friction box-clutch is cast upon the lower face of gear D. The lower half L^2, of the clutch slides upon the shaft B in a guiding groove, in a way well known to machinists, being moved up and down the shaft by the fork L^3, of the lever L, which is supported on a standard L′; the outer end of the lever embraces the screw-rod P, which is moved up and down in the boss N′, by turning the milled screw-head N. When the lever is in the position shown in red in Fig. 4, the clutch is disengaged, and the gears D, D′, D′, pinions *d*, and platform J, remain stationary while the shaft B, carries around the gears C, and *f*, *f*. The gears *f*, *f*, are each mounted upon a short shaft suspended vertically in hanging bearings *e′*, on the lower face of the gun platform. The upper ends of these short shafts have each a bevel pinion *e*, which engages with miter-wheels *k*, set on a sliding shaft Y, secured to the lower face of the platform J, by means of brackets *o*, and *m*. This shaft lies close to the platform, passing

through a slot in the flange J^2, and collar J', and its outer end has a screw thread on it to receive a grooved nut which receives in its groove the finger of a lever P′, pivoted to the platform, and whose handle is made to protrude through a slot cut through the platform so as to be operated by the gunner from above. A pinion *n*, secured to this sliding shaft so that the latter can move endwise through it, protrudes through a slot in the platform sufficiently to enable its teeth to engage with the teeth of a rack *n*, secured across the bottom of a radial plate M, which illustrates the position and office of a gun carriage, and which is coupled to another plate M, of like form; this shaftY, may extend beyond the rack *n*′, and be made to transmit power to operate the guns on the plate M, M, by toothed gearing and a shaft through the boss or joint M′, as explained in my application filed ——— now pending. They are seen in dotted outline Fig. 3, in two positions, and in plan view in Fig. 5. One of them is also seen in section in Fig. 4. They are strapped together as seen in these figures so that they both move in obedience to the pinion *n*. They move freely about bosses M′, which serve also as collars for steam branch pipes or shafts or other means of transmitting power, through the platform J, at these points in order to work the guns, as illustrated in an application for a patent now pending by the inventor for improvements for operating heavy ordnance filed ——— and also in Patent No. 41,611.

The lever P′, is a spring lever, moving horizontally around a pivot as shown in Fig. 3, with a tooth at its end which articulates with one of several grooves swaged or otherwise made on the underside of the platform, in order to hold the lever and through it the sliding shaft in the desired position, to hold both of the miter wheels *k*, free from the bevel gear *e*, or to hold either in engagement with it. A slot is cut through the platform as shown in Fig. 3, to permit the movement of the lever and its handle to their different positions.

The revolution of the pinion G, on shaft H, causes the tower to rotate independently of the platform J. The revolution of the gear D, which takes place when the clutch L^3, is engaged, causes the platform J, to rotate through the gearing D′, *d*, and J′.

The carriages of the gun are trained to any desired angle by means of the gear wheels C, and F, and the bevel gears *e*, which engage with the miter wheels *k*, for the purpose of driving the sliding shaft that carries the pinion *n*, which meshes with the rack *n*′, formed on the under side of one of the pair of carriages M, which rack is shown in dotted outline Fig. 3. Thus each of these movements, to wit: those of the tower, of the platform, and of the carriages is wholly independent of the other.

As many carriages and pairs of carriages are provided as can be carried and worked upon the platform J, I have shown but one pair, and only one sliding shaft and its appurtenances. Another sliding shaft and its accompanying devices are to be placed so as to operate with the bevel gear *e*, on the opposite side of the shaft B, and as many more of these devices can be supplied as can be used.

The steam pipe *b*, passes up through the center of the shaft B, through the collar S, shown in Fig. 2, upon the lower face of the platform J, and which collar receives the upper end of the shaft, at which point it connects with the horizontal pipes which are led along the lower side of the platform J, passing through slots cut in the flanged collar J′, J^2, and thence passing to the bosses or journals about which the gun carriages revolve. The vertical part of this steam pipe may rotate with the platform by means of a simple central steam joint below the step of the shaft, which is not shown, because well understood by all persons skilled in steam machinery, and this part of the pipe may be surrounded by a second one of larger size forming an annular passage between the two for the exhaust steam to be conveyed through the central shaft, from the platform to the condenser. The manner of making the joints on these steam pipes to accomplish this conveyance of the steam, water, air or other element used to work the guns and carriages, is so well understood by those skilled in such work as to require no drawings or explanations to illustrate it. But to those less skilled, I would refer to the descriptions given in my patents granted for improvements in rotating turrets and for handling heavy ordnance dated respectively ——— and also to descriptions contained in an application for similar improvements now pending filed in the Patent Office on the ——— day of ———, 1864.

The shaft Y, instead of sliding may be fixed and have sliding clutches on it to actuate the pinions upon it at pleasure. In which case the pinions would not be keyed to the shaft but would turn with it only when they are in contact with the clutches which slide on the shaft and would be made by a groove and feather to rotate with it, in a manner well known to machinists.

I claim as new and desire to secure by Letters Patent—

1. The use of a rotating tower in combination with a rotating (gun) platform when each is arranged to rotate independently of the other.

2. The combination in one turret of devices for training ordnance operated by

means of power transmitted through the pivot or shaft of the platform on which the ordnance is mounted, with a rotating platform and a rotating tower each arranged in such a manner that the training of the guns, the rotating of the platform and the revolving of the tower may be performed independently of each other substantially as described.

JAS. B. EADS.

Witnesses:
M. M. LIVINGSTON,
EDWARD H. KNIGHT.