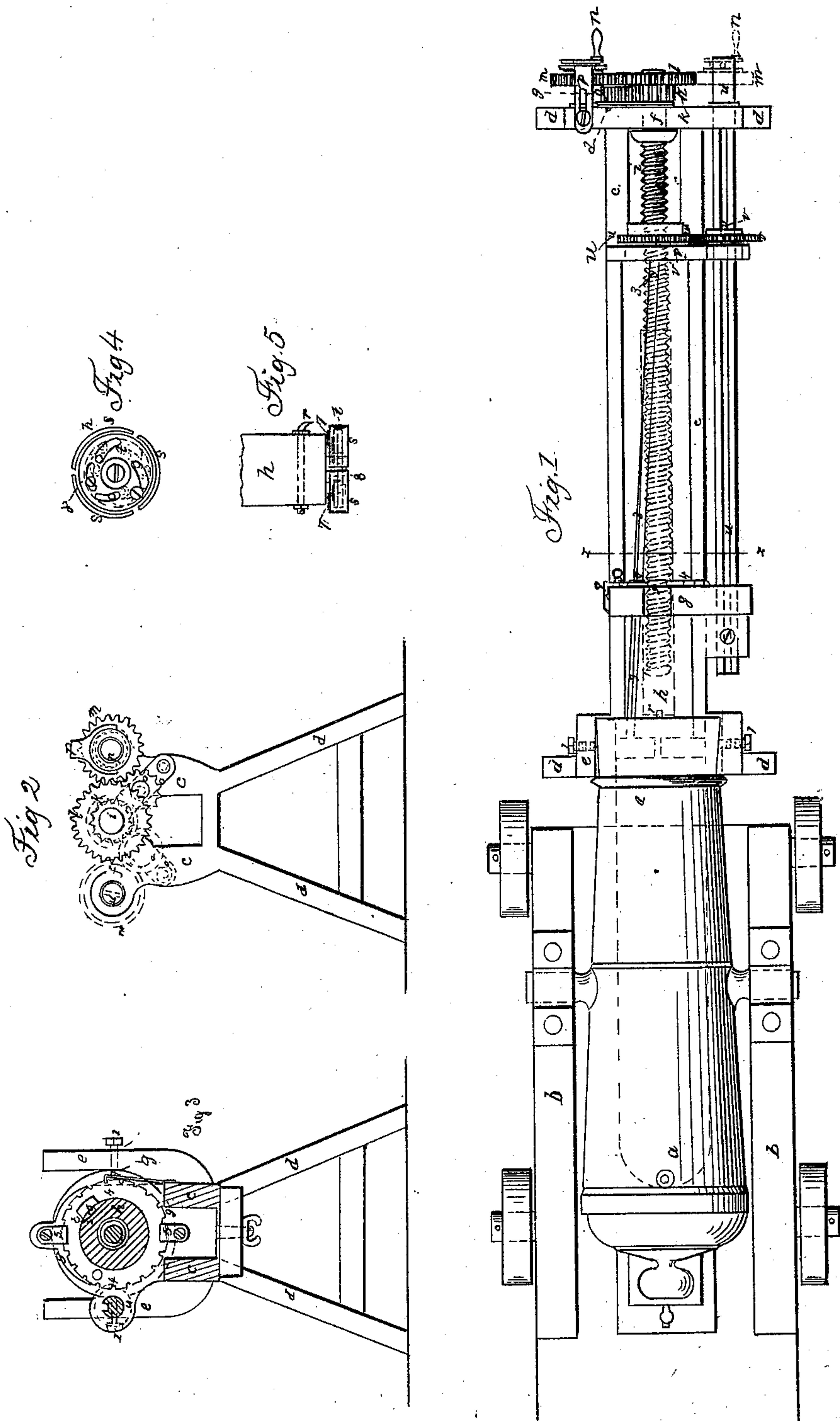


P. FOY.

Boring and Rifling Cannon.

No. 34,661

Patented Mar. 11, 1862.



Witnesses  
Lemuel W. Correll  
Thos. L. Kewell

Inventor  
Patrick Foy



# UNITED STATES PATENT OFFICE.

PATRICK FOY, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND JOHN FITCH, OF SAME PLACE.

## IMPROVEMENT IN APPARATUS FOR BORING AND RIFLING CANNON.

Specification forming part of Letters Patent No. 34,661, dated March 11, 1862.

### *To all whom it may concern:*

Be it known that I, PATRICK FOY, of the city and State of New York, have invented and made a certain new and useful Means for Boring and Rifling Cannon, &c.; and I do hereby declare that the following is a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a plan of my apparatus as in place for use. Fig. 2 is an end view of the same. Fig. 3 is a cross-section at the line *xx*. Fig. 4 is an end view of the guiding apparatus at the end of the tool bar or stock, and Fig. 5 is a plan of the end of said stock and cutter.

Similar marks of reference denote the same parts.

In rifling cannon it is usual to mount the same in a lathe and communicate a turning movement to the cannon as the cutter-bar moves back and forth. The operation of handling and centering the cannon is both costly and difficult, involving the necessity of conveying the cannon to the lathe and the loss of time consequent thereon.

The nature of my invention consists in a mechanism that is to be connected to the cannon itself and can be employed for rifling a cannon or for boring out or truing the interior of the piece.

My apparatus is of such a character that it can readily be conveyed to the cannon and employed thereon while in a fortification or on a vessel or in any convenient locality.

The construction and operation of the said mechanism and the mode of using the same will be fully apparent from the following description.

In the drawings, *a* represents the cannon to be bored or rifled. I have shown the same on the carriage *b*. It, however, may be mounted or sustained in any usual manner.

*c* is a bed or frame carrying my apparatus and of a length adapted to use with such size and caliber of gun or cannon as intended to be rifled or bored. This frame is to be sustained in any convenient manner so as to remain parallel to the axis of the cannon. I have shown legs *d d*; but any suitable blocking may be employed.

*e* is a yoke or jaw receiving the muzzle of

the cannon and firmly connected therewith by means of any suitable clamp-screws *l l*, and a chain may also be employed from the bed *c* to the cannon trunnions or breech set up by tightening-screws, so as to render the connection of the bed to the cannon rigid and unyielding, care being taken that the parts hereinafter described move on or parallel to the axis of the cannon.

On the bed *c* is a head-block *f*, permanently fitted at one end, and *g* is a movable head-block adjustable on the upper surface thereof and confined by a clamp and screw beneath. (See Fig. 3.)

*h* is a cylindrical tool-stock sustained in the head-block *g* and receiving the screw *i*, that passes through the head-block *f*, and is provided with the gear-wheels *k* and *l*.

*m* is a wheel provided with a crank *n*, or the same may be driven by a connection to a steam or other engine, so as to apply the necessary power to rotate the screw *i* and give an endwise movement to the tool-stock *h*, so as to project the same into the cannon *a* with the required force, and in order to revolve the screw in the opposite direction and draw the tool-stock out I slip the wheel *m* back into contact with an intermediate pinion *o*, that acts on the pinion *k* and revolves the screw backward with a quicker velocity. This pinion *o* is on an arm *o'*, held to its place by a pin inserted at 2, and *p* is a clutch taking a groove in the hub of *m* and confined by a screw, whereby the said wheel *m* is held in contact with *l* or *o*.

The tool-stock *h* is formed with an inclined or partially-diagonal groove 3 in the outer surface thereof at the angle or spiral corresponding with that desired for the rifle-grooves, and on the head-block *g* is a ring 4, held to the surface thereof by the guides 5 5, and carrying a roller or pin 6, fitting the spiral groove 3. This ring 4 is provided with notches at proper distances apart around its edge, and *q* is a stop set on *g* and taking one of said notches. It will now be seen that as the said tool-stock *h* (fitted with a tool and guides, as hereinafter set forth) is pressed into the cannon the tool or tools thereon plane out a spiral groove or grooves in the interior thereof, the pin 6 remaining in one position as the tool-stock *h*, with its spiral groove 3, is passed back



and forth by means of the screw *i*, and when one groove or as many grooves as there are cutters are finished then the ring 4 is partially turned to bring the tool or tools into position to form other grooves, and so on until the rifling is completed, each groove being parallel with that previously made, as the spiral of the groove 3 determines that of all the rifling-grooves.

*r* is the tool or cutter introduced in the tool-stock *h* at or near the end thereof. This is to be of any usual shape and made adjustable, so as to be set out farther from the axis of the tool-stock as the cutting progresses.

At the end of the tool-stock *h*, I provide adjustable segmental guiding-blocks *s s*, formed with curved surfaces adapted to take the inside of the cannon, and each of these segmental blocks is jointed to a diagonal link 7, that at its other end is attached to the end of the tool-stock *h*, and *t* is a disk provided with diagonal slots, that is attached to the end of *h*, and the slots therein take pins from the link 7, so that by turning this disk the said diagonal links are moved to a more or less radial position and the segmental blocks *s s* adapted to take a cannon of greater or less caliber. The said disk *t* is retained firmly when adjusted by the clamping-screw 8, and thereby the segmental guiding-blocks are held firmly, and in use they slide on the interior of the gun and keep the cutter or cutters firmly to their work.

When this mechanism is to be employed for boring out a cannon or for smoothing the interior, a suitable tool or tools are to be attached to the stock *h*, and in some instances the same may have to extend beyond the guide-blocks *s s* or be attached to the extreme end of the said stock *h*, and the stop *q* is to be turned aside, that the ring 4 may revolve with the cutter-stock *h*.

*u* is an auxiliary shaft with a groove taking a key in the pinion *v*, set and moving with the sliding head *v'* at the end of the tool-stock *h*, and on this tool-stock is a wheel *w*. These parts when the machine is used for rifling slide back and forth without being operative; but for boring I slip the pinion *m* off its stud and place it upon the end of the shaft *u*, to which it is to be attached by the cross pin or key. (See dotted lines, Figs. 1 and 2.) It will now be seen that the parts are all free to turn, and that the crank *n* or its equivalent will rotate the tool-stock and cause its cutter to bore out the cannon. If the screw *i* stood still, the feeding would be too fast, and if ro-

tated at the same speed as the tool-stock there would be no feeding movement or progression of the cutter and stock into the cannon. I therefore provide that the pinion *m* be slightly smaller than the pinion *v*, while the wheel *l* is slightly larger than the wheel *w*, whereby the screw *i* will be rotated a very little less than the tool-stock *h*, to gradually feed the same along. To run the screw back, the key may be taken out, so that the pinion *m* may be used to revolve the screw *i* alone in the opposite direction, or the intermediate pinion *o* may be moved to the other side, as seen by dotted lines in Fig. 2, and the pinion *m* slid back on the end of the shaft *u* into contact therewith, when all the parts will still be revolved, but the screw will be run back with a faster motion than the aforesaid forward movement, because the wheel *k* is smaller than the wheel *l*.

The advantages of my apparatus will be apparent, for the machine can be transported and applied to any cannon to which it may be adapted in size, and said apparatus can be used with several different calibers, in consequence of the movable segmental guide-blocks *s s* being adjustable.

This apparatus, when attached to a cannon, can be used for smoothing and truing out the inside, and then for rifling, without disconnecting from the gun, and on the parts being drawn out of the gun the expanding segmental guides *s s* aid in the removal of all chips or borings.

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

1. The head-block *g*, provided with the adjustable ring 4, pin 6, and stop *q*, together with the frame *c* and driving-gearing, in combination with the screw *i*, and spirally-grooved cutter-stock *h*, the whole arranged and acting in the manner and for the purposes substantially as specified.

2. The guiding-segments *s s*, and plate *t*, arranged and acting as and for the purposes set forth.

3. The auxiliary shaft *u*, provided with the gearing *v m*, in combination with the tool or cutter stock *h* and screw *i*, with their respective gears *w l*, substantially as and for the purposes specified.

In witness whereof I have hereunto set my signature this 25th day of January, 1862.

PATRICK FOY.

Witnesses:

LEMUEL W. SERRELL,  
THOS. GEO. HAROLD.