C. SHARPS.

Rifling Machine.

No. 37,057. Patented Dec. 2, 1862.

Fig. 1

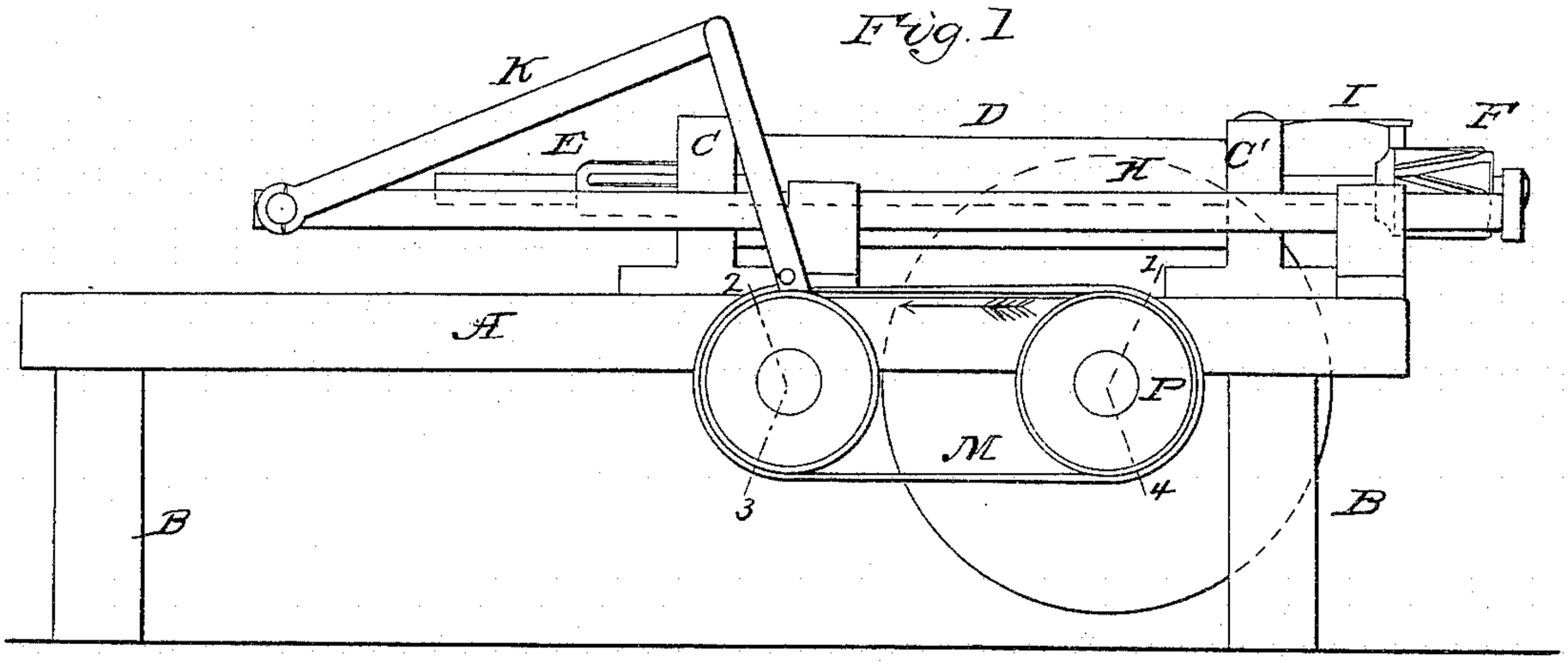


Fig. 2

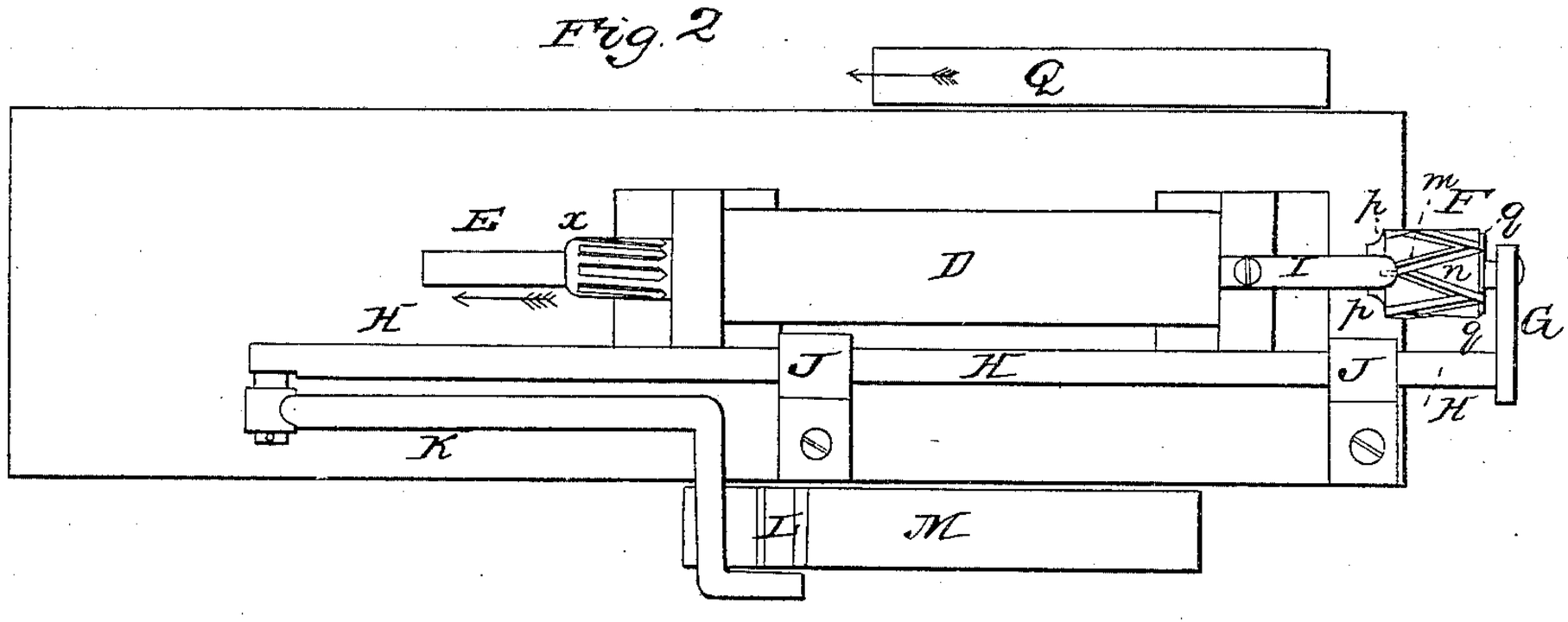
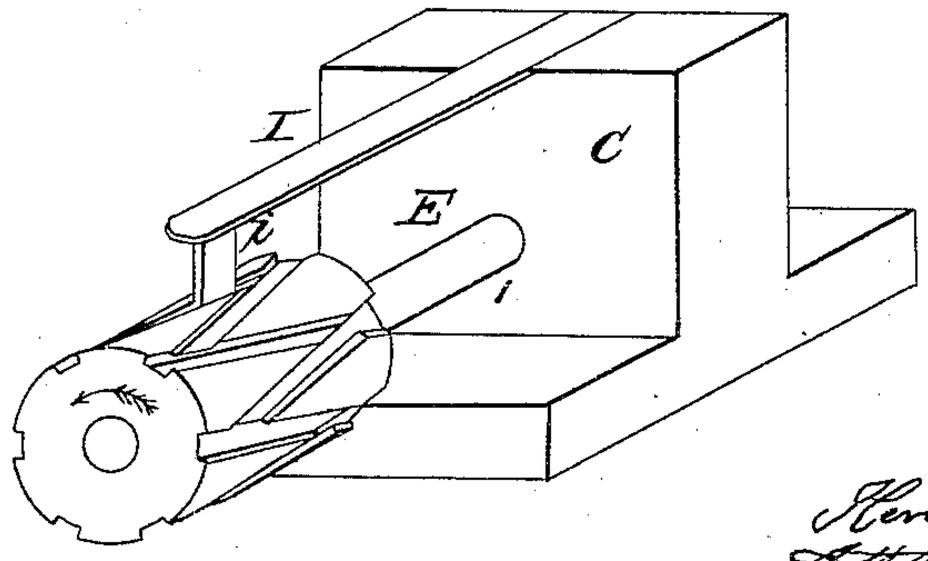


Fig. 3



Witnesses

H. A. Steel.

Charles Howson

Inventor

Henry Howson.

per Munn & Co. Attys

UNITED STATES PATENT OFFICE.

CHRISTIAN SHARPS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN RIFLING-MACHINES.

Specification forming part of Letters Patent No. **37,057**, dated December 2, 1862.

To all whom it may concern:

Be it known that I, CHRISTIAN SHARPS, of Philadelphia, Pennsylvania, have invented an Improved Rifling-Machine; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of mechanism, fully described hereinafter, for imparting the desired reciprocating motion, the intermittent rotating motion, as well as the necessary spiral motion to the rod and cutter of a rifling-machine.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a side view of my improved rifling-machine; Fig. 2 a plan view, and Fig. 3 a perspective view, of part of the machine.

Similar letters refer to similar parts throughout the several views.

A is the table or platform of the machine, and is supported by suitable legs or frames, B B. To this table are secured the two standards C and C′, to the former of which is attached the front end of the hollow cylinder D, the rear end of the latter being secured to the frame C′. In the interior of the cylinder are cut (in the present instance) six spiral grooves to correspond with the six grooves to be cut in the barrel of the fire-arm. A rod, E, passes through the hollow cylinder D, and this rod is enlarged near the front end, the enlarged portion fitting snugly to the bore of the cylinder, and being furnished with six inclined projections, *x x*, which engage into the spiral grooves cut in the said cylinder. The rod E is furnished near its rear end with a hub, F, on which are cut a number of inclined grooves, a projection, *i*, on the end of a spring, I, which is secured to the standard C′, being arranged to engage in one or other of these grooves.

The operation and purport of the grooved hub F and spring I, with its projection *i*, will be fully explained hereinafter. The extreme rear of the rod E is secured by a connecting-bar, G, to the rod H, which is arranged to slide in guides J and J′, secured to the table A. To a pin projecting from the rod H, at the front end of the same, is joined one end of the bent connecting-rod K, the rear end of which has a pin fitting snugly, but so as to turn freely, in a box, L, secured to the endless belt M, which passes round the two pulleys N and P, the former being hung loosely to a pin secured to the under side of the table A, and the pulley P being secured to a shaft, which is arranged to turn in suitable bearings secured to the table, the outer end of this shaft being furnished with a suitable driving-pulley, Q. The barrel to be grooved is secured to the table A, and the rifling-rod to the end of the rod E. As the rifling-rod, its cutter, and other appliances connected therewith are the same as those used in other rifling-machines, it has not been deemed necessary to illustrate or describe them here. On imparting a rotary motion to the driving-pulley Q in the direction of the arrow a continuous traversing motion must be communicated to the endless belt M and the box L, and consequently a reciprocating motion must be imparted from this box L, through the connecting-rod K, to the rods H and E.

In ordinary rifling-machines it is usual to impart a reciprocating motion to the rifling-rod and its cutter by means of a crank motion, which causes the cutter to move at varying speeds as it traverses and acts upon the inside of the barrel—an evil avoided by my improved mode of operating the rifling-rod. As the box L traverses from the point 1 to the point 2, Fig. 1, it will impart a forward movement at a uniform speed to the rifling-rod. In a like manner as the box traverses from the point 3 to the point 4 the backward movement of the rifling-rod, during which the cutter takes effect on the barrel, will be at a uniform speed. As the box traverses from the point 2 to the point 3, the forward movement of the rifling-rod is converted to a backward movement, and as the box traverses from the point 4 to the point 1 the backward movement of the rod is converted to a forward movement. It will be observed that the rod K is so bent that during its movements it will escape contact with the pulleys N and P, as well as with the endless belt. The pulley N may be rendered adjustable on the table A, so as to be removed farther from or nearer to the pulley P when a change in the length of movement of the rifling-rod is required, the length of the belt being of

course altered to suit the change of distance between the pulleys.

Instead of an ordinary leather belt, M, a chain with a box, L, secured to the same may be used, the pulleys being made to suit the form of the chain.

The operation of the grooved hub F and spring I with its projection *i* may be described as follows: Supposing this hub and spring to be absent, it will be evident that as the rod E reciprocates the inclined ribs *x* would invariably traverse the same grooves in the cylinder D, and consequently the cutter at the end of the rifling-rod would cut but one groove in the barrel, whereas it is necessary that the cutter should make six grooves in the barrel, and should move from one groove to the other as the rifling-rod reciprocates. In order to accomplish this it is necessary that one inclined projection, having traversed one groove in the cylinder D during one backward movement of the rod, should during the next backward movement traverse the groove nearest to that which it had previously traversed. Now, supposing the moving parts of the machine to be in the position illustrated in Figs. 1, 2, the rod E being in the act of completing its forward movement, the inclined projections *x* having passed from the cylinder D and being consequently free from the control of the grooves in the same, and the projection *i* of the spring I being situated at the junction of the two inclined grooves *m* and *n* of the hub F, now the tendency of the spring I is to cause its projection *i* to bear hard on the hub F, and the series of inclined grooves *m* are deeper at the front edge, *p*, of the hub than they are at the rear edge, *q*, whereas the grooves *n* are deeper at the rear edge, *q*, of the hub than the grooves *m*. When the rod E is about completing its forward movement, the projection *i*, seeking the deepest point, must remain in the groove *m* as the hub F moves forward, so that by the time the hub has passed the projection *i* the rod F must have turned to the extent of one-twelfth of a revolution, there being six grooves, *m*, and six grooves, *n*, in the hub. The hub F having now arrived at a point where there is a junction between a groove *m* and a groove *n* at the rear of the hub, the projection *i* will seek the deepest groove, which at this point is the groove *n*, the latter being inclined in a direction contrary to that of the groove *m*. The rod E now commences its backward movement, during which the projection *i* remains in the groove *n*, which it had previously entered, until the hub escapes from the said projection, by which time the rod E will have turned to the extent of one-twelfth of a revolution, making with the former turning through the action of the groove *n* one-sixth of a revolution. By the time the hub F has passed the projection *i* during the backward movement of the rifling-rod the projections *x* have entered the grooves of the cylinder D, and the rod E remains under the control of the grooves during the remainder of its backward movement and until the moving parts again arrive at the position shown in Figs. 1 and 2. It will now be seen that as the rifling-rod completes its forward and commences its backward movement it is turned to the extent of one-sixth of a revolution, and consequently that the cutter of the rifling-rod must cut first one groove and then the other until the six grooves are completed in the barrel.

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

1. Imparting to the cutting-rod of a rifling-machine a reciprocating motion through the medium of an endless belt or chain, or their equivalents, and a rod connected thereto, substantially as and for the purpose herein set forth.

2. Any convenient number of projections *x* on the rod E, in combination with the grooved cylinder D, when each projection is caused to pass from one groove of the cylinder to the adjacent groove by the automatic devices herein described.

3. In combination with the rod E of a rifling-machine, the hub F, with its reversed inclined planes *m* and *n*, the spring I, and its projection *i*, the whole being arranged and operating substantially as and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHRISTIAN SHARPS.

Witnesses:
CHARLES E. FOSTER,
JOHN WHITE.