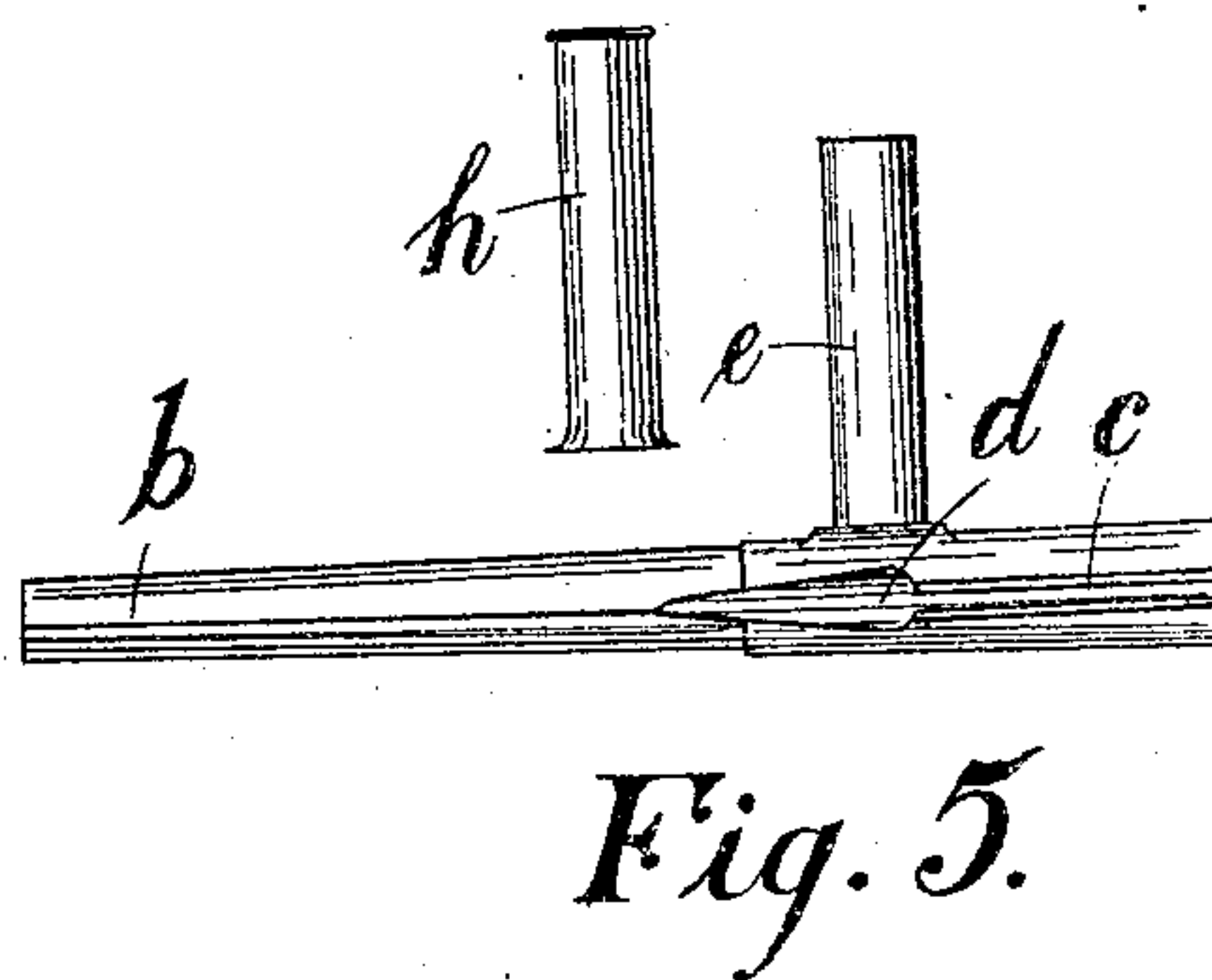
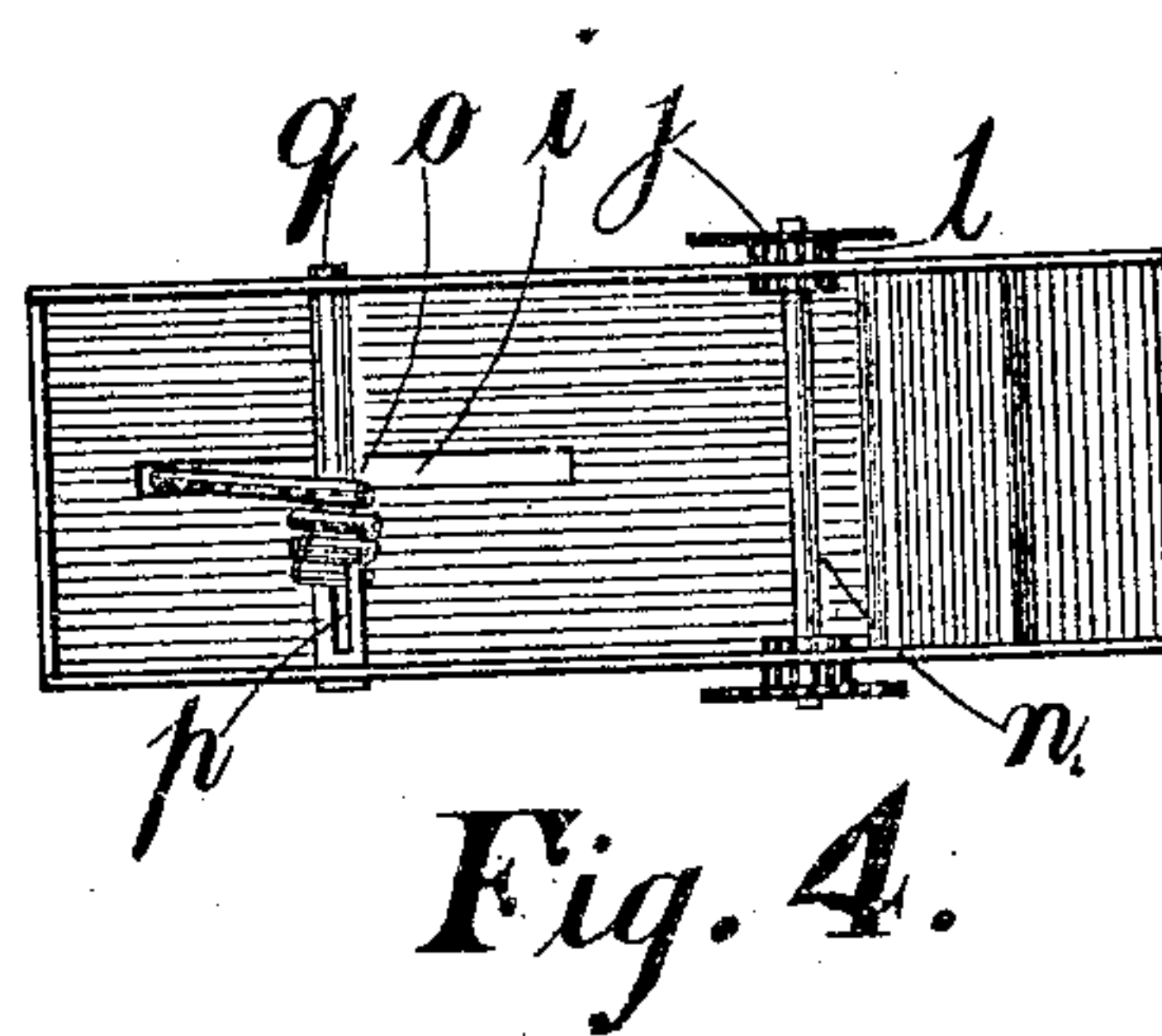
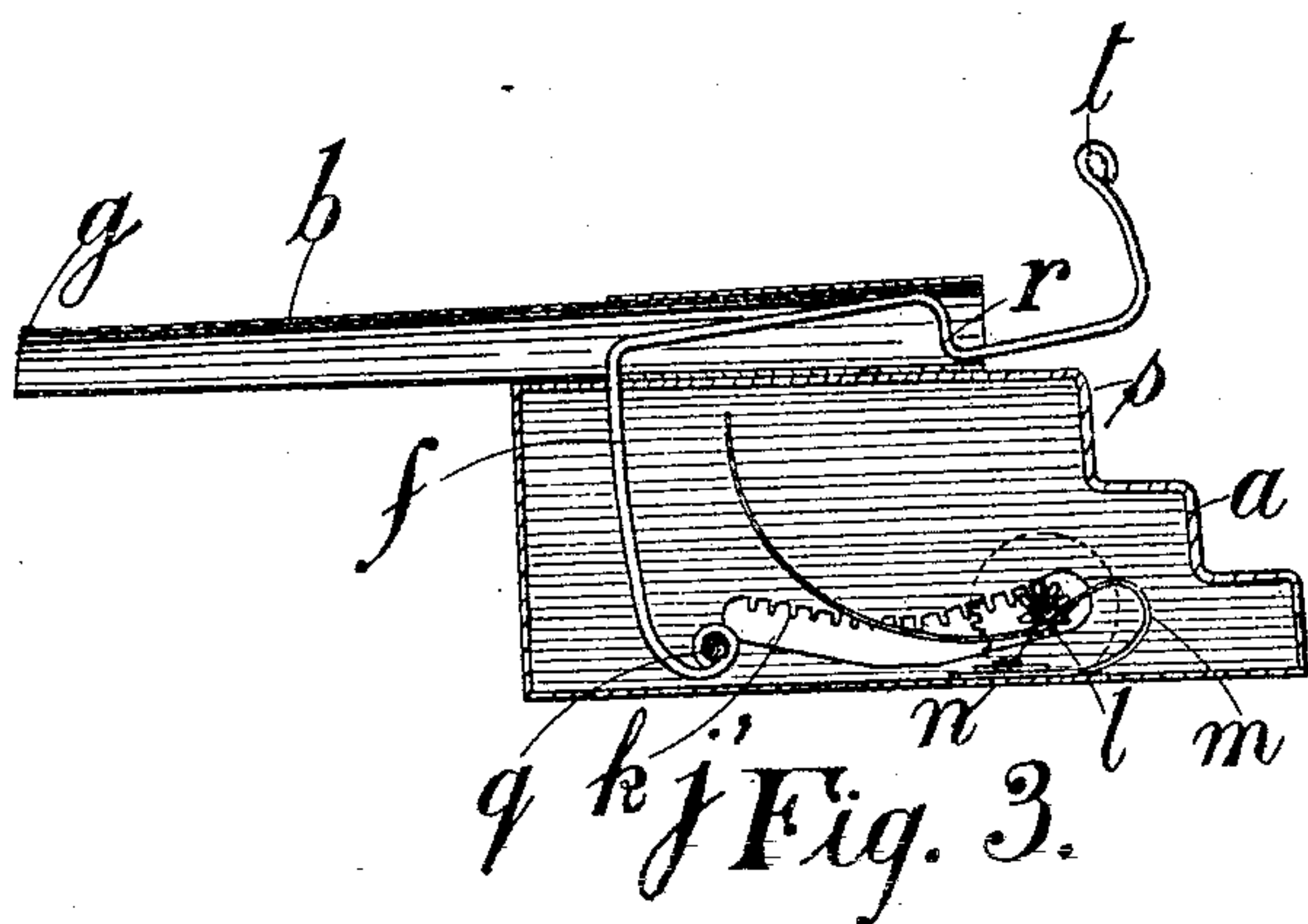
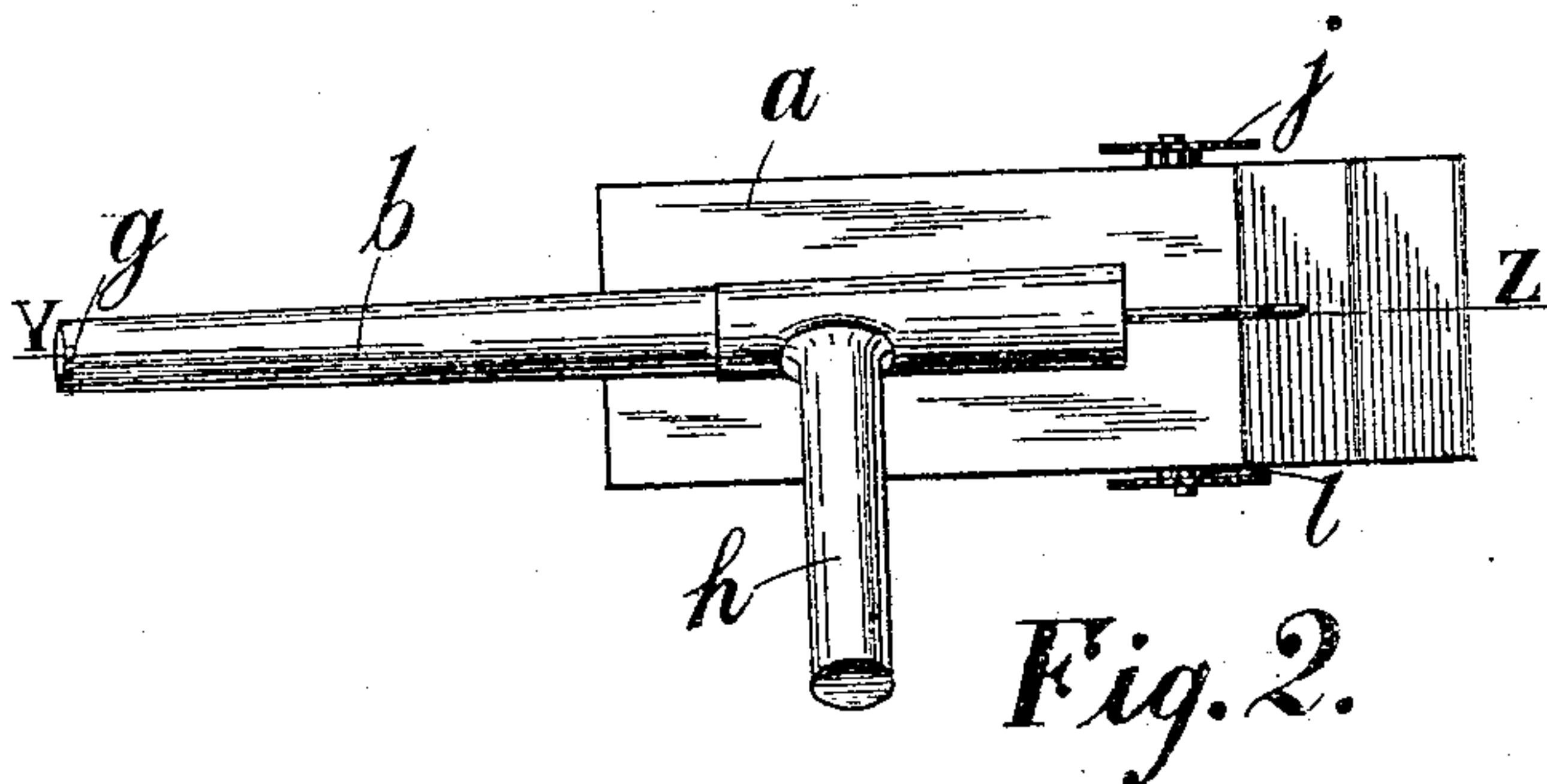
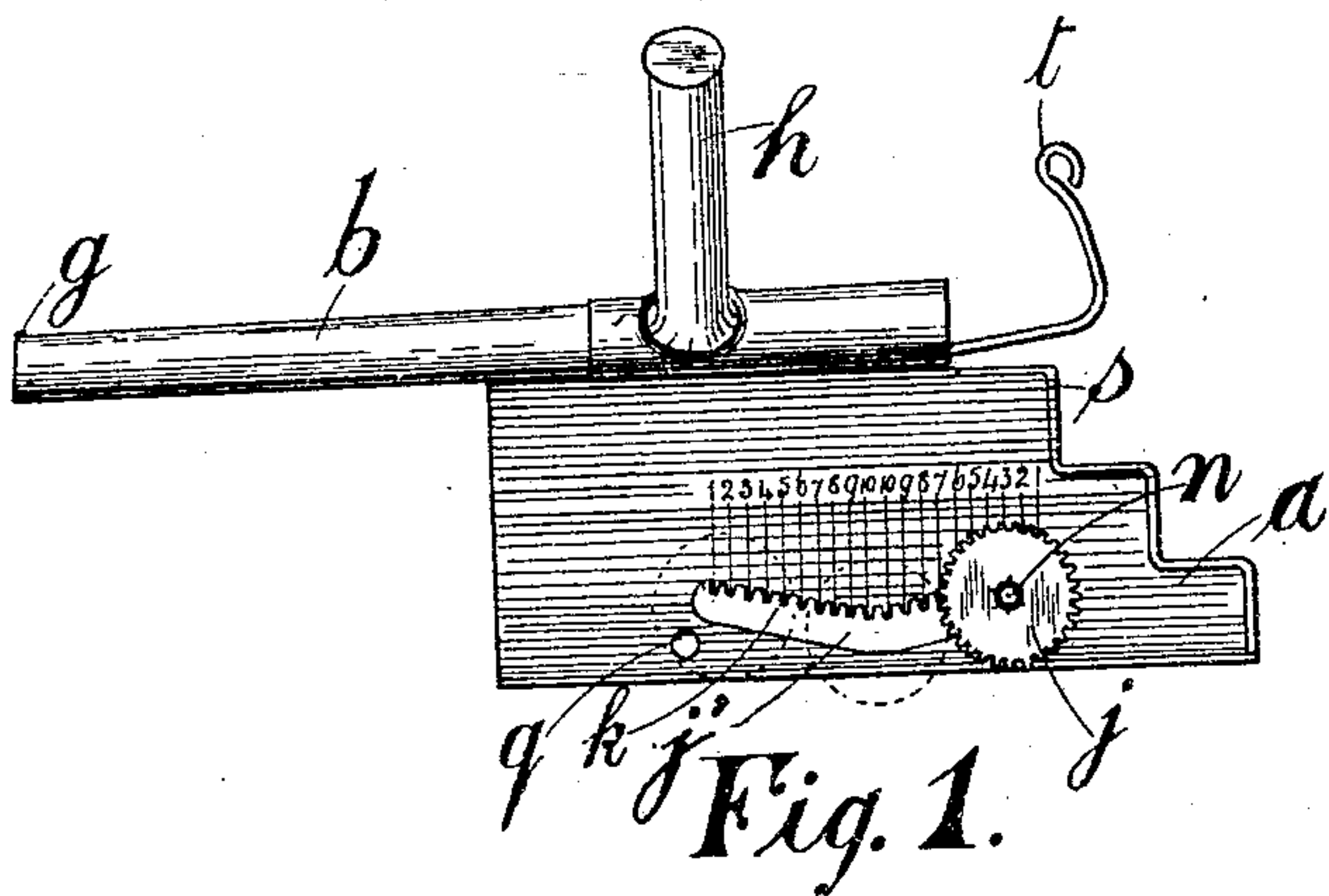


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TOY CANNON.  
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Patented Nov. 2, 1909.

938,982.



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# UNITED STATES PATENT OFFICE.

WILLIAM HENRY CORNFORD, OF MORNINGTON, VICTORIA, AUSTRALIA.

TOY CANNON.

938,982.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed February 20, 1909. Serial No. 479,077.

*To all whom it may concern:*

Be it known that I, WILLIAM HENRY CORNFORD, gentleman, of Tuerong, No. 1 Three-Chain road, Mornington, State of Victoria, Commonwealth of Australia, have invented a certain new and useful Toy Cannon, of which the following is a specification.

This application is in part a division of the application filed by me November 12, 1907, Serial No. 401,798, for Letters Patent on a military game or toy, and the invention relates to a toy cannon or gun of special construction adapted to be used in connection with said game.

The apparatus shown and described in my prior application consists of a board or table upon which are placed miniature forts, men, castles, casemated screens, and objects to be fired at by contending parties with pellets from either end of the board. The word "board" is intended to designate any suitable space made or prepared, fixed or portable, of wood or other material. It may be of oblong, square or other shape or an ordinary table may be used, and raised firing platforms or mounds can be employed.

The miniature forts or objects to represent forts, men, flags, and appurtenances are made of card, paper, or other substance. These may be of various shapes constructed so as to be capsizable by pellet shots. In order to enable this game to be played the herein-described cheaply constructed toy cannon has been devised with provision for rapid firing of pellets, retaining them in position till fired, automatically re-adjusting them if displaced, and means for elevating and depressing the cannon.

I will now describe the invention, reference being had to the accompanying drawing.

Figure 1 is a side elevation of the invention. Fig. 2 is a plan. Fig. 3 is a sectional elevation taken on the line Y—Z in Fig. 2. Fig. 4 is a plan of the carriage up side down, showing the fastening of the propeller spring. Fig. 5 is an inverted view of the barrel showing the retaining slot.

A gun carriage of any desired size and stepped or otherwise is taken as the base. I prefer to form the same of a metal plate or casting as shown. Upon such base *a* is mounted or formed integrally a tube or barrel *b* having the following features.

In the rear and under part of the barrel

is a slot *c* extending from the breech to the charging magazine and thence widening in the form of a half circle *d* immediately below the mouth of the magazine tube *e* hereinafter described and thence contracting gradually to a closure a short distance forward. The block, barrel, and magazine may be formed or cast in one or more pieces and in the latter case joined by straps or the like.

The slot is constructed as described in order to receive each pellet as it drops from the magazine, and hold the same in position even though the muzzle of the gun be depressed, and in case of displacement of the pellet to compel its return to correct position. A pellet in any part of this slot, through the peculiar shape of the latter, possesses potential energy to run back toward the breech, even though the muzzle of the gun be depressed. It is checked in this movement at the right spot—that is where it will be at the "center of percussion" when struck by the propeller spring *f*—by the convergence posteriorly of the two sides of the slot in the half circle referred to, and in case of violence in handling the head of the spring prevents further backward movement. In its motion forward, in expulsion, the pellet has a free run up the anteriorly converging lines and is not met by such sudden check, resulting in loss of force, as would be the case in the employment of a merely circular depression. Further if a pellet gets misplaced by rough shaking of the gun while in use, it rolls back into position.

In addition to these advantages the gun may, owing to this construction, be placed upon a stand of considerable height (representing a hill in the game) and its fire be directed downward over intervening obstacles. Alternatively, the breech may be depressed for elevating the fire. The barrel has a sight *g* on its front end, and the top of the propeller spring forms the back sight.

The magazine *e* is a side extension of the barrel sloping at an angle of 25 degrees. This angle prevents undue pressure of the pellets in the magazine upon the one awaiting discharge. It also allows for clear sighting by leaving the top of the barrel free from obstruction. The magazine cap *h* is a separate tube closed and weighted at one end and bell-mouthed at the other. It



fits closely but freely to the magazine tube. In operation, the cap is charged with pellets, and slipped down over the magazine. The length of the cap (equal to that of the magazine) prevents its displacement by concussion in firing. Also used in duplicate, one cap can be filled while the other is being emptied in firing, or a number may be ready filled and standing on end awaiting use, and so a continuous fire be maintained, one cap when emptied being thrown off and another fully charged slipped on.

The propeller spring is of special form, being a combination of spiral and vertical and in one piece. It effects five separate operations namely that of pull, catch, trigger, propellant, and back sight, besides constituting a supplementary back stop for pellets in the barrel of the gun. It is also much cheaper than the ordinary horizontal spiral spring and with an equal pull strikes with greater force. A slot  $i$  is made in the block to correspond with the rear portion of the slot  $c$  in the barrel. The spring is secured and anchored by the lower end  $o$  being passed through the slot  $p$  in the cross bar  $q$ .

The gun-block or carriage is provided with mechanism for elevating and depressing the gun. A pair of toothed or rubber tired wheels  $j$  with a pinion-fitted axle  $n$  extending through slots  $j'$  in the carriage and working on a rack of appropriate shape in each side of the gun block enables the muzzle of the gun to be raised, lowered, or leveled by a slight movement of the carriage forward or backward or by rotation of the wheels by hand. At each end of the racks  $k$  the wheels being above the lower surface of the block are out of action and the gun stands level. In use assuming the wheels to be at the anterior end of the rack they are moved back in the manner described until the rims of the wheels catch the surface of the table or board. At this point the muzzle of the gun is at its minimum elevation and as the carriage is pushed forward the wheels  $j$  revolving the pinions  $l$  engage the rack and the muzzle of the gun rises to the desired elevation. If the motion is continued it reaches its maximum elevation when the wheels have reached the lowest part of the anterior slope of the rack. Thence the rack is level for a short space at the center of the gun carriage. Thereafter it runs again upward and backward at a slope corresponding with the anterior portion and when the wheels are at the lower end of this incline the gun will show its maximum depression. As the wheels are still further moved by slightly pushing the gun carriage forward or by turning with a finger, the gun is given a less and less depression till it finds its level again by the wheels reaching the posterior end of rack.

Attached interiorly to the floor of the gun carriage is a flat spring  $m$  which runs the length of the rack and pressing upward against the axle  $n$  at its center keeps the pinions engaged with the rack at any angle at which the gun is set whether on the board or while being handled off it. A figured scale is marked on the side of the gun carriage which shows the amount of elevation or depression given at certain distances by each tooth in the rack, so that the gun can be laid with mathematical accuracy. When the spring  $f$  is pulled back the angle  $r$  engages the corner  $s$  and the part  $t$  forms a back sight corresponding with the front sight  $g$ .

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A new toy cannon comprising a block, a barrel provided with a retaining slot whose greatest width is at the center thereof, and which tapers toward each end for the purpose specified, and a magazine delivering to the slot, said magazine consisting of a cap having a closed outer end, the barrel having a lateral tube over which the cap fits.

2. A new toy cannon adapted for playing battle games, comprising essentially a block, a barrel, a magazine, and an adjusting, retaining slot in such barrel adapted to retain the firing pellets in their proper position until fired, said slot having its greatest width at the rear end thereof and tapering toward the front end.

3. A new toy cannon adapted for playing battle games, comprising essentially a block, a barrel, a magazine, a cap, a retaining slot for retaining pellets in their proper position until fired, and a spring having one end secured to the base, the other end being extended at right angles to the body portion thereof to act as a handle and as a back sight when set, said spring having an off-set portion for engaging the rear end of the base for retaining it in set position.

4. In a toy cannon, a barrel, a charging magazine connected with the barrel, said barrel having in the bottom thereof a slot whose greatest width is at its rear end and whose sides converge toward the front end of the barrel.

5. A toy cannon comprising a barrel, a base upon which the barrel is mounted, and a spring, said spring having one end fixed to the base and the other end extending upward into the barrel, said barrel being slotted for the reception of the spring, said spring extending thence rearwardly and provided with an off-set portion for engaging the base to retain the spring in set position, and thence extending upwardly to form a handle for manipulating the spring and a back sight when the spring is in set position.

6. In a toy cannon, a base, a shaft, said



base having upon each side thereof curved slots arranged with their concavity upward, the upper edge of the slots being provided with rack teeth, the shaft having its ends 5 received in the slot and provided with teeth for engaging the rack, and wheels on the outer end of the shaft.

7. In a toy cannon, a base, a shaft, said base having upon each side thereof curved 10 slots arranged with their concavity upward, the upper edge of the slots being provided with rack teeth, the shaft having its ends received in the slot and provided with teeth for engaging the rack, wheels on the outer 15 end of the shaft and a spring pressing the shaft into engagement with the teeth.

8. In a toy cannon, a base, a shaft, said

base having upon each side thereof curved slots arranged with their concavity upward, the upper edge of the slots being provided 20 with rack teeth, the shaft having its ends received in the slot and provided with teeth for engaging the rack, wheels on the outer end of the shaft and a spring pressing the shaft into engagement with the teeth, said 25 spring extending the full length of the slots to engage the shaft throughout its travel.

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

WILLIAM HENRY CORNFORD.

Witnesses:

DAISY H. WILLIAMS,  
PHOEBE McLEAN.