

No. 812,140.

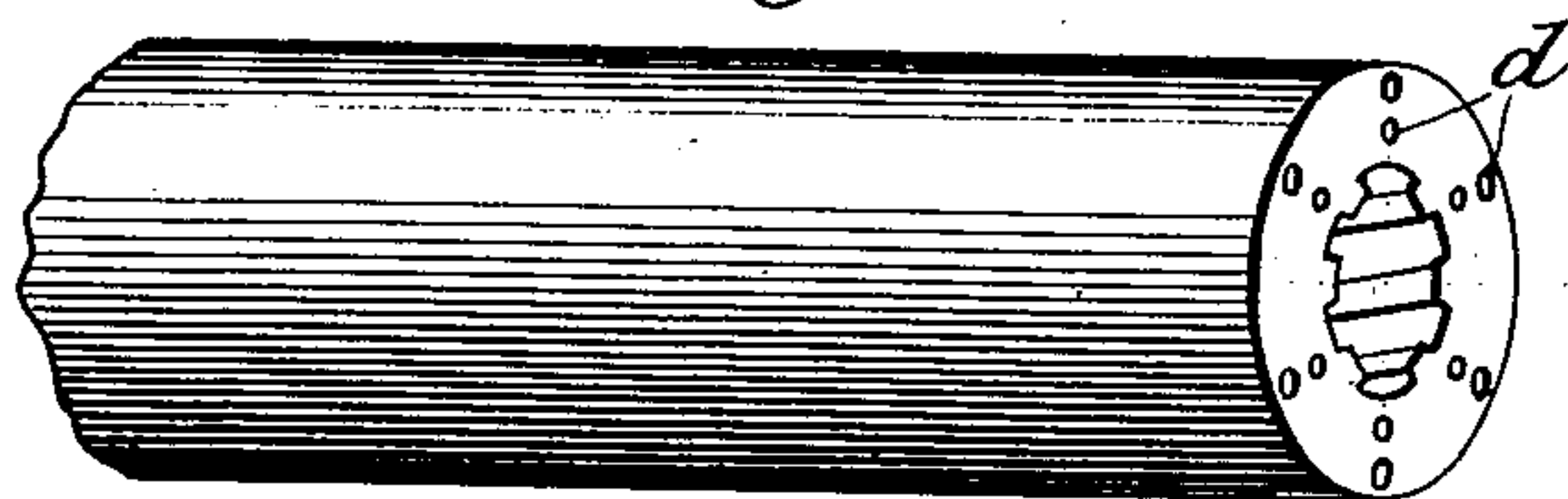
PATENTED FEB. 6, 1906.

P. E. KENT.

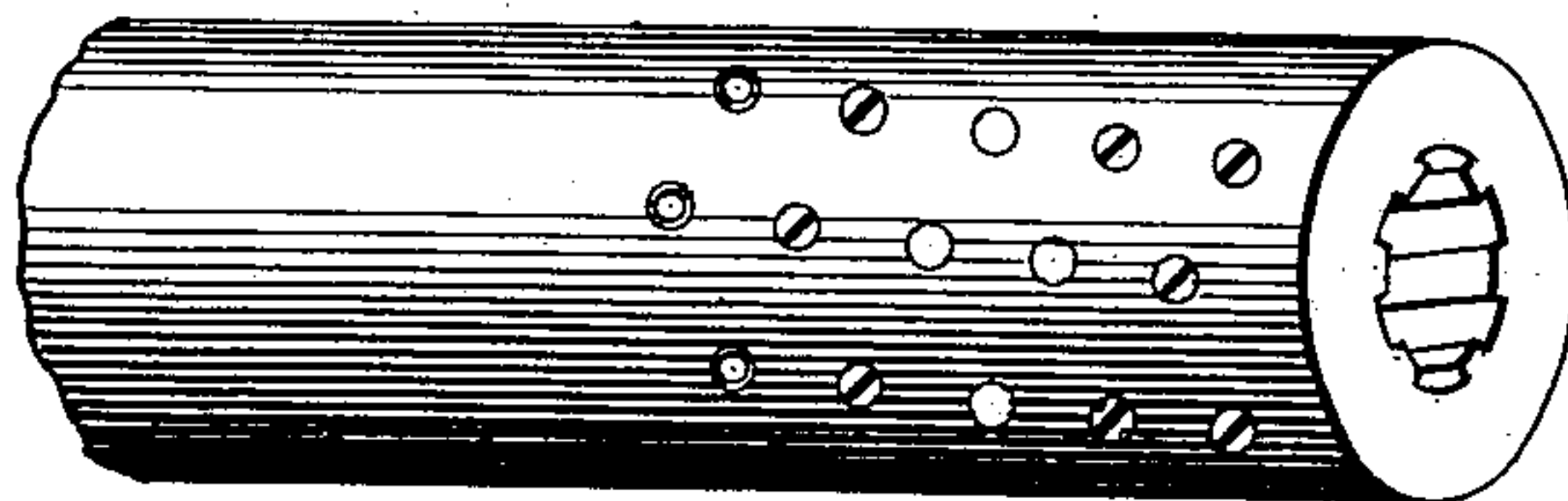
GUN BARREL FOR PISTOLS, RIFLES, AND ORDNANCE.

APPLICATION FILED JUNE 14, 1901. RENEWED JULY 25, 1903.

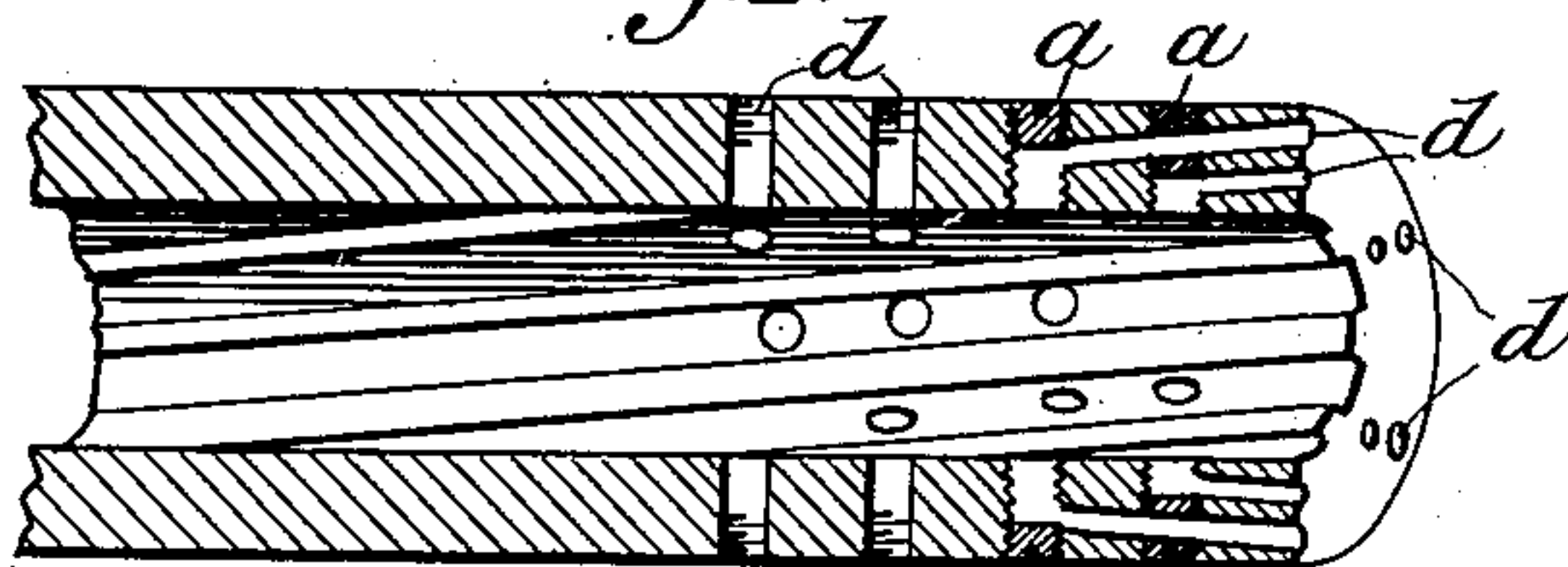
*Fig. 1.*



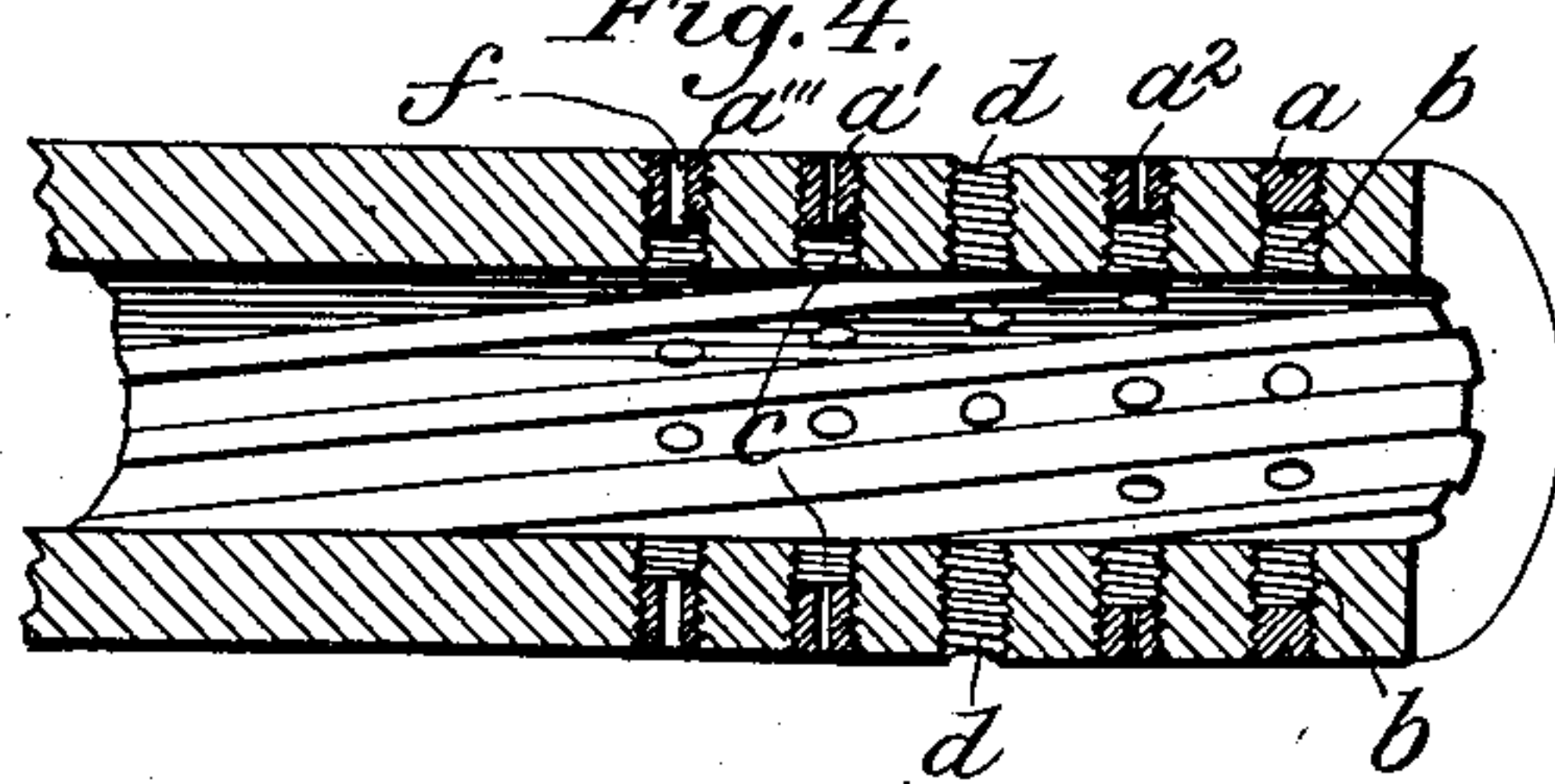
*Fig. 3.*



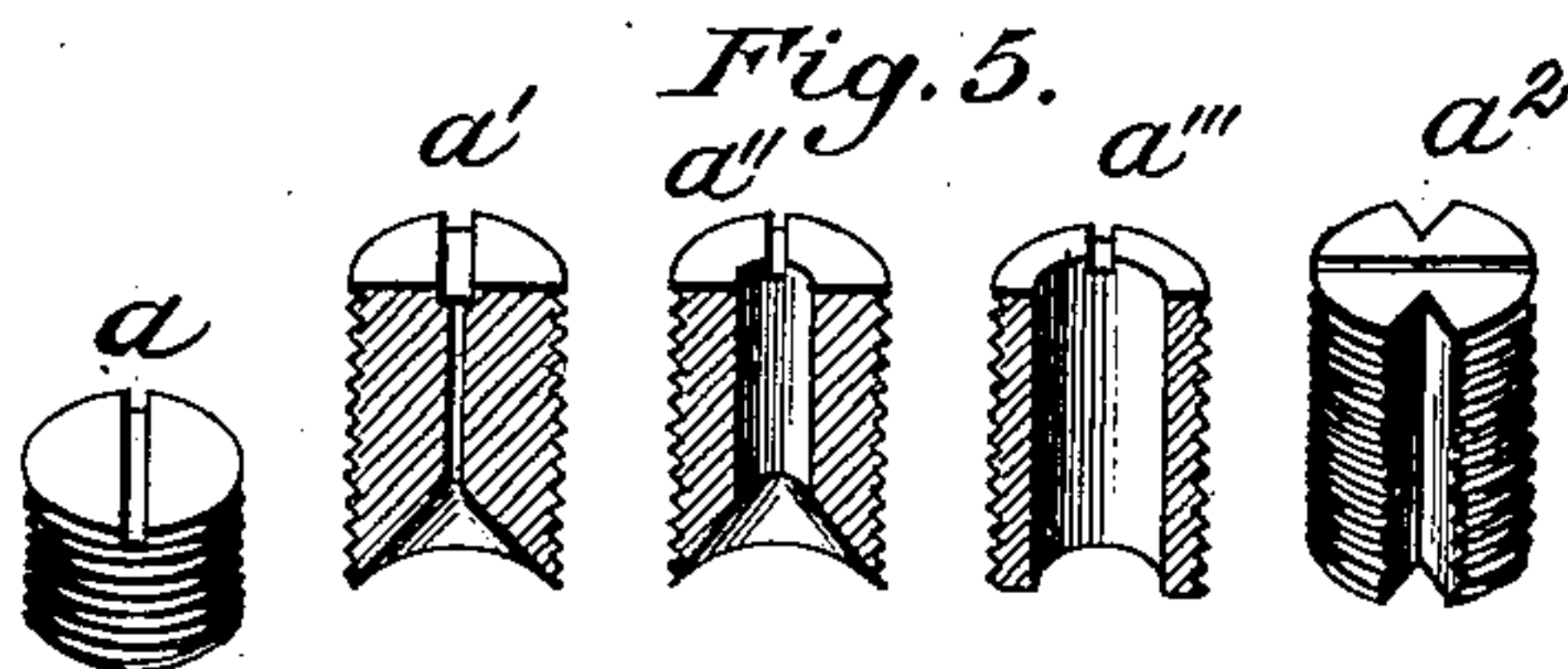
*Fig. 2.*



*Fig. 4.*



*Fig. 5.*



*Witnesses:*

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# UNITED STATES PATENT OFFICE.

PERRY E. KENT, OF UTICA, NEW YORK.

## GUN-BARREL FOR PISTOLS, RIFLES, AND ORDNANCE.

No. 812,140.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed June 14, 1901. Renewed July 25, 1903. Serial No. 167,044.

*To all whom it may concern:*

Be it known that I, PERRY E. KENT, of the city of Utica, in the county of Oneida and State of New York, have invented certain  
5 new and useful Improvements in Gun-Barrels for Pistols, Rifles, and Ordnance; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to  
10 which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

15 My improvement consists in perforating the barrel of the gun at or near the muzzle with several small holes or orifices drilled into the bore at a greater or less angle thereto or otherwise, so as to enter the rifling at a point  
20 inside of the muzzle, or they may be drilled into the barrel from around the outside of the muzzle, so as to enter the bore from the sides of the barrel, or these pressure-relief channels may be so constructed as to run parallel with  
25 the bore, or nearly so, and coalesce therewith wholly or in part, as deemed expedient. These perforations or openings are so calculated as to enter the bore between the lands thereof or within the grooves of the rifling;  
30 but they can be located in any desired position and be of any angle, shape, or size deemed expedient, and where the lands are wide enough to admit thereof they can be arranged so as to enter the lands as well as the  
35 grooves, or they may enter the lands and grooves alternately, so as to produce a more continuous or less interrupted exhaust; and, further, it consists of providing a means whereby the escape of gas therefrom can be  
40 wholly or partially shut off, regulated, or adjusted from any one of, or any series of, or any desired combination of, or the whole of the vents thus provided, at the will of the operator.

45 The object of this invention is to improve the barrels of rifled firearms and ordnance of all kinds (as they are now generally manufactured) so as to increase their accuracy and efficiency in ejecting the bullets or projectiles therefrom, give a more steady and  
50 effective flight and a greater range and more penetration thereto, and materially reduce the recoil. This will obviate the necessity of giving so great a twist to the rifling in order

to keep the bullet point-on during its flight, 55 thus decreasing erosion to a great degree and the cause of the excessive heating of the barrel in firing the piece continuously, chiefly due to friction of the bullet on the walls of the bore, in compelling rotation, and to provide 60 improved means for regulating and controlling the escape of gas or pressure from the barrel at the moment of or just prior to the axit of the projectile. In order to accomplish this result, I provide pressure-relief pas- 65 sages, which operate just prior to the issue of the bullet from the muzzle. These openings may take the form of channels constructed at an angle to the line of flight or channels so constructed that the exhaust will 70 be in direction, of or parallel with the line of flight, thus utilizing the escaping force to form a current of moving gas, which by its being capable of moving faster than the projectile it propels precedes the delivery of the 75 same by rushing through these channels and forms a surrounding or enveloping current in direction of the line of flight, thus materially assisting in accelerating the momentum as well as steadying and aiding the accuracy 80 of the delivery. I also provide several lengths, sizes, styles, and variety of construction of regulating or adjusting plugs, which may be inserted into these openings when and where desired. 85

Whenever a rifle, cannon, or other firearm is discharged, there is left on the muzzle of the piece a deposit of burned powder or a residuum which radiates from the bore outwardly and seems to be more or less in evidence, ac- 90 cordingly as the construction of the muzzle is rounding, countersunk, or flat, and diminishes in density as the radius increases. This is caused by the gas or propelling forces within the barrel seeking exit and indicates a 95 spiteful blast at the muzzle at right angles to the line of flight and leads to the conclusion that when the base of the comparatively slow moving bullet arrives at the edge of the muzzle the more elastic gas rushes out and past it in 100 all directions and more sharply and detrimentally so just at this very instant of parting with the edge of the muzzle. This powerful escaping gas at the instant of separation catches onto the burs at the base of the bullet 105 (left there by the lands of the rifling) or other imperfections and forces the rear of the now independently-moving and unsupported pro-



jectile out of a correct line, giving it a tendency to wobble and vary from the direction imparted to it coincident with the bore of the arm, causing it to "keyhole" or turn over in its flight or tip more or less in spite of its rotary motion, causing the base of the bullet to rotate around a periphery greater than its own circumference, thereby developing an unnecessary area of air-resistance. Consequently less penetration is obtained, and an unsteady, erratic, and unreliable flight is the result, and in my estimation it is chiefly due to this eccentric centrifugal force caused by the deleterious action of the gas upon the base of the bullet as it leaves the guiding confines of the bore which is the sole cause of the well-known "corkscrew" motion so common to all elongated projectiles during the first portion of their flight. It is to overcome this tendency that a sharp twist is necessary, and more particularly so in modern high-power rifles. In all properly - constructed rifled arms the grooves of the bore are uniformly of the same depth throughout, and the lands are correspondingly all of the same relative height or protrude uniformly the same into the bore, leaving the bore proper (comprising lands and grooves) all of the same uniform size throughout, save in the best or most accurate ones, where a converging bore or slightly-contracted portion at muzzle is deemed preferable, which serves, if anything, to confine the gas still more securely until the base of the bullet has parted with the muzzle of the piece.

The chief object of this invention is to provide gas-exits or pressure-relief vents that will permit of the lessening of the tremendous pressure behind as the bullet leaves the bore, so as to deliver it in a steadier manner and at the same time to utilize the escaping gas by forming a rapidly-moving current preceding and accompanying its issue and encircling, sustaining, and aiding the flight of the bullet.

Referring to the accompanying drawings, Figure 1 is a perspective view of the device. Fig. 2 shows a longitudinal section of Fig. 1. Fig. 3 shows a perspective view of a modification. Fig. 4 shows a longitudinal view of same. Fig. 5 shows various constructions of the adjustable regulating-plugs.

It is apparent that by combining lateral entrances to the bore and longitudinal exits at the muzzle and then plugging the outer end of the lateral hole an exhaust is thereby created at the muzzle around and encircling the one from the bore and parallel with the line of flight prior to the exit of the bullet, thus creating a current of rapidly-moving atmosphere in the path which the bullet is to travel, which not only greatly lessens the air resistance which the bullet would otherwise meet upon emerging from the bore,

but by being delivered in a correct manner from the muzzle of a gun with this improvement the peculiar gyrations which the projectile has heretofore been subject to does not now exist. Therefore more penetration and greater accuracy is the result, and not on account of attaining an increased muzzle velocity, but by materially reducing the area of the air-resisting surface of the bullet during its flight in consequence of its being delivered with its longitudinal axis coincident with the axis of the bore instead of in the usual manner, whereby the rear axis of the bullet is forced to diverge from its path or compelled to assume a greater or less angle with the tangent of the trajectory. It is also apparent in this construction that with the exhaust at the muzzle in a longitudinal direction encompassing the one issuing from the bore and beginning prior to the exit of the bullet there is thereby provided a counter-expansive blast which to a large degree mitigates the injurious effects of the muzzle-blast on the base of the bullet at the instant of separation. This, in combination with relief afforded prior to its issuing therefrom, results in a more steady and uniform delivery, and by the expansive radius of the outer encircling escaping gas, which completely surrounds the one issuing from the bore behind the bullet, the one from the bore is more completely confined to its own circumferential column, and therefore does not get the chance to so detrimentally effect the bullet at the instant of its delivery by so vicious a diverging influence which is effectively neutralized, and the whole column is kept moving in a more compact and less detrimental manner, with the before-mentioned results.

Referring more particularly to the openings for the escape of gas both longitudinally and circumferentially, I prefer to make them all of a uniform size, so that one plug may be interchangeable throughout; but as very few rifled barrels exactly correspond throughout with those of other makers it is obvious that the style, size, and formation of the perforations will be governed by the arm it is to be used upon and the conditions to be met. It is very evident, however, that by the use of these adjustable regulating-plugs any desired relief can be secured adaptable to various charges in the same gun, and the area of escape can be so very accurately and completely controlled and regulated that it can be made to completely transpose itself or to converge toward or diverge from the center, if deemed expedient, or assume a more or less interrupted character throughout the whole series, either longitudinally or circumferentially considered.

The solid plug *a* is used for completely shutting off any desired perforation. Plug *a* shows a very small aperture for materially



reducing the volume of the exhaust, while  $a''$  and  $a'''$  have larger apertures for the purpose of modifying or slightly reducing the volume of exhaust from any desired opening.  $a^2$  is another form of construction of the plug which is susceptible of still further alteration in construction.

If it is found more desirable or beneficial (in using several kinds or varieties of explosives or more or less quantities thereof or for any other cause) to increase the distance from the muzzle to the first series of openings or diminish the capacities thereof, it is obvious that it can be very quickly, easily, and effectively accomplished, so that virtually by this construction and the use of the plugs here provided not only the capacities of the several vent-holes may be nicely regulated, but the approximate distance from the muzzle to the first or other circumferential series of openings may be virtually increased or diminished at will, thereby practically allowing the exhausting or venting of the pressure within the barrel to be accomplished nearer to or farther away from the muzzle or the volume thereof diminished or increased at either end of the longitudinal series or any intermediate portion thereof. It is apparent that by compelling this relief-exhaust to be delivered through these gas-ports independent from and encircling the main one issuing from the bore a separate enveloping preceding current is formed that not only relieves the excessive pressure at the muzzle at the moment of delivery, but also creates a suction in front of the bore proper, into the vortex of which the projectile is launched with a pulling force from in front, as well as a pushing effect from behind from the gas yet contained in the barrel.

Having fully described this invention, what I claim, and desire to secure by Letters Patent, is—

1. A rifled barrel containing a series of perforations at the muzzle, adjacent to and encircling the bore, having the egress of the several openings located between the circumference of the barrel and the bore of the piece, and the ingress to the rear of the muzzle.

2. A rifled barrel containing a series of longitudinal gas-escape channels located between the circumference of the barrel and the periphery of the bore, having their openings at the muzzle, and intersecting the bore rearwardly thereof, permitting a portion of the gas-pressure to thereby escape past the bullet, in direction of and substantially parallel to the line of flight, prior to the exuding of the bullet, thus forming a preceding, encompassing, and separate current from the one immediately thereafter issuing from the bore.

3. A rifled barrel containing a series of perforations encircling the muzzle, entering the

bore at an angle to the line of flight, with means which enter into said perforations by means of which one or more of said perforations can be diminished, adjusted or varied in capacity.

4. A rifle-barrel containing a series of perforations encircling the muzzle and entering the bore of the piece, in combination with one or more plugs inserted therein for regulating the escape of gas therefrom.

5. A gun-barrel containing a series of perforations or gas-escape openings encircling the muzzle, with one or more plugs inserted therein, for the purpose of reducing or regulating the maximum flow of gas therefrom.

6. A rifled barrel perforated at or near the muzzle with a series of holes encircling the same and radiating from the bore outward with means for partially closing said holes by the use of plugs or their equivalent entering said holes, essentially as shown and described.

7. A rifled barrel containing a series of perforations or gas-escape openings encircling the muzzle and entering the bore thereof, with means entering into any one or more of said perforations by which the circumferential area of gas-escape may be diminished, regulated or changed wholly or in part, essentially as described.

8. A rifle-barrel containing a series of perforations or gas-escape openings encircling the muzzle, and means by which the longitudinal area of gas-escape may be varied, regulated, or changed independently of the circumferential area, essentially as set forth.

9. A rifled barrel containing a series of perforations or gas-escape openings near the muzzle, with means consisting of perforated plugs inserted therein, by which the distance from the muzzle to the nearest full openings may be increased or diminished, and the area or volume of escape be thereby changed or regulated as desired.

10. A gun-barrel containing a series of gas-escape openings encircling the bore, fitted with plugs containing openings through which the propelling force may find exit prior to the bullet leaving the muzzle thereof.

11. A gun-barrel containing a multiple of longitudinal gas-escape channels, adjacent to and encircling the bore of the piece, having their exits between the circumference of the barrel and the periphery of the bore, intersecting the bore rearwardly of the muzzle, through which a portion of the gas-pressure may escape prior to the parting of the rear end of the bullet with the muzzle of the piece in direction of the line of flight; in combination with spirally-cut grooves or rifling within the bore of the piece.

12. A rifle-barrel containing a series of lateral gas-escape channels, one or more of which are estopped at the outer opening of

same with plugs, coalescing with a series of longitudinal gas-escape channels located between the circumference of the bore and the circumference of the barrel, permitting the  
5. gas to escape approximately parallel to the line of flight separately from the blast issuing from the bore.

In witness whereof I have affixed my signature, in presence of two witnesses, this 12th day of June, 1901.

PERRY E. KENT.

Witnesses:

G. M. JONES,  
CLAUDE E. HAKES.