

April 7, 1931.

E. HOLEK

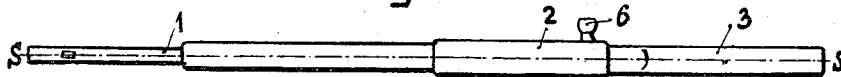
1,799,981

FIREARM

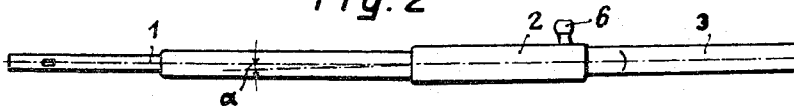
Filed June 18, 1929

2 Sheets-Sheet 1

*Fig.1*



*Fig. 2*



**Fig. 3**

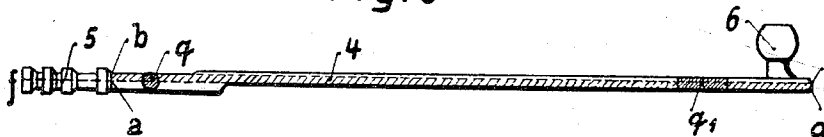
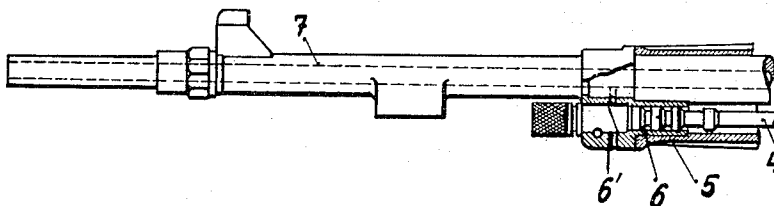


Fig.4



Emanuel Holek  
INVENTOR

BY *Otto H. Frank*  
his ATTORNEY

April 7, 1931.

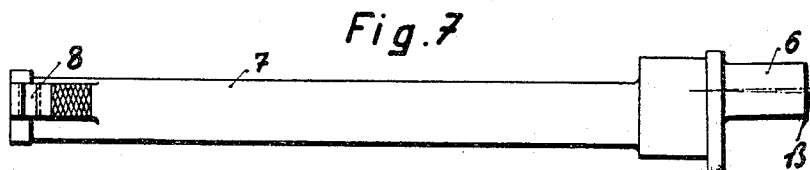
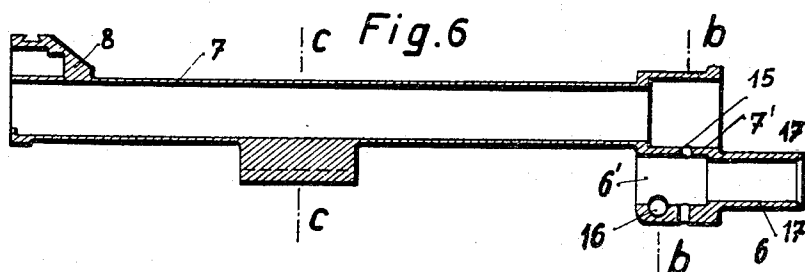
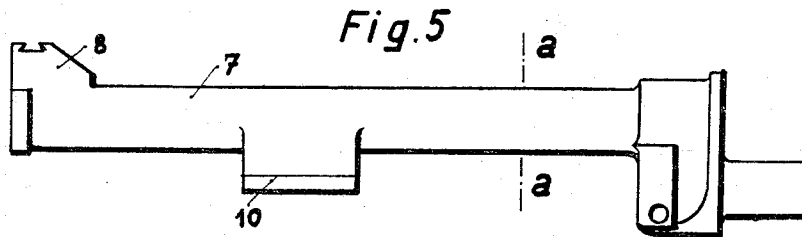
E. HOLEK

1,799,981

FIREARM

Filed June 18, 1929

2 Sheets-Sheet 2

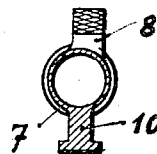
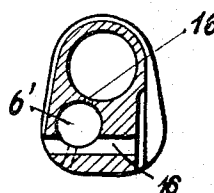
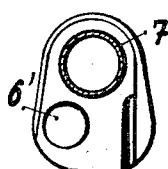


*Fig. 8*

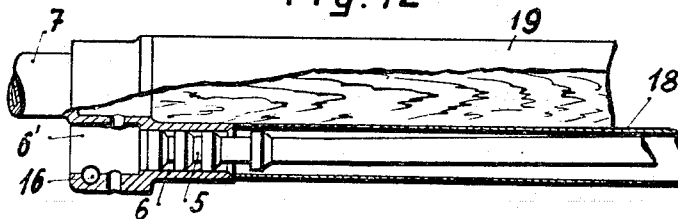
*Fig. 9*

*Fig. 10*

*Fig. 11*



*Fig. 12*



Emanuel Holek  
INVENTOR

BY *[Signature]*  
his ATTORNEY

## UNITED STATES PATENT OFFICE

EMANUEL HOLEK, OF BRUNN, CZECHOSLOVAKIA, ASSIGNOR TO THE FIRM CESKO-SLOVENSKA ZBROJOVKA AKCIOVA SPOLECNOST V BRNE, OF BRUNN, CZECHOSLOVAKIA

## FIREARM

Application filed June 18, 1929, Serial No. 371,789, and in Czechoslovakia May 10, 1929.

This invention relates to fire-arms and consists essentially in providing a special construction of fire-arms in which the barrel is axially displaced with respect to the other parts of the fire-arm so that the rifleman may keep the fire-arm in its normal position permitting to conveniently take aim at an object, even in case the rifleman carries a gas-mask or a steel-helmet.

A further feature of this invention consists in a novel construction of the piston-rod which forms part of the gas-pressure operated charging device for the purpose of preventing objectional strains from being imposed upon said piston-rod.

A further feature of this invention consists therein that the gas-cylinder of the gas-pressure operated charging device is made integral with the carrier for the gun-sight to permit both of said parts of being easily exchanged by a single manipulation.

A number of constructions of fire-arms according to this invention are shown in the accompanying drawings in which Fig. 1 is a diagrammatic top-view showing a fire-arm of ordinary construction, Fig. 2 a similar top-view of a fire-arm constructed according to this invention in contra-distinction to Fig. 1, Fig. 3 a detail-view of the gas-piston together with the piston-rod, Fig. 4 a view, partially in section, of the carrier for the gun-sight and the gas-cylinder, Fig. 5 a side-view of said carrier and the gas-cylinder, Fig. 6 a longitudinal central section and Fig. 7 a top-view, respectively of Fig. 5, Fig. 8 a detail view showing the sight-carrier of Fig. 5 as seen from the right-hand side, Fig. 9 a section along line *a-a* of Fig. 5, Figs. 10 and 11 sections along lines *b-b* and *c-c*, respectively, taken on Fig. 6, Fig. 12 a view and partial section of the connecting member which is arranged intermediate the sight-carrier and the gas-cylinder with a small protective tube serving for the protection of the upper part of the gun-stock.

In Figs. 1 and 2, the barrel of the fire-arm is shown at 1, the central piece at 2 and the gun-stock at 3. As may be seen from Fig. 1, the three aforementioned parts of the fire-arm are positioned in a common plane of symmetry *s-s*, such as is ordinarily the case in known constructions of fire-arms. According to Fig. 2 the part of the fire-arm which consists of the gun-stock 2 and the central piece 3 is inclined towards the barrel 1 at an angle  $\alpha$  which preferably amounts to about  $1^\circ$  as I have ascertained by experiments. This axial displacement between the barrel and gun-stock and the central piece is so small that the lateral dimensions of the fire-arm will not essentially be increased and that in addition to this rifleman will not need to bring portions of its head above the butt-end of the fire-arm during taking aim at an object. It will therefore be possible for the rifleman to properly take aim by merely slightly placing his cheek against the gun-stock, even if the rifleman wears a gas-mask or a steel-helmet. The position in which the rifleman may hold the fire-arm will now be the normal position and the aforementioned axial displacement of the several parts of the fire-arm will have no influence whatever upon its manipulation.

In Fig. 3 the piston-rod is shown at 4, the gas-piston at 5 and the handle or knob at 6. The piston-rod, for reasons of construction, had heretofore ordinarily been of somewhat bent conformation which during firing had resulted into bending strains upon the piston-rod. In the construction according to my invention as shown in Fig. 3 the gas-pressure operated charging device now comprises a piston-rod composed of a central essentially straight portion *a, b, c, d* extending along the greater part of the length of said rod, while the front part of said rod is of round cross-section in proximity to the piston as indicated at *g*, and of rectangular cross-section in the rear part as indicated at *g'*. By

providing a piston-rod of this cross-sectional conformation, the gas-pressure which is exerted upon the front-piston surface  $f$  will be mechanically transmitted in a very favorable way in form of compressive strains to the piston-rod and from here to the breech or breech-carrier (not shown in the drawing). Furthermore, by constructing the piston-rod in the afore-described manner with a central pressure transmitting part, it will be possible to construct the piston-rod as economically as possible, because the gas-pressure will always act upon the piston-rod in the direction of the axis. Reducing the strength of the piston-rod, apparently will result in a saving of material and in consequence thereof also in a reduction of the weight of the fire-arm. By reason of the herein described essentially straight conformation of the piston-rod and its varying cross-section the mode of guiding the gas-piston in the gun-stock will be greatly simplified.

In Fig. 4 the piston-rod is again shown at 4, the piston at 5 and the gas-cylinder at 6. The gas-cylinder according to Fig. 4 is made integral with the sight-carrier which permits to conveniently exchange the gas-cylinder together with the sight-carrier in case of excessive wear of the barrel of the fire-arm. According to my invention the gas-cylinder 6 is connected by means of an extension 6' with the end 7' of the sight-carrier 7. Moreover, the gas-cylinder is of a length which is smaller than the stroke of the gas-piston, this permitting convenient cooling of the gas-cylinder and rendering soiling or sooting impossible so that a sticking of the piston to the cylinder will be effectively prevented. In Figs. 5-7 the sight-carrier 7 is provided at its end with an extension 8 permitting the reception of the gun-sight proper within the dovetail-shaped groove shown at the left-hand end of Figs. 5, 6 and 7, the gun-sight itself being omitted in the drawing. The bayonet-carrier is shown at 10. An aperture 15 is provided in the wall which separates the gas-cylinder 6 and its extension 6' from the sight-carrier 7 and 7', said aperture permitting passage of the powder-gas from the barrel into the gas-cylinder. A bore 16 is provided in the said extension 6' of the gas-pressure cylinder 6 and a bolt may be rotated in said bore in order to adjust a regulating device which is not shown in the drawing. After the barrel of the fire-arm has worn-out to such an extent that it can no more be used, the portion of the fire-arm which consists of the gas-cylinder and the sight-carrier may now be taken off by a single manipulation and mounted upon another fire-arm. In order to permit the gas-piston to be easily introduced in to the gas-cylinder, the front-side of the latter is provided with an oblique or conical surface as indicated at 17. The

gas-pressure cylinder 6 together with the extension 6' provided thereon is displaced with respect to the sight-carrier 7 by an angle  $\beta$  which likewise amounts to about  $1^\circ$  (Fig. 9). According to my invention the clear diameter of the extension 6' is larger than the gas-cylinder proper which carries the piston.

According to the construction shown in Fig. 12 the piston-rod is loosely surrounded by a small tube 18 which serves for protecting the upper parts of the gun-stock 19 against the action of the hot discharge gases.

By reason of the fact that the gas-cylinder in the present case is of relatively short length, said gas-cylinder may conveniently be subjected to treatment by heat, such as for instance to a hardening process, or some other process which serves for increasing the mechanical strength of said cylinder. The relatively small length of the gas-cylinder which is due to the aforescribed mode of connecting said cylinder with the end of the sight-carrier will further greatly simplify the manufacture and provide ample possibilities for cooling.

I claim:

1. A hand or gas-pressure operated fire-arm, comprising in combination, a gun-stock, a central piece, and a barrel, said gun-stock, and said central piece being positioned at an angle with respect to said barrel so as to permit the rifleman to take aim, even when wearing a gas-mask or a steel-helmet, by merely laying his cheek against the butt-end of the gun-stock without bringing portions of his head above said butt-end.

2. A gas-pressure operated fire-arm as specified by claim 1, comprising a gas-cylinder, a piston, and a piston-rod having a varying cross-section and including a central member extending over the greater part of the length of said piston-rod to permit transmission of the gas-pressure which acts upon said piston in the form of compressive strains imposed upon said piston-rod.

3. A fire-arm as specified by claim 1, having a gas-cylinder which is integral with a sight-carrier attached to the barrel and permitting convenient exchange of said gas-cylinder together with said sight-carrier.

4. A fire-arm as specified by claim 1, having a gas-cylinder which is adapted to form a rest for the butt-end of the fire-arm and connected with a sight-carrier by means of an extension provided on said gas-cylinder.

5. A fire-arm as specified by claim 1, in which the gas-cylinder is adapted to form a rest for the butt-end of the fire-arm and provided with an extension, said gas-cylinder being connected with the end of said sight-carrier by means of said extension.

6. A fire-arm as specified by claim 1 comprising a gas-cylinder, an extension thereon, a sight-carrier integral with said gas-cylinder

der, said gas-cylinder together with said extension being angularly displaced with respect to said sight-carrier.

5 7. A fire-arm as specified by claim 1 comprising a gas-cylinder, an extension thereon, a piston, a piston rod having a varying cross-section and including a central member  
10 extending over the greater part of the length of said piston rod and a tube-shaped sight carrier integral with said gas-cylinder, said  
15 gas-cylinder together with said extension being angularly displaced with respect to the axis of the tube of the sight-carrier and to the longitudinal axis of the barrel.

15 In testimony whereof I affix my signature.  
EMANUEL HOLEK.

20

25

30

35

40

45

50

55

60

65