

June 29, 1943.

W. T. GORTON

2,322,780

GUN

Filed June 4, 1940

3 Sheets-Sheet 1

Fig. 1

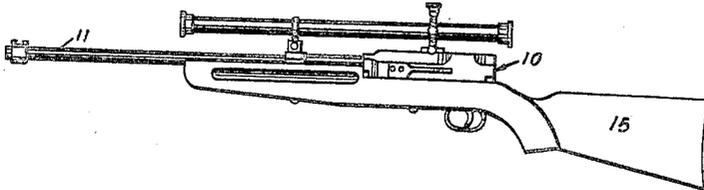


Fig. 2

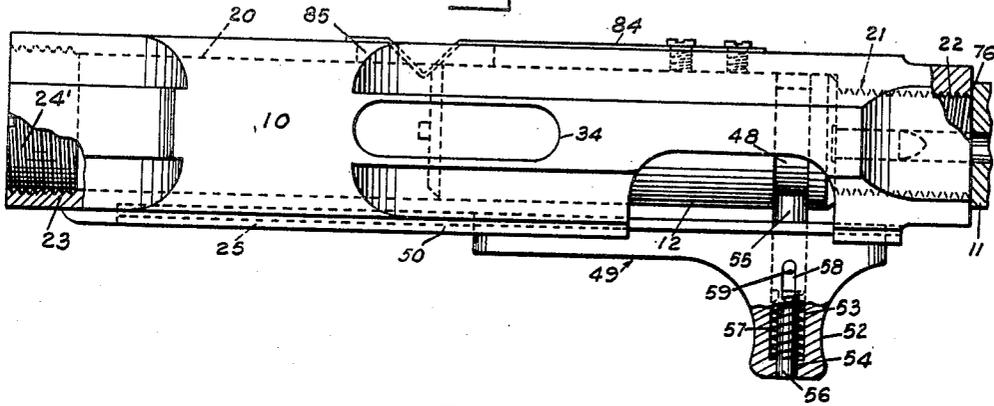
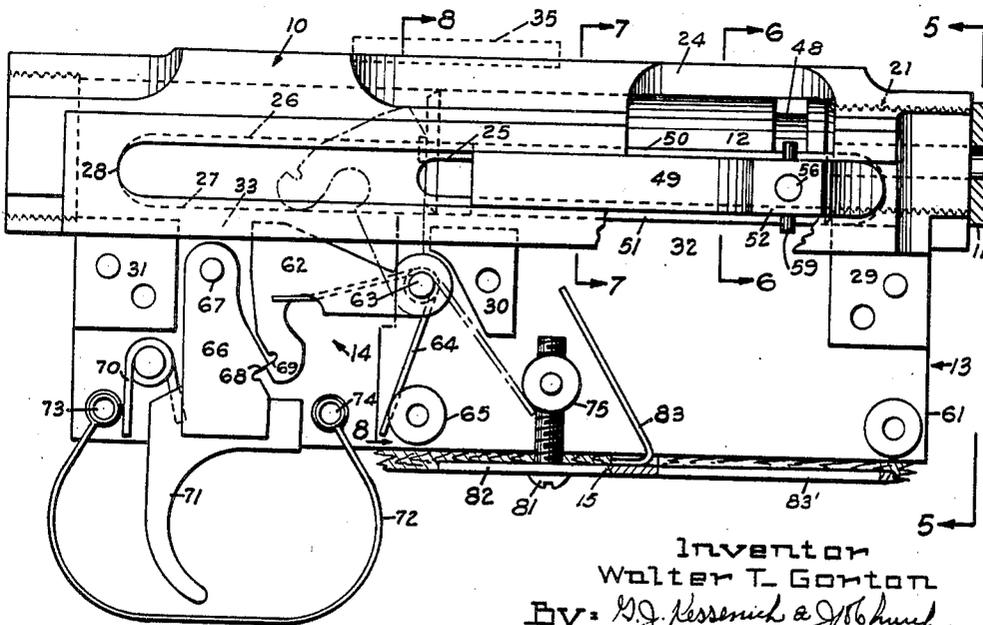


Fig. 3



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Fig-4-

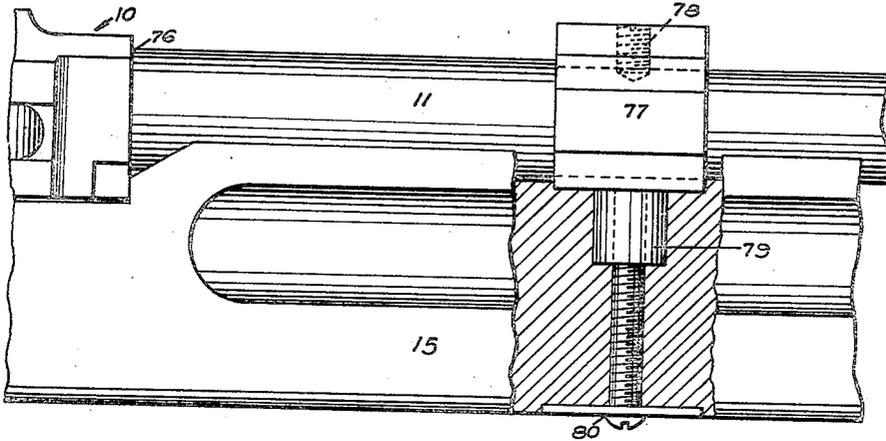


Fig-5-

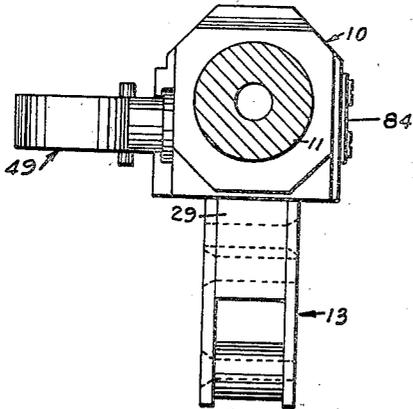


Fig-6-

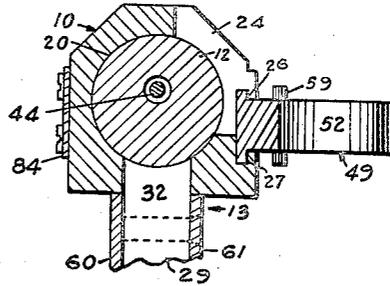


Fig-8-

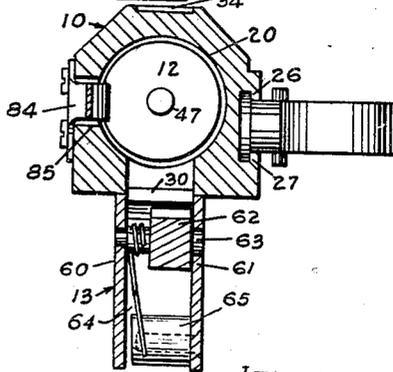
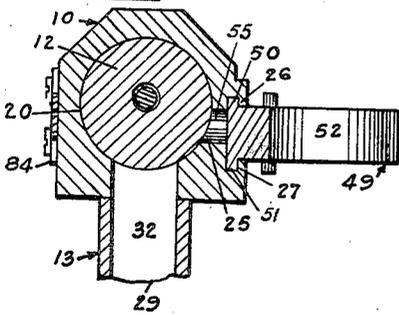


Fig-7-



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Fig-9-

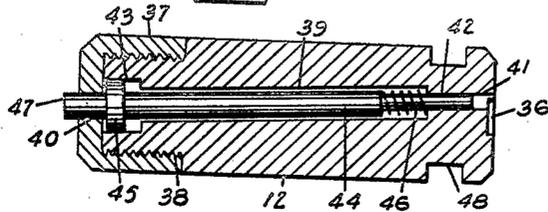


Fig-10-

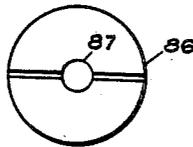


Fig-11-

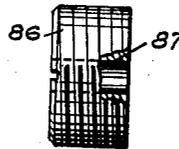
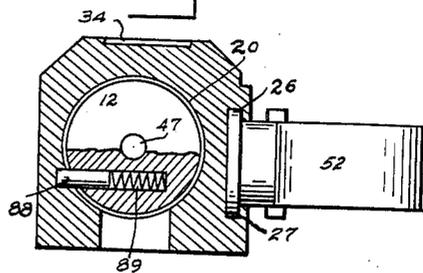


Fig-12-



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UNITED STATES PATENT OFFICE

2,322,780

GUN

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Application June 4, 1940, Serial No. 338,717

7 Claims. (Cl. 42—20)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a firearm of the type wherein the breech bolt is automatically opened and a chambered shell ejected through the force of explosion in firing, the other operations in the firing cycle being initiated manually, and constitutes an improvement in the firearm disclosed by my copending application Serial No. 273,707 filed May 15, 1939.

It is an object of the invention to generally improve the firearm disclosed in said copending application and to provide an embodiment thereof particularly adapted for use in a rifle.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Fig. 1 is a view in elevation showing the left side of the gun;

Fig. 2 is a top plan view partially in section of the receiver with the bolt in "in battery" position;

Fig. 3 is a view partially in section showing the right hand side of the receiver in elevation and a fragmentary portion of the barrel with the bolt in "in battery" position.

Fig. 4 is a fragmentary elevational view partially in section showing the forward attachment between the stock and barrel;

Fig. 5 is a section taken on the line 5—5 of Fig. 3;

Figs. 6, 7 and 8 are detail sectional views taken upon the lines 6—6, 7—7 and 8—8, respectively of Fig. 3;

Fig. 9 is a sectional view of the breech bolt;

Fig. 10 is a view in rear elevation of a cleaning attachment;

Fig. 11 is a view in side elevation of the attachment shown in Fig. 10;

Fig. 12 is a sectional view through the bolt showing a modified form of bolt detent.

Referring now to the drawings by characters of reference there is disclosed a rifle comprising the receiver 10, barrel 11, bolt 12, housing 13 for the firing mechanism 14, and stock 15 all as generally designated, and while the specific features herein disclosed are embodied in a rifle it will of course be understood by those skilled in the art that certain of the features may be embodied with equal facility in any suitable firearm.

The receiver 10 may conveniently be formed

by casting; but is preferably formed from a bar of T-shape in cross section which is machined to provide a longitudinal extending bolt recess or bore 20 disposed within the head or cross web of the bar. At the forward end portion thereof the bore 20 is reduced in cross section to form a barrel receiving opening 21 coaxially arranged with respect to the bore and provided with suitable means arranged for detachable interlocking relation with the received portion of the barrel, such as the threads 22. The rear portion of the bore or recess 20 is threaded as indicated at 23, or otherwise suitably formed to detachably receive a buffer plug 24'.

As shown more particularly in Figs. 2 and 3 the right side of the receiver is formed with a loading opening 24 communicating with the bore 20 in rear of passage 21 of such size and configuration as to afford facile manual insertion of a shell within the chamber of a barrel disposed in opening 21. Leading rearwardly of the opening 24 in intercommunicating relation therewith and communicating with bore 20 is an elongated opening or slot 25 arranged in parallelism with the axis of bore 20 and adapted to guidingly receive a cocking handle plunger hereinafter described. The right side of the receiver is additionally machined to form, or is otherwise provided with vertically spaced guideways 26 and 27 adapted to reciprocally receive and restrain the movement of a cocking handle, also hereinafter described, to parallelism with the axis of bore 20. As disclosed in the particular embodiment of this invention the guideways are freely accessible at their forward end portions and terminate in a stop 28 at their rear ends this, however, is merely by way of example since the above described arrangement may be reversed if desired.

The bottom of the receiver is either cast or formed of a bar of T shape in section is machined to provide three longitudinally spaced depending lugs 29, 30 and 31 disposed as shown in Fig. 3 and openings leading from the bottom of the receiver to the bore 20 are located between the lugs as indicated at 32 and 33, the former opening 32 serving as an egression opening for shells ejected from the chamber and the latter opening 33 as a passage through which the hammer of the firing mechanism may swing to strike the firing pin carried by the bolt in bore 20.

The top of the receiver may be machined to provide any desirable appearance such as shown in the drawings and is recessed as at 34 to re-

ceive a rear sight securing bracket 35 in any desirable demountable manner.

The breech bolt 12 comprises a cylindrical member of such diameter and finish as to be received within the bolt recess 20 of the receiver in a nicely fitted slidable relation and has its forward face provided with a circular recess 36 disposed axially thereof in such manner as to receive and nicely engage the head of a cartridge chambered in a barrel secured in opening 21 when the breech bolt is in its "in battery" position. The rear end portion 37 of the breech bolt is detachable from the body thereof as by the interthreaded engagement indicated at 38 and the breech bolt is formed with a firing pin recess 39 inclined to the axis of the bolt with its rear end portion 40 concentric with the axis of the bolt and its forward end portion 41 eccentric with the bolt axis and terminating adjacent the periphery of recess 36 in a manner to overlie the rim of a cartridge having its head disposed in recess 36. In accordance with the arrangement of this invention the forward portion of the firing pin recess 39 is of reduced section as indicated at 42 and the rear portion is of enlarged section, as indicated at 43, adjacent the rear end of the body portion. A firing pin 44 having a flange 45 is inserted in the firing pin recess 39 of the body of the bolt with a light helical firing pin retracting spring 46 interposed between the shoulder formed by the reduced section 42 of the firing pin recess and a shoulder on the firing pin. The firing pin is retained in the recess 39 by the rear end portion 37 of the bolt which engages the flange 45 of the firing pin in the retracted position of the latter with the spring 46 under slight initial compression and the head 47 of the pin projecting without the portion 40 of the recess 39.

Adjacent its forward end the breech bolt 12 is formed with a circumferential groove 48 for a purpose that will become apparent as the description proceeds.

In the instant application, as in my co-pending application above referred to, the weight of the breech bolt 12 is so proportioned with respect to the caliber of the weapon that its inertia will be such that it will be propelled in recoil upon firing at a velocity that may be arrested by the buffer plug 24' without rebound of the breech bolt.

The breech bolt 12 with its assembled firing pin is inserted in the bolt recess or bore 20 through the rear end of the latter after which the buffer plug 24' is secured in place through interthreaded engagement with the threads 23.

To facilitate manipulation of the breech bolt a cocking slide 49 having upper and lower guides 50 and 51 adapted to be received in the guideways 26 and 27, respectively, is provided. The cocking slide 49 is formed with a hand grasp 52 adjacent its forward end which is longitudinally bored at 53 and 54 to receive a cocking slide plunger 55 having a shank portion 56 of reduced diameter fitting the bore 54. A spring 57 is housed in the bore 53 in operative engagement with and under sufficient initial compression to urge the plunger without the bore. The hand grasp 52 is formed with a transverse longitudinally elongated opening 58 communicating with the bore 53 of such length that the cocking slide plunger retracting pin 59 will be effective to retract the plunger against spring 57 to a position where its inner face will be flush with the inner face of the cocking slide.

To assemble the cocking slide on the receiver the plunger 55 is retracted by the pin 59 and the slide is inserted in its guideways from the forward end of the latter. When the plunger 55 is in alignment with the groove 48 in the breech bolt it is released whereupon it engages the bolt in the groove 48 and is effectively secured on the receiver for limited reciprocal motion by the extent of forward movement of the bolt and the stop 28 in a rearward direction.

By employing a bolt and cocking slide of the character above described all necessity of orienting the bolt in the recess 20 has been eliminated as the firing pin is as effective in one circumferential position of the bolt in its recess as another.

The housing 13 is comprised of left and right lock plates 60 and 61, respectively, which are secured to the depending lugs 29, 30 and 31 with the lugs intermediate thereof so as to separate the plates to provide a housing space therebetween.

The firing mechanism, other than the firing pin, is located in the housing formed by the lock plates 60 and 61 and comprises a hammer 62 pivoted on the pin 63 and arranged to swing through the opening 33 in the bottom of the receiver and strike the protruding end of the firing pin 44 when the bolt 12 is in its "in battery" position with the firing pin retracted. The hammer, when released from the cocked position shown in Fig. 2, is driven home by a torsion spring 64 coiled about the hammer pin 63, Figure 3, and disposed under initial compression in the cocked position of the hammer with its upper limb engaging the under side of the hammer and its lower limb engaging the hammer spring abutment stud 65 secured at one end to one of the lock plates, its other end being spaced from the opposite plate for a reason made apparent hereinafter.

A sear 66 is pivoted within the housing 13 formed by the lock plates 60 and 61 on the sear pin 67 and is adapted to have its nose 68 engage within the hammer notch 69 under the influence of a torsion sear spring 70 disposed as shown in Fig. 3 to retain the hammer in cocked position against the action of hammer spring 64.

The sear 66 has a trigger 71 secured thereto in a manner to depend without the housing 13 for providing ready access thereof and is disposed within a trigger guard 72 secured as by the studs 73 and 74 to the lock plates. The stud 73 also serves to limit rearward swinging movement of the sear and trigger while the stud 74 serves the additional function of limiting downward swinging movement of the hammer 62.

A trunnion nut 75 is secured to the lock plates within the housing 13 and serves to receive the rear fastening means for securing the weapon to its stock 15. The trunnion nut 75 is so disposed relative to the stud 65 that the hammer spring 64 may be disengaged from its compressed position on stud 65 and moved through the lateral space between the stud and adjacent lock plate into engagement with the trunnion nut 75 where it will be retained in position under substantially no stress, thus permitting storage of the gun with the hammer spring unstressed or "dry firing" of the gun without undue fatiguing of the hammer spring.

The barrel 11 has its chamber end portion formed to be inserted within the opening 21 of the receiver in interthreaded or other suitable interlocked relation with the means 22 and has

an annular shoulder engaging the forward end of the receiver as indicated at 76. Intermediate its ends at a suitable point the barrel 11 has a barrel band 77 sleeved thereover in any convenient manner and secured in position by any desirable means such as the stud 78. The upper surface of the barrel band is suitably machined to receive a securing bracket for the forward support of a telescopic sight, the rear support for the telescopic sight, when used, being bracket 35 located in recess 34 of the receiver. The barrel band 77 has a securing lug 79 depending from its lower surface arranged to receive the forward fastening means for securing the gun to its stock 15.

The stock 15 may be formed to have any suitable configuration and is recessed and/or slotted as indicated in Fig. 1 to receive the housing 13, receiver 10 and a portion of the barrel 11. The forward fastening means 80 passes through the forward part of stock 15 and secures the gun to the stock through interlocking engagement with lug 79. The rear fastening means 81 passes through a floor plate 82 and is secured in the trunnion nut 75 to detachably secure the housing 13, receiver 10 and the floor plate 82 to the stock 15. If desired the floor plate 82 may have a deflection member 83 secured thereto operable to deflect shells ejected from the chamber from the trunnion nut 75 and mechanism in rear thereof toward the shell exit opening 83'.

After the rifle has been assembled in the manner above described and assuming the breech bolt to be in its "in battery" position; to load for the first shot the breech bolt will be drawn to its recoil position in engagement with the buffer plug 24' through means of the cocking slide 49 and plunger 55. This action will cause the bolt to engage and downwardly swing the hammer 62 against the hammer spring 64 and the sear being urged forwardly by the sear spring will engage and retain the hammer in cocked position. A cartridge may now be chambered in the barrel through the loading opening 24 after which the bolt is moved to its "in battery" position by the cocking slide 49. The piece is now conditioned for firing and upon pulling the trigger the hammer is released and driven forward by the hammer spring thus striking the firing pin and firing the chambered cartridge. Direct breech pressure generated by ignition of the propellant charge causes the bolt to recoil and at the same time extracts the empty cartridge case which falls clear through the egression opening 32 in the receiver and stock. To condition the piece for subsequent firing it is only necessary to chamber a fresh cartridge and push the bolt home as recoil of the bolt from the previous firing cocked the hammer as in the case when the bolt was manually retracted to its recoil position as above described.

To steady the bolt in its "in battery" or "home" position a spring detent 84 secured to the left side of the receiver and having a detent portion adapted to project through an opening 85 in the receiver plate just in rear of the bolt and engageable therewith in the "in battery" position of the bolt is provided. It will be understood that the detent 84 offers no appreciable resistance to the recoil of the bolt and serves merely to retain the bolt in its "in battery" position against accidental displacement therefrom.

Figs. 10 and 11 disclose a cleaning rod attachment 86 that may be used to replace the buffer plug 24' after the latter and the bolt have been

removed from the receiver. The cleaning attachment 86 is formed to provide a cleaning rod guide 87 that is aligned with the axis of the bore of the piece whereby the bore may be cleaned without injury to the rifling thereof.

Fig. 12 discloses a modified form of bolt detent which may be used in lieu of the detent 84 and comprises a plunger 88 arranged in the bolt under a normal outwardly urging force, such as the force exerted by the spring 89, and serves to engage within a detent groove arranged in the receiver of the piece in such manner as to refrain the bolt to its "in battery" position against accidental displacement.

Having now described what is at present a preferred embodiment of the invention, I claim:

1. In a weapon of the class described, in combination a receiver comprising a web portion bored to provide a bolt recess, a plurality of spaced lugs depending from the receiver axially thereof, said receiver being formed to provide openings communicating with the bolt recess intermediate the depending lugs, lock plates having their upper edges abutting the bottom of the receiver and secured to the lugs on either side thereof, a hammer pivoted to the lock plates for swinging movement through the rear most of said openings, a leaf hammer spring having one limb engaging the hammer, a stud between the lock plates to engage the other limb and retain said hammer spring under initial stress, a trunnion spaced from said stud and adapted to engage and retain said other limb of the hammer spring when said spring is unstressed, a sear pivoted between the locking plates operable to engage and retain the hammer in cocked position within the housing, a trigger secured to the sear and depending without the housing and a sear and trigger spring engaging and operable to normally urge the sear into engagement with the hammer.

2. The structure of claim 1, wherein said trunnion is formed to receive means for securing the receiver to a stock.

3. The structure of claim 1, wherein studs are secured to the plates forwardly and rearwardly of the trigger and a trigger guard is secured to said studs in operative relation to the trigger.

4. A breech bolt comprising a cylindrical member provided with an annular recess upon one end portion and an axially projecting threaded portion of reduced diameter at its opposite end portion, said cylindrical member being formed with an interior inclined bore extending from end to end thereof comprising a portion of enlarged diameter terminating axially of said end portion of reduced diameter, a portion of reduced diameter joining the enlarged diameter portion and traversing the greater portion of the length of the cylindrical member and another portion of additionally reduced diameter joining said portion of reduced diameter and said circular recess eccentrically of the latter, a firing pin having a flange adjacent its rear end portion and a forward end portion of reduced diameter slidably mounted with the flange in said bore portion of enlarged diameter and the reduced forward end portion in said bore portion of additionally reduced diameter, an interiorly threaded member of the same outside diameter as the cylindrical member secured thereto by interthreaded engagement with said end portion of reduced diameter thereof to retain the firing pin in position, and a spring mounted on the forward end portion of the firing pin in said bore portion of reduced di-

ameter operable to normally maintain the firing pin in retracted position.

5. In a weapon of the class described, in combination, a receiver comprising a web portion bored to provide a bolt recess, at least three spaced lugs depending from the web portion axially thereof, the spaces between the lugs opening into the bolt recess, plates secured to the lugs on either side thereof and forming a housing for a firing mechanism, one of the spaces between the lugs forming a passage for the hammer of the firing mechanism and another of said spaces providing a shell ejection passage from the receiver.

6. In a weapon of the class described, in combination, a receiver having a cylindrical bolt recess, and a slot in one side and communicating with and parallel to said recess, a cylindrical

bolt movable in said recess and having a circumferential groove adjacent its forward end, a cocking slide mounted in said slot, means for guiding the cocking slide, a housing on the cocking slide, a plunger mounted in said housing for movement transversely of the slot, means for normally urging the plunger into the recess in said bolt, whereby the slide is adapted to reciprocate the bolt irrespective of the circumferential position of the bolt in the recess.

7. The invention according to claim 6, characterized in that the housing is provided with a slot disposed in axial relation to the plunger, and a pin carried by the plunger and extending through the slot, whereby the plunger can be retracted from the recess in the end of the bolt.

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