

May 16, 1939.

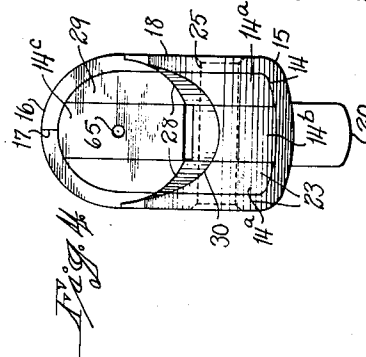
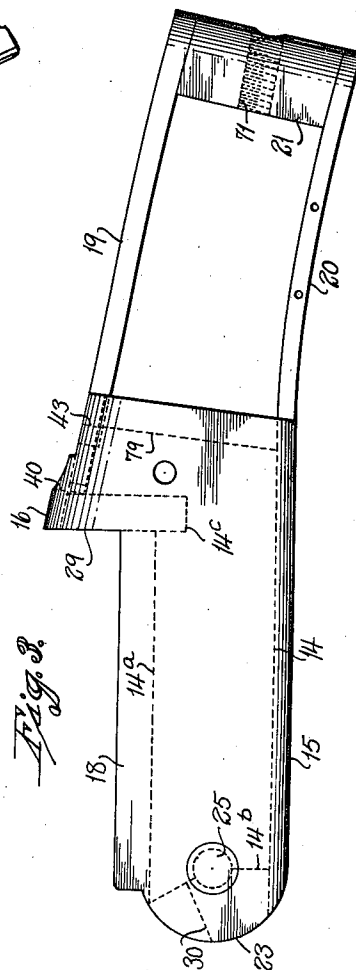
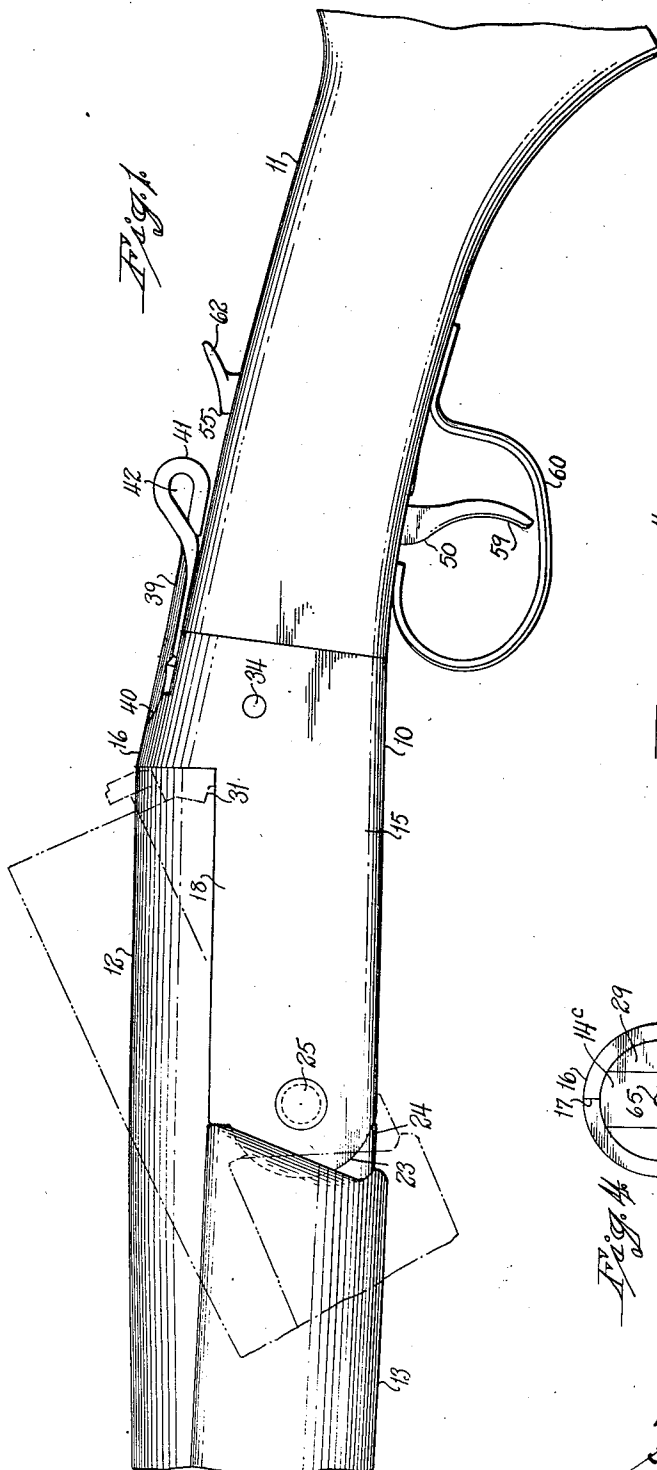
E. PUGSLEY

2,158,148

FIREARM

Original Filed Feb. 7, 1935

4 Sheets-Sheet 1



May 16, 1939.

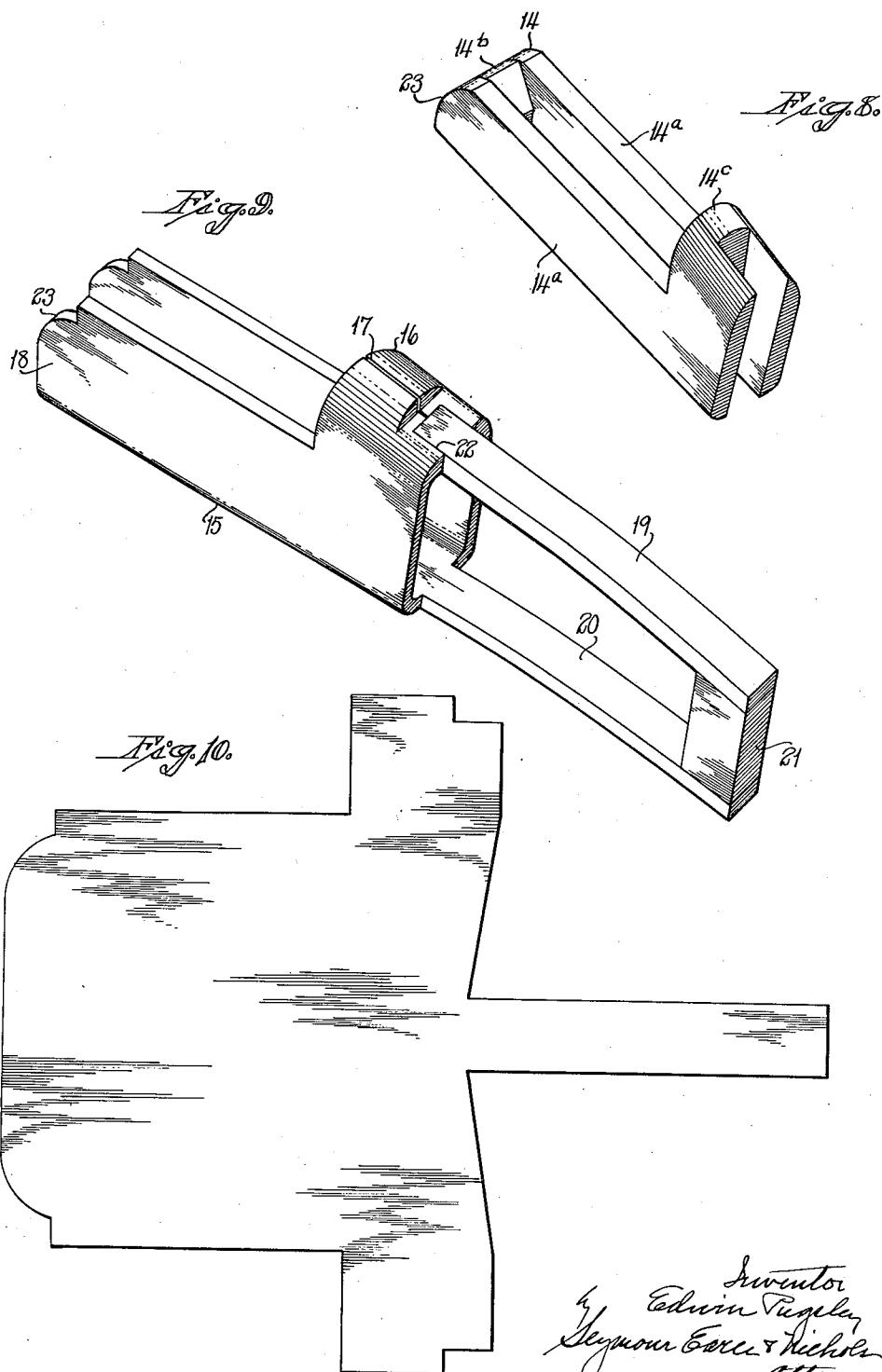
E. PUGSLEY

2,158,148

FIREARM

Original Filed Feb. 7, 1935

4 Sheets-Sheet 3



May 16, 1939.

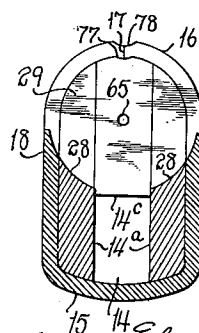
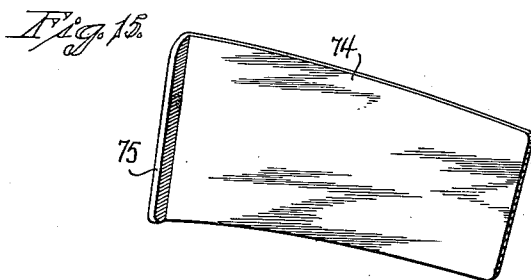
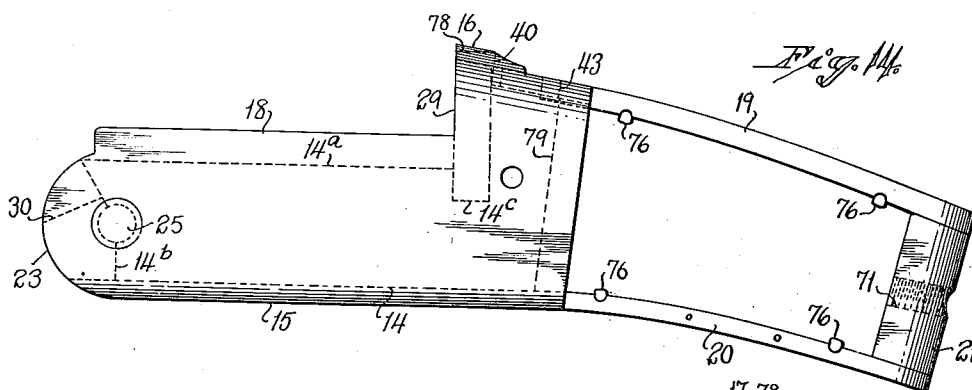
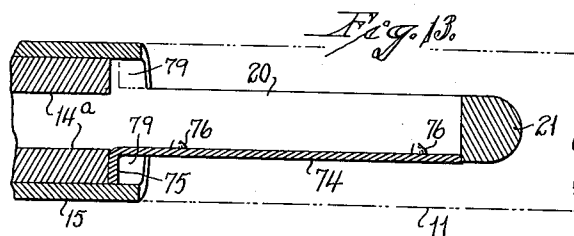
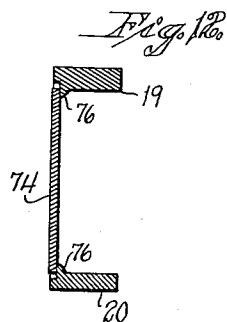
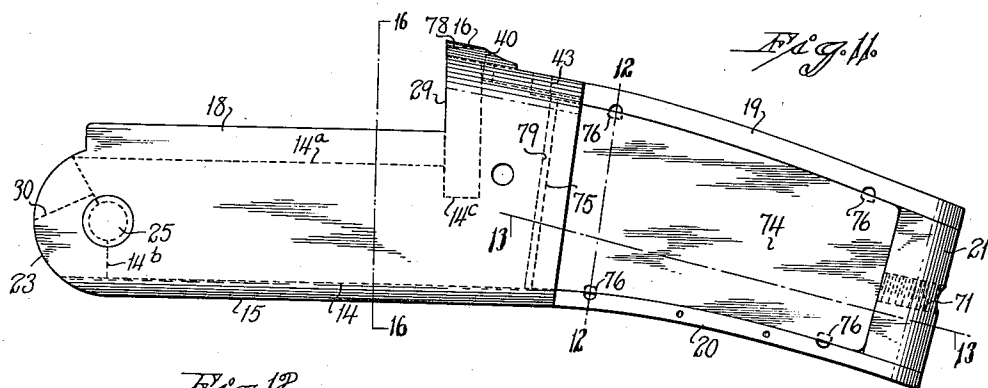
E. PUGSLEY

2,158,148

FIREARM

Original Filed Feb. 7, 1935

4 Sheets-Sheet 4



Inventor
Edwin Pugsley
Seymour Earle Nichols
attys

UNITED STATES PATENT OFFICE

2,158,148

FIREARM

Edwin Pugsley, New Haven, Conn., assignor, by
mesne assignments, to Western Cartridge Com-
pany, a corporation of Delaware

Application February 7, 1935, Serial No. 5,421
Renewed January 9, 1939

20 Claims. (Cl. 42—40)

This invention relates to firearms and has for one of its objects the provision of a strong and durable firearm which may be produced at a low cost for manufacture.

Another object is to provide a firearm having a composite frame-structure of economical character which does not detract from the neat and attractive appearance of the firearm.

A further object is to provide a composite firearm-frame having marked strength and resistance to the dislocation of its composite parts.

Other objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings and the appended claims.

In the accompanying drawings:

Fig. 1 is a broken view in side elevation of a breakdown firearm embodying the present invention;

Fig. 2 is a broken vertical longitudinal sectional view thereof;

Fig. 3 is a view in side elevation of the composite frame;

Fig. 4 is a view thereof in front-end elevation;

Fig. 5 is a top or plan view thereof;

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 2;

Fig. 7 is a similar view taken on the line 7—7 of Fig. 2;

Fig. 8 is a perspective view of the frame-body ready for installation in the frame-shell;

Fig. 9 is a perspective view of the frame-shell prior to the welding thereof;

Fig. 10 is a face view of a blank from which the frame-shell may be formed;

Fig. 11 is a view in side elevation showing a composite frame having a stiffening-plate positioned between its complementary tangs;

Fig. 12 is a transverse sectional view taken on the line 12—12 of Fig. 11;

Fig. 13 is a broken longitudinal sectional view taken on the line 13—13 of Fig. 11;

Fig. 14 is a view in side elevation of the frame-body of Fig. 11 with the stiffening-plate omitted;

Fig. 15 is a perspective view of the stiffening-plate; and

Fig. 16 is a transverse sectional view taken on the line 16—16 of Fig. 11.

For the purpose of illustrating the present invention, a so-called "breakdown" firearm has been shown in the accompanying drawings. The said breakdown firearm includes two major units separable one from the other, the rear unit, which may, for convenience of description, be designated as the "butt-unit," comprises in the main

a composite frame generally designated by the numeral 10 and a buttstock 11. The complementary front unit of the firearm, designated for convenience of description as the "barrel-unit," comprises, in the main, a barrel 12 having a fore-stock 13 secured to its under side.

The composite frame 10, before referred to, comprises two main features, i. e., a frame-body generally designated by the numeral 14 and a frame-shell generally designated by the numeral 15. The said frame-body is located within and rigidly united with the frame-shell 15, and for reasons of economy of manufacture, may be composed of two juxtaposed L-shaped side-plates 14^a, 14^b, held in spaced relationship at their respective opposite ends by a front spacing-block 14^b and a rear spacing-block 14^c. The L-shaped side-plates 14^a may be stamped from relatively-heavy sheets or plates and are united into a unitary structure (Fig. 8) before introduction into the frame-shell 15, together with the respective spacing-blocks 14^b and 14^c, by brazing, welding or otherwise. After assembling the parts 14^a, 14^b and 14^c, as illustrated in the figure referred to, to form a built-up frame-body, and before insertion into the frame-shell 15, the top of the upstanding rear portion of the said frame-body and the bottom edges of the latter are milled or otherwise transversely curved as illustrated, to snugly fit the interior of the said frame-shell.

The frame-shell 15 may be folded up from a sheet-metal blank, such as is shown in Fig. 10, and joined along the abutting edges 17 by welding, brazing or the like, to provide a tubular rear portion 16, and a trough-shaped forward portion 18. Extending rearwardly from the tubular portion 16 of the said frame-shell are two spaced-apart butt-attaching tangs 19 and 20 respectively welded or otherwise secured at their rear ends to a vertical spacing-block 21. The forward end of the upper wall of the tubular portion 16 of the frame-shell is transversely curved as shown, while the rear portion is struck downwardly, as shown particularly well in Fig. 9, and is provided with a rearwardly-opening notch 22, into which the forward end of the tang 19 fits for being welded, brazed or otherwise united with the frame-shell 15. The tang 20 before referred to, may be made integral with the frame-shell, as shown.

Preferably and as shown, the frame-shell 15 is formed of sheet-metal, but if desired the same may be formed by casting or otherwise and composed, for instance, of malleable iron or other

suitable material. If desired, the frame-shell may be seamless and produced as a unit together with its tangs 19 and 20, by die-casting the same, inasmuch as the relatively-rugged frame-body 14 will serve to absorb the major strains.

The forward ends of both the frame-body 14 and the frame-shell 15 are cylindrically contoured or otherwise rounded as at 23, for engagement by a forestock-shoe 24 (Figs. 1 and 2), constituting the rear terminal of the forestock 13 and with the latter forming a unit with the barrel 12 for vertical swinging movement with respect to the frame and other features of the butt-unit.

Preferably, the frame-body 14 (comprising the parts 14^a, 14^b and 14^c) in the form in which it is shown in Fig. 8, is inserted into the frame-shell 15 (Fig. 9) before the same is welded along the line 17. It may be mentioned that it has been found convenient to install the frame-body 14 in the frame-shell 15 before the upper portion of the rear end 16 thereof is folded inward, so that the part 16 may be folded tightly over the rear upstanding portion of the frame body 14. After the frame-body and the frame-shell have been assembled together, as before described, the forward end of the composite unit thus formed is transversely drilled to form a pin-receiving passage for the reception of a fulcrum-pin 25, which latter is headed over at its respective opposite ends in the suitably-formed beveled terminals of the portion of the pin-receiving passage lying adjacent the respective opposite side-faces of the frame-shell, as clearly shown in Fig. 7.

The fulcrum-pin 25 has approximately the forward half of the diameter of its central portion seated in the front spacing-block 14^b of the frame-body 14, as particularly well shown in Fig. 2, and has the central portion of its rear half exposed for engagement by the surface of a forwardly-opening transverse bearing-notch 26 formed in the forward edge of a barrel-coupling lug 27, forming a rigid feature of and depending from the rear end of the barrel 12, and adapted to fit into the vertical space or pocket bounded by the inner surfaces of the side-plates 14^a, 14^a and the spacing-blocks 14^b and 14^c of the frame-body 14. The fulcrum-pin 25, just above referred to, in addition to serving as a fulcrum for the barrel-unit when the same is vertically rocked, as is customary in breakdown firearms, between the positions indicated respectively by full and broken lines in Fig. 1, also serves to rigidly interlock the frame-body 14 and the frame-shell 15, and serves to transmit any strains or shock received by one to the other.

When assembled together, the trough-shaped forward portion of the frame-shell and the forward portion of the side-plates 14^a of the frame-body, are milled or otherwise shaped to provide a barrel-seat 28, conforming in transverse curvature to the cylindrical cross-sectional form of the rear end of the barrel 12. The axis of the said barrel-seat 28 extends perpendicularly with respect to the forward faces of the upstanding rear portions of both the frame-body and frame-shell, which serve together to provide what may be termed a "standing breech" 29, which is closely fitted by the rear end of the barrel 12, when the same is in its closed position. The said standing-breech 29 serves to receive the rearward shock or recoil of the cartridge contained within the barrel 12, when the said cartridge is fired. The forward end of the barrel-seat 28 slopes down-

wardly as indicated at 30 in Fig. 2, to provide clearance for the barrel 12 when the forward end of the same is rocked downwardly.

The barrel-coupling lug 27 is provided in its rear face with a locking-notch 31 (Fig. 2) receiving the locking-nose 32 of a pivotal barrel-locking member 33, located between the rear portions of the side-plates 14^a and adapted to swing in a vertical plane upon a transverse pin 34. The said pin 34 extends through the rear portions of both the frame-shell 15 and the side-plates 14^a of the frame-body 14, as well as through the said locking-member 33. Upstanding from the barrel-locking member 33 to one side thereof is an operating-finger 35 preferably having a spherically-contoured upper terminal 36 fitting within a transverse downwardly-opening groove 37 formed in the under-side of a cylindrically-contoured operating-head 38. The said operating-head is riveted to or otherwise forms a unitary feature of an operating-lever 39 seated upon the upper surface of the depressed rear portion of the frame-shell 15 and extending forwardly into a notch 40 formed in the upper wall of the said frame-shell. The rear end of the operating-lever 39 is reversely bent or otherwise shaped to provide a thumb-piece 41 having a transverse aperture 42 therein which serves the purpose of preventing to a material degree the slippage of the finger from the said thumb-piece when the lever is being swung sidewise to effect the retraction of the locking-nose 32 of the barrel-locking member 33 from the locking-notch 31 in the barrel-coupling lug 27.

As before noted, the operating-head 38 of the operating-lever 39 is of cylindrical form, and projects downwardly into the interior of the frame through a passage 43 (Fig. 5), the boundaries of which passage are formed partly in the top portion of the frame-shell 15, partly in the forward portion of the tang 19, and partly in the opposed inner faces of the side-plates 14^a of the frame-body 14. The operating-head 38 and hence the operating-lever 39 are retained in place by providing the rear portion of the said head with a transverse groove 44 receiving the forward end of a sheet-metal retainer 45, secured to the under-face of the tang 19 by means of a screw 46 or in any other suitable manner.

The lower end of the barrel-locking member 33 is formed with a rearwardly-opening pocket 47 receiving and guiding the forward end of a plunger 48 which bears at its rear end against the forward face of a cocking-nose 49 of a trigger 50. The said plunger 48 is encircled by a spring 51 thrusting at its forward end against the rear face of the lower end of the barrel-locking member 33 to urge the same forwardly for engaging the locking-nose 32 with the locking-notch 31. The said spring 51 bears at its rear end against a suitable thrust-shoulder 52 formed on the plunger 48 and urging the latter rearwardly to in turn swing the trigger 50 in such direction as to engage its cocking-nose 49 with a cocking-notch 53 or a rebound-notch 54, both formed in the forward face of a cocking-lever 55.

The lower end of the cocking-lever 55 projects downwardly into a passage 56 extending vertically through the tang 20 of the frame-shell 15, and swings in a vertical plane upon a transverse pin 57 extending transversely across the said passage 56. Similarly, the trigger 50 is mounted upon a transverse pin 58 and extends downwardly through the said passage 56 to place its finger-piece 59 in position for convenient manipulation

within the space outlined by a trigger-guard 60 which is brazed or otherwise suitably secured to the under-face of the tang 20.

The upper end of the cocking-lever 55 extends through a vertical passage 61 in the upper tang 19 of the frame-shell and is provided with a suitably-knurled cocking-head 62 engageable by the finger of the marksman to effect the cocking of a firing-pin 64 to be presently described. Immediately below the under-surface of the tang 19, the cocking-lever 55 has pivotally attached to it, by means of a pivot-screw 63, a firing-pin 64, the reduced and tapered forward end of which is projectable through a passage 65 formed in the spacing-block 14^c of the frame-body, and is rounded at its extreme forward end to provide a firing-point 66. The cocking-lever 55 and the firing-pin 64 are urged forwardly by a firing-pin spring 67 encircling the said firing-pin 64 and bearing at its forward end against a transverse thrust-pin 68 carried by the same. At its rear end the said spring 67 is adapted, when the firing-pin 64 is cocked, to bear against a stud 69 depending from the tang 19 and extending into a vertical passage 70 formed in the rear end of the said firing-pin and serving to bifurcate the same. The forward wall of the passage 61 in the tang 19 is engaged by the forward face of the upper portion of the cocking-lever 55 and acts as a definite stop therefor.

The spacing-block 21 extending vertically between the rear ends of the complementary butt-attaching tangs 19 and 20 is provided with a substantially-horizontal threaded bore 71 receiving the threaded forward end 72 of a buttstock-bolt 73, which serves to firmly attach the buttstock 11 to the composite frame.

To avoid even the remote possibility of the tangs 19 and 20 becoming distorted when the firearm is in use, a stiffening-plate 74 may be inserted between the said tangs (Figs. 11 to 13 inclusive). Preferably, the forward end of the stiffening-plate 74 is fitted within the rear end of the tubular portion 16 of the frame-shell 15 and is bent outwardly to form a flange 75 normally abutting against the adjacent rear end of one of the L-shaped side-plates 14^a (Fig. 13).

As shown, the stiffening-plate 74 fits between and is located substantially flush with the left side of the tangs 19 and 20 and is held against inward displacement by upsetting the metal of the said tangs to provide each thereof with two (more or less) seating-lugs 76. The outer faces of the said seating-lugs are located inwardly from the left side of the tangs a distance sufficient to enable the outer face of the said stiffening-plate to lie substantially flush with the adjacent side of the said tangs. When the buttstock 11 is attached to the frame, it will serve to retain the stiffening-plate 74 in place against the said seating-lugs 76 and prevent the undue outward displacement of the said stiffening-plate.

In the construction illustrated in Figs. 11 to 15 inclusive, not only does the stiffening-plate 74 serve to reinforce the tangs 19 and 20 and add rigidity thereto, but it also serves to practically eliminate vibrations in the said tangs which might occur as an incident to the firing of the arm.

In the event that it is desired to provide a sight-groove in the top of the composite frame 10, the rear spacing-block 14^c of the frame-body 14 may be formed in its upper surface with notch or groove 77, into which the overlying metal of the tubular portion 16 of the frame-shell 15

may be depressed, as at 78, and as shown particularly well in Fig. 16.

It will be noted from the accompanying drawings, and particularly from Fig. 13 thereof, that the respective rear edges of the side-plates 14^a of the frame-body 14 are positioned forwardly of the rear edge of the frame-shell 15 and, in effect, provide sockets or mortises 79 for the reception of the tenoned forward end of the buttstock 11. Thus, without requiring complex milling operations, suitable buttstock-sockets may be provided by so locating the frame-body and frame-shell longitudinally with respect to each other that the rear end of the latter rearwardly overlaps the rear end of the former.

Particular attention may be called to the fact that composite frames of the general character above described and shown in the accompanying drawings, may be produced at a very low cost for manufacture, inasmuch as forging operations may be dispensed with and numerous machining operations avoided, despite which the frame possesses, in addition to a neat workmanlike appearance, the necessary ruggedness and strength to withstand the relatively-heavy shocks imposed thereon when the gun is fired. Preferably, and as before pointed out, the side-plates 14^a of the frame-body may be stamped from relatively-heavy sheet or bar stock and by interposing spacing-blocks or other spacing-means therebetween, a suitable socket, so to speak, is provided for the reception of the barrel-coupling lug 27. Furthermore, it may also be noted that the spacing-block 14^c by being spaced upwardly from the bottom edges of the side-plates 14^a provides a passage through which the locking-nose 32 of the barrel-locking member 33 may project into engagement with the barrel-coupling lug 27.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A composite firearm-frame comprising an interior frame-body and an exterior frame-shell, the said frame-body being located within the said frame-shell and rigidly secured thereto and forming a unitary structure therewith having a breech-abutting portion; and a fulcrum pin extending transversely through and supported by both the said frame-body and frame-shell in position to provide a fulcrum for a barrel-unit said frame body extending along and reinforcing said frame shell from said pin to the breech-abutting portion of the frame shell.

2. A composite firearm-frame comprising an interior frame-body and an exterior frame-shell, the said frame-body being located within the said frame-shell and rigidly secured thereto and forming a unitary structure therewith, the forward ends of the said frame-body and the said frame-shell both being substantially flush with each other and rounded to provide a laminated fore-end seat substantially equal in total wall width to the thickness of the total wall width of the end wall portions of the frame body and frame shell.

3. A composite firearm-frame comprising an exterior frame-shell; and an interior frame-body located within the said frame-shell and compris-

ing two complementary plate-like members and two spacing-blocks, the said plate-like members being spaced apart at each of their respective opposite ends by one of the said spacing-blocks and rigidly secured within the said frame-shell to form a rigid unitary body reinforced adjacent the front and rear ends of said frame body.

4. A composite firearm-frame comprising an exterior frame-shell; and an interior frame-body located within the said frame-shell and comprising two spaced-apart L-shaped plate-like members, each having an upstanding breech-portion and rigidly secured within the said frame-shell.

5. A composite firearm-frame comprising an exterior frame-shell; and an interior frame-body located within the said frame-shell and comprising two complementary plate-like members of L-shaped form, each having an upstanding breech-portion and spaced apart at each of their respective opposite ends by a spacing-block, the said plate-like members being rigidly secured within the interior of the said frame-shell.

6. A composite firearm-frame having a pair of vertically spaced-apart tangs and comprising: an interior frame-body; an exterior frame-shell; the said frame-body being located within the said frame-shell and rigidly secured thereto and forming a unitary structure therewith; and a longitudinal tang stiffening plate extending between the tangs of the firearm-frame along a substantial portion of their otherwise unsupported span and serving to stabilize the same with respect to each other.

7. A composite firearm-frame comprising: an interior frame-body; an exterior frame-shell; the said frame-body being located within the said frame-shell and rigidly secured thereto and forming a unitary structure therewith, the said frame-shell being provided with a pair of rearwardly-extending vertically spaced-apart tangs; and a longitudinal tang stiffening plate extending between the tangs of the frame-shell along a substantial portion of their otherwise unsupported span and serving to stabilize the same with respect to each other.

8. A composite firearm-frame comprising a pair of vertically spaced-apart tangs elongated sufficiently to accommodate therebetween a substantial portion of a cocking and firing mechanism; a spacing and reinforcing member extending between and connected to the free ends of said tangs; and: an interior frame-body; an exterior frame-shell; the said frame-body being located within the said frame-shell and rigidly secured thereto and forming a unitary structure therewith; and a flanged longitudinal stiffening-plate extending vertically between the tangs of the firearm-frame and serving to stabilize the same with respect to each other.

9. A composite firearm-frame comprising: an exterior frame-shell; and an interior frame-body located within the said frame-shell and including two plate-like members extending to a point flush with the forward end of the said frame-shell and rigidly attached to the interior of the latter to provide a fore-end abutment and spaced from each other therein to form a recess for the reception of a barrel-lug.

10. A composite firearm-frame comprising: an exterior frame-shell; and an interior frame-body located within the said frame-shell and comprising two complementary L-shaped spaced-apart side-plates and two spacing-blocks all rigidly secured within the said frame-shell, one of the said spacing-blocks being interposed be-

tween each of the respective opposite ends of the said side-plates and one of the said spacing-blocks having its lower end spaced above the bottom wall of the said frame-shell to provide a passage for a barrel-locking bolt or the like.

11. A composite firearm-frame comprising: an exterior frame-shell; and an interior frame-body located within the said frame-shell and comprising two complementary side-plates rigidly secured within the said frame-shell and two spacing-blocks, one of which is interposed between each of the respective opposite ends of the said side-plates, the rearmost one of the said spacing-blocks being provided with a firing-pin passage and having its lower end spaced above the bottom wall of the said frame-shell to provide a passage for a barrel-locking bolt or the like.

12. In a firearm, a frame formed from an integral, unitary blank of plate metal, said blank having a forward trough-forming portion and a rearward tube-forming portion including a lateral extension, said blank being bent so that said forward trough-forming portion defines a forward, open top, U-shaped barrel-receiving trough and said rearward tube-forming portion forms a closed tube, the free edges of said tube-forming portion being united by a welded seam at said lateral extension, said lateral extension forming an arch upstanding from the edges of said trough, and a breech-closing member seated within and integrally united with said closed tube and providing a breech-closing wall at the forward end of said arch, and a rearward portion extending rearwardly from said closed tube.

13. In a firearm, an integral, unitary frame formed from a plate metal blank bent to define a trough having spaced side walls and a transverse bottom wall connecting said spaced side walls, the forward portion of said trough forming a barrel-receiving frame portion, said plate metal blank having an extension bridging the space between the side walls of said trough at the rearward portion thereof and connected thereto by a seamed joint to form with the adjacent portion of the trough a closed tube, and a breech-closing member seated within and integrally united with said closed tube to form therewith a breech-closing frame portion.

14. A composite firearm-frame comprising an interior frame-body and a plate metal exterior frame-shell, the said frame-shell having a trough-shaped barrel-receiving portion and a portion tubular in cross-sectional form to provide a rigid breech-abutting portion and the said frame-body being located within the said frame-shell and extending into the tubular portion thereof and rigidly secured thereto to form a unitary structure therewith.

15. A composite firearm-frame comprising an interior frame-body and an exterior frame-shell, the said frame-shell having a forward portion formed with spaced side walls, a rigid self-reinforcing tubular portion and having one or more tangs extending rearwardly from the tubular portion thereof, the said frame-body being located within and extending throughout the major portion of and reinforcing said forward portion and extending into said tubular portion, said frame body being rigidly secured to said frame shell to form a unitary structure therewith.

16. A composite firearm-frame comprising an interior frame-body and an exterior frame-shell, the said frame-shell being formed from plate metal and having a rear portion of tubular form in cross section and an upwardly opening for-

ward portion of trough-shaped form in cross section to provide substantially parallel side walls, and a bottom wall spacing said side walls and reinforcing them over a substantial length, the
 5 said frame-body being located within the said frame-shell and rigidly secured thereto to form a unitary structure therewith.

17. A composite firearm-frame comprising an interior frame-body and an exterior frame-shell,
 10 the said frame-shell being formed from plate metal and having an upwardly opening forward portion of trough-shaped form in cross section having the top edges of its side walls arcuate to form a barrel-fitting seat and a rear portion of
 15 tubular form in cross-section, the latter portion having one or more tangs extending rearwardly therefrom; the said frame-body being located within the said frame-shell and rigidly secured thereto to form a unitary structure therewith.

20 18. In a firearm, an integral, unitary frame comprising an interior frame-body and an exterior plate metal frame-shell having an upwardly-opening forward portion of trough-shaped form in cross-section defining a barrel-
 25 and-barrel-lug recess and a rear portion of tubular form in cross-section to provide a rigid breech-abutting portion and shaped around the

said frame-body and integrally joined thereto to form a unitary structure therewith.

19. A composite firearm-frame comprising an interior frame-body and an exterior frame-shell
 5 formed from plate metal shaped around the said frame-body and rigidly secured thereto to form a unitary structure therewith, the said frame-shell having a rear portion bent up and seamed together to form a rigid self-reinforcing tubular
 10 section and an integral tang of approximately equal wall thickness therewith extending rearwardly in substantial continuation of its bottom wall.

20. A composite firearm-frame comprising an interior frame-body and an exterior plate metal
 15 frame-shell shaped around the said frame-body and rigidly secured thereto to form a unitary structure therewith, the said frame-shell having a rear portion bent up and seamed to form a breech-abutting portion tubular in cross-section, 20
 the latter portion having an integral tang extending rearwardly in substantial continuation of its bottom wall, an attached tang rearwardly extending from said upper wall, and means integral
 25 with at least one of said tangs for spacing the outer ends thereof.

EDWIN PUGSLEY.