Sept. 27, 1949. W. SUMMERBELL 2,482,808

ADAPTER FOR GUNS

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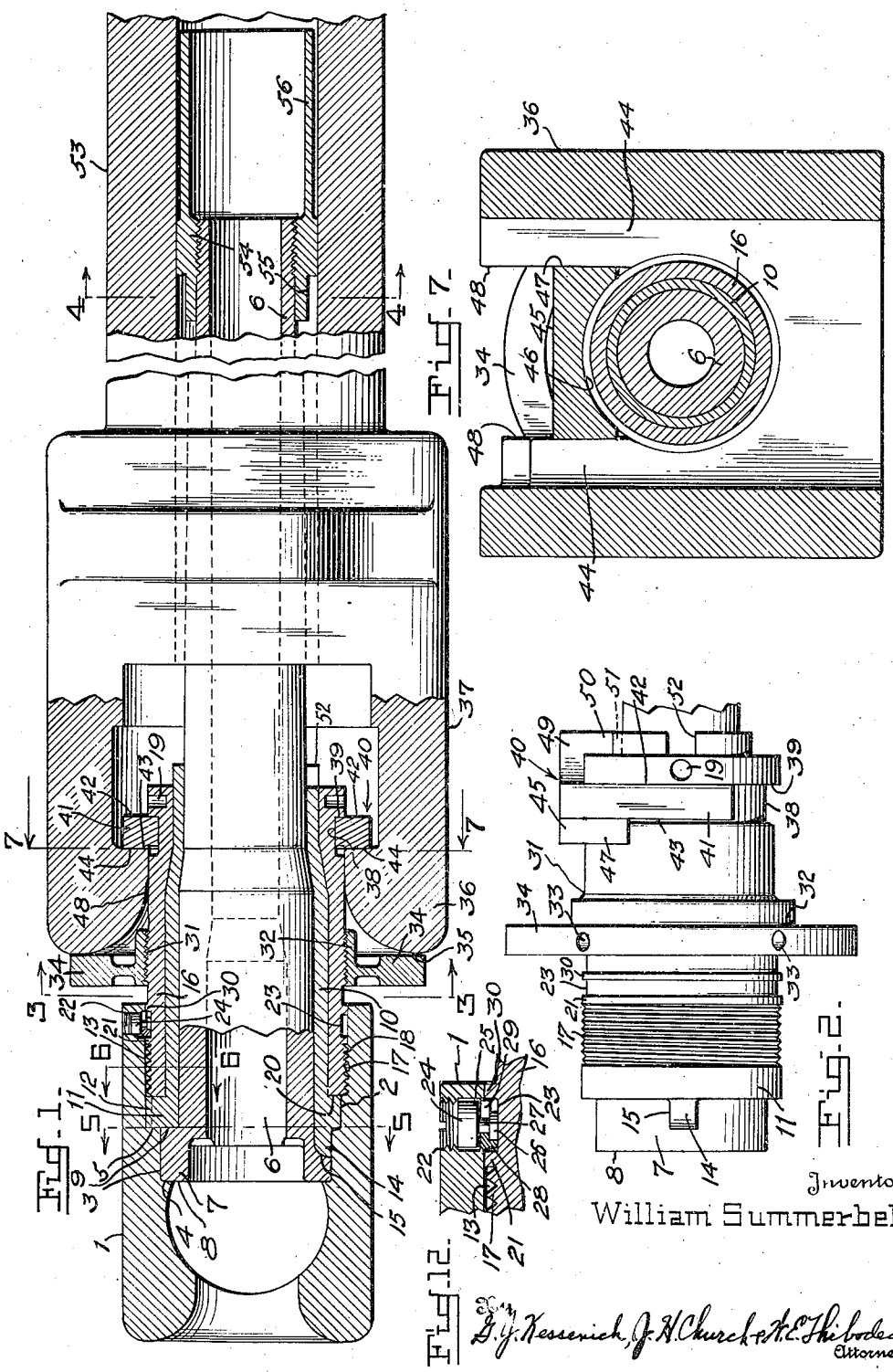


Fig. 1.



Fig. 7.



Fig. 2.



Fig. 12.

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Fig. 3.

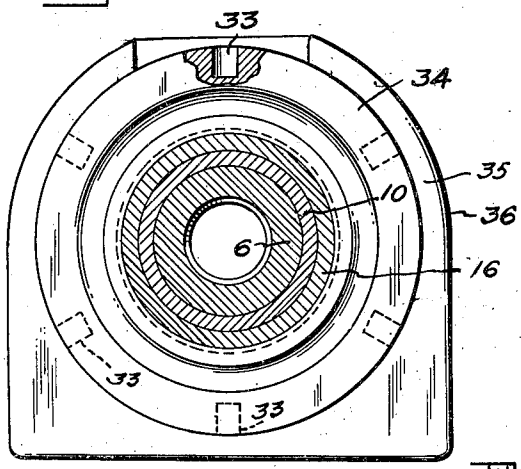



Fig. 4.

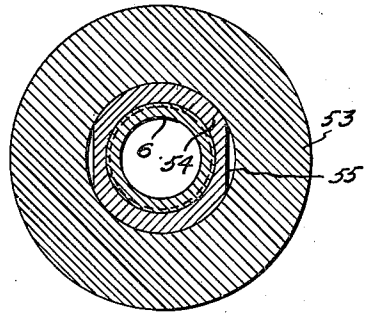



Fig. 9.

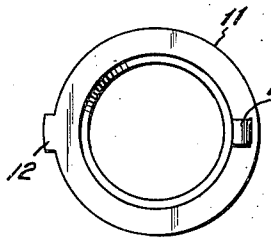



Fig. 8.

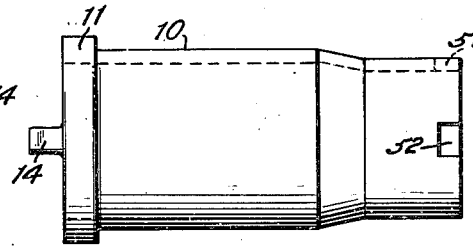



Fig. 10.

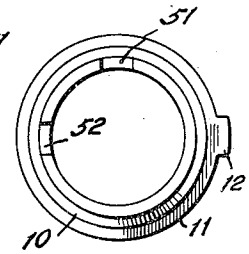
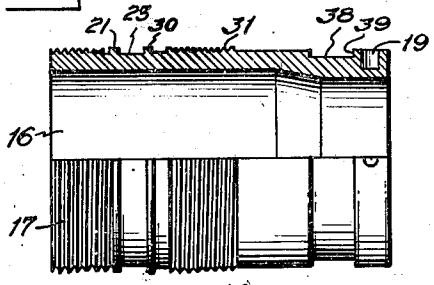



Fig. 11.



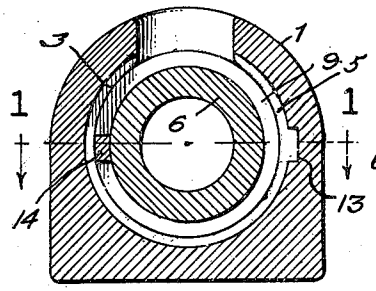




Fig. 5.

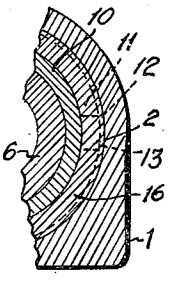



Fig. 6.

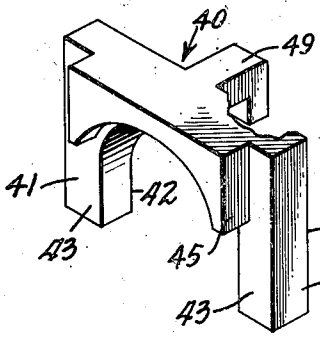



Fig. 13.

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# UNITED STATES PATENT OFFICE

2,482,808

## ADAPTER FOR GUNS

William Summerbell, Washington, D. C.; Edith May Summerbell executrix of said William Summerbell, deceased

Application August 15, 1946, Serial No. 690,649

10 Claims. (Cl. 89—29)

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

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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 new and useful improvement in adapters for guns whereby a gun can be changed to an "in bore" subcaliber gun, and is designed more particularly for mounting a 37 mm. gun coaxially on and within a 75 mm. gun. The particularly novel and useful features of my device are the means for coupling the breech ring and tube of the subcaliber gun in a threadless joint and the means for coupling the tube of the subcaliber gun to the rear apron of the breech ring of the larger gun, the tube of the subcaliber gun being supported co-axially in the tube of the larger gun.

While I have illustrated in the drawings filed herewith and have hereinafter fully described one specific embodiment of my invention, it is to be distinctly understood that I do not consider my invention to be limited to said specific embodiment, but refer for its scope to the claims appended hereto.

In the drawings:

Figure 1 is a horizontal longitudinal section, partly in plan, on the line 1—1 of Figure 5, in the direction of the arrows, showing my improved adapter, mounting a 37 mm. subcaliber gun in a 75 mm. gun.

Figure 2 is a side elevation of the device mounted on the tube of the 37 mm. gun.

Figure 3 is a vertical section on the line 3—3 of Figure 1, in the direction of the arrows.

Figure 4 is a vertical section on the line 4—4 of Figure 1, in the direction of the arrows.

Figure 5 is a vertical section on the line 5—5 of Figure 1, in the direction of the arrows.

Figure 6 is a fragmentary vertical section on the line 6—6 of Figure 1, in the direction of the arrows.

Figure 7 is a vertical section on the line 7—7 of Figure 1, in the direction of the arrows.

Figure 8 is a side elevation of the coupling sleeve for connecting the tube and breech ring of the subcaliber gun.

Figure 9 is a rear elevation of the said sleeve.

Figure 10 is a front elevation of said sleeve.

Figure 11 is a side elevation, partly in section, of the locking sleeve serving to lock the coupling sleeve in operative position and to connect the subcaliber gun with the 75 mm. gun.

Figure 12 is an enlarged fragmentary section of the locking wedge for the locking sleeve, shown in Figure 1.

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Figure 13 is a perspective view of the locking yoke, a portion being broken away to disclose a feature thereof.

As illustrated in the drawings, my improved adapter is utilized to convert a 75 mm. gun to a subcaliber gun by using a 37 mm. gun of improved design having its tube and breech ring united in a threadless joint. The breech ring 1 is provided at its forward end with an axial bore 2 having a reduced portion 3 at its rear end, forming inner peripheral shoulders 4 and 5 on ring 1. The tube 6 has a peripheral flange 7 in its rear end which is received in bore portion 3, its rear face 8 seated against shoulder 4 and its forward face 9 registering with shoulder 5. A coupling sleeve 10 (Figs. 8, 9, and 10), received about the rear portion of tube 6, has a peripheral flange 11 on its rear end seated against shoulder 5 of breech ring 1 and face 9 of flange 7 of tube 6. Flange 11 has a radial key 12 seated in a key way 13 in breech ring 1, and an axially extended tenon 14 in a mortise 15 in face 9 of flange 7 of tube 6. The above-described details of structure of sleeve 10 effect coupling of breech ring 1 and tube 6 against relative rotation. A locking sleeve 16 received about coupling sleeve 10 is provided on its rear portion with external threads 17 inter-engaging internal threads 18 in bore 2 of breech ring 1, and at its forward end with suitable spanner sockets 19 for setting up the end 20 of sleeve 16 against flange 11 of sleeve 10, to prevent relative axial movement of breech ring 1 and tube 6. Sleeve 16 has a peripheral collar 21 immediately forward of threads 17. Breech ring 1 has a bore 22 registering radially with portion 23 of sleeve 16 immediately forward of collar 21. A plug 24 is threaded in bore 22 and has heads 25 and 26 connected by stem 27. A wedge 28 has a forked portion 29 received about stem 27 to retain wedge 28 on plug 24. When sleeve 16 is seated, plug 24 is set up in bore 22, causing wedge 28 to bear against collar 21 to prevent relative axial movement of sleeve 16 and breech ring 1. Sleeve 16 is provided, forwardly of portion 23, with a peripheral collar 30 fitting snugly in bore 2 of ring 1 at the forward end of ring 1. Sleeve 16 is provided forwardly of flange 30 with exterior threads 31 on which is threaded a locking ring or nut 34 including a threaded sleeve 32 and having spanner sockets 33 in its periphery which bears against the rear face 35 of the rear apron 36 of the breech ring 37 of the 75 mm. gun on which the subcaliber gun is mounted. Sleeve 16 is provided, immediately rearwardly of spanner sockets

19, with a peripheral groove 38 forming a shoulder 39 on the periphery of sleeve 16 forward of groove 38. A generally U-shaped locking yoke or plate 40 has its legs 41 received in groove 38, their forward faces 42 bearing against shoulder 39 of locking sleeve 16 and their rear faces 43 bearing against the forward faces 44 on rear apron 36 of breech ring 37. It will be noted (Fig. 2) that the faces 43 of legs 41 are inclined to correspond precisely with the inclination of faces 44 on which faces 43 bear. The yoke or plate 40 has a rearwardly extending saddle 45 having a concave portion 46 embracing the upper portion of sleeve 16 and vertical end walls 47 fitting between vertical walls 48 of the throat of rear apron 36 to retain legs 41 in proper position between shoulder 39 of sleeve 16 and apron 36 of ring 37. The yoke 40 has an arm 49 extending forwardly from the middle of the bight portion of yoke 40 over the forward portion of sleeve 16, and provided with a depending key 50 received in a key-way 51 in the forward end of sleeve 10. A second key-way 52 is provided in the end of sleeve 10, disposed at an angle of 90° relative to key-way 51, to receive key 50 when the subcaliber gun is rotated through an arc of 90° to convert from a drop-block to a side-open type.

The tube 6 is supported at its muzzle in the tube 53 of the 75 mm. gun by a bushing 54, threaded on tube 6 and having suitable wrench bearing faces 55 and a suitable deflector tube 56 for protecting the bore of tube 53.

Having described my invention, what I claim is:

1. In an adapter for mounting the barrel of a first gun of smaller caliber within the breech ring and barrel of a second gun of larger caliber, the breech ring of the second gun having an apron defining front and rear faces, a locking sleeve secured to and extending about the breech portion of the barrel of said first gun, means rigidly securing said locking sleeve to said second gun, said means including an external flange secured to said sleeve and axially adjustable there-along, said sleeve having a peripheral external groove at its forward end, said groove being positioned within the breech ring of said second gun when said first gun is inserted thereinto with said flange abutting the rear face of the apron of said second gun, and a locking yoke insertable in said groove to engage the front face of said apron and thereby hold said flange in abutting relation with the rear face of said apron to secure said guns in assembled relation.

2. In an adapter for mounting a first gun barrel of relatively small caliber within the bore of a second gun barrel of larger caliber, said second gun having a breech-ring provided with an apron affording opposed front and rear surfaces, a locking sleeve mounted about said first gun barrel, means rigidly securing said sleeve about the breech portion of said first barrel, said sleeve having a peripheral groove adjacent its forward end, a locking yoke insertable into said groove in a direction transversely of the bore axis of said first barrel, and a locking nut threaded on and about said sleeve rearwardly of said groove, said yoke and nut being adapted to engage the front and rear surfaces, respectively, of the rear apron of the breech-ring of said second barrel in response to turning of said nut, whereby to rigidly secure said first barrel within the bore of said second barrel.

3. In an adapter for mounting a first gun barrel of relatively small caliber within the bore of a second gun barrel of larger caliber, the second gun having a breech-ring, a locking sleeve fixed to and about the breech portion of said first gun barrel coaxially thereof, said sleeve having an external peripheral groove adjacent its forward end, a U-shaped locking yoke having legs fitting said groove and insertable into said groove in a direction transversely of the bore axis of said first gun barrel, and a locking nut threaded on said sleeve rearwardly of said groove, said nut being rotatable to clamp a portion of the breech ring of said second gun barrel between said yoke and nut.

4. In an adapter for mounting a first gun barrel of relatively small caliber within the bore of a second gun barrel of larger caliber, said second gun barrel being provided with a breech-ring having a throat and an apron affording front and rear opposed surfaces, the combination of a locking sleeve having a peripheral groove in the forward portion thereof, means including a coupling sleeve fixing said locking sleeve to and about the breech portion of said first gun barrel, said coupling sleeve having a key-way, a locking nut fixed to and about said locking sleeve for axial adjustment therealong, a U-shaped yoke having legs adapted to straddle said locking sleeve within said groove, said yoke having a saddle integral with its bight portion, said saddle fitting into the throat of the breech-ring of said second gun when said first gun barrel is within the second gun barrel with said yoke abutting against the front surface of the apron of said second gun and with said nut against the rear surface of the apron of said second gun, said locking nut and yoke acting to secure said first gun against axial movement within the second gun, said yoke having key means coacting with said key-way in said coupling sleeve whereby, to prevent relative axial rotation of said guns.

5. Means for mounting the barrel of a first gun within the bore of the tube of a second gun barrel having a breech-ring with an apron providing forward and rear surfaces, comprising, a breech ring for said first gun and having a bore and a threaded counterbore to provide a forwardly facing peripheral shoulder, the breech end of the barrel of said first gun having a flange fitting the barrel of said bore, sleeve means rotatably fitting said first gun and threaded into said counterbore to force said flange into contact with said shoulder, and means carried by said sleeve means and adapted to engage the forward and rear faces of the apron of the breech ring of said second gun to secure said first barrel within the bore of said second barrel against longitudinal movement and axial rotation relatively thereto.

6. In a sub-caliber gun adapted to be mounted within the bore of a gun of larger caliber comprising, a breech-ring having a bore and counterbore through the forward end thereof, to provide first and second forwardly-facing circular shoulders, said counterbore being threaded, a barrel having a flange at its rear end, which flange has its forward face coplanar with said second shoulder when seated on said first shoulder, a coupling sleeve fitting around said barrel and having a rear external flange seating on both said coplanar face and second shoulder, and a locking sleeve threaded into said counterbore and engaging the flange of said coupling sleeve to thereby secure said breech-ring and barrel in assembled relation.

7. A gun as recited in claim 6, first key means

between said coupling sleeve and breech-ring, and second key means between said coupling sleeve and said barrel flange to thereby prevent relative rotation of said breech-ring and barrel.

8. In a gun, the combination of a breech ring having a bore; a tube having its rear portion disposed in said bore; a coupling sleeve on said tube and provided with means for connecting said sleeve to said ring and said tube to prevent relative rotation of said ring and said tube; and a locking sleeve on said coupling sleeve and threaded in said bore, to prevent relative axial movement of said ring and said tube.

9. In a gun, the combination of a breech ring having an axial bore providing two peripheral shoulders spaced axially in the ring, and a key-way extending longitudinally of the ring and disposed radially of said bore, from the forward of the two shoulders to the front of the ring; a tube having a peripheral flange on its rear end, the rear face of said flange seating on the rear of the two shoulders and the forward face of the flange registering with the forward shoulder, said flange having a mortise in its forward face; a sleeve mounted on said tube, extending into said bore, and having a peripheral flange on its rear end, seated against the registering forward shoulder and front face of the tube flange, and having a radial key seated in said key-way and a tenon seated in said mortise; and a second sleeve mounted on said first sleeve and threaded



in said bore, its rear end bearing against the said sleeve flange.

10. In an adapter for mounting the barrel of a first gun within the bore of the barrel of a second gun having a breech-ring with an apron providing forward and rear surfaces, a breech ring for said first gun barrel, sleeve means threadedly engaging said breech ring of the first gun barrel for rigidly uniting the same and first gun barrel, in coaxial relation, and means carried by said sleeve means for engaging the forward and rear surfaces of the apron of the breech ring of said second gun barrel to thereby clamp said first gun barrel in position in the bore of said second gun barrel.

WILLIAM SUMMERBELL.


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