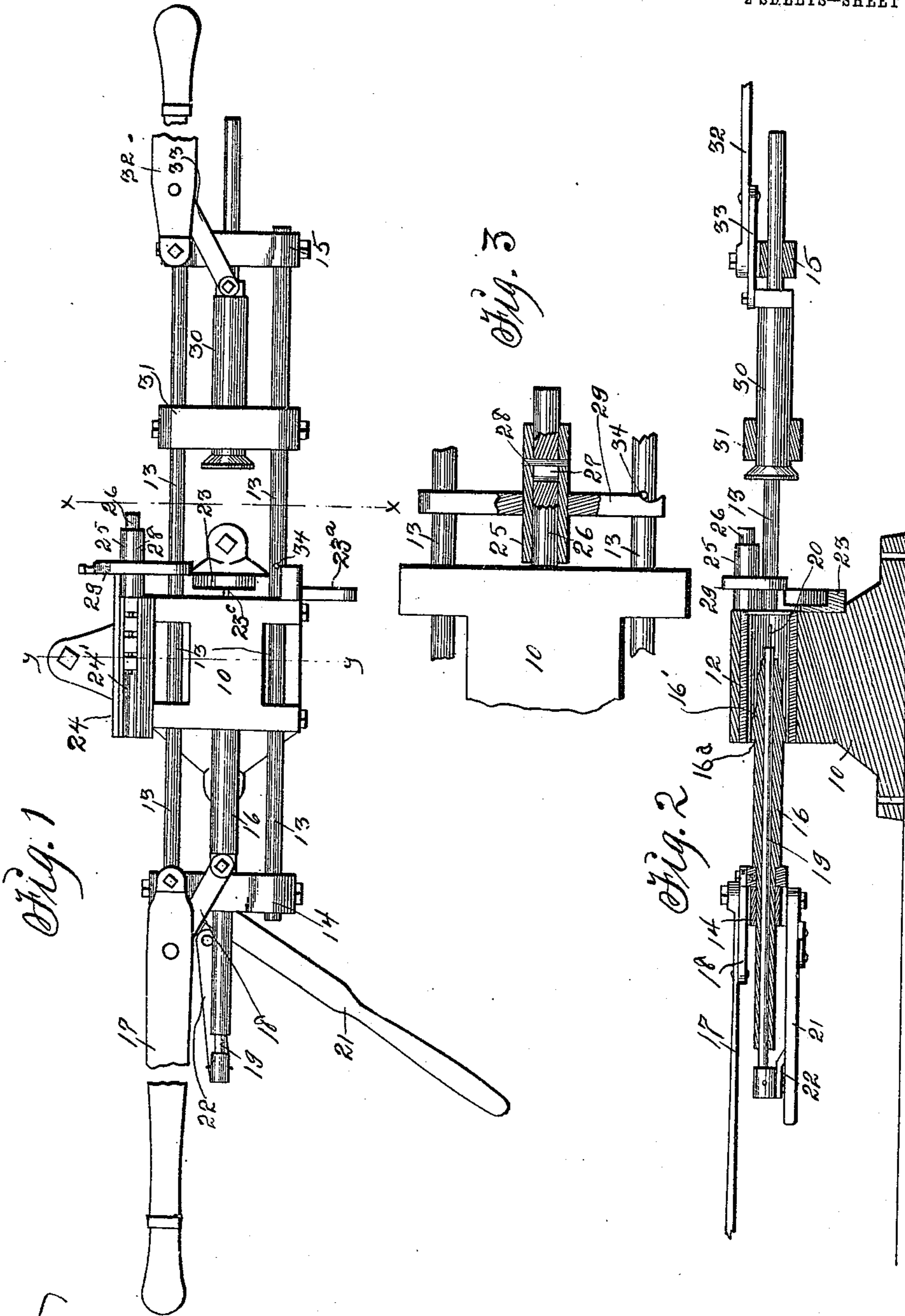


J. W. HAUGHAWOUT.
MACHINE FOR REPAIRING CARTRIDGE SHELLS.
APPLICATION FILED OCT. 23, 1905.

900,532.

Patented Oct. 6, 1908.
2 SHEETS—SHEET 1.



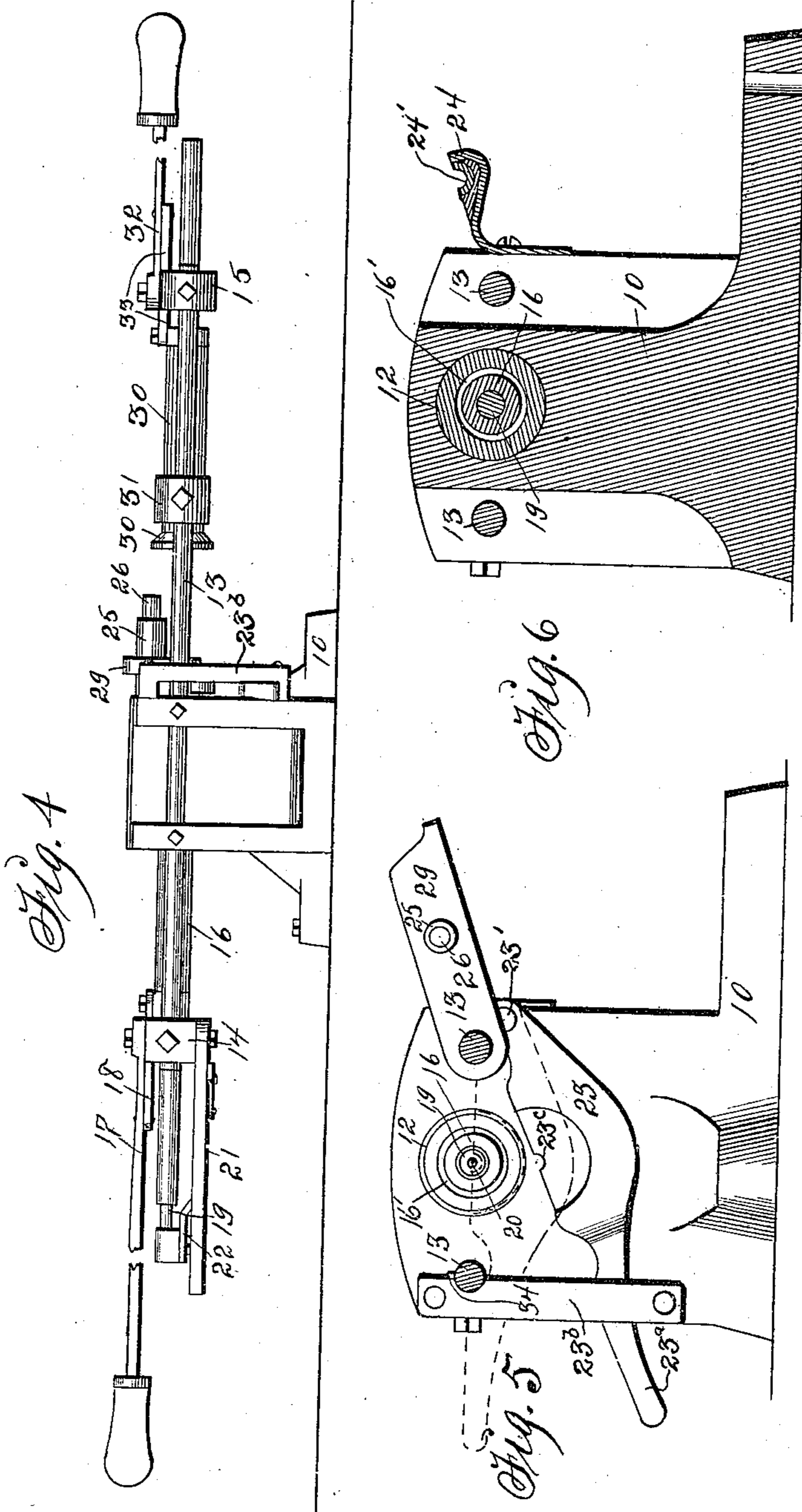
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By Thomas G. Orwig, Attorney.

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Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN W. HAUGHAWOUT, OF FORT DODGE, IOWA, ASSIGNOR TO WILLARD P. MARKLE, OF ST. LOUIS, MISSOURI.

MACHINE FOR REPAIRING CARTRIDGE-SHELLS.

No. 900,532.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed October 23, 1905. Serial No. 284,080.

To all whom it may concern:

Be it known that I, JOHN W. HAUGHAWOUT, a citizen of the United States, residing at Fort Dodge, in the county of Webster and State of Iowa, have invented a new and useful Machine for Repairing Cartridge-Shells, of which the following is a specification.

My invention relates to a machine for use in repairing cartridge shells after the ammunition present therein has been discharged and the shell enlarged and mutilated due to such discharge.

My machine includes mechanism for resizing the used cartridge shell, mechanism for removing the exploded cap, mechanism for re-capping the shell, mechanism for expanding or reshaping and ejecting the repaired shell from the machine, and inserting caps into the repaired shell previous to the ejection of the shell from the machine.

Figure 1 is a plan view of my machine. Fig. 2 is a view partly in vertical longitudinal section and partly in elevation. Fig. 3 is a view partly in horizontal section and partly in plan showing the cap carrier in the position assumed just previous to the insertion of a cap into the shell. Fig. 4 is a side elevation. Fig. 5 is an enlarged vertical cross section taken on line $x-x$ Fig. 1 and showing parts adjacent to said line in elevation. Fig. 6 is a vertical cross section taken on line $y-y$, Fig. 1.

10 designates a base that is adapted to be mounted upon a bench or other suitable support. This base is provided with a bore extending therethrough longitudinally of the machine, and in which is preferably located a barrel 12, the interior diameter of which corresponds to the diameters of the shells that are to be repaired in the machine. The barrel 12 may, however, as is obvious, be omitted, and the bore in which the barrel is shown fitted may be of an interior diameter corresponding to the diameter of the shells to be repaired, but I prefer to utilize the barrel for the reason that by doing so I furnish a member for the reception of the shells which may be more readily finished with an absolutely smooth interior and also be more readily tempered or annealed to withstand wear or prevent breakage. In any event the bore in which the barrel 12 is fitted or the barrel itself must be of a length correspond-

ing to or greater than the shells to be repaired when introduced thereinto, in order that when the shells are expanded in the manner to be hereinafter described there will be a bearing provided for the exteriors of the shells throughout their entire lengths, whereby the expanding member to which reference will hereinafter be made may act to expand the shell tube in a uniform manner while it is confined in its receiving bore or barrel.

13 designates horizontal rods that are rigidly mounted in the base 10. These rods extend longitudinally of the machine and protrude from each end of the base. The rods 13 are arranged parallel with each other and they have connected to them at one end of the machine a cross-piece 14 and at the other end of the machine a cross-piece 15.

16 designates a tubular plunger that is reciprocally mounted in the cross-piece 14. This plunger is arranged to be moved in a forward direction toward base 10 to enter the barrel or bore therein and it is provided at its forward end with an expanding or ironing member 16' of conical form that is adapted to enter the shell to be repaired while said shell is confined in the bore or shell receiving barrel of the machine, in order that when the plunger 16 is reciprocated said conical member will act to press the tube of the shell into which it enters outwardly, thereby expanding or ironing it to the degree permitted by the diameter of the shell receiving barrel or bore, which should correspond approximately to the gage of the shell when originally made.

The conical ironing or expanding member 16' is provided at its rear end with an annular angular shoulder 16^a that juts outwardly from the plunger 16, by which the member 16 is carried. As a consequence of the ironing or expanding member being made shorter than the shells which are to be treated in the machine, the shoulder of said member is designed to enter into each shell during the ironing and expanding action. Then as the ironing or expanding member is withdrawn from the shell, while it is confined in the bore or barrel that receives it, the angular shoulder acts against the shell tube to force it outwardly with the result of straightening out any crimps that may be present at the end of the shell tube. The

crimps referred to are such as are commonly occasioned due to the end of the shell tube being turned inwardly for the purpose of confining the outer wad of a shell when loaded.

17 is a lever pivoted to the cross-piece 14 and 18 is a link pivoted at one end to said lever and at its other end to the plunger 16, whereby upon the movement of said lever to and fro said plunger may be reciprocated to cause its conical expanding member to be reciprocated in the shell receiving bore or barrel of the machine.

19 designates an ejector rod that extends longitudinally through the tubular plunger 16 and which is provided at its forward end with an ejector pin designed for service in decapping the shells to be repaired when said ejector rod is reciprocated forwardly and its pin is caused to exert pressure against the previously exploded cap to force it out of its seat in the shell head.

21 is a lever pivoted to the cross-piece 14 and 22 is a link pivoted at one end to said lever and having its other end fitted to the ejector rod, whereby upon the movement of said lever to and fro the ejector rod may be reciprocated in performing its office.

23 designates a stop bar that is pivoted to the base 10 at 23' (see Fig. 5) and which has a handle 23^a that protrudes beyond the base at the front of the machine and is confined between the base and the guard bar 23^b secured to said base. The stop bar 23 is adapted to be lowered into the position seen in full lines Fig. 5 when a shell to be repaired is to be introduced into the receiving bore or barrel of the machine, and when said shell has been introduced the bar is elevated to the position seen in dotted lines same figure, where it serves to prevent ejection of the shell while the used cap is being dislodged therefrom by the ejector pin 20. In the stop bar is a notch 23^c of sufficient dimensions to permit the ejection of the used cap therethrough while the adjacent portion of the stop bar bears against the cap receiving bushing of the shell and serves to prevent dislodgment or distortion of said bushing to the detriment of the shell.

24 designates a cap holding member supported by the base 10 at the rear side thereof and provided with a channel 24' that extends longitudinally of said base and in which the fresh caps to be applied to the repaired shells are laid in alinement to be delivered to a cap carrier and transferred to a position where they may be inserted into the repaired and decapped shells that are operated upon in the machine. This cap carrier consists of the following parts: 29 is a swinging arm that is loosely fitted to one of the horizontal rods 13 and which is adapted to be thrown outwardly or forwardly to the position seen in Figs. 1, 2, 4 and 5, in

order that a cap may be received by the cap carrier and also adapted to be thrown into the horizontal position seen in Fig. 3 whereby the cap is delivered into a position to be inserted into the shell. While the arm is in the last named position it is restrained from movement in the direction away from the base 10 by a stop stud 34 projecting from the rod 13 on which the free end of the bar rests. When the arm 29 is in the last named position its free end is upheld due to engagement of said end with the horizontal rod 13 at the rear of the machine. 25 is a cap receiving tube that is mounted in the arm 29 and into which the caps are delivered from the channel of the cap supporting member while said tube is in its outturned position, as illustrated most clearly in Fig. 1. In the cap receiving tube is a plunger 26 that is provided with a longitudinal slot 27 and the degree of reciprocation of which is restricted by a stop pin 28 seated in the cap receiving tube and passes through said slot 27. The slot 27 is preferably of such length that it will permit just sufficient outward movement of the plunger 26 to allow a single cap to be introduced into the cap receiving tube in front of the plunger therein.

30 designates a pressure plunger that is reciprocally mounted in the cross-piece 15 and a cross-piece 31 also supported by the horizontal rods 13, this plunger being so mounted that its forward end may be advanced to the end of the base 10 at which the shells to be repaired are introduced into the receiving bore or barrel in said base. The pressure plunger is reciprocated through the medium of a lever 32 pivoted to the cross-piece 15 and a link 33 having one end pivoted to said lever and having its other end pivoted to said plunger.

In the practical use of my machine the forward end of the tube of a cartridge shell to be repaired is first placed in the receiving bore or barrel in the base 10 at the end of said base which faces the pressure plunger 30. Said pressure plunger is then moved forwardly by operating the lever 32 with a result of forcing the shell into the bore or barrel. The stop bar 23 is then raised into horizontal position to prevent ejection of the shell from the bore or barrel and the lever 17 is moved to carry the plunger 16 in a forward direction toward the base 10 to cause its expansion or ironing member 16' to enter the cartridge shell. The lever 21 is operated to move the ejector rod 19 in a forward direction and cause its ejector pin 20 to eject the used cap from the shell through the notch 23^c in said stop bar.

A fresh cap is inserted into the shell in the following manner: The cap carrier being in its forward and elevated position a cap is manually slid into the receiving tube 25 from the channel in the cap supporting bar

24 in which action the plunger 26 in said tube is caused to recede to the distance permitted by its slot and pin connection to said tube. The cap carrier arm 29 is then swung
 5 into horizontal position and the end of the cap carrying tube in which the cap is located is brought into juxtaposition and into alinement with the cap receiving bushing of the cartridge shell. The pressure plunger 30
 10 is then advanced to the outer end of the plunger 26 and said plunger is moved in the cap receiving tube under pressure to force the fresh cap from said tube into the cartridge shell. Either before or after the fresh
 15 cap has been inserted into the cartridge shell the tube of the shell is expanded or ironed to re-shape it from its mutilated condition by repeatedly reciprocating the plunger 16 through the medium of the lever 17 whereby
 20 the conical expansion or ironing member 16' of said plunger causes the shell tube to be pressed outwardly into close contact with the confining wall of the shell receiving bore or barrel in the base 10 whereby said tube
 25 is effectually put into a condition that will permit of the shell being reloaded as readily as it was originally loaded.

I claim:

1. In a machine for repairing cartridge
 30 shells, the combination of a body having a bore, a stop member for retaining a shell in said bore, a reciprocatory expander arranged to enter said bore to operate upon a shell therein, means for operating said ex-
 35 pander, a cap ejector arranged to operate through said expander, and means for

operating said ejector, substantially as set forth.

2. In a machine for repairing cartridge shells, the combination of a shell supporting
 40 member, a swinging cap carrier arranged to be brought into alinement with the shell supporting member and having a cap receiving tube, a plunger reciprocatorily positioned in said tube, and means for operating
 45 said plunger to deliver a cap from said tube to a shell, substantially as set forth.

3. In a machine for repairing cartridge shells, the combination of a shell supporting
 50 member, a swinging cap carrier arranged to be brought into alinement with the shell supporting member and having a cap receiving tube, a plunger reciprocatorily positioned in said tube, and a pressure plunger
 55 for engagement with said cap carrier plunger to deliver a cap from said tube to a shell, substantially as set forth.

4. In a machine for repairing cartridge shells, the combination of a shell supporting
 60 member, a swinging cap carrier arranged to be brought into alinement with the shell supporting member and having a cap receiving tube, a plunger reciprocatorily positioned in said tube, and means for exerting
 65 pressure against said plunger to deliver the cap from said tube; said plunger having slot and pin connection with said tube, substantially as set forth.

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