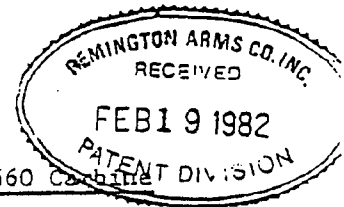


Remington Arms Company, Inc.



Ideas Pertaining to Reintroduction of a Modified Model 660 Carbine

- ① - Recent magazine articles have renewed my interest in your Model 600/660 carbine. In the March 1981 issue of the American Rifleman, pg. 42, John E. Maxson told how he made his ideal lightweight rifle by modifying a Model 600 carbine. Jim Carmichel, in the April 1981 issue of Outdoor Life, pg. 88, praised the Model 660 he had used on an elk hunt. It is unfortunately true, to paraphrase Mr. Carmichel, that the gun did not catch the sportsman's fancy until it was out of production.
- ② - The December 1974 issue of Guns & Ammo, pg. 36, carried an interesting article by John F. Rea on the Model 660. After shooting two of these carbines extensively for several years, he said it was undoubtedly the best carbine ever offered to the hunter. It is impossible to know what caused the demise of the firearm. Some have suggested it failed because it was competing with the Model 700. This sounds unlikely because of your introduction of the Model 788 rifle, and now you are marketing the Model 788 as a semi-carbine, as well as a rifle, without hurting your Model 700 sales. The two best possibilities for the failure of the Model 660 are the choice of cartridges for which it was chambered and the use of plastic in its fabrication.
- ③ - Rifles are made with falling block, lever, pump, autoloading and bolt actions. They are chambered for the many different rounds from the .222 Rem. to the .458 Win. Although the bolt action is the most popular, the favorite singular rifle-cartridge combination is the Winchester/Marlin lever action chambered for the .30-30 Win. Levers chambered for other cartridges have only limited appeal. Undoubtedly the late John Wayne contributed much to the nostalgia of the .30-30, but the continuing acceptance of the rifle is because hunters realize the cartridge is adequate for their needs and the rifle is easy to

handle and pleasant to shoot. A bolt action carbine with similar performance and characteristics would gain the acceptance and popularity that the .30-30 Winchester has. The ideal choice for such a gun is the Model 660 chambered for the .30 Rem.

④ There will be those who will want the carbine chambered for some cartridge other than the .30 Rem. It is well known that a 5½ to 6 lb. carbine with a 20-inch barrel has greater recoil and muzzle blast than a 7½ to 8 lb. rifle with a 22 to 24-inch barrel has when chambered for the same cartridge. The avid shooter is impervious to heavy recoil, but the average hunter is not an avid shooter. Although it is true recoil is not noticed during the excitement of the hunt, the anticipated recoil is considered in the gun shop when a rifle is being selected and is felt on the range when the rifle is being fired and zeroed in. This carbine is not designed for the Elmer Keiths, the Col. Askinses or the Jim Carmichels. It is designed for the John Does and the Joe Doakses who comprise the larger segment of the market. Col. Townsend Whelen believed the average shooter could tolerate approximately 15 ft. lbs. of recoil. This tolerance, along with muzzle blast, must be kept in mind when selecting alternate cartridges for the carbine.

⑤ For those hunters who will want a cartridge that has a flatter trajectory than the .30 Rem. has, I suggest developing a new one based on the .30 Rem. case. It will utilize the same bolt face and thus absorb some of the tooling costs. The .243 Win. and 6 mm Rem. cartridges are loaded with lightweight bullets for high velocity. They produce mild recoil, approximately 13 ft. lbs., but have small expansion ratios which cause some muzzle blast. Although these cartridges are acceptable, they are not ideal for a carbine. An ideal cartridge can be made by necking the .30 Rem. case to .257 caliber and moving the shoulder forward approximately .145 inch. The case may have to be strengthened to withstand chamber pressures of 50 000 to 53 000 c. u. p. By retaining the

outside dimensions of the case while increasing the thickness of the walls, the capacity would be reduced by no more than one grain of water. With a 100-grain bullet seated to a depth of .270 inch, the cartridge will have sufficient powder capacity to propel the bullet at a velocity of approximately 2800 fps. This is between the velocities developed by the nearly obsolete .250 Sav. and .257 Roberts and well below that generated by the .25-06 Rem. Just as the .222 Rem., .222 Rem. Mag. and .223 Rem. complement rather than compete with the .22-250 Rem. and nearly obsolete .220 Swift, this cartridge would appeal to those who are not interested in the .25-06 Rem.

⑥- It goes without saying that developing and introducing a new cartridge is not without risk. Therefore, it is necessary to consider all possible applications for which the cartridge/case may be used. Here, the axiom, "Need is the mother of invention", comes into play. A .224 caliber cartridge based on this case would perform approximately the same as the popular .22-250 Rem. A .243 caliber cartridge would have somewhat less velocity than the .243 Win. and 6 mm Rem. For these reasons, plus the fact this is a light hunting carbine rather than a heavy varmint rifle, these cartridges may be disregarded. A .264 caliber cartridge would be nearly the same as a .257 caliber. It is true the larger caliber of two bullets of the same weight will have a greater muzzle velocity, everything else being equal, but it also has a smaller ballistic coefficient and therefore loses the velocity advantage on the way to the game at ranges of 200 yards or so. The 6.5 mm suffers from a bad reputation, although undeserved, and should be avoided.

⑦ A .257 caliber cartridge is the only practical one that can be developed from the .30 Rem. case for use in a hunting rifle. However, there is a conspicuous gap between cartridges based on the .308 Win. and those based on the .222 Rem. used in benchrest rifles and silhouette/hunting pistols. Cartridges for these

firearms based on the new brass would fill that gap and prove to be quite successful, particularly in the 6 mm and 7 mm calibers. The lack of an adequate supply of this brass to date has precluded wildcat development of such cartridges. If Remington Arms were to develop these cartridges in addition to the .257 caliber rifle cartridge, the rewards for the efforts invested would be greatly increased.

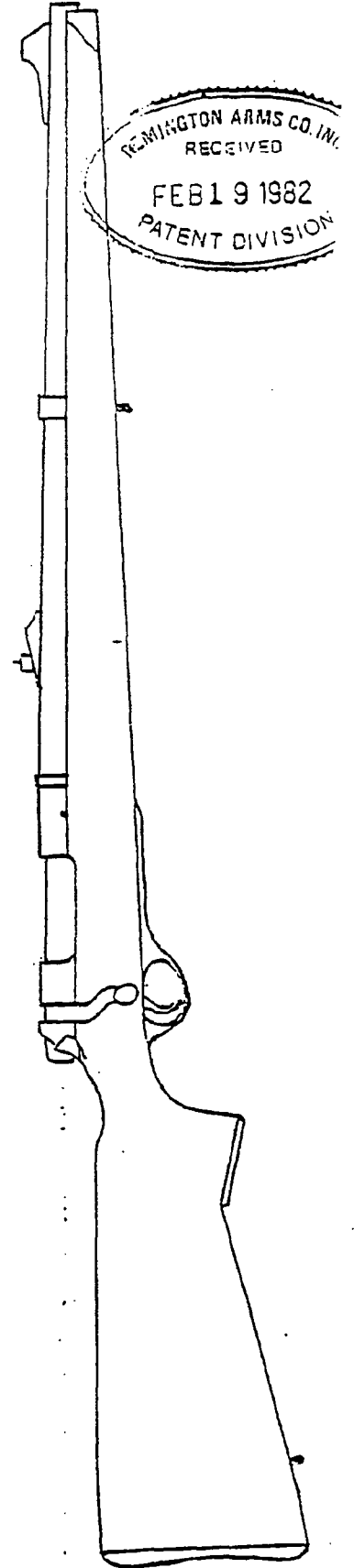
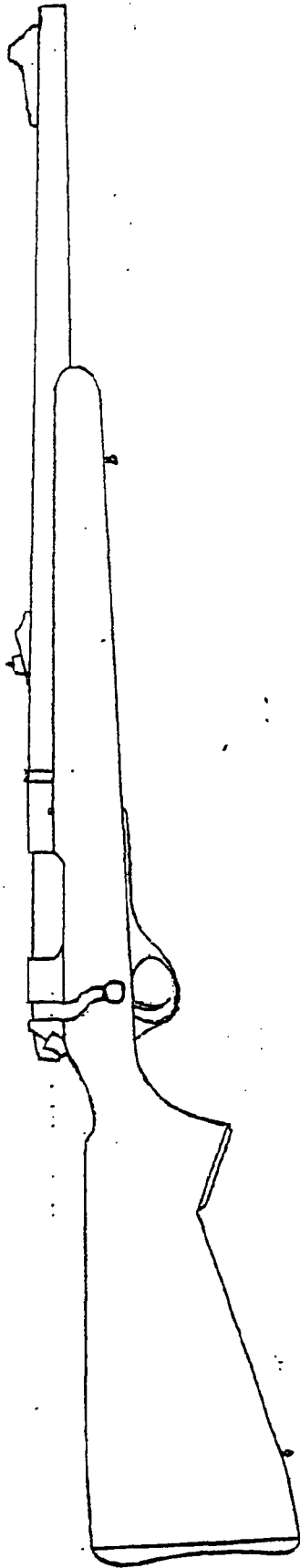
- 8- The .223 Rem. and possibly 6 x 47 mm are two additional cartridges well suited for this carbine. They are good varmint cartridges at the shorter ranges and when properly handloaded are excellent for turkey hunting.
- 9- For those who wish a more powerful weapon, the obvious choice of cartridges is limited to the .308 Win. and .358 Win. The .308 Win. is a well known and respected cartridge. Nothing derogatory can be said for its selection, and there is no need to repeat its fine qualities. The .358 Win. is a different matter. Since its introduction in 1955, it has never become popular. The reason for this, and this applies to the .350 Rem. Mag. also, is that hunters prefer bullets of .30 caliber or less for deer size game. A .35 caliber bullet appeals only to a relatively few hunters of the larger elk and moose. The .358 Win. is less powerful than the .350 Rem. Mag, but it kills just as effectively and recoils considerably less. Therefore, the .358 Win. will be accepted by those who would prefer the .350 Rem. Mag. and will be preferred by those who would not accept the .350 Rem. Mag.
- 10- As to the carbine itself, it will, naturally, use the Model 660 action. It should be a quality piece so as to complement your Model 700 rather than compete with the Model 788. It should be offered with two styles of stock, a full Mannlicher and a conventional short stock. The stock should be as


straight as possible with minimum drop at the heel. The comb should be high and wide with a very slight forward slope. A builtin cheekpiece also may be considered. The butt plate area should be ample with $5\frac{1}{4}$ " x $1\frac{1}{2}$ " minimum dimensions. The length of pull should be $13\frac{1}{2}$ ". The grip should be full or nearly full pistol, especially for the heavier cartridges. The forestock should be of sufficient size, not less than $1\frac{1}{2}$ " width, to provide a firm grip. The cross sectional dimensions in the receiver area can be scaled to the appropriate cartridge head diameter of .422" and .473" to achieve the desired slimness and weight. The 20-inch barrel should have a blade front sight similar to the Model 788. I prefer an aperture receiver sight but realize an open rear sight is quicker and more familiar to most hunters.

(11) Remington is continually involved in research and development. Your introduction of the .25-06, 8 mm Mag., 7 mm Express, 7 mm-08 and 7 mm BR cartridges are fine examples of your endeavors. You have redesigned your autoloading and pump rifles to improve already excellent products. There is a need for a small, light sporting rifle. Your comments on the resale value of the Model 600, as told by the editors of Outdoor Life, July 1981, pg. 8, indicates the current interest shown in the weapon. A Model 660, modified along the lines suggested will satisfy the need for a bolt action carbine that is easy to handle and pleasant to shoot, and chambered with an adequate cartridge. It will be welcomed by sportsmen and will enjoy a lasting popularity in the years to come.

(12) I respectfully hope you find this idea compatible with Remington's policy to provide products that satisfy the needs of the shooting community.

Garry H. Lee
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