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ILION RESEARCH DIVISION

MONTHLY REPORT

JULY 1956

SHOTGUNS

SPORTSMAN-58

12 Gauge Design Improvements

Endurance testing has continued satisfactorily through approximately 5,000 rounds and assembled with the following proposed improvements:

1. New Fore End Support (for better support of neoprene ring).
2. Increased length of receiver rail on left side for additional support of the Action Bars, Slide and Breech Bolt (to improve endurance).
3. New Firing Pins (better endurance).
4. Improved Magazine Cap (to reduce leakage).
5. Powder metal Triggers (checking endurance of preliminary production).

The nylon Magazine Tube Spacer was released earlier for production, along with an initial quantity of approximately 5,000 components. However, this has been delayed awaiting tool repairs for piercing the retainer pin holes in the Magazine Tube.

16 Gauge

Eighty (80) guns were assembled for pilot testing. With Remington ammunition, results were satisfactory but with Win. Magnum, Federal Magnum, and Win. light loads, feeding failures were encountered. This was probably influenced to some extent through absence of the

16 Gauge. Continued

Magazine Follower Latch which is used in the 12 Ga. gun. It was also found that the shells were catching on points of the Barrel Support extending into the Receiver. When this was corrected and guns retested considerable improvement was noted.

20 Gauge

Forty-five (45) 20 Ga. guns have been assembled and are being subjected to the same improvements found necessary in the earlier 16 Ga. test. Preliminary shooting through the Plant gallery was reported to be very good. Research testing, utilizing the complete variation in loads as well as shooting conditions, has been started and should be completed before the end of July.

Power Cone Development

Three (3) 12 Ga. guns selected from the last pilot test lot have been turned over to the Development Engineering Division for use in effort to adapt a power cone design to the existing 12 Ga. action. It is planned to first undertake a preliminary test using the existing design and if possible avoid necessity of any major changes.

SPORTSMAN-X

Internal ballistic characteristics are now available for time-pressure relationships with essentially each type of load. With this information, work has been resumed on preliminary design investigation of operating mechanisms which might be employed to span the range of load requirements. At the same time consideration is being given as to possible use of more unconventional ideas, giving emphasis on possible applications of other gas power transmission techniques

SPORTSMAN-X Continued

which might possibly be applied to an autoloading gun.

To further explore the advantage of molded nylon and similar materials, a model has been built with integral checkered grip and trigger guard. Similar treatment is being considered for the fore end and other variations are also in the planning stage. Dimensional characteristics will of course be influenced by development of the action and operating mechanisms.

CENTER FIRE RIFLES

MODEL 725

Parts are being prepared for assembling at least five models incorporating the design changes which were requested by Sales. This includes revisions to the stock and a new safety. Effort is being made to have these models available by the first of September.

MODEL 740 - 303 Caliber

Although the first rifles assembled performed satisfactorily it has since been found that with some combinations of rifles and ammunition the available power is insufficient to operation the action. This is of course also effected by normal variations in manufacture to the extent that gallery rejects were sufficiently high to warrant investigation. From previous experiments it had been found that further increasing the diameter of the gas ports offered no additional power. In the meantime a rather practical means was conceived for gaining an additional impulse reaction through an increase in the area of the action tube support bracket. New parts were rather quickly obtained and apparently the problem has been cleared so that shipments on this new caliber were started.

MODEL 750 - Caliber 244

The design work for this new caliber was completed several months ago and initial assembly for a pilot test of this model is expected to be run within the next few months. This additional time is necessary in order to permit the factory to place into effect the several general design improvements for the basic rifle as reported previously.

MODEL 760 - Caliber 222 Rem.

As reported previously, a design for a Caliber 222 version in this model was completed earlier and a functioning model built. It requires a new bolt head assembly to accommodate the smaller cartridge case in addition to changes to the magazine. Although these changes are significantly greater than for some of the earlier calibers, the indicated returns based on sales forecast are favorable and a project is being prepared for completing the development.

RIM FIRE RIFLES

MODEL 552

Design testing of the revised models has progressed through more than 16,000 rounds and is continuing. Performance has been considered to be generally satisfactory, especially with high speed long rifle cartridges. Some difficulty has been experienced with bolts but this seems to have been corrected with a change in heat treatment. The indicated life of extractor springs has been improved from 6,000 to 7,000 rounds. The design of the bolt is now essentially the same as that for the M572 and is used in conjunction with a neoprene buffer in the receiver. In order to further check

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MODEL 552 Continued

adequacy for release to manufacture it is planned to proceed with necessary tooling as required to produce a pilot test quantity of components which are not common in the M/572 rifle. Component drawings have therefore been released to the Plant for necessary processing and tool design.

MODEL 555

The design testing of the functioning model has continued through 12,000 rounds. The machined nylon stock and receiver has shown no indication of deterioration. The feeding and ejection systems have been developed sufficiently to release the final details as related to stock molds which are expected to be completed by the vendor late in September.

In line with a Management decision the present development is being restricted to the tubular magazine autoloader, although present forecasts are based on future development of a single shot and clip magazine repeater versions of this rifle.

The Sales Department has been furnished four mock-up rifles which are definitive as to appearance and color. Effort is being made to obtain approvals on these characteristics since the availability date for pilot production quantities may be delayed as result of any significant holdups.

MODEL 524

This bolt action, target rifle version of the M/521T was conceived earlier in the year at suggestion of Sales in order to meet indicated requirements. However, since completion of the new 5-year forecast for the rim fire line this item has been reconsidered and is being dropped from the Development Schedule.

MODEL 572

Functioning samples of rifles assembled with components of several colors have been supplied to Sales for review. Use of the aluminum alloy receiver in conjunction with an aluminum barrel make it possible to select from a rather wide range of colors through the anodizing process. Barrels would be made having steel tube inserts since the accuracy life was not found to be satisfactory with barrels made from aluminum alloy bars.

MODEL 40X TARGET RIFLE

Investigation was completed to determine possible causes for several customer complaints in connection with this rifle. As result, an improvement has been made in the bolt assembly to reduce wear affecting increases to the head space. It was confirmed through use of a "dry fire" cycling machine that in some rifles there is a condition which appears to produce slight changes in the trigger pull, especially when fired through thousands of rounds. The characteristic is considered to be significant from standpoint of match rifle requirements and will be the subject of further investigation in effort to determine causes for such variations.

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