

Third bites

Are third bites necessary on shotguns?

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Guns & Gunmakers | JUNE 2019

Birmingham makers were very fond of their extra locking systems but do they actually work?

The Anson & Deeley of 1875 was a design ahead of its time. It was the basis for a reliable, strong, safe and neat hammerless sporting shotgun virtually indistinguishable from the boxlocks now made by firms from Turkey to Italy, Spain to Birmingham.

What was not at the time universally understood, however, was the science and metallurgy concerned with the mating of breech to barrels. Gunmakers and shooters were extremely concerned with breech-locking safety.

The original locking system used by Westley Richards on Anson & Deeley guns was the 1863 patent bolted top-lever without any under-bolts. However, the two systems were quickly mated and the treble-grip action (Purdey under-bolts plus Westley Richards bolted top-lever and doll's head rib extension) was born.

Some gunmakers, like W.W Greener, made a selling point for their guns by championing third bites as an extra means of securing the breech to the action face. Competition for market share was strong and Birmingham makers emphasized the robust nature of their guns, as opposed to the London reliance on Purdey bolts.

Greener, promoting his 'treble-wedge-fast' system wrote: 'Any gun with a well fitting bolted top connection is vastly superior to those with bottom bolts only, or with extension of the rib without any bolt fastening into it.' He cites the live-pigeon shot W.F Carver firing over 40,000 shots in 200 days and continuing to use it for another two years, in which over 130,000 shots were fired without it shooting loose.

Greener also draws attention to some poor quality guns then available: 'The Anson & Deeley gun, as made by some firms in this country and abroad, now that (patent) rights have lapsed is far from equalling the original type from whatever point of view it may be regarded.' He refers to 'sham top-fasteners' and continues: '.these guns do not stand continual wear; not only does the lock action prove faulty but even the breech mechanisms, after firing but a few shots, are found to gape at the breech joint...'

Irritatingly for Greener, his own patented third grip was widely mimicked by the producers of poor quality guns, trading on Greener's well-known advocacy of the system.

Of course, they neglected his strenuous quality control and made guns that loosely resemble Greener's output but these third fasteners are actually almost totally ineffective, due to the sloppy engineering involved and the loose fit. After a few shots, the third fastener becomes mere decoration as it is not holding the gun shut when it fires and the bar flexes, the tolerances being such that the flexing happens anyway and the cross bolt is a mere spectator to the action.

So, what happens when the lock does its work and fires the charge in the chamber?

The burning of powder in the cartridge sends pressure waves out in every direction. The chamber walls prevent outward movement and the force is therefore channelled backwards into the breech face, and forwards, sending the wadding and shot charge down the bores. The backward force into the un-moving breech face is channelled through the static barrels onto the hook, braced against the hinge pin and prevented from opening by the under-bolts.

The force is absorbed by the bar of the the action, which flexes at the radius between action face and bar. The tensile strength of quality steel allows it to flex and then return to its original shape immediately. These stresses, however, do not work to open the gun. I have fired a 12-bore shotgun unbolted without event.

If a gun is properly made of quality materials and jointed correctly, then it requires no top extension to hold it together. The action will flex upon firing, opening a 'V' shaped gap,with the sharp end at the radius and the open end at the top of the action. When the right barrel is fired, lateral flexing also occurs, with the open end of the 'V' on the right side and the sharp end at the left. The hook, hinge pin and lumps engaging with the machined recesses in the bar ensure the process of expansion and spring-back is controlled and not damaging.

My own experience suggests very strongly that one of the most important virtues a pleasant shooting gun possesses is rigidity. An action with less observable flexing is better to shoot. It vibrates less, it feels steadier, it is easier to shoot consistently and less likely to give you a headache.

If the action is sufficiently robust, flexing will be minimised and third bites become superfluous. Their presence makes manufacturing more expensive because properly fitting them is skilled and time consuming. Vintage guns with third bites are more difficult to re-joint because there are more surfaces to be reconciled when the barrels are brought back onto the face. Second hand guns often have noticeable gaps at the front of the doll's head from repeated re-jointing.

For game guns, third bites are not really necessary, though they may be useful in double rifles. They remain an interesting avenue of 19th century design but few modern game guns bother with them.

Published by Vintage Guns Ltd on 26th June 2019

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