

From Our Scrap-Book



HOW ROCKETS ARE MADE.

BY LIEUT. W. R. HAMILTON, U. S. A.

ROCKETS are made for three purposes: for signaling; for decorations or celebrations, or as projectiles in war. For signals, the charge consists of 12 parts of niter, 2 of sulphur, and 3 of charcoal. The ornamental, or decorative, rocket is the one we see used on the Fourth of July, and the composition of which it is made comprises 122 parts of mealed or finely pulverized powder, 80 of niter, 40 of sulphur, and 40 of cast-iron filings.

The principal parts of the rocket as shown in the diagram are: *a*, the case, made by rolling stout paper, covered on one side with paste, around a wooden form, at the same time applying considerable pressure. The end is then "choked," or brought tightly together, with twine. The paper case thus made is next placed in a copper mold, so



that a conical copper spindle will pass up through the choke, and the composition, *b*, is then poured in and packed by blows of a mallet on a copper drift or packing-tool made to fit over the spindle. The top of the case is now closed with a layer of moist plaster-of-paris one inch thick, perforated with a small hole for the passage of the flame to the upper part, or "pot"—*c*. The pot is formed of another paper cylinder slipped over and pasted to the top of the case and surmounted by a paper cone filled with tow. The "decorations" are placed in the pot and are scattered through the air when the flame, having passed through the aperture of the plaster, reaches a small charge of mealed powder, *d*, placed in the pot. The stick is a piece of pine wood, tapering, and about nine times the length of the rocket. It is to guide the rocket in its flight. The decorations in the pot may be "stars," "serpents," "marrons," "gold-rain," and so on. "Marrons" are small paper shells filled with grained powder and pinned with quick-match. "Serpents" are small cases about $\frac{1}{2}$ inch in diameter in which is a composition of 3 parts niter, 3 sulphur, 16 mealed powder, $\frac{1}{2}$ charcoal. This composition is driven in the case, the top of which is closed by plaster-of-paris, having a small aperture through which passes a piece of quick-match.

A "Tourbillon" is a rocket that moves upward with a spiral motion. This motion is produced by six holes, two lateral ones (one on each side) and four underneath. It is steadied by two wings formed by attaching pieces of hoop-iron to the middle of the case and at right angles to it. Rain of fire, or gold fire, is cast-iron filings which become red-hot in the flame of the explosion, and, on dropping through the air, gleam accordingly. Looking at the plan of the rocket, we find at the rear end of the case a hollow part. This is where the copper spindle has passed through the choke. It is filled with quick-match, and a paper cap is placed over all. Now, when the match is lighted it sets fire to the composition, and the gas generated by the burning of the latter must escape. In doing so, it strikes against the air, which not giving way fast enough causes the expanding body of gas to push the rocket forward also. Of course, it is easy to see that the more the composition burns the larger the burning surface becomes, and therefore there is constantly a greater amount of gas generated each instant. So the rocket, having begun to move comparatively slowly, rapidly increases its rate of speed till the composition is nearly all burned out. Then the flame, passing through the aperture in the plaster, reaches the mealed powder in the pot, bursts it, setting fire at the same time to all the decorations, which are scattered through the air in beautiful colors.

PUSSY IN THE WITNESS-BOX.

BY THOS. W. CHITTENDEN.

ALTHOUGH animals were not unfrequently summoned in judicial proceedings, in days gone by, it is not now a common thing for animals to be formally summoned by a court of justice, either to stand trial themselves or to give evidence against or in behalf of litigants. Nevertheless, such an instance has just occurred in this country, and the testimony of a fine Maltese cat summarily decided a case that had puzzled judge and jury for a week.

The circumstances of this novel occurrence were as follows: Two men living in a Western city each owned a young Newfoundland dog, and the two animals resembled each other so strongly in all points that it was not possible for even the respective owners to distinguish