

The chief advantage of the Roumanian spade appeared to be its portability, but except in soft ground it was useless.

The engineers' pattern, with its pointed blade and longer handle, seemed more suitable for various work; it was, however, apt to buckle up at the end and to lose its crutch, while in the use of both spades, and especially in the Roumanian, the men's knuckles suffered greatly.

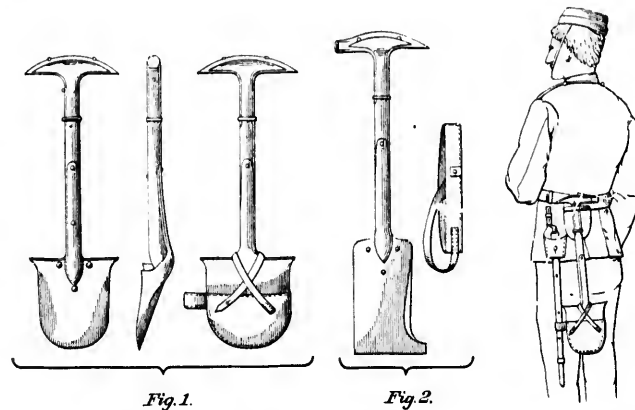
These trials taught me what were the essentials of a really serviceable intrenching tool which may be summed up in four words—

*Strength, Portability, Handiness, Power.*

The tool should be adapted for use in every kind of ground, rocky or soft.

Be able to cut roots and lever up stones; to break open boxes and barrels, and, at a *pinch*, loophole walls.

The tool which I have the pleasure of showing you this afternoon has passed through these tests under the supervision of Col. Sir Andrew Clarke and the Royal Engineers' Committee.



As a specimen of these official trials it will be enough to say that in ordinary soil a shelter *pit* was dug in six minutes and a shelter *trench* in twenty minutes.

On a consolidated parade ground one hour proved enough for the regulated trench; gun-pits and epaulements were thrown up, and, as an experiment, a 14-inch brick wall, strongly constructed, was loopholed in forty minutes. The proposed trials on a large scale, which I am glad it will have in the coming maneuvers will doubtless yield some useful hints for further improvements of the tool, and my suggested mode of carrying it, which I shall gladly avail myself of, whether I am permitted to have the advantage of witnessing the maneuvers or not.

I suggest it will be found useful not only for cavalry—where it saves considerable weight—and infantry in the field and camp life—for marines and naval brigade on shore, but also for steam launches, for mining purposes, and for carriage or gun limbers. I have also adapted it for the use of the Ordnance Survey by the addition of a hammer and bill-hook (Fig. 2), and in this form I think it could with advantage be carried either by the pioneers or by a proportion of the rank and file.

In conclusion, let me say that I do not propose that this small tool, weighing about 2½ lbs., and measuring 23 inches in length, should take the place of the heavier and more powerful service pick and shovel; still less do I claim for it *perfection* or indestructibility.

A tool so limited in weight and size cannot reasonably be expected to bear *anything* and do *everything* which the British soldier may be pleased to require of it; simple as it looks it is not so easy to make. But I do not hesitate to say that when made with care, and of the best material, as are all which my contractors, Messrs. Lucas & Son, have turned out, it is a *marvel* of strength and *power* for its