

which at the beginning of a voyage attracted the North end of the needle, should it become magnetic, would *repel* the North end, under certain obvious conditions.

I believe it was recently discovered that the needle was influenced to a dangerous extent on a Man-of-war by the side arms of a sentry who passed near the compass and whose bayonet had become magnetised by having been stored near the ship's dynamo.

All of these irregularities of the needle may be successfully guarded against *in fair weather*, by frequent astronomic observations, but such observations require special instruments, which are not always obtainable.

In the absence of astronomic observations, the correctness of the work in hand depends upon the skill of the observer and his knowledge of the *capricious pranks*, so to speak, of this little instrument, which, with all its faults, is so marvelously useful.

With a view to increase the accuracy of compass surveys, I several years ago, invented and obtained a patent, in the United States, upon a little instrument which I called an Improvement on Transit Compasses, and it obtained considerable favor among surveyors: in fact, some of my confreres were kind enough to say that they thought that my instrument would supercede the plain sight compass.

The instrument consists mainly of a compass, rigidly attached to the upper side of a telescope turning upon trunions in a bifurcated holder. It possesses many of the advantages of the heavy and expensive transit instrument, with the lightness and inexpensiveness of the compass, and it is therefore particularly desirable for surveys in places not easily accessible.

In ordinary so-called "line running" the surveyor would only use the needle at starting, after which required points in the great circle would be accurately determined by the use of the telescope, indicated in the cut of the instrument.