

sufficiently to wear well, they were brittle and broke too frequently to warrant their use.

At present the only effort being made to improve the lasting qualities is confined to heating and dipping the tooth point after it is drawn out under the hammer.

The life of a set of teeth will of course depend upon the nature of the material being dredged. In unblasted grey rock seven hours continuous work is a fair average as shown by records kept by the writer. Upon becoming too blunt to hold well, the points are again hammered out, but there is a limit to the drawing out process and the tooth soon goes to the scrap pile.

During last season the four dredges of the fleet used up 181 teeth, each tooth having been in service at least four times.

The weights of the several parts of a seven yard dipper are as follows:—

Cast steel lip.	2,510 lbs.
Cast steel bottom band.	3,230 "
Cast steel bail.	1,335 "
Door, complete, with latch.	2,230 "
Shell.	1,500 "
Cast steel shackle.	125 "
Rivets, pins, etc.	605 "
Four cast steel teeth.	1,800 "
<hr/>	
Total weight of bucket.	13,335 "

Considerable trouble has been experienced on account of the very rapid wear of the faces of the latching dogs, even though they have until very recently been made of Manganese steel. Castings of common steel with faces hardened as much as possible are now being tried and though the duration of the test will not allow of a decision as to the wearing qualities, it is certain that they withstand shocks and blows far better than those of Manganese steel.

Experiments are in progress to determine the advisability of an annealing all steel castings used in the construction of buckets and clams. There is no doubt that the initial strain in some of these castings is very high, as its presence is frequently denoted by shrinkage cracks. It is hoped that annealing will relieve more or less of this tension and materially increase the life of the piece.

With regard to rivetting, it has been proved that rivets driven by pneumatic tools are superior to those put in by hand. The drift pin seems unavoidable in work of this kind, but it is certain that were all holes drilled fair and good, slack rivets and broken castings would not be so common.