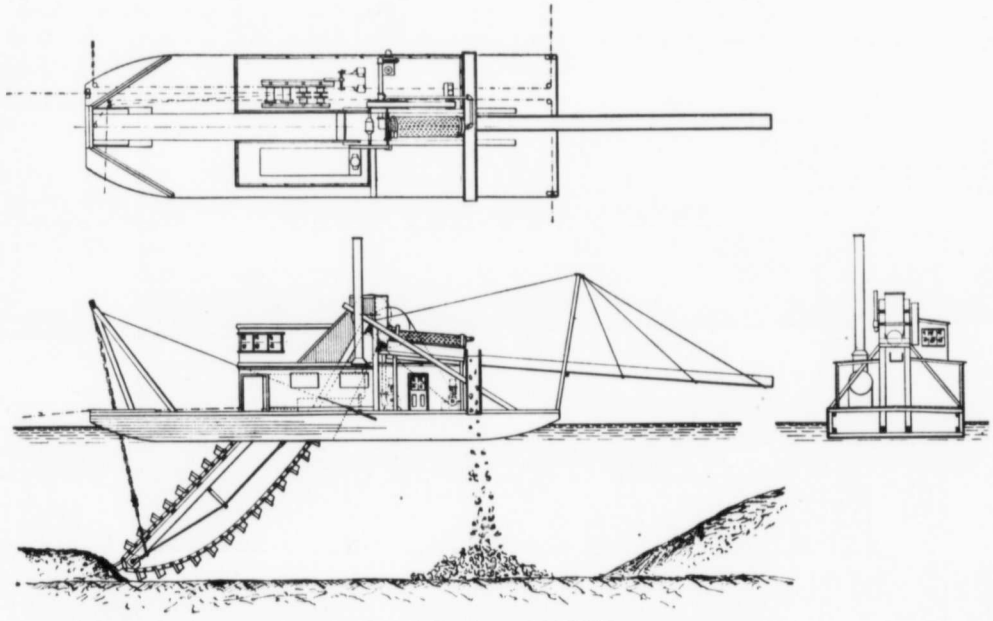
and a form of construction of the principal machinery was adopted after such consideration and study which gives the greatest simplicity and the smallest number of parts that can possibly be used to accomplish the desired result. The importance of simplicity and strength in a machine of this kind can only be appreciated by those who have had to struggle in a far-off locality with a machine which was so complicated that it was difficult to keep in order, and with certain parts so weak that they would break down. In a machine of this kind the presence of a single defective element is enough to nullify the advantage of all the rest which may be good.

The following is a brief description of the dredge: The hull is of wood 85 feet long, 25 feet wide and 4 feet 6 inches deep and is built of a form specially adapted to work in a rapid running river if required. The main framing is also of wood and consists of three main timbers on each side. These are connected in such a way as to hold the entire head machinery. The head frame timbers are connected by bracket castings of steel which also carry the ladder shaft so that no additional attachment is necessary for this purpose.



Plan of Elevation and End View.

The dredge is fitted with a chain of buckets having a nominal capacity of two and a quarter feet each. These buckets are entirely of forged steel; no steel castings are used in their construction. Cast steel bucket backs are extensively used for elevator dredges and the writer has also used them successfully for gold dredges, but where it is necessary to keep the weight down to the smallest possible limit a higher degree of strength can be secured and the liability to breakage through flaws in the steel castings obviated by making it of forged steel. The lip plates of the buckets are of the highest quality of machinery steel of such hardness that they will resist abrasion and at the same time will have the requisite toughness to resist breakage. The pins are of Hadfield's patent manganese steel and all the pin connections are bushed with renewable bushings of oil tempered tool steel.

The material from the buckets is delivered into the hopper and passes through a revolving screen. The coarse tailings are rejected and the fine material passes through the screen into the sluice box and is discharged astern. This dredge therefore is of the coarse screen and sluice box type as distinguished from the new Zealand type which possesses a fine screen and in which the gold is saved on tables. The writer prefers this type of dredge wherever it can be used on the score of simplicity and also because large capacity can be reached with a comparatively small screen and the tailings can be discharged astern and distributed without the necessity of employing a tailings elevator. The only objection that can be urged against the sluice box type is that it is not capable of saving the very finest gold or at least will not save as large a percentage of it as the fine screen and table method. This is, therefore, a question of adaptability to the character of the ground and the gold to be saved, and in the particular locality where this dredge is to be used the gold is sufficiently coarse to be saved in the sluice boxes. The action of the gold-saving