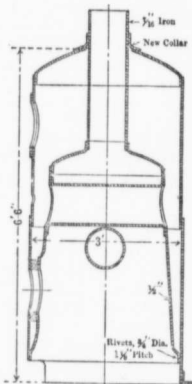


Estimating the Cost of Repair Work

A Practical Article Discussing the Estimation of the Cost of Several Repair Jobs. Renewal of Cone of Upright Boiler: Converting a Galloway Type Boiler into an Oil Tank: Repair of Scotch Marine Boilers.

By JAMES CROMBIE*

In the present article the writer will take up the estimation of the cost of a few repair jobs, trusting that some of our successful veteran boiler makers will be led to do the



Job No. 1—Vertical Donkey Boiler.

same and thus give the younger men in the trade the benefit of their experience on this important point.

In a contract shop one is called upon to face all kinds of problems, especially in a shop where much repair work is carried on. It may be that a steel mast must be replaced or

plating are badly twisted, all of which must be made good to pass the inspector. It may be necessary to put in new coal bunkers or to take down the old funnel or smokestack and erect a new one. The donkey or upright boiler may be in need of repairs. Repairs may be necessary on a water-tube, locomotive, return-tube, Scotch marine, or any other type of boiler, but in every case, no matter how large or how small the job, the question with which we are confronted is: "What is your price on the job?"

The foregoing gives but a suggestion of the many different phases of repair work on which it is necessary to estimate the cost and to estimate it correctly, not only so that there will not be any loss, but also so that the price will stand favorably as a competitive bid.

Take the following job of repair work as an example. The price is asked on the work necessary to renew the fire-box or cone of an upright or donkey boiler, including a new up-take pipe and a new collar or flange to fit the up-take pipe and outside head. In the following analysis no account will be taken of the cost of material, as that is not so much a question of estimation, since it can be figured out exactly.

Assume that the boiler is 36 inches in diameter, 6 feet 6 inches high and has two cross-tubes riveted in the cone. The up-take pipe is 8½ inches in diameter by 33 inches long. The top of the cone is flanged in the centre to fit this pipe, the pipe then extending up through the crown or top of the boiler. It was found that the flange for the pipe on the outside was pitted and grooved so that it had to be cut off and a new collar made to fit the pipe, this collar, of course, to be riveted to the top of the boiler.

A fair estimation of the time taken for this work would be as follows: Removing the old fire-box, a boiler maker and an apprentice, 17 hours; flanging the bottom of the cone to fit the outer shell, which is 36 inches

scarfing four corners, rolling up, fitting in the head and two cross-tubes, rivetting up on the hydraulic machine, calking and testing the job will take a boiler maker 170 hours, an apprentice boiler maker 30 hours, helpers 130 hours and a boy 30 hours.

Total time on the job:

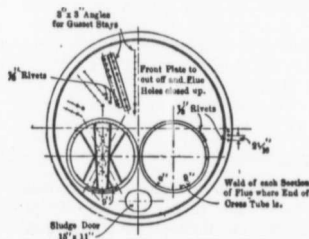
	Cents per hour.	Hours.	
Boiler maker.....	24	209	\$50.16
Apprentice boiler maker .	10	47	4.70
Helpers.....	15	270	40.50
Boy.....	10	30	3.00

Estimated cost of labor..... \$98.36

■ All material extra (two cross-tubes were bought, welded and flanged, but had to be fitted into the boiler, allowance being made for this in the above estimate for the time of the helpers).

As another instance of estimating the cost of repair work, figure out the cost of converting an old land or Galloway type boiler into an oil tank. The boiler is 30 feet long, 8 feet mean diameter; all rivets ½ inch in 15-16 holes, machine driven. The work required for this job is as follows: Removal of two flues, closing up the flue holes at each end of the boiler, calking and testing with cold water.

Both flues must be cut at each end where they are riveted to the boiler heads, and the front head must be cut out in order to allow the flues to be taken out. Cutting out the rivets from the back end of the flues, the front end of the boiler and all the rivets attaching the gusset stays to the front end plate would take two boiler makers 20 hours each. The flues would have to be worked out with chain blocks and rollers if there were no crane near the job. Taking out the flues and fitting on the front plate, also fitting on two plates, each 36 inches in diameter, and two plates, each 42 inches in diameter, to cover the flue holes in both the front and back boiler heads would take one boiler maker 36 hours, an apprentice



Job No. 2—Galloway Boiler.

that several plates must be taken from the bottom of a steamboat, and the floor plates, frames and plating in the way of repairs made good, or it may be that 30 or 40 feet of the bulwarks must be taken down and renewed, or the bow of a boat may have been smashed in a collision, so that the stem and shell

in diameter, and recessing the fire-door hole, welding the up-take pipe, which is 8½ inches in diameter and 33 inches long and made of 7-16 inch Lowmoor iron, and flanging the collar for the up-take pipe (the collar must be machine flanged and all the other work hand flanged) will take a boiler maker 22 hours and two helpers 22 hours each; laying out the new cone (two plates in the cone), punching,

boiler maker 40 hours, and helpers 165 hours. The time required for riveting, including the riveting of the front head to the shell, also to the gusset stays and the riveting of the four plates on the flue holes, would be as follows: One boiler maker 49 hours, one helper 39 hours, one boy 24 hours. The calking and testing would take one boiler maker about 30 hours.

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