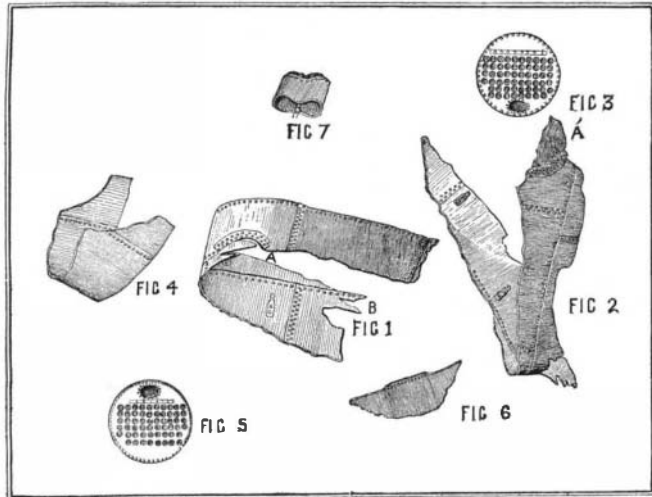


BOILER EXPLOSION AT FRANKLIN, IND.

To the Editor of the Scientific American:

Accompanying sketches show details of boiler which exploded at Franklin, Ind., on the morning of February 12. The boiler was used at a flour mill owned by Messrs. McDaniels & Wright; it had been put in new about a year ago; it was a horizontal tubular, 5 feet in diameter and 16 feet long, containing sixty-two $3\frac{1}{2}$ inch tubes. It had a steam dome, about 40 inches in diameter and 24 inches high, riveted on at the second sheet (taking in part of the third sheet) with a double row of rivets. The boiler was set on a stand at the rear, the front resting on the cast iron front. The



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tubes are not shown, as they were scattered in all directions, and their being shown would not aid in a correct understanding of the accident.

The initial point of rupture was at the dome, shown at A' A', Figs. 1 and 2, passing round the line of rivets, and then through the sheet and through the rivet holes of the first ring of plates, Fig. 4; at the heads the dome was blown away nearly intact, as were both the heads, Figs. 3 and 5.

By cutting out (in paper) the pieces, Figs. 1 and 2, placing the latter against the former at A' and B, and twisting them into a cylinder, the shape of the boiler is obtained; by adding the portions shown in Figs. 4 and 6, the whole boiler is obtained, and it shows that the rent commenced at the dome, and tore apart like the paring of an apple. If this had occurred under a pressure of water, there would have been no further damage after the pressure was relieved; but in the case of steam contained in a boiler, with the usual amount of water, say at 80 pounds pressure, the conditions are altogether different. Water boils at 212° in an open vessel; the temperature of steam at 80 pounds pressure is 312° . Now suppose, as in this case, a rupture takes place, the whole volume of water remaining in the boiler endeavors to form into steam, because it seeks to get down from 312° to 212° ; and in that effort the 100' makes steam. It is this sudden change in the normal conditions which causes the total destruction of the boiler, and of course when it starts the rupture follows the easiest direction, and a crack from the edge of a rivet hole into a sheet would start the crack through the sheet.

The plan view accompanying shows the position of the mill and the direction in which the portions were thrown; by comparison with the other sheet each portion can be identified.

A boiler of this size should have been set in the brickwork on rollers, the boiler being provided with brackets for the purpose, and very likely the additional strain caused by the mode of setting had a good deal to do with weakening the seams of the boiler. The iron was stamped Coalale I. Co., Pena., C. H. No. 1. A. R. P.

A NUGGET of gold weighing 21 pounds (about \$5,000) has been found at the Berlin diggings, Victoria, and brought into Dunolly by two miners. The gold field was celebrated for nuggets some years since, and the present find will no doubt lead to the discovery of others.

TARPON FISHING WITH ROD AND REEL.

Mr. W. H. Wood, of this city, has demonstrated the fact that it is feasible to take and kill with ordinary rod and reel the mighty tarpon of Florida, by capturing one weighing 117 pounds, which we show in the accompanying sketch. For the past two years quite a discussion has taken place in some of the newspapers between anglers as to the possibility of taking the tarpon with ordinary tackle, which so interested Mr. Wood that, finding during the month of March last he had the leisure to spare, he ordered the following outfit made and started for Punta Rassa, Florida, where he made his headquarters. He had a reel made of rubber and white metal to hold 1,200 feet of twenty-one thread line, without gearing, had a square handle, and was $5\frac{1}{8}$ inches in diameter and $2\frac{3}{8}$ inches wide in the clear. Two strong bamboo rods, each 5 feet long, and a gaff hook mounted on an ash hoe handle, also formed part of the equipment. The hooks used were large cod 0, baited with mullet tied on with fine copper wire.

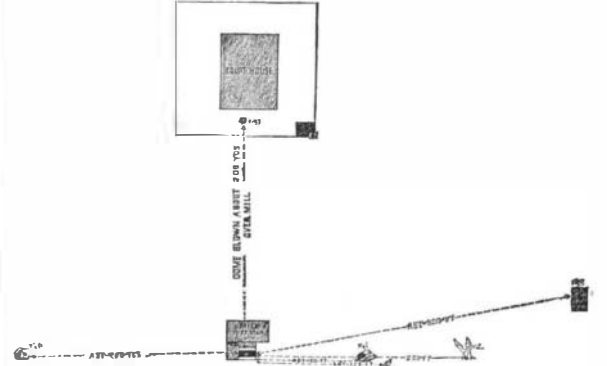
Mr. Wood thus describes the capture of his first fish: "We caught sight of the back fin of a tarpon lying within two feet of the bushes, and as we were running slowly toward him I saw another some fifty feet out from the mangroves. I told my man to stop the skiff, and I then cast my bait (which consisted of the side of a mullet cut in the same manner as a menhaden bait is cut, and put on the hook in the same way and wired on) to within five or six feet of the mouth of the tarpon, which was lying still at the time. I cast out the bait near his head, and he whirled, making toward it, in taking which he was obliged to show his tail out of water, which was shoal, and as he was taking the bait I drew out from my reel through the tip some fifteen to twenty feet of extraline. After getting the bait moved slowly away, taking the slack line, and just the instant the slack was all taken up, I drew and hooked him, when he came instantaneously entirely out of the water, trying to shake out the bait; then the trouble began.

We paddled after him, and he racing and leaping until he had made six leaps and had run say half a mile, when I found I was tiring him out, as he could not then leap entirely out of the water. After getting him pretty well tired out I suggested gaffing him, but my man thought he might knock the skiff to pieces, so we awaited the arrival of the sail boat, when I stepped out of the skiff into the boat, and reeled the

five foot bamboo rod and the large tarpon reel (owing to following him with the skiff), not having out at any time more than 250 feet of line. The time was $26\frac{1}{2}$ minutes from the moment the fish made his first leap to the time we placed him back in the skiff a minute after he was drawn on board. The tarpon was 5 feet 9 inches long, and weighed 93 pounds."

The following is the score made by Mr. Wood during his trip:

No.	Length.	Weight.	Time catching.
1	5 ft. 9 in.	93 pounds.	$26\frac{1}{2}$ minutes.
2	5 " 7 "	81 "	$21\frac{1}{2}$ "
3	6 " "	111 "	33 "
4	5 " 11 "	105 "	5 "
5	6 " 1 "	117 "	45 "



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This would make an average weight of over one hundred and one pounds.

Mr. Wood describes the violent manner in which the tarpon shakes its head in leaping as something wonderful, and thinks that fish No. 4, which took but five minutes to land, broke its vertebra in one of its early aerial flights, as the fish was nearly if not quite dead when brought to gaff. The flesh of this fish is a delicate rosy tint, and is said to be quite savory.

Mr. Wood considers the tarpon the coming king of all game for sporting fishermen. His taking the still bait, his response to being hooked by immediately leaping out of the water, his swift running between leaps, his beautiful shape and superb metallic luster, added to his magnificent proportions, make him a delight to the sporting fisherman who captures him.

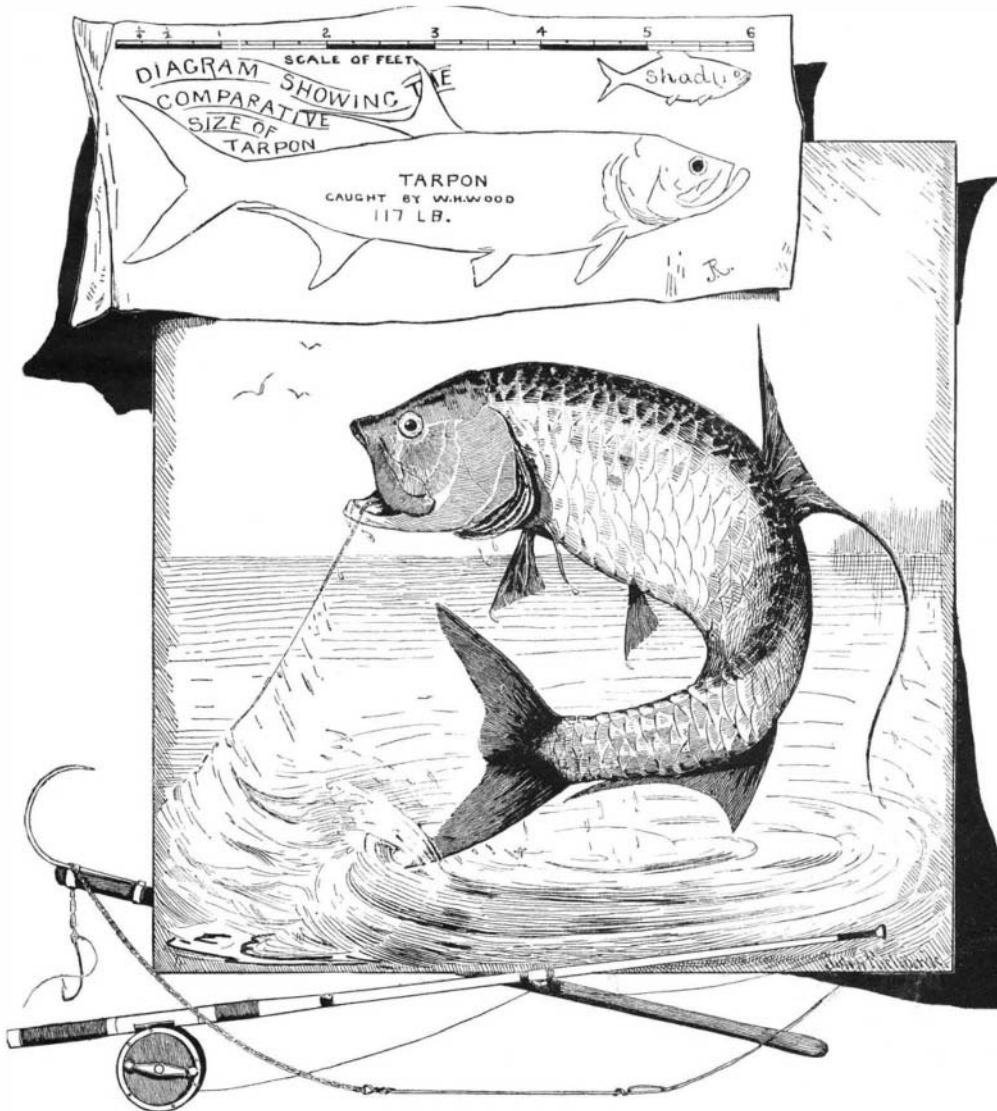
Cost of Gas and Electricity in New York.

Stephen McCormick, Secretary of the Gas Commission, has reported to the city of New York regarding the relative cost of gas and electricity for lighting streets. The city has 647 electric lights, costing annually \$165,308.50. These displaced 3,016 gas lamps, costing \$52,780. The Common Council has requested that 2,093 additional electric lights be put in use, displacing 5,345 gas lamps. The cost of these electric lights will be \$534,761.50 a year, while the gas lamps over the same area cost \$93,537.50. Should the additional electric lights be authorized, there will be on Manhattan Island 2,740 electric lights, costing \$700,070, and 13,685 gas lamps, costing \$232,986.50. As the cost of lighting the Twenty-third and Twenty-fourth wards is \$117,630, the entire cost of lighting the city would be \$1,050,686.50. Mr. McCormick says that it would not be wise to remove the gas lamps in areas covered by electric lights, as there might be emergencies that would compel the city to use gas. He has not discovered any advantage that the electric light possesses except instantaneous lighting. The Gas Commission is now considering proposals from gas and electric light companies for lighting streets and public buildings for the ensuing year.

A Singular Tank Explosion.

A tank of half inch wrought iron, with cast iron heads an inch thick, used to heat water for a hundred horse power boiler in a Lynn shoe factory, recently exploded, blowing the top head through the roof of the one

tory boiler house, so that a piece fell through the roof of the factory, a four story building, 65 feet high. The tank was three feet in diameter and six feet long, and the piece of iron which came through the roof weighed twenty-six pounds, but no one was injured.



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fish toward me, and when he got within reach Mr. Smith gaffed him through the gills in a splendid manner, and almost with the same movement drew him into the sail boat. The feat was accomplished. A tarpon had been caught with a twenty-one thread line on a