

The machine is composed of two parallel bars of steel, supporting a traversing carriage, through the centre of which passes a spiral auger attached to a screwed bar; this bar fits into a female screw clamp above the carriage, and on the upper end is a winch with four handles.

When the instrument is in use it is fixed by two cramps upon the stone to be pierced, and the auger being made to revolve by means of the winch, scoops out at each revolution as great a depth of stone as is equal to the distance which the screw descends; the chips ascending through the spiral channel of the auger, are thrown off at the top. The peculiar shape of the point of the auger prevents its being abraded, as it operates by chipping the stone, and not by grinding it away. This, with the means of forcing it down by the screw, is the chief novelty of the machine. It has been extensively used at the works of the new Harbour of Arbroath by Mr. Leslie, who speaks of it in the following terms:—

“Mr. Hunter’s Boring Machine has been advantageously employed for above a year, in boring trenail holes in the stones used at the new Harbour of Arbroath. The holes are $1\frac{1}{4}$ inch diameter and from 9 inches to 2 feet in depth: the aggregate of the holes already bored amounts to upwards of 30,000 linear feet. The machine may be adapted for boring holes of any dimensions. It does the work considerably cheaper than the “jumper,” and much more correctly as it makes the holes perfectly straight, cylindrical, and equal throughout, instead of the irregular form made by the common jumper. This machine is very well adapted for boring railway blocks, and has been much used in this quarter for that purpose. I consider it to be more especially valuable from the facility which it affords of boring and trenailing down the stones used in sea buildings in any exposed situation, as I have found that trenailing is a great security to such building while in progress, when the upper courses are much exposed and liable to be washed off unless they be held down by other means than their own absolute weight.

“The expense of boring the old red sandstone rock, here, is about three halfpence per linear foot.”

Mr. Vignoles bore testimony to the advantages of the machine: Mr. Vignoles. he was now employing it for piercing holes in stones going from Arbroath to the West Indies for the construction of a patent slip—there was great economy of cost and time by its use in addition to the superior manner in which the holes were made.

Mr. Smith
of Deans-
ton.

Mr. Smith was convinced of the advantage of the machine in working almost all kinds of stone, but more especially for those resembling the Arbroath stones, which were from a bed beneath the old red sandstone: they were of fine grit mingled with schistose debris. The action of the tool was like that of the stone-planing machine, to burst chips off instead of grinding down the surface by small portions and destroying the edge of the tool at the same time. With the planing machine it was common to take off a thickness of 3 inches at one passage of the tool—it acted like a “pick;” and being fixed in a frame weighing about $1\frac{1}{2}$ ton, the power was great; at the same time there was little abrasion of the tool and it never became heated or softened. It was probable that with other qualities of stone a screw with another pitch of thread might be required to force the auger forward, but with the thread now used in boring stones from the Arbroath quarries, the economy of time and cost appeared very great. In each of the blocks for the Arbroath railway it was requisite to bore two trenail holes $1\frac{1}{2}$ inch diameter and 6 inches deep—and to level a space 9 inches diameter to receive the cast-iron chair: this had been contracted for at two-pence halfpenny per block, which was a material diminution of the usual cost. He was convinced that the instrument only required to be known to be extensively used.

Mr. F.
Braithwaite

Mr. F. Braithwaite had for some years used Hunter’s stone-planing machines, for dressing up slate and other stones, and was well qualified to give a favourable opinion of the principle of its action: he believed that the machine under discussion being upon the same principle must be very useful.

May 24, 1842.

The PRESIDENT in the Chair.

“On the Machinery used for working the Diving Bell at Kingstown Harbour, Dublin.” By Peter Henderson, Assoc. Inst. C. E.

Diving Bell
at Kings-
town Har-
bour.

After referring for the details of the machinery to the two drawings which accompany the paper, the author describes the foundations of the pier head to have been laid in a depth of 20 feet at low water on rock and firm sand. For 14 feet from the bottom, the wall is formed of Runcorn sand-stone of fine quality, each stone containing about 50 cubic feet and thoroughly squared. This has been preferred to granite on account of its cheapness and the facility with which it is worked under water.