

“Improved Rock Drill and Air Compressor”

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“This is the invention of Mr. James McCulloch, of Wolverhampton.

“Fig. 1 show the machine mounted on the end of a special tripod for drilling close to the wall, while at Fig 2 we give a longitudinal section, showing the detail arrangements. Fig. 3 represents Mr. McCulloch’s tunnel car mounted with four 3 ½ inch Rio Tinto drills.





FIG. 2.
IMPROVED ROCK DRILL.

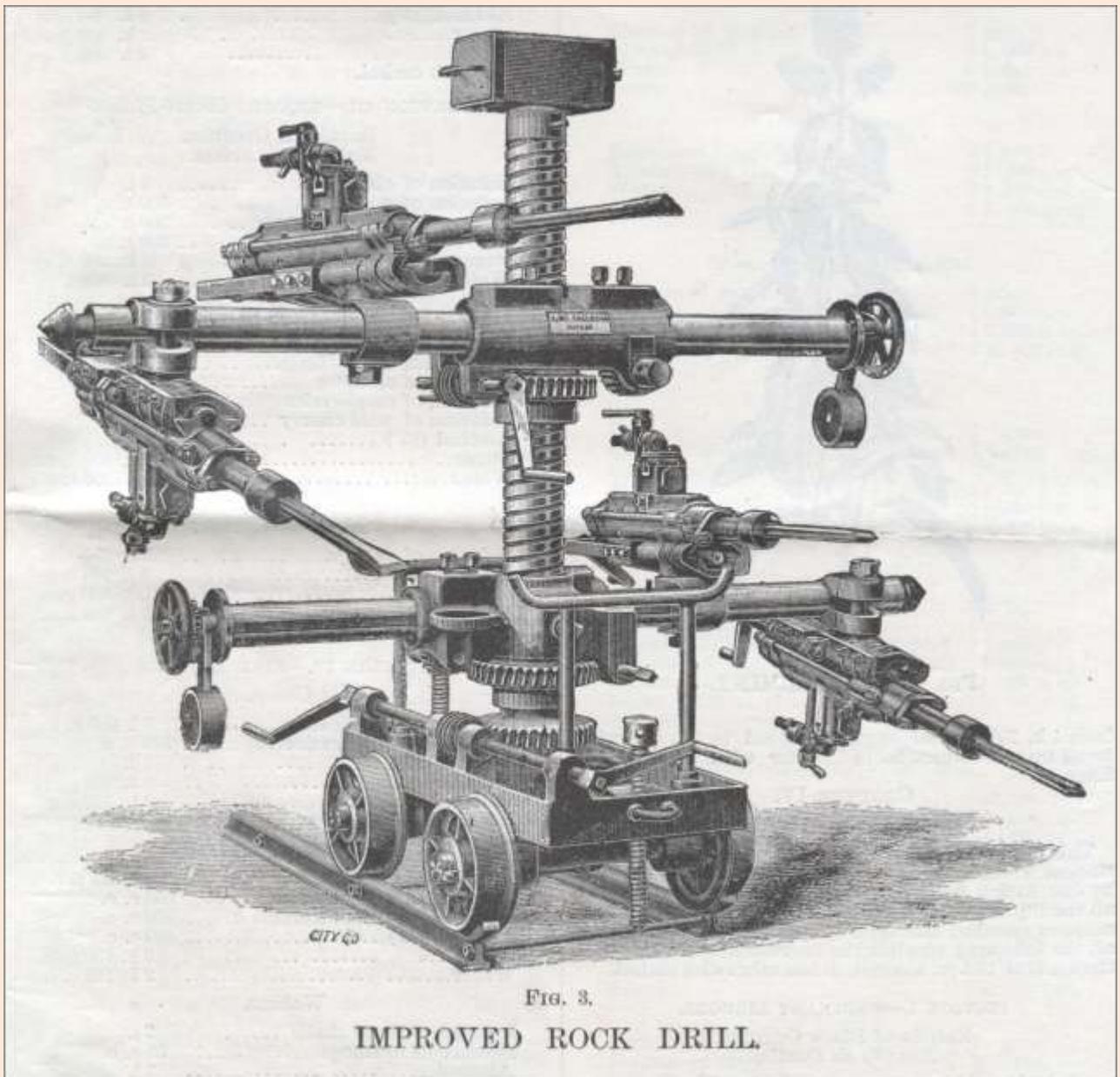


FIG. 3.
IMPROVED ROCK DRILL.

“Turning to the advantages of the drill, we may observe that the first one claimed – positive valve motion sure and a tappet actuated by the piston rod itself, which imparts a definite and positive movement to the valve at each stroke. Where the valves are operated by the pressure of air alone, it has been found unreliable, and is rendered inoperative by the entrance of dirt, grit, or rust. Tappets and tappet valves are also employed, in some cases in conjunction with springs, at the back of the valve, to retain it in position during the time it is not being acted upon by the piston. The failure of the springs to fulfill their function, owing to excessive friction, weakness, or breakage, is often the cause of stoppages, loss of time, and expense, which are entirely avoided by Mr. McCulloch’s valve motion. With respect to the second advantage we observe that the importance of a reliable and durable twist gear cannot be overestimated. An ineffective or partially disabled gear will quickly reduce the effective or actual work of a drill to a minimum, and, when in the hands of unskilled men, much loss is caused by drills being kept at work in a partially disabled condition. Ratchet wheels, with internal or external teeth, held by pawls and springs, have been hitherto employed in rock drills. These form a chief source of trouble and expense through the constant breakage of the ratchet teeth, pawls, and springs, which are subject to frequent and violent concussion when the drill is at work, sometimes causing the fracture of the twist bar itself. The rotation of the drill is thus either interrupted or entirely arrested. The ‘star’ twist gear now introduced in the Rio Tinto drill is an entirely new departure from the above methods. All ratchet wheels, pawls, and springs are done away with. It is unique in simplicity durability, and certainty of action, no matter what the nature of the rock may be, how fast or slow the drill is running, or how long or short its stroke. The rotation is always precise and accurate, and no injury can be done to either gear or twister, both being relieved of the concussion and friction which other gears are subjected to.

“Turning to the third advantage as to the cradle, it is to be observed that in some cases the cradles of rock drills have no provision made for taking up the wear and keeping the machine steady when at work. Attempts to effect this have, however, been made in some instances, but the necessity of removing the drill from its work and the employment of skilled labor in order to adjust it reduce the value of the result to a minimum. In the case of the Rio Tinto drill, the cradle can be easily and quickly adjusted while the drill is at work, no skilled labor or fitting being required. In order to enhance the durability of the machine, the highest class of design, workmanship and materials are employed throughout. Experience has shown that this increases the life and maintains the boring power considerably beyond those of inferior and cheaper manufacture. Generally we may observe that the constant renewals and fitting of moving parts is now greatly obviated by the recent improvements and self-adjustment of them in working. The entire absence of all springs, combined with the foregoing advantages, are features which recommend themselves at once, and are in fact being fully recognized. The improved mountings of which there are others besides those illustrated by us, are the result of twenty-two years’ experience which Mr. McCulloch has had in the performance of all classes of mining and quarrying work, and they are found to facilitate the handling of the drills and economize time and labor to a remarkable degree. The provided superiority of the Rio Tinto rock drill, under all conditions, is confirmed by testimonials from a number of practical users, based on their own observation and experience. – *Iron.*”