# Description of an Improved Coking Crane for Supplying Locomotive Engines

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## DESCRIPTION OF AN IMPROVED COKING CRANE FOR SUPPLYING LOCOMOTIVE ENGINES.

This Coking Crane was designed by the writer about two years ago, in consequence of the great wear and tear of coke skips used for coking engines, at the Manchester Station of the London and North-Western Railway, and the necessity that then more particularly existed fo coking the engines in the least possible time, owing to the limited space there was then for the traffic. The crane is shown in Plate 28, and consists essentially of a large wheel or circular rim 20 feet in diameter, made of iron segments A A A (see plan, Fig. 2) having arms B B B, 20 in number, which may be considered the jibs of so many small cranes. These are mounted upon one common post or pillar CC, which revolves upon bearings at top and bottom, and each arm or jib is tied by a rod DD, to a hollow cast-iron cone, which is fastened upon the top of the pillar, and is adjusted by means of a screw and nuts. In fact, the whole may be considered, so to speak, as twenty small cranes working from one common centre. Around the circumference of the rim are suspended, at equal distances, twenty wrought-iron cylindrical buckets, E E E, 2 feet 6 inches diameter, and 2 feet 8 inches deep. Each bucket is fitted with a bow handle and swivels, so as to be readily turned over when its load is to be discharged. The segments A A A are also provided with teeth upon the lower edge, which gear into a pinion G, and the movement is carried forward to the handle H by means of the two pairs of bevil wheels, and in such proportion as to give 115 revolutions of the handle for one of the crane. The chief peculiarity, however, consists in the main post being fixed in an inclined

position. This is done to such an extent as to throw one side of the rim 6 feet higher than the other, and it will be seen from the drawing that the buckets on one side are sufficiently low to be filled direct from the waggon L, and on the other sufficiently high to deliver their loads upon the tender M. The buckets hold in the aggregate 3 tons of coke, so that the crane will carry, ready for delivery at a moment's notice, sufficient coke to supply three passenger or two goods engines at least. Of course, when the crane is fully loaded, the whole is in equilibrium, and it can then be moved by a force sufficient to overcome the friction only; on the other hand, the greatest power is required when the buckets are empty on the descending side, and full on the other. The proportion given, however, will enable one man to work it under the worst circumstances.

In using this crane, the practice is to keep the buckets full as far as circumstances will allow, and any engine requiring coke has the tender backed under the higher edge of the crane; the cokeman then turns the crane round by the handle previously described, and continues to do so until the fireman or other person has turned over as many buckets of coke as are required. The time rarely exceeds two minutes for the delivery of 21 cwt. of coke, and is often less.

As respects the saving of labour, it may be mentioned that four men were formerly required to deliver coke at this station, and it is now delivered by two, and the skips are dispensed with.

The fact that this little machine has worked very satisfactorily during the last two years, has induced the writer to bring it before this meeting; it evidently possesses the advantage of carrying a considerable quantity of coke ready for immediate delivery, and of elevating, advancing, discharging, returning, and lowering the buckets by one simple movement.

There is one slight drawback, however, namely, that an engine cannot run past it, owing to the chimney; but where this is considered necessary, the crane may readily be fixed about 3 feet further from the rails, and the coke delivered by a moveable shoot.

The CHAIRMAN observed, that he had seen the coking crane described in the paper, and thought it a very simple and efficient plan; the one objection that had been named, of not leaving space for passing along the line by the side of the crane, might probably be remedied in several ways if required in another situation.

Mr. RAMSBOTTOM said that object had not been thought of at all in the present case, as it was at the termination of the line, where it could not be extended beyond the crane, and that was the only one on the plan at present tried. The crane had been found very convenient for use, as it required very little power to work it, and held a large store of coke always ready for loading the tenders; it had been in constant work for more than two years, with scarcely any expense for repairs.

Mr. COWPER thought the crane was well contrived for the purpose, and suggested that it might readily be made applicable to a situation where a clear passage was required on the line past the crane, by omitting a portion of the buckets on one side, perhaps one-third, which would always allow the passage of a train, when the blank side was turned towards the line; the same quantity of coke might be carried by increasing the size of the buckets or the diameter of the crane. He thought that a perfect coking crane should, if possible, be balanced in all positions, for the engineman to be able to pull it round by hand, and take in a supply of coke without requiring a second man to help; on the same principle as the present large 8-inch water cranes, which supplied the water with great rapidity without help. This might be accomplished by working the crane round on a level instead of inclined, so as to be always balanced, and lifting the coke up previously to the level by other means.

Mr. WOODHOUSE thought there would be a difficulty in raising the coke by other means, and the oblique crane which he had frequently seen at work was a very convenient mode of gradually raising the coke by the same movement as changing the buckets. In some places the coke was raised up at once from the waggons to a high platform, and then loaded into the tenders by a shoot; but that plan was not so convenient for measuring the coke as the crane with buckets holding exactly 3 cwt. each.

Mr. RAMSBOTTOM observed that the average height the coke had to be lifted in loading the tenders was only 3 feet, as the coke was already

lifted an average of 3 feet, or half the total height 6 feet, in the process of filling the buckets all round.

Mr. COWPER suggested that each bucket when loaded on the platform might be slung up or raised by a small windlass, and then hooked on to the crane at the upper level.

Mr. RAMSBOTTOM observed, it would certainly store up more power ready for coking the tenders, if all the coke were previously lifted up to the full height 6 feet, instead of an average of only half the height; but the simplicity of the machine would be somewhat interfered with.

Mr. DOWNING remarked that there might be room to pass the crane by fixing it a little farther from the line, and tipping the buckets over the side of the tender; there being no necesity he supposed to empty over the centre of the tender.

Mr. LLOYD suggested an octagon form for the purpose instead of a circle; he thought the same plan of crane would suit well for filling blast furnaces, where, as in Wales, there was not more than 6 feet to lift the materials in many cases.

Mr. GIBBONS thought the plan might be very applicable in several parts of iron works, such as raising small coal and rubbish, and removing the cinder from the furnaces; he thought it a very good contrivance, involving the least possible expenditure of labour, where a large quantity of material was required to be lifted a small height.

A vote of thanks was passed to Mr. Ramsbottom for his paper.

The following paper, by Mr. Samuel Lloyd, jun., of Wednesbury, was then read :—

# COKING CRANE.

Fig. 1. *Elevation.*

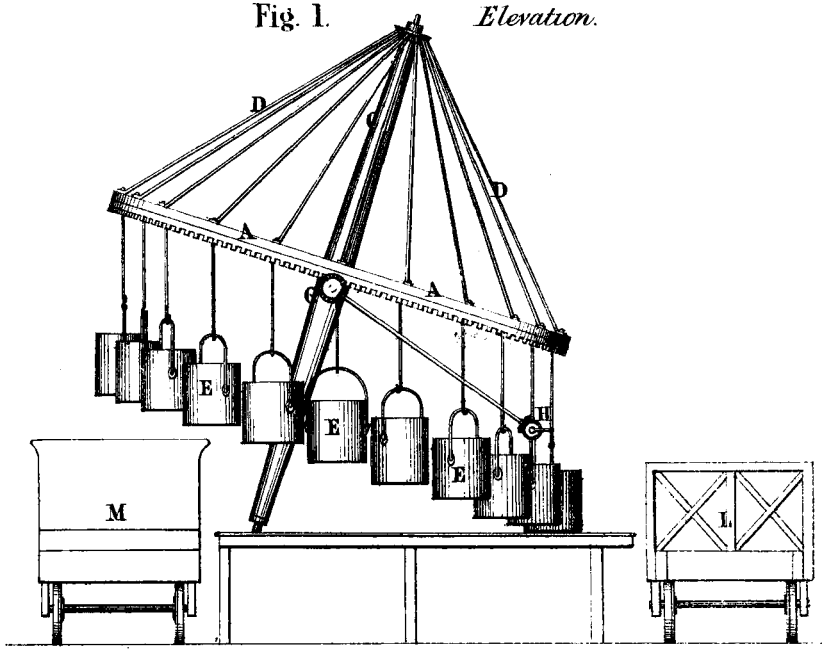
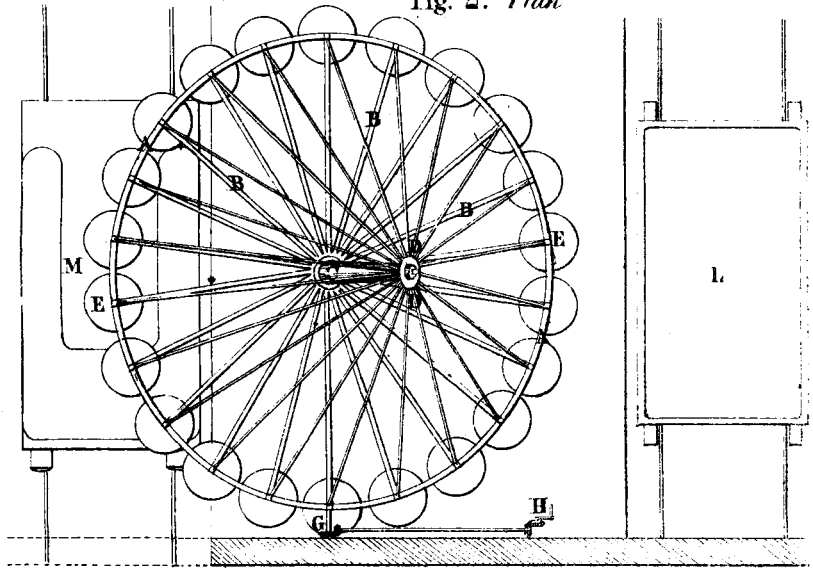



Fig. 2. *Plan*




Scale 1/96th 0 5 10 15 30 Feet

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