W. FOULIS.

Apparatus for Charging Retorts.

No. 165,667. Patented July 20, 1875.

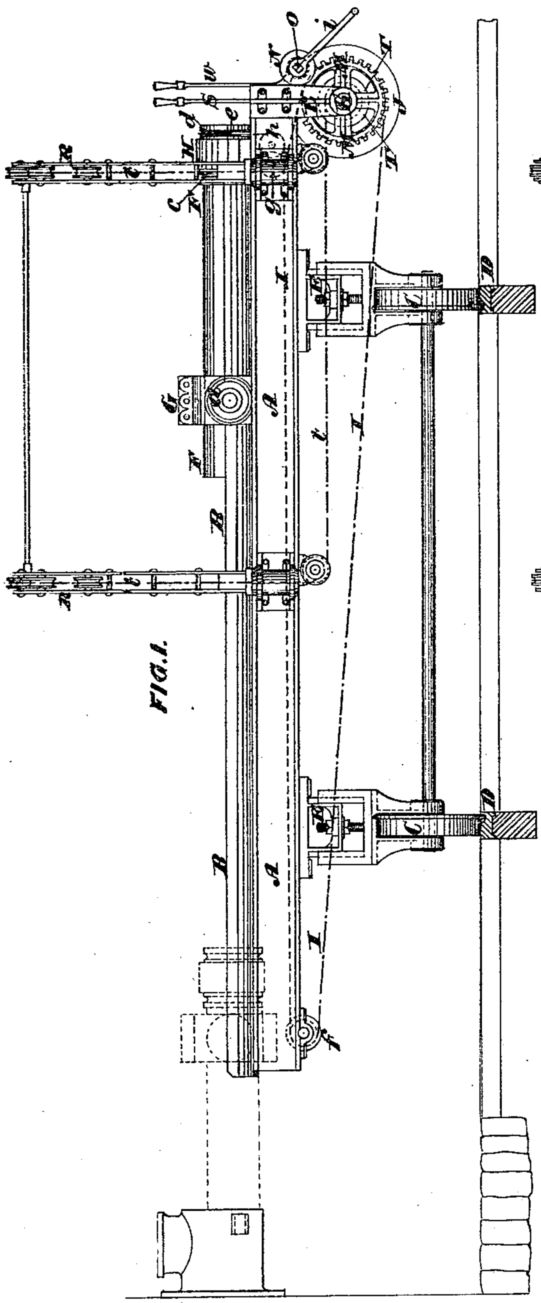

FIG. 1.

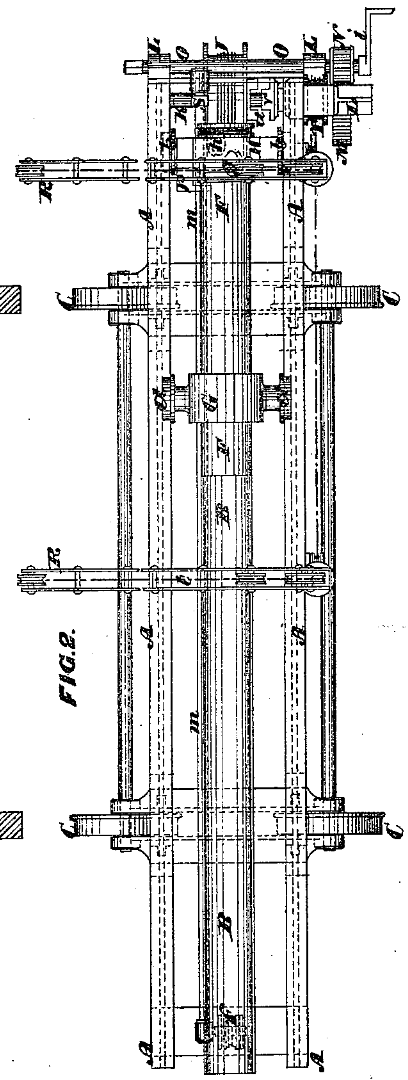

FIG. 2.

Witnesses,
Darch Austin
George Macaulay Cruikshank

Inventor.
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2 Sheets--Sheet 2.

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FIG. 4.

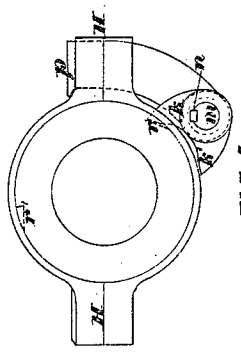


FIG. 5.

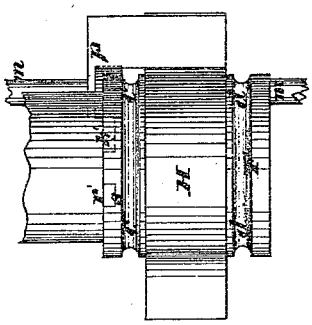


FIG. 7.

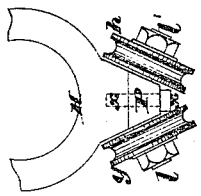
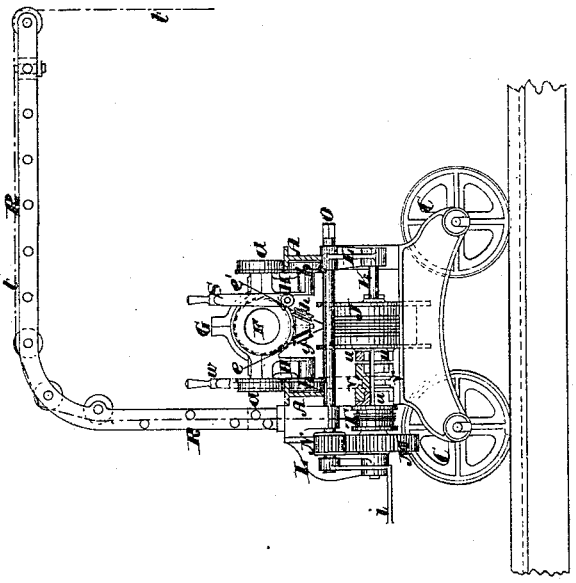


FIG. 3.

FIG. 6.



Witnesses,
David Auston,
George Macaulay Cruickshank

Inventor,
William Foulis

UNITED STATES PATENT OFFICE.

WILLIAM FOULIS, OF GLASGOW, NORTH BRITAIN.

IMPROVEMENT IN APPARATUS FOR CHARGING RETORTS.

Specification forming part of Letters Patent No. **165,667**, dated July 20, 1875; application filed September 3, 1874.

To all whom it may concern:

Be it known that I, WILLIAM FOULIS, of Glasgow, in the county of Lanark, North Britain, civil engineer, have invented new or Improved Machinery or Apparatus for Charging Retorts, of which the following is a specification:

The object of my invention is to provide a simple and effective apparatus for charging retorts; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is a side view of my apparatus; Fig. 2, a plan view; Fig. 6, Sheet 2, an end view, and Figs. 3, 4, 5 and 7 enlarged views of parts detached.

A is the frame-work of the machine, on which the charging-scoop B and its attachments are supported. The framing A is mounted upon wheels C, by which the apparatus is traversed along rails D from one retort to another, and the framing is capable of being raised and lowered so as to regulate the height of the scoop B to that of the retort-mouth through which the materials are to be charged by means of screws E. The scoop B is attached to a circular block, F, of metal, which is carried in bearings G and H, and is capable of being rotated therein. The bearings G and H are each provided with carrying rollers or wheels *a* and *b*, respectively, which run upon the upper and under flanges of the side frames A, as shown more particularly at Fig. 6, Sheet 2. Grooves *c d* are made round the rearward end of the block F to receive the terminations of a chain, I, which are fixed to the block, one at each side, at the position marked *e*, Fig. 6, Sheet 2. Part of the chain I, intermediate between the ends, is wound in opposite directions round a winding-drum, J, situate beneath the rearward end of the framing A, the axis K of which drum is at right angles to the length of the frame and is suspended therefrom by brackets L. The forward and backward movements of the scoop B are effected by the chain I, and the portion thereof which moves the scoop with the materials therein into the retort is passed from the under side of the winding-drum J round a pulley, *f*, at the forward end of the framing A, thence under a pulley, *h*, the axis of which is fixed to the bearing H and round the groove *d* to the side of the block F, whereat that end of the chain is fixed at *e*. The portion of the chain I which withdraws the scoop B from the retort is passed from the opposite side of the block F, whereat it is fixed at *e'* round the upper side of the groove *c* and under the pulley *g*, whose axis is also fixed to the bearing H, from whence the chain is conducted to the upper side of the winding-drum J and wound thereon. The axes or studs *l l'* on which the pulleys *g* and *h* are placed are fixed in a separate block, P, of metal, as more particularly seen in detail at Figs. 3, 4, and 7, Sheet 2, of the drawings, which block is attached to the bearing *h* by screws *x*. The drum J is rotated so as to move the scoop B into and from the retort by a spur-wheel, M, placed on the same shaft K therewith, and into which a spur-pinion, N, situate on the shaft O, is geared, the said shaft being rotated by means of the crank-handle *i*, or a hand-wheel may be employed for that purpose. A double stop or pawl, *k*, the construction of which is shown at Figs. 4 and 5, Sheet 2, enters notches *r* and *r'* formed in the periphery near the rearward end of the block F to keep the block and scoop B in position while being moved toward and from the retort—that is to say, to prevent the hauling-chain I from turning the block and scoop through an arc until the extreme limit of the forward and backward strokes of the scoop are reached. The pawl or stop *k*, which is situate on a shaft, *m*, extending throughout or nearly throughout the length of the framing A, is capable of moving along a feather, *n*, on the shaft *m* as the scoop is traversed backward and forward, and it is retained in its position in the notch *r* while the scoop with a charge of material therein is being traversed by the chain I toward the retort by the side of the notch—that is, the portion *s*, Fig. 5, Sheet 2, intervening between the notch and the groove *c*. When the scoop B has arrived at or about the position indicated in dotted lines at Fig. 1, Sheet 1, that being the extreme limit of its forward stroke, the pawl or stop *k* is released from the notch *r* by turning the shaft *m* through an arc by means of the lever S, which being effected,

and the drum J continuing to wind on the chain I in the direction of the forward stroke, the scoop, having then no further support, is turned over by the chain until the claw *k'* of the pawl or stop enters the notch *r'*, by which means the charge of material is deposited in the retort. When this has been effected the scoop B and block F are drawn rearward to the extreme limit of their backward stroke, when the claw *k'* of the stop or pawl is released by operating the lever S from the notch *r'*, and the further winding of the chain I in that direction turns up the scoop into the position shown on the drawings to receive another charge of materials. The pawl or stop *k* is retained in position while moving backward with the scoop by a bracket, *p*, fixed to the bearing H, or the pawl or stop may be held in position while moving forward by the bracket *p* and in moving backward by the side *s* of the notch *r'*, or it may be retained in position solely by the bracket or by other suitable means, it being understood that I do not confine myself to the arrangement hereinbefore described of retaining the pawl or stop *k* in position. The bracket *p* also affords a traveling support to the shaft *m* at or near that portion thereof whereon a strain is made by the tendency of the chain I to partially rotate the scoop. The scoop B is charged by the cranes R, which raise the material in boxes or hoppers from a carriage or truck not shown on the drawings. The material is raised by winding the lifting-chains *t* onto the drum T, situate on the same axis K, with the winding-drum J, as shown. The drum T is operated by the same spur-gearing, M N, which operates the drum J, and both of these drums are placed loosely on the shaft K, and provided with clutch-boxes *u*, into one of which the clutch *v*, which is placed firmly upon the shaft K, is pushed by the lever *w* accordingly as it is desired to move the scoop backward or forward, as hereinbefore described, or to charge the same with materials. When a box or hopper has been raised the cranes are swung round so as to bring it over the scoop into which the materials are allowed to fall by releasing the bottom of the box or hopper, which is constructed to swing open.

I claim as my invention—

1. The combination of the scoop, capable of both longitudinal and rotary movements, a hauling-chain connected at both ends to and lapped in opposite directions round the scoop, and appliances for imparting motion to the chain in either direction, substantially as and for the purpose set forth.

2. The combination of the scoop B, chain I, for imparting longitudinal and rotary movement to the scoop, and a pawl, K, moving longitudinally with the scoop and controlling the rotation of the latter, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM FOULIS. [L. S.]

Witnesses:

DAVID AUSTEN,

GEORGE MACAULAY CRUIKSHANK.