

No. 632,183.

Patented Aug. 29, 1899.

A. JACK.

APPARATUS FOR CHARGING MATERIALS INTO OPEN HEARTH FURNACES.

(Application filed May 12, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

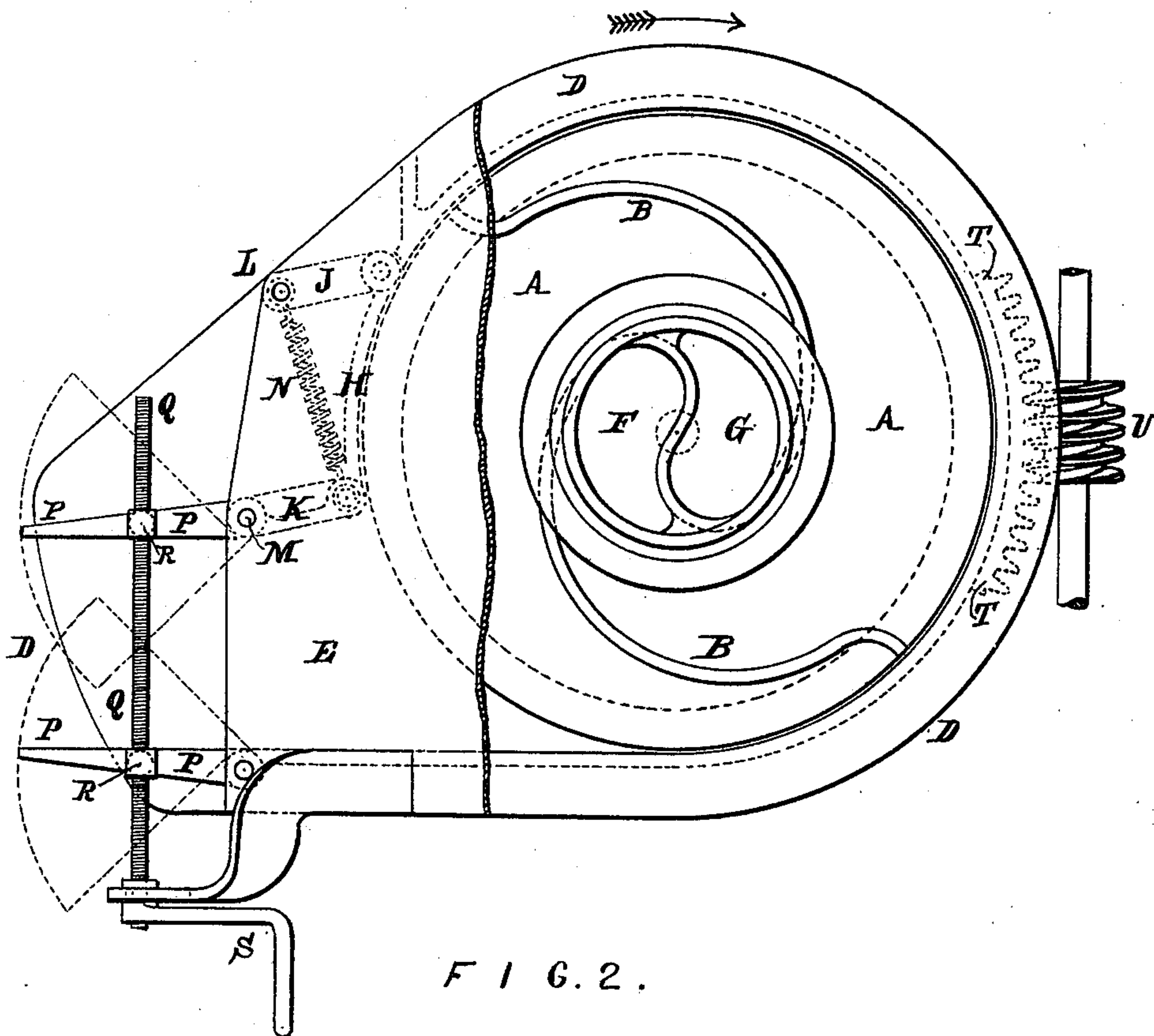
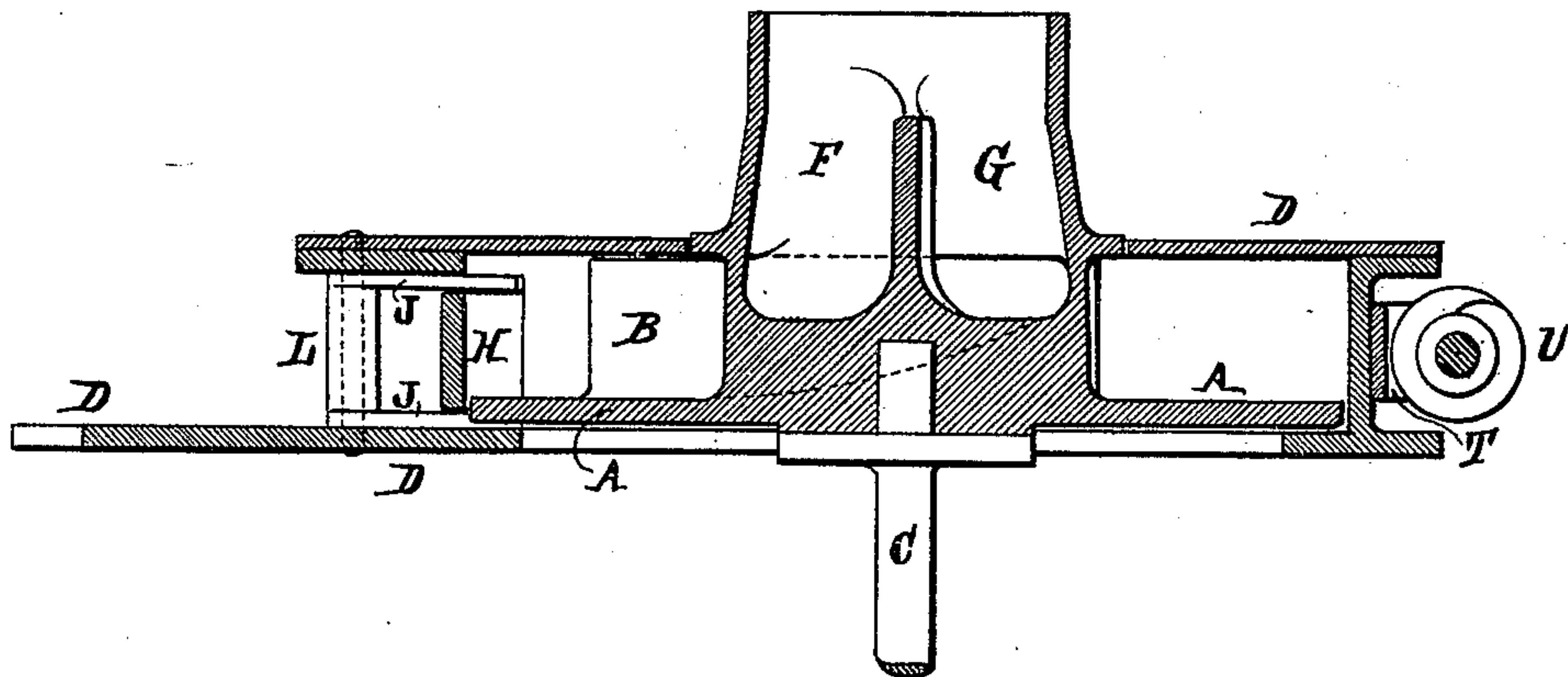


FIG. 2.



WITNESSES:

*F. Wright.*

*Edythe Searles*

INVENTOR

ALEXANDER JACK

BY

*Howson and Howson*  
HIS ATTORNEYS.

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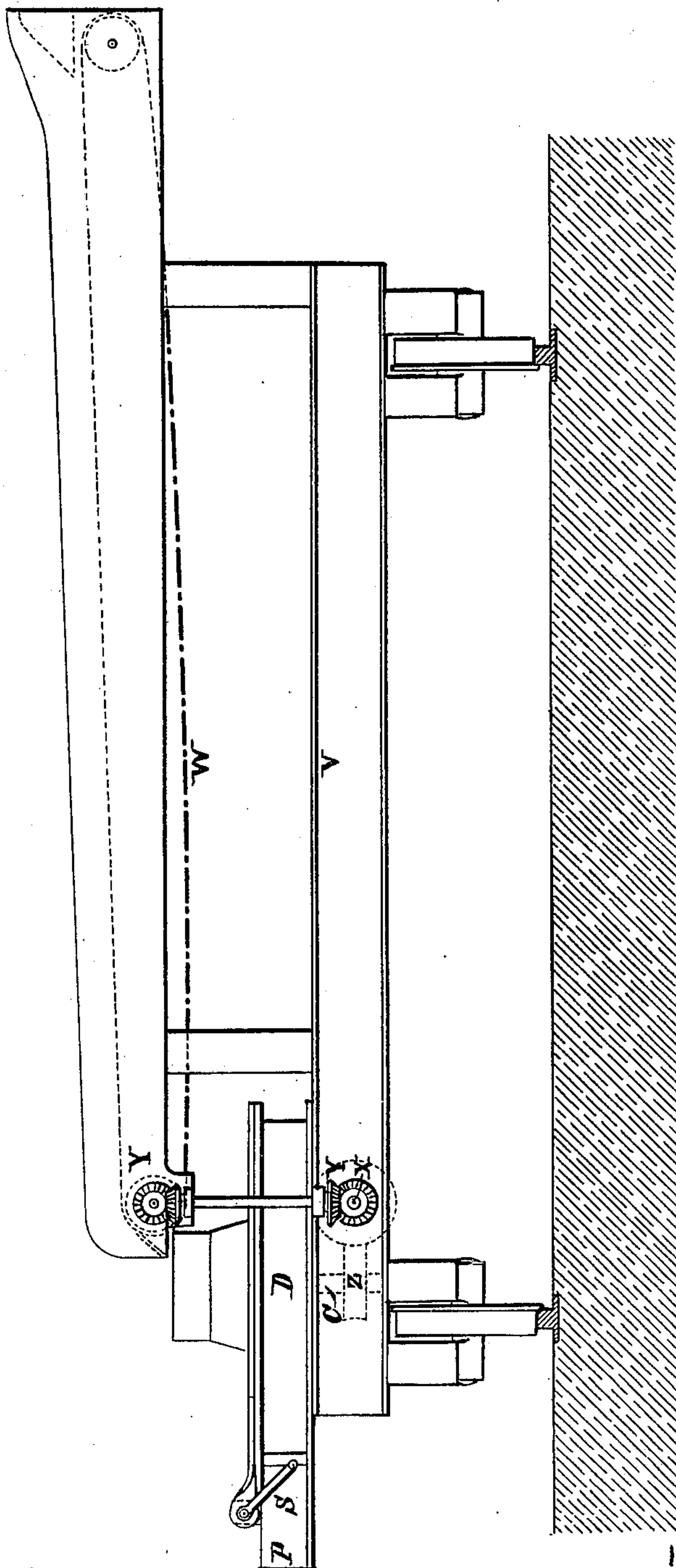
## APPARATUS FOR CHARGING MATERIALS INTO OPEN HEARTH FURNACES.

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**2 Sheets—Sheet 2.**

F/G.M.



WITNESSES:

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F. W. Wright.

WITNESSES:  
P. W. Wright.  
Edythe Saules.

INVENTOR

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# UNITED STATES PATENT OFFICE.

ALEXANDER JACK, OF MOTHERWELL, SCOTLAND.

APPARATUS FOR CHARGING MATERIALS INTO OPEN-HEARTH FURNACES.

SPECIFICATION forming part of Letters Patent No. 632,183, dated August 29, 1899.

Application filed May 12, 1899. Serial No. 716,559. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER JACK, a subject of the Queen of Great Britain and Ireland, and a resident of Motherwell, in the county of Lanark, Scotland, have invented new and useful Improvements in Apparatus for Charging Materials into Open-Hearth Steel-Melting Furnaces, (for which I have applied for British Letters Patent No. 22,140, dated October 21, 1898,) of which the following is a specification.

My said invention has for its object to save labor and expense in charging materials into steel-melting furnaces, and in order that my said invention and the manner of performing the same be properly understood I hereto append two sheets of explanatory drawings, to be hereinafter referred to and showing my improvements.

Figure 1 on Sheet 1 of the accompanying drawings is a plan of my improved apparatus with part of the cover removed, Fig. 2 being a vertical section of the same. Fig. 3 on Sheet 2 is a side elevation showing the apparatus combined with a traveling band and mounted on a carriage, so as to be movable along the melting-shop.

In carrying out my invention the improved apparatus for charging the materials into the furnaces consists, essentially, of a hollow revolving "impeller" A, made with spiral vanes B, forming curved channels, so as to be somewhat similar to a centrifugal pump, the impeller being mounted on a suitable bearing C and inclosed in an outer casing D. The centrifugal apparatus is so placed in front of the furnace that what may be called a "discharge" branch E in the casing D of the apparatus is opposite one of the openings or doors in the furnace-front. The materials are to be fed into the center of the impeller and will pass into one or other of two openings F G, the shape of the channels being such that the direction of movement of the materials will be changed from the vertical to the horizontal gradually and without excessive shock. The velocity of the movement of the materials will be increased as they approach the circumference, being guided and impelled by the curved vanes B until they are discharged through the branch E with such force that they will be projected as de-

sired through the opening or door into the furnace.

To prevent the possibility of any damage being done by materials getting jammed between the tips of the vanes B and the cover of the discharge branch E, I make the part H of the casing, against which the materials may strike, separate from the other part and hinged at both ends to links J K, centered at L M, a spring N extending between one hinge and the center L, so that in the event of the part H being struck it will move outward and compress the spring N. After the material has passed into the branch E the spring N will return the part H to the normal position shown, or a weighted lever may be substituted for the spring N.

Guides P are hinged at the outer end of the discharge branch E, these guides being adjustable by a screw-rod Q, working in swivel-nuts R on the upper edge of the guides and turned by a crank-handle S, so as to assist in spreading the materials over the bed of the furnace by giving direction to the pieces. As a further means of giving direction to the pieces the casing D is fitted with a toothed sector T, movable by a worm U.

The centrifugal apparatus described may be mounted on a carriage V, along with a traveling band or conveyer W, which carriage can be moved along the melting-shop to bring it in succession opposite the doors or openings of the several furnaces. The outer end of the conveyer W will be opposite a wagon or truck (not shown) holding the materials, which are passed on to the conveyer and fall off the inner end into one or other of the openings F or G in the centrifugal apparatus. Any suitable motor may be carried on the carriage V and give motion to a shaft X, which through gearing Y Z transmits motion to both the conveyer W and the centrifugal apparatus.

The centrifugal apparatus instead of being placed horizontally, as shown, may be placed vertically or at any angle which may be found most suitable in practice for the performance of the work, and where the apparatus has to deal with pieces of material of considerable size it may, if desired, be made with a single channel curving from the center to the circumference, so as to utilize the

full area of the central opening for the one channel.

What I claim as my invention is—

1. Apparatus for charging materials into  
5 open-hearth furnaces, and comprising a hollow rotary impeller with a central opening and one or more spiral channels, an inclosing casing therefor having a discharge branch, in combination with a traveling band or conveyor,  
10 veyer, a motor-shaft to drive the impeller and conveyer, and a carriage on which all said mechanism is mounted, substantially as set forth.

2. Apparatus for charging materials into

open-hearth furnaces and comprising a rotary hollow impeller, with a central opening  
15 and one or more spiral channels, in combination with an inclosing casing having a discharge branch with adjustable guides and an adjacent yielding part, substantially as and  
20 for the purpose set forth.

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

ALEXANDER JACK.

Witnesses:

DAVID FERGUSON,  
GEORGE PATTERSON.