

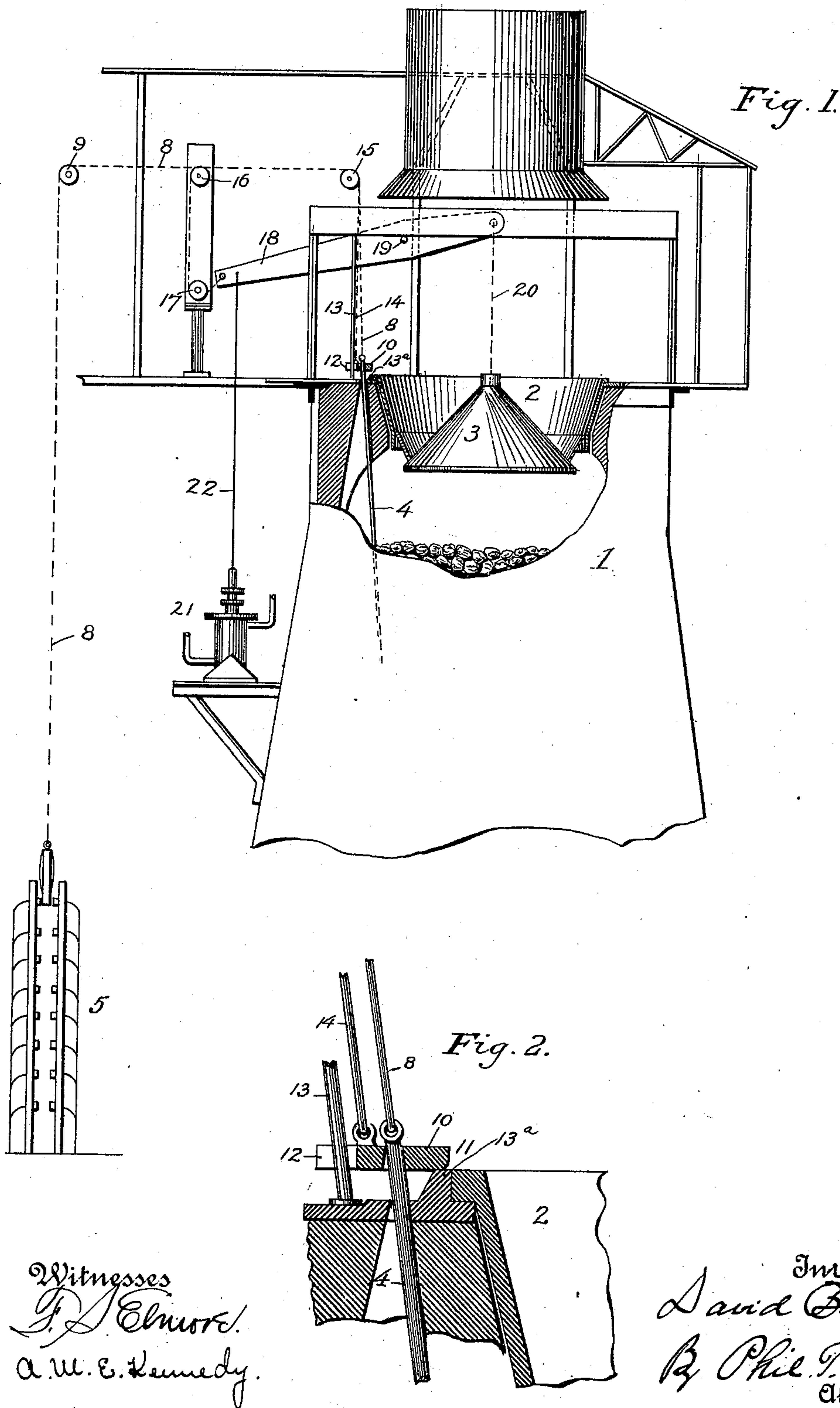
No. 674,112.

Patented May 14, 1901.

D. BAKER.
STOCK INDICATOR FOR BLAST FURNACES.

(Application filed Oct. 2, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

DAVID BAKER, OF CHICAGO, ILLINOIS.

STOCK-INDICATOR FOR BLAST-FURNACES.

SPECIFICATION forming part of Letters Patent No. 674,112, dated May 14, 1901.

Application filed October 2, 1900. Serial No. 31,793. (No model.)

To all whom it may concern:

Be it known that I, DAVID BAKER, of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Stock-Indicators for Blast-Furnaces, of which the following is a specification.

This invention relates to a device for indicating the height of the stock in blast-furnaces; and the invention consists of a measuring-rod movable through the top of the furnace and adapted to rest on the surface of the stock and connected with an indicating device at the outside, the said rod being operatively connected with the furnace-bell in such manner that when the bell is moved to open the furnace for recharging the rod will be lifted free of the stock, so that if struck by the incoming charge it may swing aside.

The invention consists also in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a vertical section through the stack of a blast-furnace, showing my invention applied thereto. Fig. 2 is a sectional view, on an enlarged scale, of the gripping device by which the measuring-rod is elevated when the bell is lowered to open the furnace.

Referring to the drawings, 1 represents the stack of a blast-furnace formed with the usual charging-mouth 2, closed by a vertically-movable bell 3, adapted when raised to close against the mouth and when lowered to open the same for the entrance of the charge. In the top of the stack, at the side of the mouth, a vertical opening is formed, in which is slidably mounted a measuring-rod 4, adapted to rest with its lower end on the surface of the stock and through the medium of an indicating device 5, connected with the rod by means of a cord or rope 8, passing over guide-pulleys 9, to designate the height of the stock within the furnace. The measuring-rod passes loosely through a gripping-plate 10, Fig. 2, weighted, as at 11, at one end and formed in its opposite end with an open slot 12, loosely embracing a fixed vertical guide 13, rising from the top of the stack, the construction being such that when this plate is raised the weight will incline it and cause it to grip the measuring-rod, which will be carried upward with it. When the plate is low-

ered, the rod will be lowered with it until the weighted end of the plate contacts with a fixed projection 13^a on the furnace-stack, when the plate will assume a horizontal position, as indicated in Fig. 2, and release the rod, the latter being then freely movable through the plate. The gripping-plate has connected with it an operating-cord 14, passing upward over a pulley 15, then downward over and around guide-pulleys 16 and 17, and has its end connected with the outer end of a horizontal lever 18, pivoted between its ends, as at 19, and connected at its opposite end by means of a link 20 with the furnace-bell 3. This lever is operated to open and close the mouth of the furnace by a cylinder and piston 21, the piston being connected with the lever by a cord 22. The bell is held normally upward, closed against the mouth of the furnace, with the gripping-plate in a horizontal position, as shown in Fig. 2, and the measuring-rod movable freely therethrough and resting on the surface of the stock to indicate its level. When now the bell is lowered to open the mouth to permit the furnace to be recharged, the gripping-plate will through its connection with the operating-lever be raised, and its weighted end will cause it to assume an inclined position and firmly grip the rod, and the latter will be drawn upward from off the stock and be loosely suspended, so that it will be free to yield if struck by the incoming charge, and thus prevented from being injured.

The opening in the stack through which the rod extends is of such form that at its upper end it loosely encircles the rod close enough to prevent the escape of gases, but is widened at its lower end to permit the rod to swing aside when lifted.

It is obvious that the details of the connecting devices between the measuring-rod and bell may be variously modified without departing from the line of my invention, the essence of which resides in operative connections between the rod and bell, formed and arranged to cause the rod to be lifted off the stock and suspended when the bell is moved to open the mouth of the furnace.

Having thus described my invention, what I claim is—

1. In a blast-furnace the combination with the movable bell adapted to open and close the

mouth of the furnace, of the measuring-rod adapted to rest on the stock, and suitable connections between the bell and rod, formed to cause the rod to be lifted off the stock when the bell is moved to open the furnace-mouth.

2. In a blast-furnace the combination with the vertically-movable bell adapted to be lowered to open the mouth of the furnace, of a measuring-rod movable vertically through the top of the furnace-stack, and adapted to rest on the stock therein, and connections between the rod and bell adapted to elevate the rod when the bell is lowered.

3. In a blast-furnace the combination with a vertically-movable bell, of the horizontal lever connected therewith, a measuring-rod adapted to rest on the stock in the furnace, a gripping device engaging the measuring-rod, and a connection between the gripping device and the lever.

4. In a blast-furnace the combination with the vertically-movable bell, of the movable measuring-rod adapted to rest on the stock, and a gripping device engaging the rod and operatively connected with the bell, said gripping device adapted to release the rod when the bell is in position to close the mouth of the furnace, and arranged to grip the rod when the bell is lowered to open the mouth.

5. In a blast-furnace the combination with the vertically-movable bell, of a measuring-

rod adapted to rest on the stock, an indicating device at the outside, a connection between the rod and the indicating device, and a gripping device connected with the bell and engaging the rod, said gripping device adapted to release the rod when the bell is in position to close the mouth of the furnace.

6. In a blast-furnace the combination with the vertically-movable bell, of a measuring-rod adapted to rest on the stock, a gripping-plate formed with an opening through which the rod loosely extends and weighted on one side of the opening, a connection between the gripping-plate at the other side of the opening and the bell adapted to cause the gripping-plate to be lowered when the bell is raised to close the mouth of the furnace, and a fixed projection in position to be encountered by the weighted end of the plate when the latter is lowered; whereby the plate will assume a horizontal position and release the rod which may then move freely subject to the level of the stock-line to indicate the height of the same.

In testimony whereof I hereunto set my hand this 24th day of September, 1900, in the presence of two attesting witnesses.

DAVID BAKER.

Witnesses:

W. J. MELOIN,
HOLLIS A. FOX.