

No. 736,365.

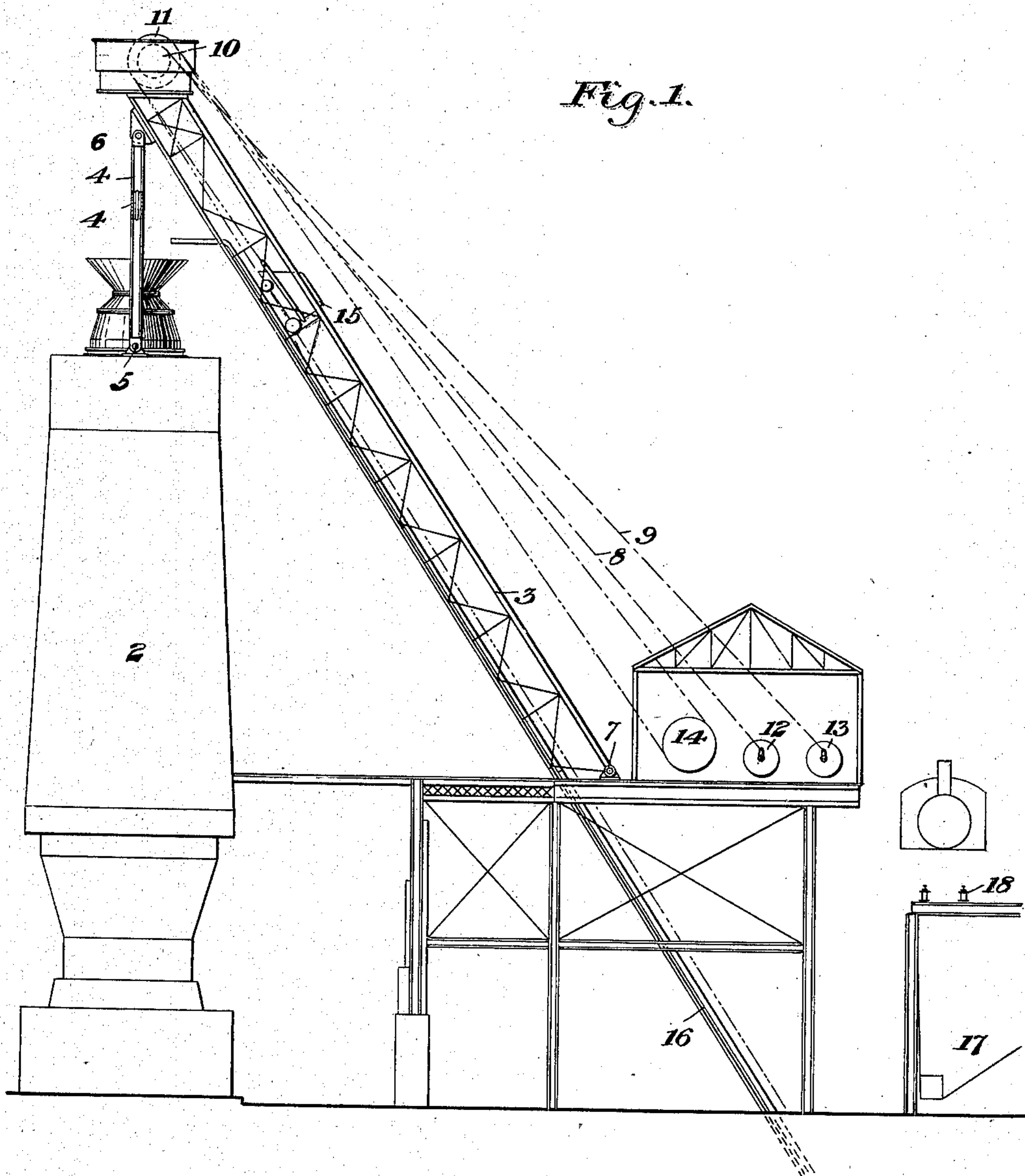
PATENTED AUG. 18, 1903.

J. C. CROMWELL.  
BLAST FURNACE.

APPLICATION FILED OCT. 22, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

Warren W. Swartz  
Geo. V. B. Shuning

INVENTOR

J. C. Cromwell  
by D. K. Currier & Co.  
his attys

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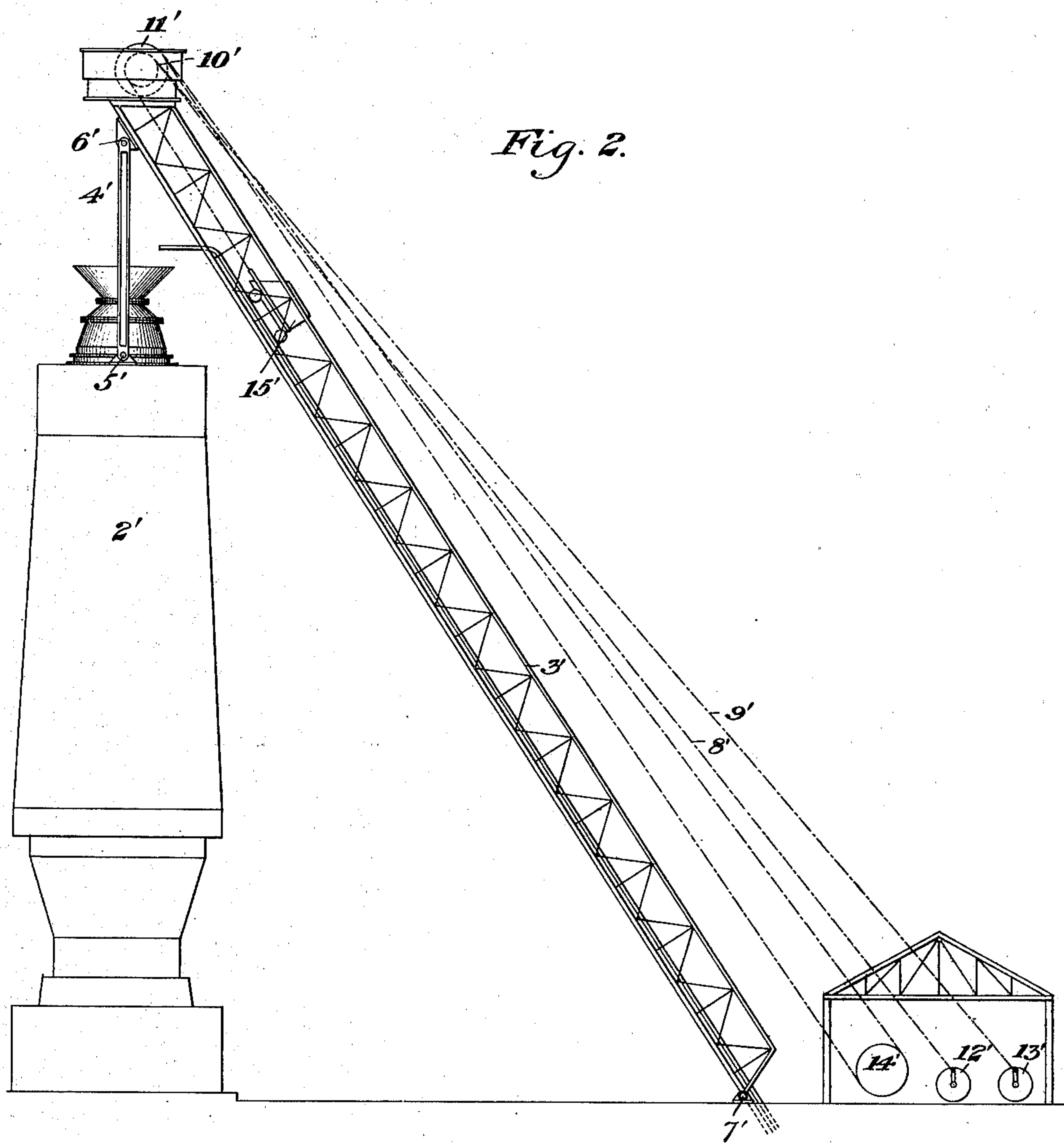
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Warren W. Swartz  
Geo. B. Blum

INVENTOR

J. C. Cromwell  
by Deane & Dykes  
his attys



# UNITED STATES PATENT OFFICE.

JOHN C. CROMWELL, OF CLEVELAND, OHIO, ASSIGNOR TO THE GARRETT CROMWELL ENGINEERING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## BLAST-FURNACE.

SPECIFICATION forming part of Letters Patent No. 736,365, dated August 18, 1903.

Application filed October 22, 1902. Serial No. 128,348. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. CROMWELL, of Cleveland, Cuyahoga county, Ohio, have invented a new and useful Blast-Furnace, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic side elevation showing a blast-furnace constructed in accordance with my invention, and Fig. 2 is a similar view showing another form of the same.

My invention relates to that class of blast-furnaces which are provided with automatic filling apparatus comprising an inclined track leading to the top of the furnace, along which a skip or car is raised and dumped into the hopper; and the object of the invention is to provide a strong support for the upper portion of the bridge, which will occupy a small space upon the furnace-top and give direct support for the bell-operating connections.

It also consists more specifically in providing substantially central supports on opposite sides of the hopper in a pivoted bridge combined with such supports and in the construction and arrangement of the parts as herein more fully described and claimed.

In the drawings, referring to Fig. 1, 2 represents the blast-furnace, and 3 the inclined bridge leading upwardly to its top and supporting the track upon which the skip-car is moved. The upper end of this bridge is carried by oppositely-located pivotal supports or posts 4 4. These posts are preferably in the form of strong links pivoted to the blast-furnace top at 5 and to the sides of the bridge at 6. The pivotal points 6 are preferably substantially in the central vertical plane of the stack, and suitable cross-bracing may be used between the two posts, if desired, at the level above the point of dumping of the car. I have also shown the bridge as pivoted at its lower end, as shown at 7, so that the vertical movements of the furnace in expanding and contracting under heat will not injure the bridge-supports. I do not, however, make any broad claim upon the use of the pivoted bridge, as the same is described and claimed broadly in

a copending application of C. W. A. Koelkebeck, Serial No. 127,680, filed October, 17, 1902. I have also shown the bell-and-hopper mechanism as operated by cables 8 and 9, which extend over top pulleys 10 and 11 at the upper end of the bridge and thence down to operating cranks or drums 12 and 13 in the engine-room. One of these cables actuates the lower bell and the other the upper or supplemental bell for the upper hopper. 14 represents the hoisting-drum, by which the skip 15 is raised or lowered along the track. In this form I have shown the bridge as terminating at the level of the engine-room above the ground-level, the track 16 extending downwardly to a point where the skips may receive the charges from suitable bins 17, which are supplied from an overhead track 18.

In Fig. 2 I show a form similar to that of Fig. 1, similar numerals being applied to corresponding parts with the prime-mark applied. In this case, however, the engine-room is shown as located at the ground-level, the bridge 3' extending down to this level and being preferably pivoted as before.

The advantages of my invention result from the substantially central supports at the top, which occupy small space and give ready access to the bell-and-hopper mechanism, and, further, from the use of the pivoted bridge in connection with such supports.

Many variations may be made in the form and arrangement of the furnace, the bridge, the hopper-and-bell mechanism, and the operating connections without departing from my invention.

I claim—

1. The combination with a blast-furnace, of an inclined bridge leading upwardly to a point over its top, the upper end of the bridge being supported on vertically-extending members located on opposite sides of the hopper; substantially as described.

2. The combination with a blast-furnace, of an inclined bridge leading to a point above its top, and having oppositely-located supports lying substantially in the vertical axial plane of the stack; substantially as described.

3. The combination with a blast-furnace, of a pivoted bridge extending to a point above

its top and carried on opposite supports which straddle the hopper; substantially as described.

4. The combination with a blast-furnace  
5 having an inclined bridge leading to a point above its top, and carried on oppositely-located supports which straddle the hopper, pulleys supported at the upper end of the

bridge, and bell-operating cables extending over said pulleys; substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN C. CROMWELL.

Witnesses:

H. D. SMITH,

C. W. A. KOELKEBECK.