No. 858,180. PATENTED JUNE 25, 1907.

F. V. HETZEL.

LOADING BARGE FOR VESSELS.

APPLICATION FILED MAR. 5, 1907.

4 SHEETS—SHEET 1.

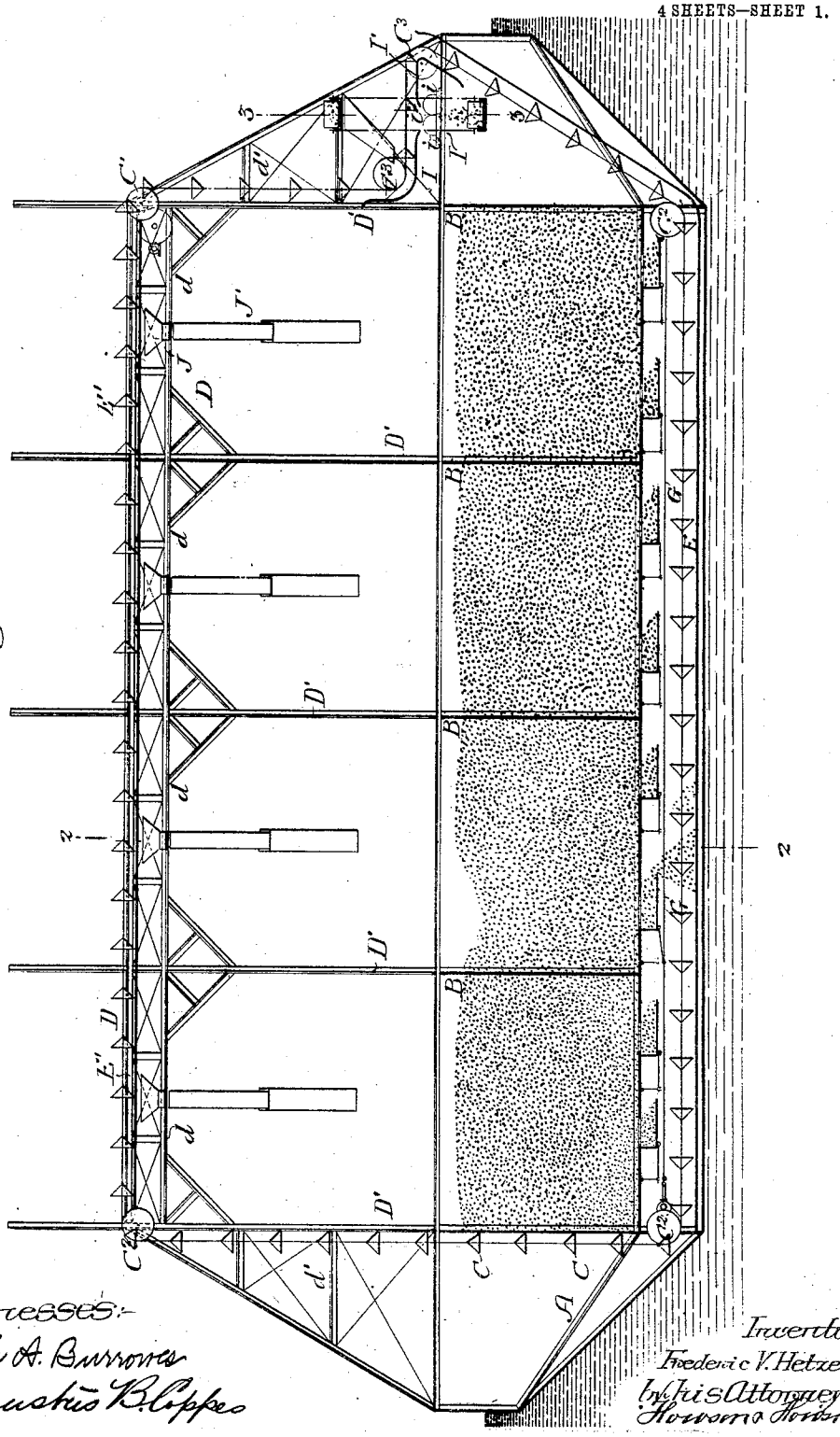

Fig. 1.

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Fig. 4.

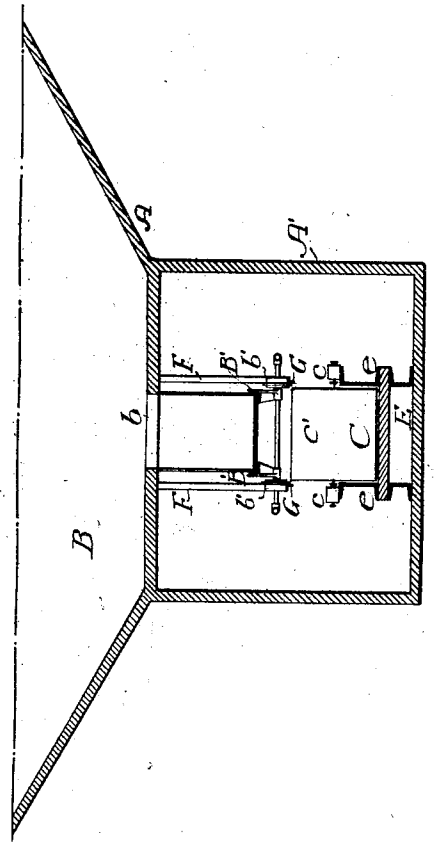


Fig. 3.

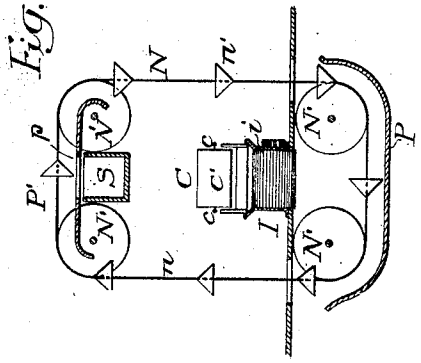
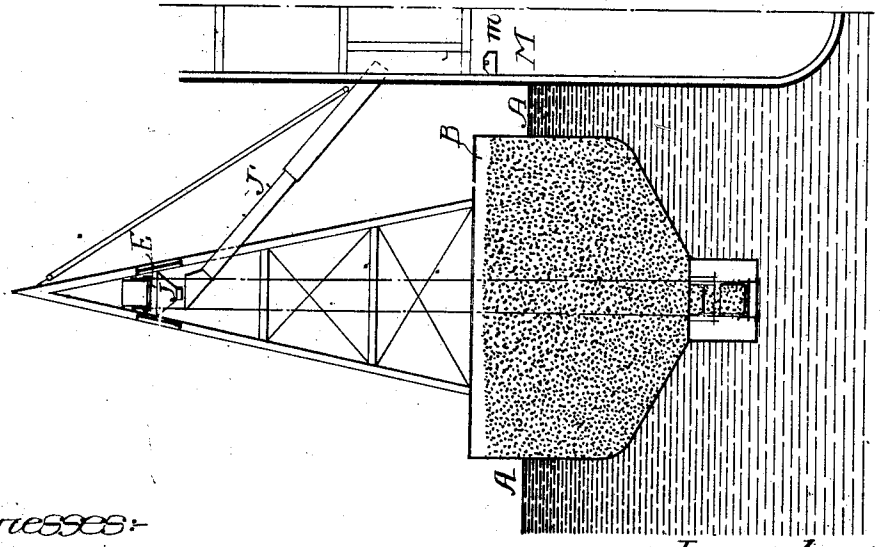


Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 6.

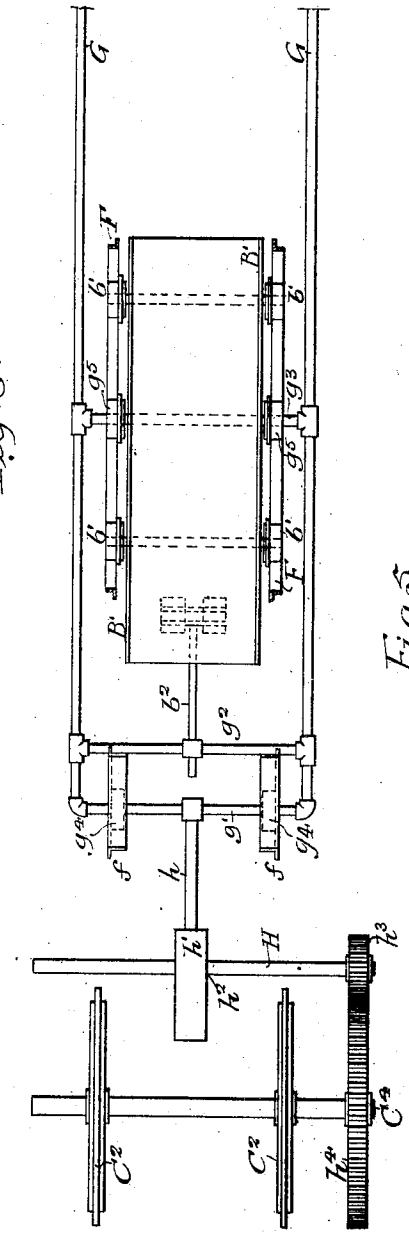
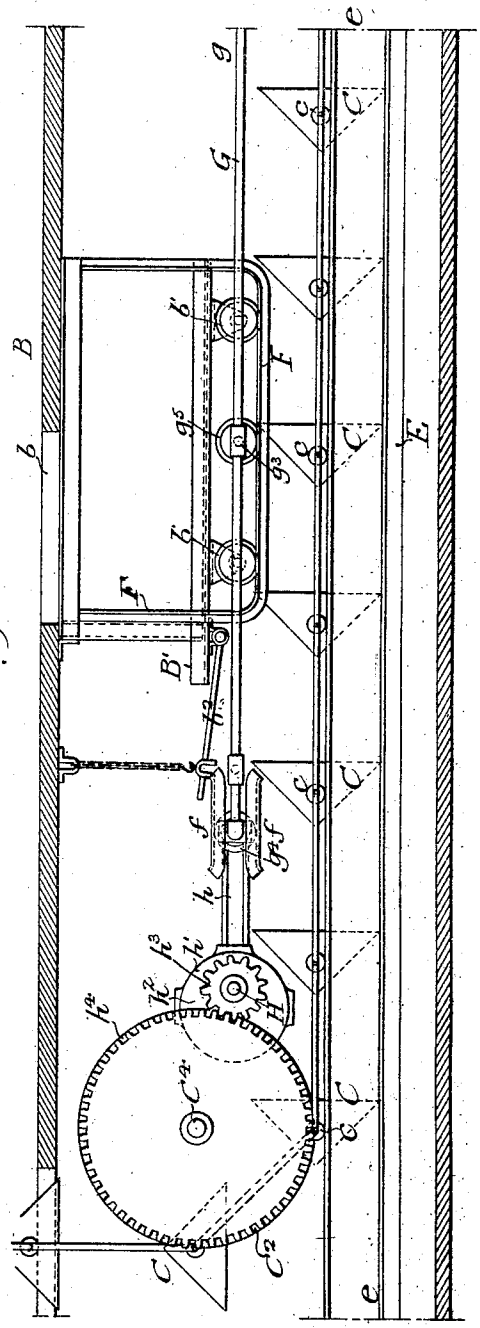


Fig. 5.



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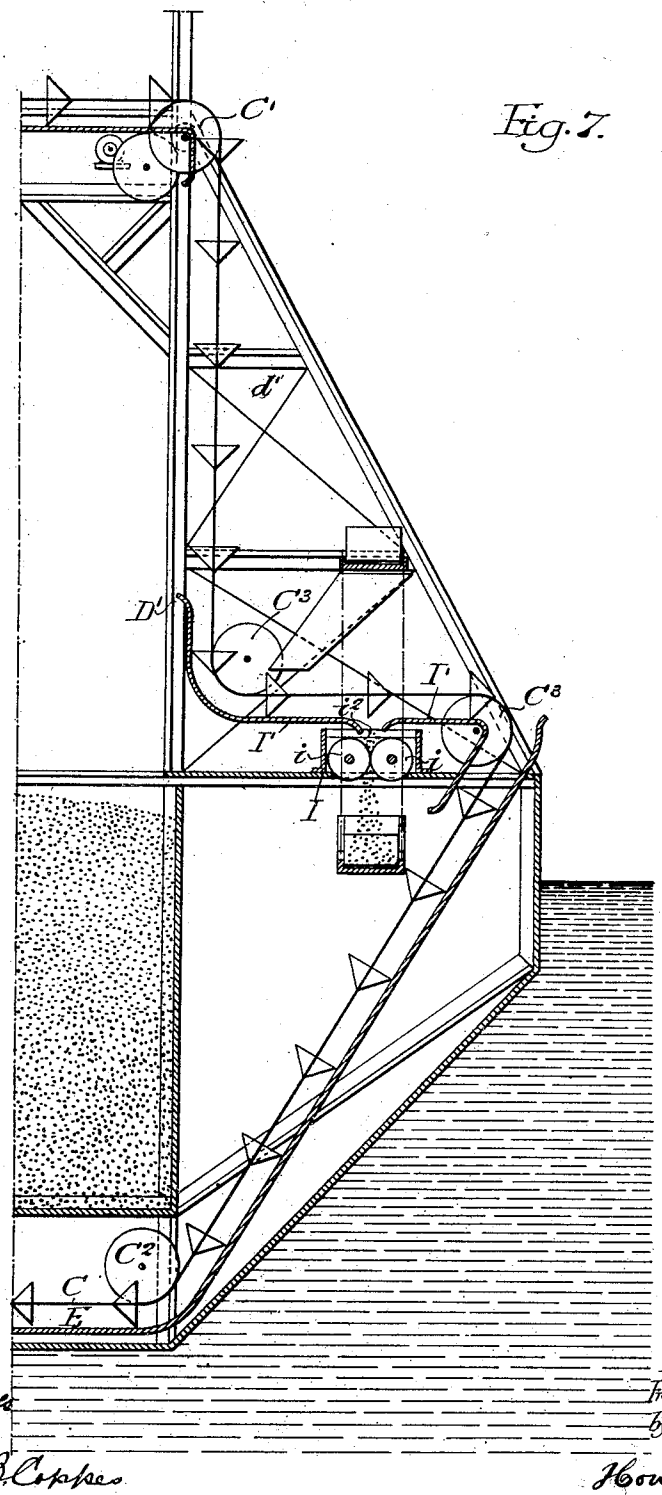
4 SHEETS—SHEET 4.

Fig. 7.



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UNITED STATES PATENT OFFICE.

FREDERIC V. HETZEL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO LINK-BELT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LOADING-BARGE FOR VESSELS.

No. 858,180. Specification of Letters Patent. Patented June 25, 1907.

Application filed March 5, 1907. Serial No. 360,688.

To all whom it may concern:

Be it known that I, FREDERIC V. HETZEL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Loading Barges for Vessels, of which the following is a specification.

My invention relates to certain improvements in barges for loading vessels with coal.

The main object of the invention is to provide means whereby the coal can be crushed to a size after it is received on the barge and before its delivery to the vessel so that it can be readily handled on board the vessel by conveying mechanism.

The coal usually delivered to steam-ships is known as "run of mine", that is, it is bituminous coal of all sizes ranging from very large lumps to powder, and it is practically impossible to handle this coal on board a ship by means of endless conveying mechanism.

By my invention, I so construct the barge that a conveyer can be used to receive the "run of mine" coal from the bins on the barge, and carry it to a crusher which reduces the coal to a given size. The coal is then transferred to the said conveyer which delivers it to the chutes through which it passes to the vessel.

In the accompanying drawings: Figure 1, is a longitudinal sectional view of my improved loading barge for vessels; Fig. 2, is a transverse sectional view on the line 2—2 Fig. 1; Fig. 3, is a transverse sectional view on the line 3—3, Fig. 1; Fig. 4, is an enlarged sectional view of the extreme lower portion of the barge showing the conveyer for receiving the coal from the bins; Fig. 5, is an enlarged longitudinal sectional view showing in detail the mechanism for delivering a quantity of coal from the bin to the conveyer, Fig. 6, is a plan view of Fig. 5; and Fig. 7, is a vertical sectional view illustrating certain mechanism of Fig. 1.

A is the hull of the barge which may be of any shape desired, and in this hull is a series of bins B in which the coal is delivered from the dock in any suitable manner.

D is a truss structure mounted on the deck of the barge and consisting of a series of masts D′ connected together by truss members d and braced at each end by truss members d' although the form of this truss structure will vary according to circumstances.

In the present instance the bottom of the hull is extended as at A′ Fig. 4, to form a runway for the lower run of the conveyer C which is of the gravity discharge type and consists of two chains c—c and the bucket c'. The trough E which extends the full length of the barge has sides e—e formed in the present instance by channel bars which also support the chains c—c of the conveyer. The conveyer chains pass around the driving wheel C′ and idlers C^2 as shown in Fig. 1, the driving wheel C′ in the present instance being driven by any suitable motor. The conveyer chains also pass around idlers C^3 which so direct the conveyer that it will travel in a horizontal path at a point between the upper and the lower run for a purpose fully described hereafter.

B′, B′ are the reciprocating discharge platforms which allow a certain quantity of coal to pass from the bins onto the trough E in front of the buckets at each reciprocation.

Referring to Fig. 5, which illustrates one platform and the operating mechansim, directly above the platform is an opening b in the bottom of the bin B. The platform is mounted on wheels b' adapted to travel on tracks F suspended from the bottom of the bin. Reciprocating motion is imparted to the platform through a longitudinal frame G consisting of side bars g and cross bars g', g^2 and g^3. Attached to the end cross bar g' is an eccentric rod h attached to an eccentric strap h' mounted on an eccentric h^2 on a shaft H adapted to suitable bearings. On this shaft is a pinion h^3 which meshes with a gear wheel h^4 on the shaft C^4 of one of the idlers C^2, the shaft deriving its motion from the endless conveyer C. On the cross bar g' are wheels g^4 which travel in ways f—f and on the cross bar g^3 are wheels g^5 which travel on the tracks F, thus the frame is properly supported throughout its entire length as it will be understood that the frame extends from one end of the barge to the other.

Each platform B′ is connected to the frame G by a hooked bar b^2 which can be

raised and held clear of the frame when desired. The bar b^2 is pivoted to the platform and engages the cross-bar g^2 as shown by Figs. 5 and 6. By simply lifting these bars and attaching them to a chain as shown in Fig. 5, any particular slide can be disconnected, and the flow of coal from that particular bin will be discontinued. The upper run of the conveyer C travels over a trough E′ supported by the truss structure D and the coal is discharged from this trough through valved openings into hoppers J which communicate with the telescopic chutes J′ of the ordinary type. These chutes are properly supported so as to direct the coal through openings in the side of the vessel. The coal can either flow directly in the coal bunkers or into the conveyer *m* in the vessel M as shown in Fig. 2, to be conveyed to any point desired.

At one end of the barge is a crusher I having rolls *i*—*i* in the present instance, although any form of crusher may be used without departing from my invention. The conveyer C is directed over the crusher by the idlers C^3 Figs. 1 and 7, and there is a short trough I′ terminating at an opening i^2 through which the coal passes to the crusher. In the type of conveyer shown, the coal is carried up in the buckets from the lower run to the trough I′ and is discharged onto the trough and pushed forward by the buckets, the coal passing through the opening i^2 as above set forth and through the crusher, the rolls of the crusher being so set as to break up the coal to a given size.

N is a conveyer arranged to travel transversely to the direction of travel of the main conveyer C. This conveyer has chains *n* and buckets *n′* similar to the conveyer C and passes over wheels N′, one of which may be a driving wheel.

P is a boot into which the coal falls from the crusher and the conveyer buckets *n′* will remove the coal from this boot and carry it up and discharge it onto a platform P′ having an opening *p*, the coal flowing through this opening and through a chute S which directs the coal in to a trough I^2 forming a continuation of the trough I′. The buckets *c* of the main conveyer C pick up the coal again at this point and lift it to the upper trough E′ and it is pushed forward on this trough until it reaches a discharge opening where it flows into a hopper J, and from the hopper into a chute J′.

Thus it will be seen that while the coal is in transit from the bin in the hull of the barge to the point of discharge, it is crushed to the proper size so that it can be readily handled by conveying mechanism in the vessel.

I claim:—

1. The combination of a barge, an upper and a lower run, an endless conveyer arranged to travel on the said runs, a crusher, midway between the upper and lower runs for crushing the coal to size, said conveyer being deflected so as to discharge the coal into the crusher as it is conveyed from the lower to the upper run, and means for discharging the crushed coal onto the conveyer at a point beyond the crusher so that it can be carried to the upper run, substantially as described.

2. The combination of a barge, a bin in the barge, an elevated structure mounted on the barge, a trough below the bin, and a trough carried by the elevated structure, an endless conveyer having buckets and arranged to travel on the upper and lower runs, means for deflecting the elevating section of the conveyer between the upper and the lower runs, a crusher mounted under the deflected portion of the said conveyer and receiving coal from the said conveyer, and a secondary conveyer for delivering the crushed coal to the main conveyer at a point beyond the crusher, substantially as described.

3. The combination of a barge, a bin in the barge, a conveyer trough in the bin, a structure mounted upon the barge, a conveyer trough carried by the said structure, a chute leading from the said structure, an endless conveyer arranged to travel on the upper and the lower troughs, means for discharging coal from the bin to the lower trough in front of the buckets of the conveyer, a trough situated between the upper and lower runs at one end of the barge, means for deflecting the conveyer at this point so that the buckets will carry the coal from the lower trough and discharge it onto the mid trough, an opening at the end of said trough, a crusher directly below the opening through which the coal must pass so that it will be crushed to size, a transversely arranged conveyer for lifting the crushed coal to a point above the deflected portion of the main conveyer, and a chute delivering the crushed coal to the main conveyer at a point beyond the crusher, substantially as described.

4. The combination of a barge, a bin in the barge, a conveyer trough under the bin, a structure mounted on the barge, a conveyer trough on said structure, an endless conveyer arranged to travel on the upper and lower troughs, means for deflecting the elevating portion of the conveyer, two troughs directly under this deflected portion of the conveyer, a crusher mounted under the troughs so that the material carried from the lower trough will be discharged onto the first of the two troughs, and pushed by the conveyer over the end and into the crusher, a transversely arranged endless conveyer having buckets, a boot for said conveyer into which

the crushed coal falls, a platform above the said troughs, and having an opening and a chute leading from the opening to a point above the second of the two troughs so that the coal will be crushed and redelivered to the main conveyer before its discharge into the vessel, substantially as described.

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

FREDERIC V. HETZEL.

Witnesses:
WM. A. BARR,
JOS. H. KLEIN.