No. 825,532. PATENTED JULY 10, 1906.

R. B. GREEN.

CONVEYING SYSTEM.

APPLICATION FILED APR. 6, 1906.

Fig. 1.

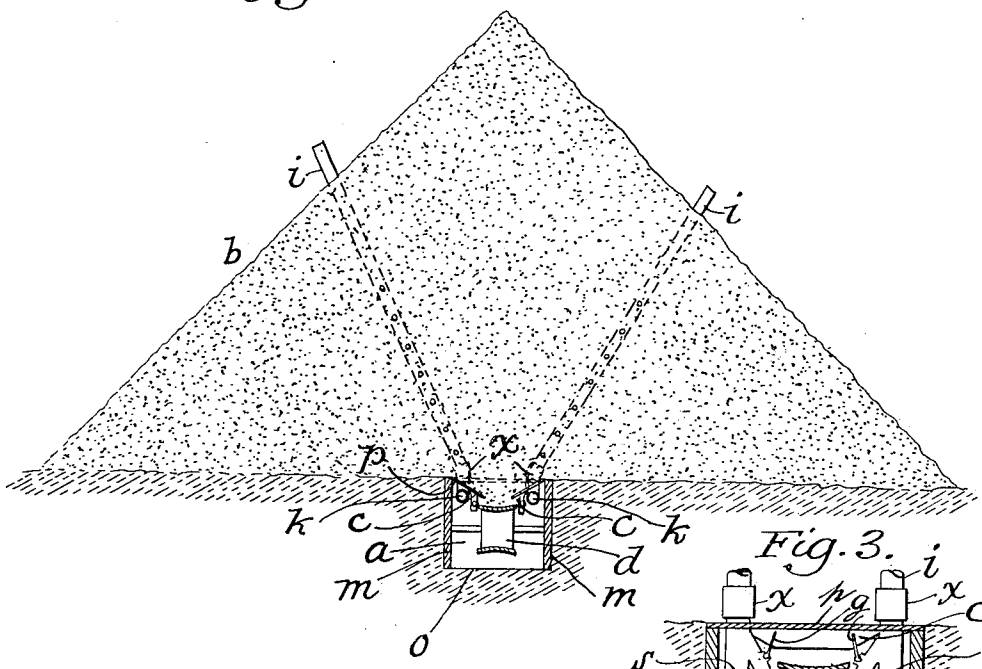


Fig. 3.

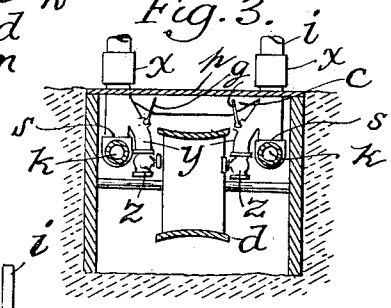
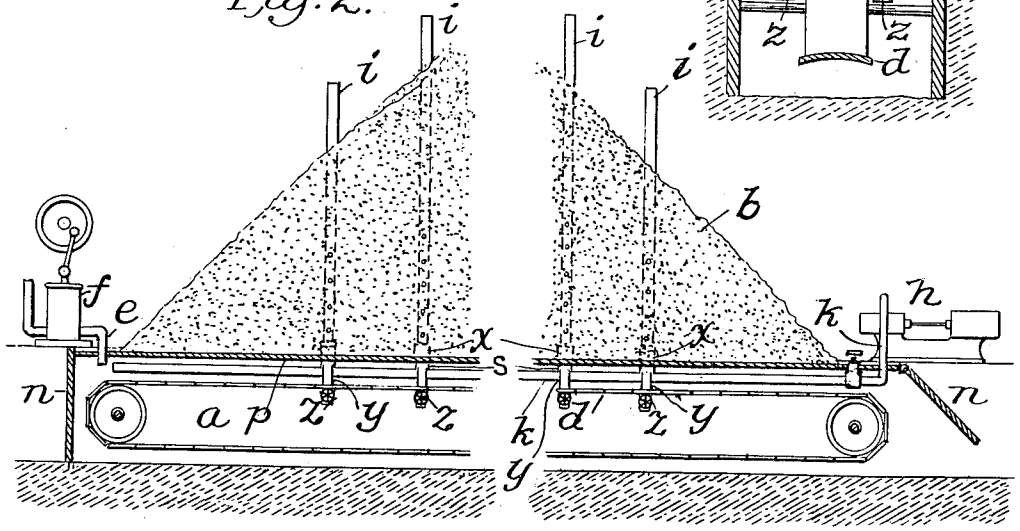


Fig. 2.



WITNESSES:

James F. Duhamel.

M. Hamilton.

INVENTOR

Robert B. Green

BY

James Hamilton

ATTORNEY

BEST AVAILABLE COPY

UNITED STATES PATENT OFFICE.

RUTGER B. GREEN, OF DETROIT, MICHIGAN.

CONVEYING SYSTEM.

No. 825,532. Specification of Letters Patent. Patented July 10, 1906.

Application filed April 6, 1906. Serial No. 310,309.

To all whom it may concern:

Be it known that I, RUTGER B. GREEN, a citizen of the United States, residing in Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Conveying Systems, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in systems for conveying material stored in bulk, such as coal, ore, grain, and the like.

An object of my invention is to provide means for maintaining a partial vacuum or plenum in a subway in which is located conveying apparatus beneath a coal pile and in a pipe system through the subway and coal pile.

The subway runs beneath the bottom of the coal pile and is fitted with air-pumps or blowers and with air-tight closures at its sides, bottom, and ends. By these means air is drawn down or forced up through pipes in the pile of material and serves to cool and dry the material and prevent spontaneous combustion. By placing a thermometer in the current of air which passes through and from any pipe in the pile the temperature of the pile may be determined at that point and timely warning obtained of a too great rise in temperature. Further, in case the material becomes "arched" over the hoppers leading to the conveying apparatus the greater pressure of the outside air will tend to break down the arch and to feed the material uniformly to the conveyers. When workmen are in the subway, as in case of making repairs, inspection of machinery, cleaning, and the like, the blowers may be used for purposes of ventilation

Another object of my invention is to provide means for flooding pipes in or under the coal pile with water for the purpose of quenching a fire, as in the case of spontaneous combustion.

In the drawings illustrating the principle of my invention and the best mode now known to me of applying that principle, Figure 1 is a diagrammatic view of a conveying system, the subway being shown in transverse sectional view; and Fig. 2 is a longitudinal sectional view through the subway. Fig. 3 is a detail sectional view.

The subway *a* runs under the pile *b* of coal, grain, ore, or like material stored in bulk and is provided at its top with the hoppers *c*, through which the material is fed to the conveying apparatus *d*, which is shown conventionally in the drawing and may be of any of the approved types now found upon the market. The sides *m*, ends *n*, and bottom *o* of the subway are air-tight when the conveyer is not running.

Running into the subway *a* is a short pipe *e*, which is connected with an air-pump *f*. (Shown diagrammatically in the drawings.) The connections between the air-pump *f* and the pipe *e* are such that air may be exhausted through the pipe *e* from the subway *a*, or the operation may be reversed and air may be forced into the subway, as for ventilation, when the conveyers are not in use and workmen are in the subway inspecting, repairing, or cleaning the machinery therein. Running up into the coal pile from points along the roof *p* of the subway are pipes *i*, perforated above the subway-wall and tight below it and having valved connections *s* to the water-pipe *k* and each having a valve *z* at its lower end *y*, which projects into the subway. This allows the pipes to be individually shut on or off from the general circulation of air maintained by the air-pump *f* through the subway and coal pile. These pipes *i* may have a flexible joint *x* just above the subway-roof to prevent their breaking under settlement in the coal pile.

When the air-pump *f* is used to exhaust air from the subway *a*, a thermometer *g* (see Fig. 3) may be placed in one of the pipes *i* in order to determine the temperature of the air drawn through the pile *b* and so timely warning may be had of an undue rise of temperature in the material of the pile, which might lead to spontaneous combustion. Further, the passage of the air through the material tends to cool and to dry it, and thus to insure dry materal being furnished and to prevent spontaneous combustion. The air-pressure existing all through the pile (and in case the pile is covered with a thin coating of ice then upon the outside of the pile) tends to break down any arch formed in the pile over the hoppers and to cause the materal to be fed uniformly from the bottom of the pile, insuring uniformity of supply both as to quality and dryness, and insuring, also, uniformity of supply as to the degree of "weathering" or change produced by exposure to the elements of the atmosphere and meteorological influences.

In order to provide means for flooding the

pipes *i* with water, they are connected by a pipe *k* with a water-pump *h*, by means of which water may be forced into them from any suitable source of supply. The ends *n* of the subway are adjustable in order that they may not interfere with the conveyers when the latter are running.

What I claim is—

1. In a conveying system, the combination of a subway running beneath a pile of material to be conveyed and provided with air-tight bottom, sides and ends; hoppers emptying from said pile into the top of said subway; conveyers mounted in said subway and cooperating with said hoppers; and means for causing air to pass through said pile and subway.

2. In a conveying system, the combination of a subway running beneath a pile of material to be conveyed and provided with air-tight bottom, sides and ends, said ends being adjustable; conveyers mounted in said subway and coöperating with hoppers; said hoppers emptying from said pile into the top of said subway; and means for causing air to pass through said pile and subway.

3. In a conveying system, the combination of a conduit arranged under a pile of material to be conveyed and open to the atmosphere on only the side opposed to said material; conveying apparatus in said conduit; and means for drawing air through said pile of material by exhausting air from said conduit.

4. In a conveying system, the combination of a conduit arranged under the pile of material to be conveyed; conveying apparatus in said conduit; and means for forcing a fluid through said conduit into said pile of material.

5. In a conveying system, the combination of a conduit arranged under a pile of material to be conveyed and open to the atmosphere on only the side opposed to said material; perforated pipes in said pile, said pipes opening into said conduit; an air-pump connected with said pipes by means of said conduit; and valved connections between said pipes and a water-supply pipe; and said water-supply pipe.

6. In a conveying system, the combination of a conveying apparatus beneath a pile of material to be conveyed; a series of perforated pipes distributed in said pile; and a pump connected with said pipes.

7. In a conveying system, the combination of a subway running beneath a pile of material to be conveyed; a series of perforated pipes distributed throughout said pile and projecting into said subway through the roof thereof, said pipes being provided with flexible joints above said roof; conveying apparatus in said subway; and a pump connected with said subway.

In testimony whereof I hereunto set my hand this 30th day of March, A. D. 1906.

RUTGER B. GREEN.

Witnesses:

LOYD WILSON,

H. W. SHIELDS.