Oct. 25, 1938. R. MOORE 2,134,452

SHAKER CONVEYER

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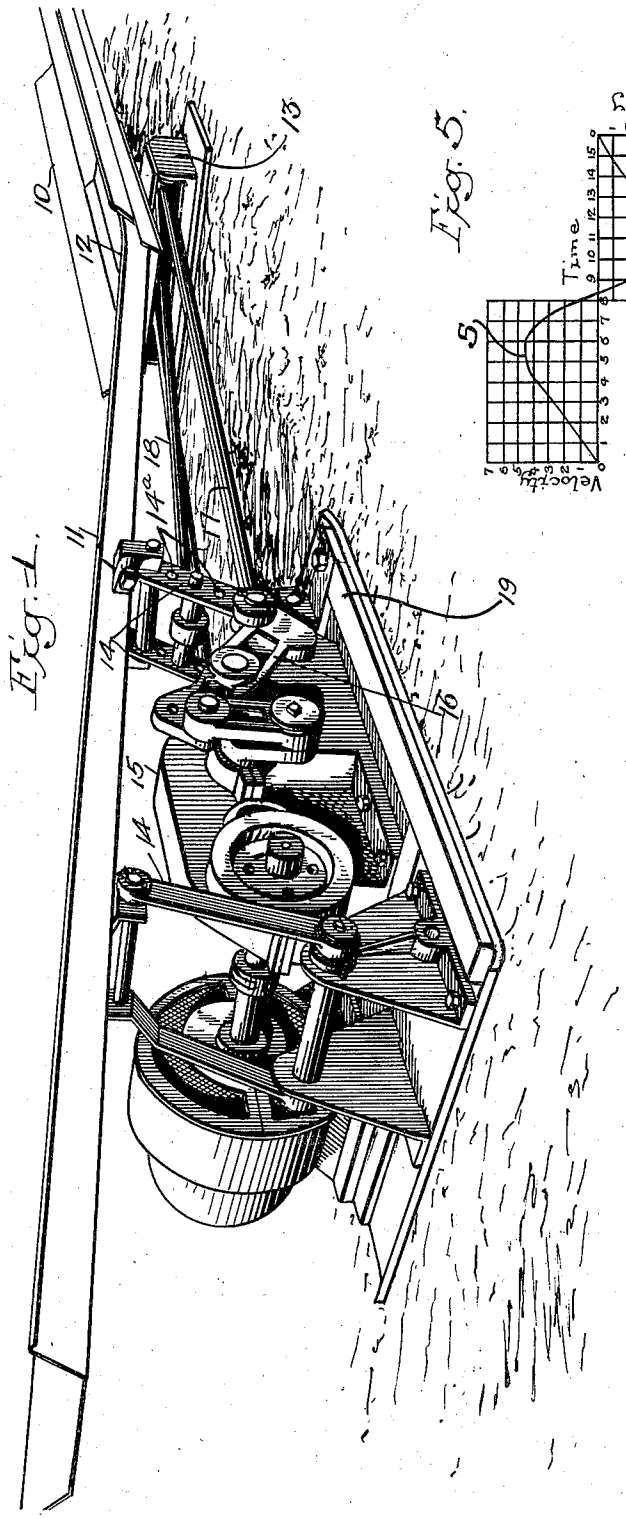


Fig. 1.

Fig. 5.

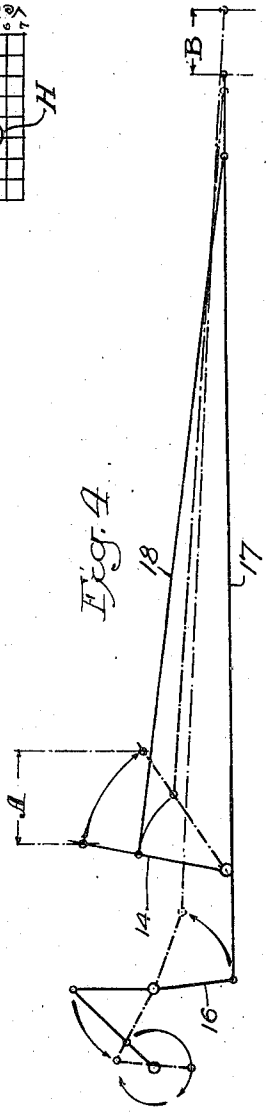


Fig. 4.

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Fig. 3.

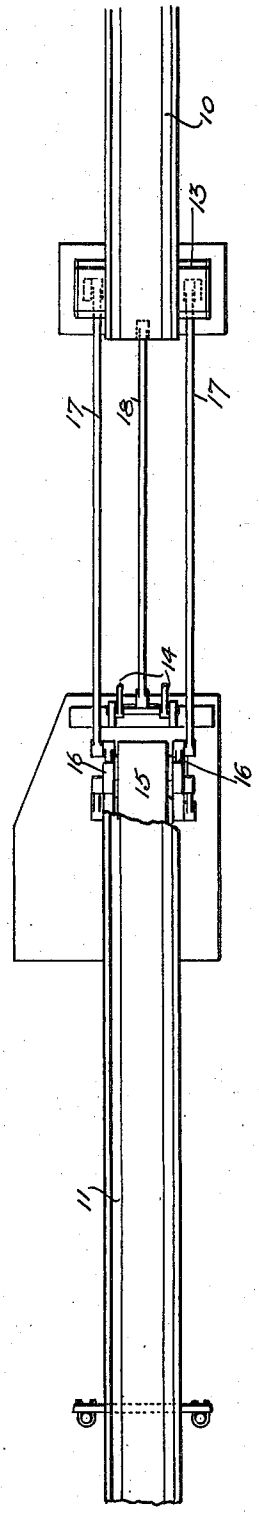
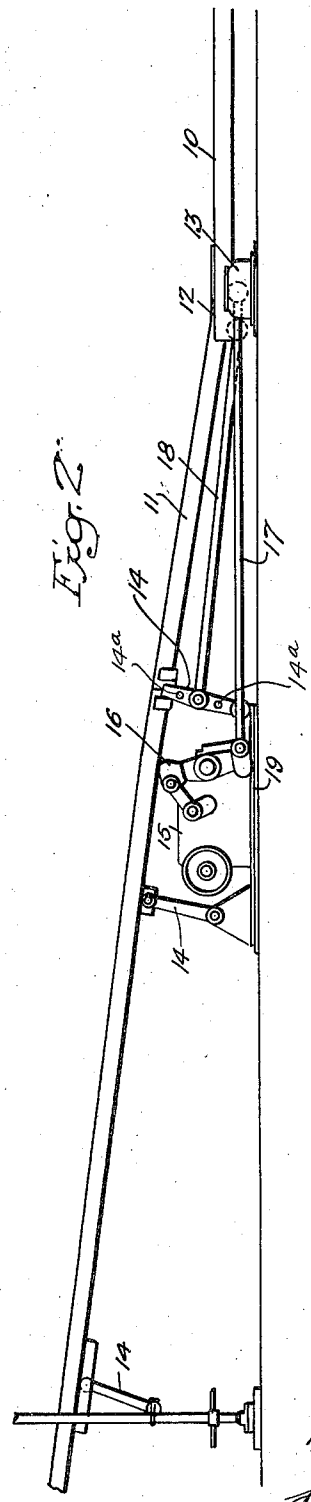


Fig. 2.



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2,134,452

SHAKER CONVEYER

Roscoe Moore, Kingston, Pa.

Application June 1, 1936, Serial No. 82,968

9 Claims. (Cl. 198—220)

This invention relates to conveyers, and more particularly to a reciprocating trough conveyer which includes both inclined and substantially horizontal sections, and in which the conveyance of material upon the inclined section is to be up the inclination.

Since the conveyance of material by the reciprocating trough depends primarily upon the frictional engagement of the material with the trough and this frictional engagement is obviously effected by variations in the inclination of the trough, reciprocating conveyers as hitherto constructed have had distinct limits where an inclined section was included. Obviously, if the conveying capacity of the horizontal section is any selected quantity, the conveying capacity of the inclined section is a lesser quantity and piling up of the material will occur at the junction of the horizontal and inclined sections, with the result that this material will overflow the sides of the chute. Furthermore, if the incline of the inclined section exceeds a given grade, it is often necessary to operate the conveyer mechanism with what is known as a "hard" conveying motion, more particularly described hereinafter, and such motion causes both a higher consumption of power and greater shock upon the mechanism.

An important object of this invention is to so construct a conveyer mechanism including both inclined and horizontal sections that the conveying capacity of the inclined section will equal or exceed that of the horizontal section.

A further object of the invention is the provision of a construction such that a single operating mechanism will suffice to impart to both conveyer sections the desired conveying motions.

A further and more specific object of the invention is the provision in a conveying mechanism including inclined and horizontal trough sections of means for imparting to the inclined section a greater longitudinal reciprocation than is imparted to the horizontal section.

These and other objects I attain by the construction shown in the accompanying drawings wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a perspective view of the invention;

Fig. 2 is a side elevation;

Fig. 3 is a plan view partially broken away;

Fig. 4 is a diagram of the lever motion showing the difference in travel of the conveyers; and

Fig. 5 is a diagram showing the speed curve development.

Referring now more particularly to the drawings, the numerals 10 and 11 generally designate horizontal and inclined conveyer sections, the inclined conveyer section having an angularly bent nose 12 fitting within and slidable upon the inner surface of the horizontal section 10. The horizontal section 10 is mounted upon suitable roller supports 13, while the inclined section is mounted upon rocker arms 14 which are, in turn, carried by suitable supports. The numeral 15 designates the usual shaker conveyer drive or jigger which, as well known to those familiar with the art, is a mechanism whereby through a system of cranks, rocker arms or other equivalent, a conveying motion is imparted to the trough. This motion is diagrammatically illustrated in Fig. 5, the section S of the curve indicating the motion of the trough in one direction, while the section H indicates its motion in the opposite direction. It is possible that either of the sections S or H be employed in conveyance; that is to say, the material may be moved with either of these graphs representing the movement of the conveyer in the direction in which the material is moving. It is, however, vastly preferred that that portion of the curve S be employed in the conveying direction, for as noted there are no abrupt velocity changes in this curve and it is, accordingly, known as a "soft" motion enabling the mechanism to pick up the weight of both the conveyer and the conveyed material at a smoothly accelerated rate, and at the same time avoiding severe shocks on the mechanism. The motion represented by the curve H is, however, often employed where coal or similar material is to be conveyed up hill. It is obviously, however, both inefficient as a conveying motion and destructive to the mechanism due to the abrupt velocity change. By employing the connections now described, I am able to utilize the curve S on the conveying stroke and at the same time eliminate the difference in capacities ordinarily existing in the horizontal and inclined sections.

In accordance with my invention, the oscillating arms 16 of the driving engine 15 are connected through pitmans 17 with the horizontal trough section 10 to reciprocate the same. The horizontal trough section 10 is in turn connected through pitman 18 with one of the sets of rocker arms 14 supporting the inclined section. The connection to these rocker arms is made intermediate the lengths thereof so that the longitudinal motion or stroke A imparted to the inclined section 11 is greater than the stroke B imparted to the section 10. The material may thus be caused to move along the inclined section 11 at

the same, or even at a greater speed than upon the horizontal section. The conveying action of the inclined section may be further increased by so disposing rocker arms 14 that the motion is entirely at one side of a perpendicular passing through the pivots of the rocker arms and, accordingly, imparting to the trough the well-known tossing motion often utilized in shaker conveyers of this type. It may be further increased by employing a conveyer trough having a bottom so constructed as to increase the gripping action between the trough and the conveyed material, as, for example, an arrangement such as shown in my prior Patent No. 1,997,495 which comprises a perforated plate disposed upon the bottom of the conveyer and adapted to receive in the perforations thereof particles of the conveyed material which will, of course, have more frictional affinity for the material than the sheet iron or steel ordinarily employed in construction of such troughs. The rocker arms to which pitman 18 is connected are preferably pivoted upon the base 19 of the conveyer drive engine 15 and so constructed that the pitman may be adjustably connected thereto, additional openings for the pin of the pitman being indicated at 14a. The motion of the conveyer section 11 being similar to that of the section 10, there is comparatively little wearing action at the contact points of these sections, the only friction resulting from the extra longitudinal motion applied to the inclined section.

Since the construction is obviously capable of considerable modification without departing from the spirit of my invention, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

I claim:

1. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, and means for imparting a reciprocating conveying motion to said sections causing movement of material placed thereon toward the upwardly inclined section, so constructed and arranged that the motions of the sections are similar and have substantially identical time intervals while the inclined section is reciprocated through a greater longitudinal stroke than the horizontal section whereby to cause material moving thereover to travel at substantially the same speed as that upon the horizontal section.

2. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, means for imparting a reciprocating conveying motion to the horizontal section causing movement of material placed thereon toward the upwardly inclined section and connections between said horizontal and inclined sections so constructed and arranged that a conveying motion similar to that of the horizontal section is imparted to said inclined section and the inclined section is reciprocated through a greater longitudinal stroke than the horizontal section whereby to cause material moving thereover to travel at substantially the same speed as that upon the horizontal section.

3. A reciprocating trough conveyor comprising relatively movable substantially horizontal and upwardly inclined sections, means for imparting a reciprocating conveying motion to the horizontal section causing movement of material placed thereon toward the upwardly inclined section and link and lever connections between the horizontal and inclined sections so constructed and arranged that the inclined section has imparted thereto a conveying motion the strokes of which are synchronous with and identical as to acceleration characteristics but of greater longitudinal extent than the strokes of the horizontal section whereby to cause material moving thereover to travel at substantially the same speed as that upon the horizontal section.

4. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, means for imparting a reciprocating conveying motion to the horizontal section causing movement of material placed thereon toward the upwardly inclined section, a support, a rocker arm pivoted to the support at one end and to the inclined section at its opposite end and a link connecting the rocker arm and horizontal section of the conveyor, said link being connected to the rocker arm intermediate the ends thereof.

5. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, means for imparting a reciprocating conveying motion to the horizontal section causing movement of material placed thereon toward the upwardly inclined section, a support, a rocker arm pivoted to the support at one end and to the inclined section at its opposite end and a link connecting the rocker arm and horizontal section of the conveyer, said link being connected to the rocker arm intermediate the ends thereof, said rocker arm at the completion of the conveying stroke of said conveying motion being substantially perpendicular to the inclined section of the trough.

6. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, and means for imparting a reciprocating conveying motion to said sections causing movement of material placed thereon toward the upwardly inclined section, so constructed and arranged that the motions of the sections are similar and have substantially identical time intervals while the inclined section is reciprocated through a greater longitudinal stroke than the horizontal section, the inclined section having an angularly bent nose fitting within and slidable upon the inner surface of the horizontal section.

7. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, means for imparting a reciprocating conveying motion to the horizontal section causing movement of material placed thereon toward the upwardly inclined section and connections between said horizontal and inclined sections so constructed and arranged that a conveying motion similar to that of the horizontal section is imparted to said inclined section and the inclined section is reciprocated through a greater longitudinal stroke than the horizontal section whereby the conveyed material will pass over said sections at substantially the same speed the inclined section having an angularly bent nose fitting within and slidable upon the inner surface of the horizontal section.

8. A reciprocating trough conveyer comprising relatively movable substantially horizontal and upwardly inclined sections, means for imparting a reciprocating conveying motion to the horizontal section causing movement of material placed thereon toward the upwardly inclined section and link and lever connections between the horizontal and inclined sections so constructed and ar-

ranged that the inclined section has imparted thereto a conveying motion the strokes of which are synchronous with and identical as to acceleration characteristics but of greater longitudinal extent than the strokes of the horizontal section whereby material will move over said sections at substantially the same speed, the inclined section having an angularly bent nose fitting within and slidable upon the inner surface of the horizontal section.

9. A reciprocating trough conveyer comprising relatively movable substantially horizontal and inclined sections, means for imparting a reciprocating conveying motion to the horizontal section, a support, a rocker arm pivoted to the support at one end and to the inclined section at its opposite end and a link connecting the rocker arm and horizontal section of the conveyer, said link being connected to the rocker arm intermediate the ends thereof, the inclined section having an angularly bent nose fitting within and slidable upon the inner surface of the horizontal section.

ROSCOE MOORE.