A. H. WOOD.

DUMP.

APPLICATION FILED SEPT. 13, 1916.

1,274,488.

Patented Aug. 6, 1918.

2 SHEETS—SHEET 1.

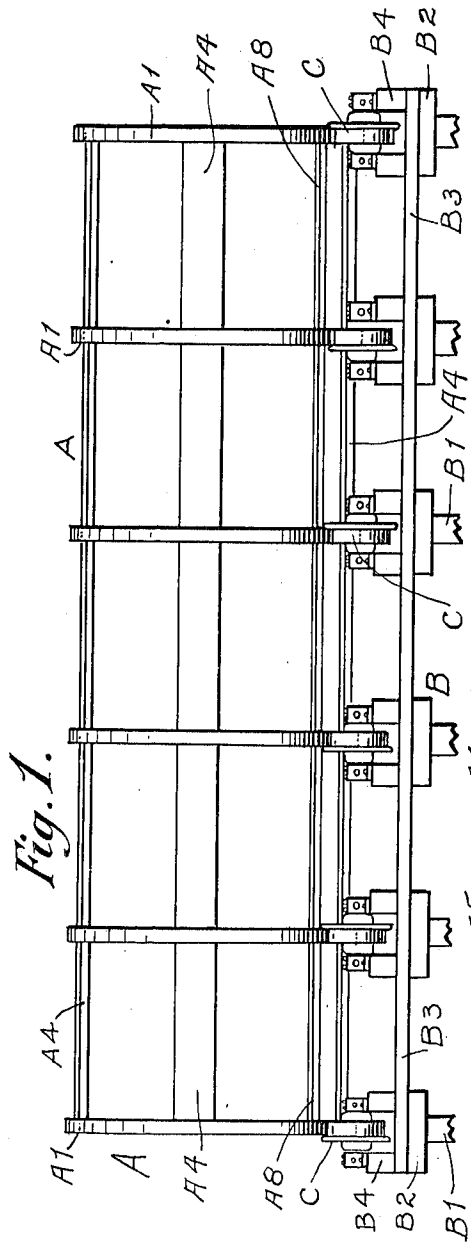


Fig. 1.

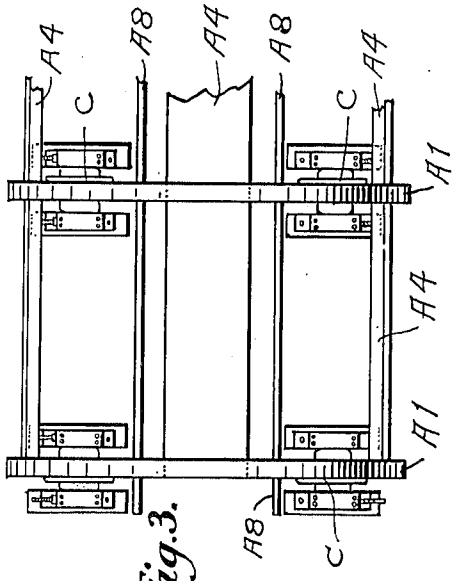


Fig. 3.

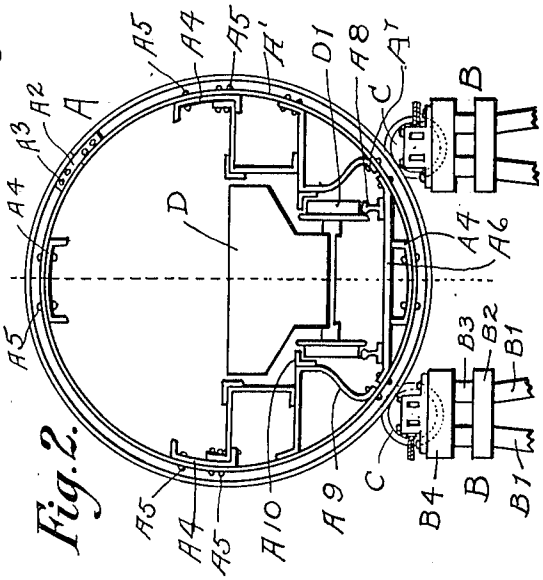


Fig. 2.

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2 SHEETS—SHEET 2.

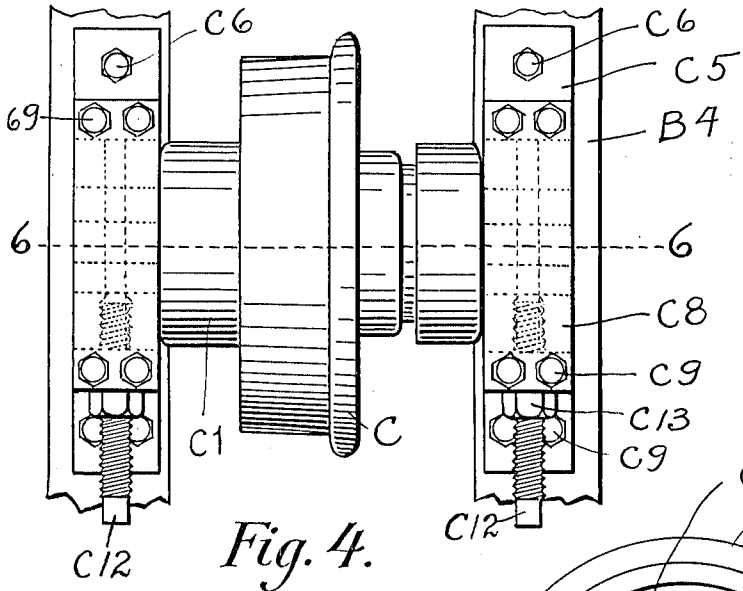


Fig. 4.

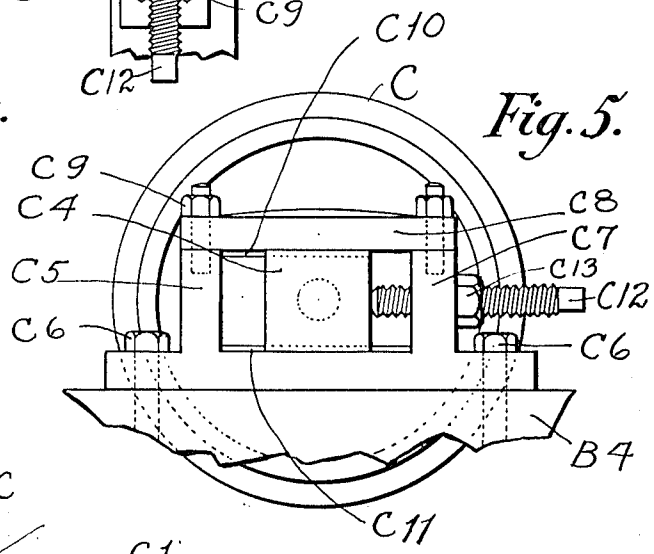
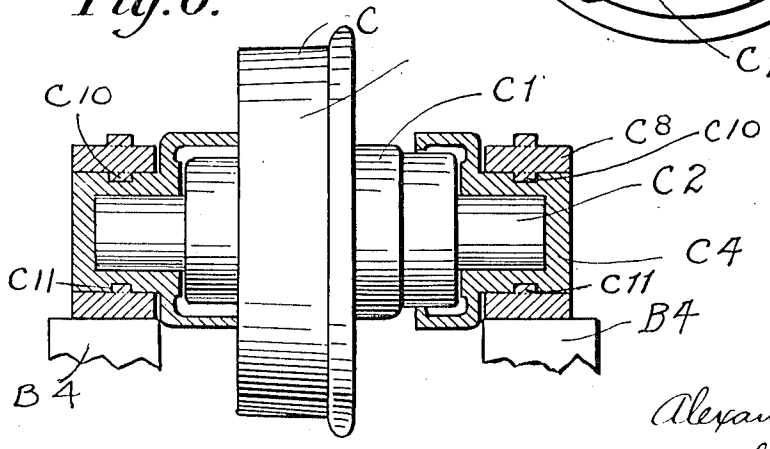


Fig. 5.

Fig. 6.



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ALEXANDER HAMILTON WOOD, OF PETROS, TENNESSEE, ASSIGNOR TO WOOD EQUIPMENT COMPANY, A CORPORATION OF ILLINOIS.

DUMP.

1,274,488. Specification of Letters Patent. Patented Aug. 6, 1918.

Application filed September 13, 1916. Serial No. 119,947.

To all whom it may concern:

Be it known that I, ALEXANDER H. WOOD, a citizen of the United States, residing at Petros, in the county of Morgan and State of Tennessee, have invented a new and useful Improvement in Dumps, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to dumps comprising an approximately horizontal rotary tubular frame in which is a track to receive and hold one or more cars which are to be emptied by rotating the tubular frame on its axis, the interior of said frame having a track for supporting said cars. In practice, it is often desirable to make these tubular frames of sufficient length to receive a plurality of cars, preferably a train or trip comprising as many as six or eight or more cars. This is desirable for the sake of giving the dump a large capacity. In a dump having a rotary frame of such length, it is difficult to properly support the frame. The frame must be so positioned as to bring the track in the interior thereof into registry with the track or tracks over which cars are brought into and discharged from the frame. This calls for bodily sidewise and up and down movement of the frame. Furthermore, lightness of the said frame is important relative to economizing in metal, to strain on the supporting structure, and to expenditure of power in rotating the frame with the trip of cars located therein. In order that the rotary frame may be made light, it must be supported at numerous points. Such contact is made with wheels or rollers turning on axes which are parallel to the axis of the rotary frame. To make such contact, the positioning of these wheels must be accurate. If the wheels are not so positioned as to cause all to bear substantially equally upon the rotary frame, the even distribution of strains on the tubular frame is destroyed.

Said wheels are arranged upon the upper face of a supporting structure, some of said wheels being at one side and some at the other side of the upright axial plane of the rotary cylinder. The wheels are shown arranged in pairs, one member of each pair being at one side and the other at the other side of said upright plane, and for adjustment, all of said wheels are bodily shiftable horizontally toward and from said plane. The wheels of every pair are separated far enough, and only far enough, to allow a portion of the cylindrical frame resting thereon to extend below the level of the upper faces of said wheels when the cylinder is resting on said wheels. All the wheels considered collectively constitute a bed upon which the rotary cylinder rests, the cylinder having no support other than said bed. While resting on said bed, by horizontally shifting the wheels, or portions of them, the cylinder may be shifted sidewise in either direction or upward or downward, as may be necessary for the bodily positioning of the cylinder relative to the fixed track or tracks over which cars enter and are discharged from the interior of the cylinder. By moving the wheels toward said upright plane, the cylinder is bodily lifted. By moving said wheels from said plane, the cylinder is bodily lowered. By moving all the wheels sidewise in the same direction and through equal distances, the cylinder is moved bodily sidewise in that direction.

Either end of the cylinder may be raised or lowered or moved sidewise in either direction by appropriately moving the wheels at that end of the cylinder in the manner above stated. It is important to note that all these various movements of the cylinder are to be produced by shifting the wheels in a single path, to wit, a path which is perpendicular to the upright axial plane of the cylinder and which path is on a chord line of the cylinder, as hereinafter described. And to produce proper contact of any of the individual wheels with the cylinder, after the latter has been positioned, said wheels are shifted individually, each on its same path.

It is the object of this improvement to provide such a rotary dump comprising such wheels and means for so adjusting the wheels as to effect the bodily adjustment of the rotary frame and to bring all of them into proper positions for contact with the rotary frame.

In the accompanying drawings,

Figure 1 is a side elevation of a portion of a dump structure embodying my improvement;

Fig. 2 is an end elevation of the structure shown in Fig. 1;

Fig. 3 is a plan of a portion of the structure shown in Figs. 1 and 2;

Fig. 4 is a sectional plan of a roller and adjacent portions whereby the roller is supported;

Fig. 5 is a sectional elevation looking toward the right of the mechanism shown by Fig. 4;

Fig. 6 is an upright section on the line, 6—6, of Fig. 4.

Referring to said drawings, A is the rotary tubular frame and B is the upper portion of a tipple structure upon which the rotary frame, A, is supported. The supporting structure may be of any desired height and form and sufficiently open to permit the falling of coal or other minerals from the rotary frame downward into cars or other receptacles. Since such structures are already well known, I omit illustrating and describing the structure, B, in detail. And it is to be understood that for the purposes of the present invention this supporting structure may be varied; that the essential requirement is the proper supporting of the rollers or wheels upon which the ring-form ribs of the rotary frame rest, as will be hereinafter described.

In the form shown by the drawings, the supporting structure, B, comprises at each side columns or posts, B^1, caps, B^2, on said columns, longitudinal beams, B^3, resting on said caps, and blocks, B^4, resting transversely on said beams.

The blocks, B^4, are arranged in pairs, the blocks of each pair being spaced from each other a suitable distance to receive the bearings for the wheels or rollers, C.

Each wheel, C, has a hub, C^1, through which extends an axle, C^2. Each end of said axle extends into a bearing block, C^4, which is seated slidably in a chair, C^5, which is horizontal and transverse to the upright axial plane of the cylinder. Each of said chairs rests on the adjacent block, B^4, and is secured thereto by bolts, C^6. Said chair comprises two standards, C^7, and a top plate, C^8, resting on the standards, C^7, and secured thereto by bolts, C^9. Between said standards, the upper face of the chair has a tongue, C^{10}, and between said standards the lower face of the top plate, C^8, has a similar tongue, C^{11}. The lower face of the bearing block, C^4, has a groove to receive the tongue, C^{11}, and the upper face of said block has a similar groove to receive the tongue, C^{10}. By means of said tongues, said block is limited to horizontal movement transverse to the cross beams, B^3.

A set bolt, C^{12}, is horizontal and parallel to the length of the chair and extends through the outer standard, C^7, and bears against the adjacent upright face of the bearing block, C^4. At the outer side of said standard, a jam-nut, C^{13}, surrounds said bolt.

The rotary frame, A, comprises ring-form ribs, A^1, and longitudinal bars, A^4. Each ring is formed of a piece of light railroad track rail having the usual T-shape cross-section, the "foot" of the rail being on the inside and the "head" or "tread" of the rail being on the outside of the ring. A binding plate, A^2, similar to a fish plate, overlaps the joint formed by the meeting ends of the rail and is secured to the rail by bolts, or rivets, A^3. Said plate lies in the channel between the head and foot of the rail. Longitudinal frame members, A^4, are formed of channel iron and are placed within the rings and against the inner faces of the latter and secured thereto by bolts or rivets, A^5. Within the lower portion of each ring is a metal cross-tie, A^6, having its ends resting on the ring and secured thereto by bolts or rivets, A^7.

On said ties are two track rails, A^8, extending lengthwise of the rotary frame and adapted to receive the wheels, D^1, of mine cars, D, (Fig. 2). Brackets, A^9, are secured to the inner faces of the rings above the cross-ties. Angle bars, A^{10}, are arranged parallel to the rails, A^8, and supported by said brackets in position to extend above the wheels, D^1, near enough to the latter to confine said wheels to the rails, A^8, when the rotary frame is turned on its axis.

Each ring-form rib, A^1, rests on two of the supporting wheels, C. Said wheels are in the form of ordinary car wheels, preferably mine car wheels, having the usual flange by which the wheel is kept on the rail. The two wheels which engage the same rib are to be regarded as a pair. Some of the wheels are turned so as to bring the flanges to one side of the adjacent ribs, while others of the wheels are so turned as to bring the flanges to the other side of the ribs, in order that some of the flanges may serve to prevent movement of the rotary frame in one direction while the flanges of other wheels prevent the frame from moving endwise in the other direction. Thus said frame is so held as to have no other movement than rotation on its axial line.

As already herein stated, it is important, for the reasons mentioned, that said rotary frame be made light; and, as has been herein stated, the frame may be made light, if it is given a sufficient number of supports which properly engage the frame. Such proper engagement involves the bearing of all the wheels against the ribs of the frame when the axes of the ribs are coincident with the axis of the frame. Then all the ribs will have support, and because of such support no rib will tend to yield downward out of alinement with the other ribs and thus strain abnormally the adjacent portions of the frame.

In this connection, it is to be observed that it is difficult to so build the supporting structure, B, as to bring all the wheels, C, at one side of the structure into alinement with each other and parallel to the axis of the rotary frame, even if said wheels are identical in shape and size and are supported in bearings which are identical and the ring-form ribs are all of the same diameter. Furthermore, it is to be noted that, even if the supporting structure is so built as to bring all the wheels at one side of the structure into proper alinement, they will not so remain, because portions of the foundations of said structure may yield, and very slight yielding at one side of the structure will move one of the superposed pair of wheels, C, downward and move both sidewise. This sidewise movement will have the effect of moving one of said wheels away from the rotary frame and causing the other wheel to bear abnormally against the frame. Under this condition, a load within the frame will tend to bend the frame sidewise and downward. Even if the foundation does not yield, the members of the structure above the foundation will yield more or less by warping or expanding or contracting; and such yielding will cause the movement of a portion of the wheels out of position for making proper contact with the cylindrical frame.

Proper positioning for the wheels, C, may be had without placing the wheels at either side of the structure into axial alinement with each other. What is essential regarding such positioning is that the periphery or bearing face of every wheel makes contact with the adjacent rib when the ribs are on a common axial line. This, it will be observed, will permit a proper positioning of all of the wheels, although all of them are out of axial alinement with each other and although the ribs differ in diameter.

The foregoing is due to the fact that the wheels do not make contact with the ribs on horizontal lines which are tangential to the outer faces of the ribs. As already stated, the wheels are arranged in pairs, one wheel of every pair being at one side and the other at the other side of the supporting structure. Each rib rests on a pair of wheels and the wheels make contact with the exterior face of the rib on horizontal lines which form chords to the ring. If the two wheels of such pair are at exactly the same level, said horizontal lines will be identical. The outer face or tread of the ring crosses said horizontal lines, and said lines are parallel to the course of the movement of the bearing blocks, C^4. Hence the wheels, C, may be moved horizontally and parallel to said chord lines; and such movement will be toward or from the tread of the ring. Hence, if any wheel does not stand at the proper distance from the axis of the rotary frame, such proper distance may be attained not by moving said wheel toward or from said axis, but by moving said wheel on said chord line either toward or from the upright axial plane of the rotary frame.

Usually the rotary frame is so heavy and so large that it is necessary to construct it on the bed of rollers or wheels, C. The frame may have a length of as much as eighty or ninety feet or more. Prior to beginning such construction, the wheels at each side of what will become the upright axial plane of the frame are set into approximate alinement with each other. For the setting of any wheel, the top plate, C^8, at each side of said wheel is loosened by loosening the bolts, C^9, and the jam-nuts, C^{13}, are loosened to permit the turning of the set bolts, C^{12}. Then the set bolts and the bearing blocks, C^4, are shifted toward or from said plane and through the proper distance. Then, with the set bolts touching the bearing blocks, the jam-nuts are again turned forward until they bear firmly against the adjacent standard, C^7.

Then the ring-form ribs are set up on the wheels by which they are to be supported in the finished structure. Then the longitudinal members, A^4, and other parts are added until the frame is complete. When the frame has been completed, its track and the adjacent fixed track or tracks are brought into registry by such up and down or sidewise movement, or combinations of these movements, as may be necessary. Then the wheels between the ends of the frame are adjusted toward or from the upright axial plane of the frame until all the wheels bear upon the adjacent rings and the axes of all the rings coincide with the axial line of the frame. When these wheels have been thus accurately positioned, said frame, although it is long and flexible under its own weight, will be held straight even when it contains a trip of loaded cars.

If thereafter it is found that any of the wheels have changed their positions on account of warping or bending or expanding or contracting or settling of any portion of the supporting structure, said wheels are adjusted by moving them on their chord lines when there are no cars in said frame. In making such adjustment, it will at times be desirable to rotate or partially rotate the tubular frame, in order to compensate for variation in any rib from a true circle.

To effect the rotation of the rotary frame for the discharge of the loads from the cars, any desired means may be used. Since such means are already known in this art, I omit illustration and description thereof.

I claim as my invention,

1. In an apparatus of the nature described, the combination of an approximately hori-

zontal, flexible, tubular frame comprising means located within said frame for guiding a car into said frame and supporting it while said frame is being turned on its axis, a supporting structure, and wheels on said structure and engaging said frame at opposite sides of the upright axial plane of said frame and each having an axle which is horizontal and parallel to said frame, a bearing block surrounding each end of said axle, a chair for each of said bearing blocks, said chair and said bearing block being formed for interengagement of said members to permit sliding of the bearing block horizontally toward and from said plane and each of said chairs comprising a top plate extending across the adjacent bearing block and bolts engaging said top plate whereby said top plate may be forced downward to bind the adjacent bearing block and whereby said top plate may be released sufficiently to permit the sliding of the bearing block, and means adapted to engage the chair and the bearing block for moving said block when it is not held by the top plate, substantially as described.

2. In an apparatus of the nature described, the combination of an approximately horizontal flexible tubular frame comprising ring-form ribs and means located within said frame for guiding a car into said frame and supporting it while said frame is being turned on its axis, a supporting structure, and wheels on said structure and engaging said ribs at opposite sides of the upright axial plane of said tubular frame and each having an axle which is horizontal and parallel to said frame, a bearing block surrounding each end of said axle, a chair for each of said bearing blocks, said chair and said bearing block being formed for inter-engagement of said members to permit sliding of the bearing block horizontally toward and from said plane and each of said chairs comprising a top plate extending across the adjacent bearing block and bolts engaging said top plate whereby said top plate may be forced downward to bind the adjacent bearing block and whereby said top plate may be released sufficiently to permit the sliding of the bearing block, and means adapted to engage the chair and the bearing block for moving said block when it is not held by the top plate, substantially as described.

3. In an apparatus of the nature described, the combination of an approximately horizontal, flexible, tubular frame comprising means located within said frame for guiding a car into said frame and supporting it while said frame is being turned on its axis, a supporting structure, pairs of blocks on said structure, wheels on said blocks and engaging said frame at opposite sides of the upright axial plane of said tubular frame and each having an axle which is horizontal and parallel to said frame, a bearing block surrounding each end of said axle, a chair for each of said bearing blocks, said chair and said bearing block being formed for inter-engagement of said members to permit sliding of the bearing block horizontally toward and from said plane and each of said chairs comprising a top plate extending across the adjacent bearing block and bolts engaging said top plate whereby said top plate may be forced downward to bind the adjacent bearing block and whereby said top plate may be released sufficiently to permit the sliding of the bearing block, and means adapted to engage the chair and the bearing block for moving said block when it is not held by the top plate, substantially as described.

4. In an apparatus of the nature described, the combination of an approximately horizontal, flexible, tubular frame comprising means located within said frame for guiding a car into said frame and supporting it while said frame is being turned on its axis, a supporting structure, chairs on said structure at opposite sides of the upright axial plane of said tubular frame, and wheels supported by said chairs and engaging said frame and each having an axle which is horizontal and parallel to said frame, a bearing block surrounding each end of said axle, a chair for each of said bearing blocks, said chair and said bearing block being formed for inter-engagement of said members to permit sliding of the bearing block horizontally toward and from said plane and each of said chairs comprising a top plate extending across the adjacent bearing block and bolts engaging said top plate whereby said top plate may be forced downward to bind the adjacent bearing block and whereby said top plate may be released sufficiently to permit the sliding of the bearing block, and means adapted to engage the chair and the bearing block for moving said block when it is not held by the top plate, substantially as described.

In testimony whereof I have signed my name this second (2nd) day of September, in the year one thousand nine hundred and sixteen.

ALEXANDER HAMILTON WOOD.