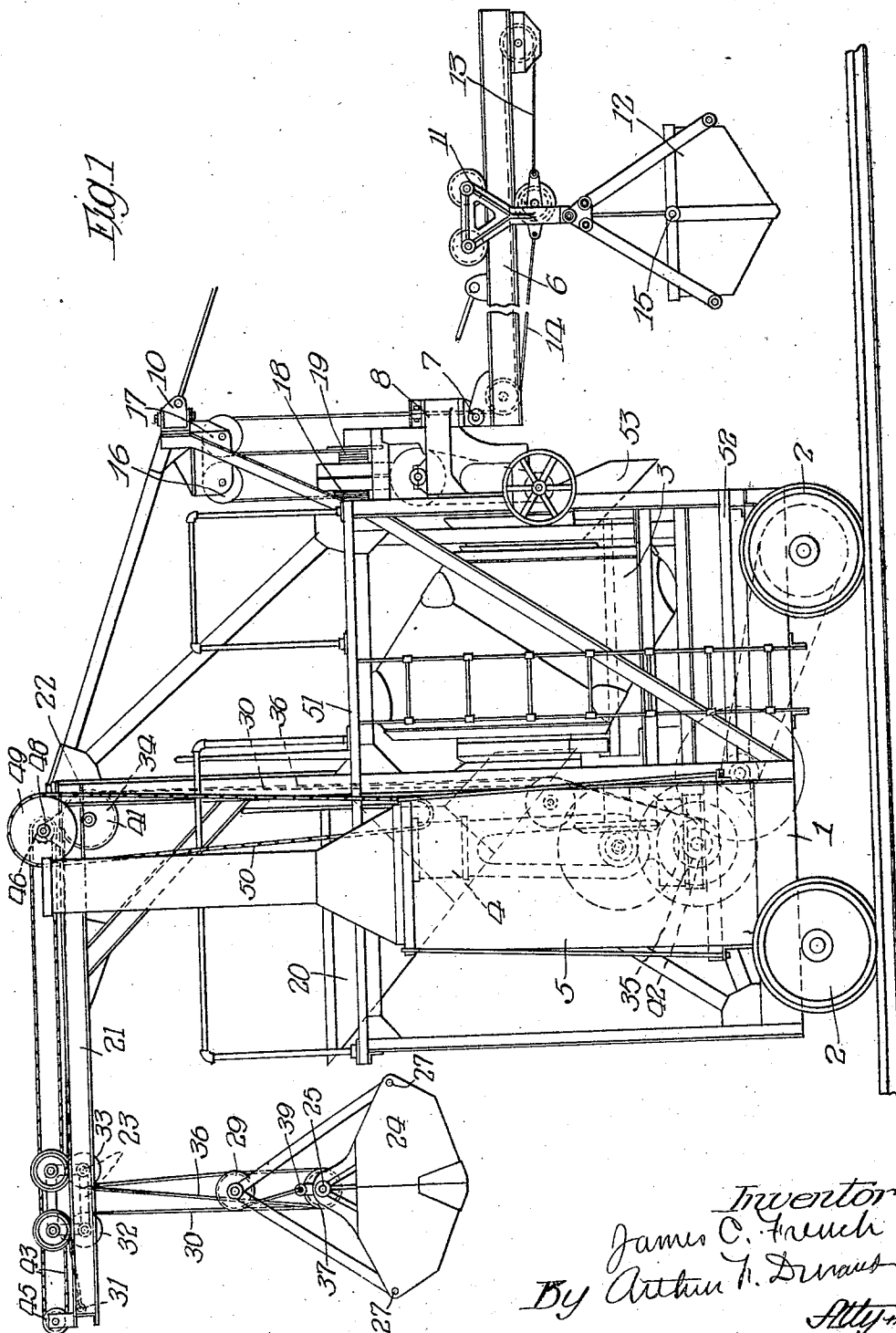


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PORTABLE MIXING PLANT.
APPLICATION FILED MAR. 7, 1918.

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Patented May 30, 1922.

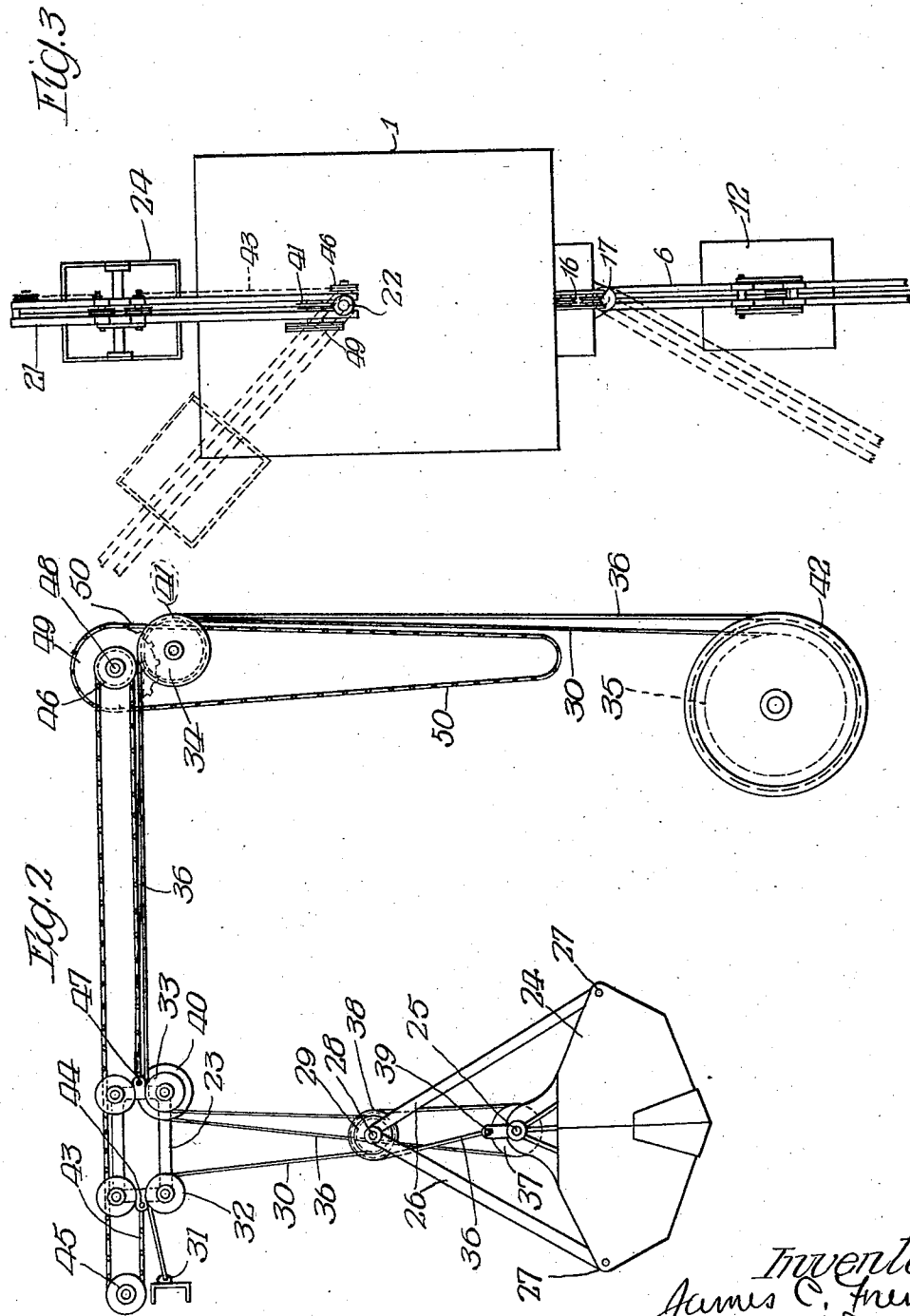
2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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PORTABLE MIXING PLANT.

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Specification of Letters Patent.

Patented May 30, 1922.

Application filed March 7, 1918. Serial No. 220,897.

To all whom it may concern:

Be it known that I, JAMES C. FRENCH, a citizen of the United States of America, and resident of Chicago, county of Cook and State of Illinois, have invented a certain new and useful Improvement in Portable Mixing Plants, of which the following is a specification.

This invention relates to machines for mixing concrete or other materials to be used in paving streets, and more particularly to portable mixing plants of that kind in which means are provided for carrying the mixture from the mixing machine to the desired place on the street.

Generally stated, the object of the invention is to provide novel and improved means for delivering the materials to the mixing machine, in combination with suitable means for receiving the mixture from the mixing machine and carrying the same to the desired place on the street, whereby the necessary materials can be lifted from the ground at either side of the mixing plant, or from the rear thereof, converted into the required mixture, and then delivered to the street at either side of the paving plant, or at a point directly in front thereof, thus enabling the body of the mixing plant which carries the mixture to occupy practically any position while in operation, and whereby the general operation of delivering the materials to the mixer and conveying the mixture from the mixing machine to the street is greatly facilitated.

It is also an object to provide certain details and features of construction and combinations tending to increase the general efficiency and desirability of a portable mixing plant of this particular construction.

To the foregoing and other useful ends, the invention consists in matters hereinafter set forth and claimed, and illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a portable mixing plant for street-paving purposes, embodying the principles of the invention, showing a portion of the apparatus broken away for convenience of illustration.

Figure 2 is a diagram of the hoisting apparatus by which the materials are lifted up and delivered to the hopper of the mixer.

Figure 3 is a diagrammatic plan view of the entire portable paving plant, illustrating the operation and range of movement of the

apparatus for hoisting the materials from the street, and of the operation and range of movement of the means by which the mixture is delivered to the street.

As thus illustrated, the invention comprises a body 1 mounted on wheels 2 which may travel on a track which is advanced from time to time in the direction in which the paving operation is progressing, or which may be adapted to travel directly on the ground, depending upon the circumstances and requirements of the work. On this body a rotary mixer 3 is mounted, of any suitable character, and operated by the engine 4 which is also of suitable character and supplied with steam from the boiler 5, the power-transmitting connections between the mixer and the engine being controlled in any suitable manner. It will also be understood that one or more of the wheels 2 can be connected with said engine, so that power may be employed for moving the machine along the track or along the street.

The apparatus for conveying the mixture from the mixer is as follows:—A horizontally disposed boom or runway 6 is pivoted at 7 to swing up and down, on the lower end of a swivel 8, which latter is suitably supported on the body frame of the machine. With this arrangement, the boom can swing laterally about the vertical axis provided by the swivel 8, having its outer end supported by a brace 9 suitably connected to the body frame at 10, whereby this boom or runway can extend laterally or forward in any direction. A wheeled carriage 11 travels on said boom or runway and supports the bucket 12, which latter can be of any suitable character, being operated by the pulling-out cable 13, when it is desired to pull the load to the outer end of the boom, and being returned by the pulling-in cable 14, which latter also controls the dumping operation of the bucket in any suitable or desired manner. As shown, the bucket is of the clam-shell type, the two sections being pivoted together at 15, and suitable mechanism (not shown) being provided for releasing the bucket and allowing the two sections thereof to separate when the initial pull is exerted on the pulling-in rope 14, after the bucket has traveled outward and reached the desired place of discharge. The two ropes or cables are suitably arranged to extend upward through the swivel 8 and

over the sheaves 16 and 17 and then downward to the drums 18 and 19, the latter being operated by the engine through the medium of any suitable power-transmitting connection, as by being gear-connected to the rotary mixer, and controlled in any suitable manner to operate the two ropes or cables at will. In this way, the mixture can be taken from the mixer and delivered to the street in practically any direction, in a manner that will be readily understood.

In order that the machine may not be required to stand in any particular position, and in order that the materials for the mixture will not have to be delivered at the same place each time, and with a view to facilitating the work and improving the operation of the mixing plant in various ways, apparatus is employed for hoisting the materials from the ground and delivering them to the hopper 20, as follows:—The rearwardly and horizontally extending boom or runway 21 swings on a vertical pivot or swivel 22 at the top of the body frame of the machine, and extends rearward directly over said hopper. A wheeled carriage 23 travels on said boom or runway 21 and has a bucket 24 suspended therefrom. This bucket can be of any suitable character, such as an ordinary clam-shell bucket, composed of two sections which are pivotally connected at 25, so that the two sections will separate to receive a load, will then close together to take up the load, and will thereafter separate to dump the load. The bucket is suspended by the links 26 pivoted to the bucket at 27, in the usual and well-known manner, and provided at their upper ends with a pivot 28 having the sheave 29 for the suspending line or cable 30, which latter is fastened at one end to the outer end of the boom at 31 and supported by the sheaves 32 and 33 on the carriage 23 which travels on the boom or runway. This hoisting or lifting cable 30 then extends to the sheave 34 on the body frame of the machine, and then downward to the drum 35 on the lower portion of said body frame, which drum may be operated and controlled in any suitable or desired manner. The bucket dumping line 36 extends downward around the sheave 37 on the axis of the pivot joint 25, then upward and around the sheave 38 on the axis of the pivot joint 28, and then downward to the point 39, where its end is fastened to the structure of the bucket. This line 36 then extends over the sheave 40 on the carriage 23, and then forward and over the sheave 41 on the body frame. (the sheaves 34 and 41 being arranged side by side) and then downward to the drum 42 below, which latter can be operated or controlled in any suitable or desired manner. With this arrangement, it will be seen that operation of the drums 35 and 42 will lift the bucket, and that the cable 36 will, by reason of its arrangement around the sheaves 37 and 38, close the two sections of the bucket together to pick up the load. On the other hand, after the bucket is raised, a backward rotation of the drum 42 and the resulting slack conditions of the line or cable 36 will allow the weight of the pivot joint 25 and the central portion of the bucket to move the sheave 37 downward, while the pivot joint 28 remains stationary, thus causing the two sections of the bucket to tilt away from each other and to dump the load into the hopper 20 previously described. Any suitable arrangement can be used for swinging the boom 21 from one side to the other, and with this arrangement the bucket 24 can descend at either side of the mixing plant, pick up a load, and then travel upwardly and forwardly on the boom until it is over the hopper 20, thus making it unnecessary to supply the materials for the mixture at any particular place on the ground, inasmuch as the bucket can descend anywhere within reach of the apparatus and pick up its load.

Any suitable means can be employed for causing the carriage 23 to travel back and forth on the boom or runway 21, and the latter can be of any suitable or desired length. As shown in the drawings, an operating chain 43 is fastened to the carriage 23 at 44 and then extends around a sheave 45 and then forward to the sheave 46 near the swiveled end of the boom, and then rearward again to the point 47 on the carriage 23, whereby the latter forms a connecting link between the two ends of this cable. The shaft 48 for the sheave or pulley 46 is also provided with a sprocket-wheel 49 and the latter is provided with a loose sprocket-chain 50 which hangs down within reach of the operator on the platform 51, which latter, it will be seen, extends over the mixer and around the hopper, whereby the operator or attendant can control the different instrumentalities. Another operator will stand on the platform 52, for the purpose of controlling the discharge of the materials for the mixer, and to control the bucket and the boom 6, whereby one operator will control the delivery of the materials to the mixer, and the other operator will control the delivery of the mixture from the mixer to the street.

With the foregoing arrangement, it will be seen that the materials can be dumped in one pile, or in different piles, around the rear end of the machine, or at either side thereof, or at any distance within limits at the rear of the machine, and that the bucket 24 can then be employed for raising the materials in the desired manner and for dumping them into the hopper 20 of the mixer. This is illustrated in Figure 3, from which

it will be seen that the boom 21 can swing to either side of the mixing plant to enable the bucket 24 to receive its load. After the mixing operation has been completed, the materials are then discharged from the spout 53 into the bucket 12 at the delivery side of the mixing plant. The boom or runway 6 can be swung around in any direction, and in this way the mixture can be discharged onto the street at either side of the mixing plant or in front thereof, as the work of paving progresses, in a manner that will be readily understood. The body 1, however, of the machine or mixing plant can stand in any position, practically, for the materials for the mixture do not have to be moved up to or dumped in any certain position at the rear of the machine or mixing plant, and after being transmitted through the mixer the materials forming the mixture can then be discharged onto the street at any point within the range of movement of the boom 6 upon which the delivery bucket is mounted to travel back and forth over the area of the street which is being paved.

As the carriage 23 forms a link in the belt 43, the latter is, therefore, practically endless, for through the carriage it forms an endless operating connection which is supported by wheels 45 and 46 and which can be controlled by rotation of one of said wheels, as explained, by means of the depending or dangling sprocket chain 5, or by any suitable means.

What I claim as my invention is:—

1. In a portable mixing plant for paving streets, the combination of a traveling body having a mixer mounted thereon, means for taking up a load of materials from either side or from a point in rear of the mixing plant and for delivering said materials to the mixer, having three separate and independent instrumentalities for (1) raising the load, (2) moving the load into position over the mixer, and (3) dumping the load, said instrumentalities including a manually operable controller and a separate endless belt operated thereby for moving said means either toward or away from the mixer, and an apparatus for delivering the mixture from the mixer to the street.

2. A structure as specified in claim 1, said apparatus comprising means whereby the mixture may be discharged at either side or directly in front of the mixing plant.

3. A structure as specified in claim 1, said means and instrumentalities comprising a hoisting bucket and a swinging boom on which said endless connection is supported, adapted for carrying said bucket around to either side of the mixing plant, and said

apparatus comprising a laterally swinging boom having a bucket thereon to carry the load from the mixer to the street, whereby the materials can be picked up at either side of the mixing plant or from a point in rear thereof and mixed and then delivered onto the street at either side of the mixing plant or at a point directly in front thereof.

4. A structure as specified in claim 1, said means and instrumentalities comprising a laterally swinging runway, a carriage to travel on said runway, said overhead endless connection being operable for moving said carriage back and forth on the runway, a clam-shell grab bucket, means for supporting the bucket on the carriage, and means for controlling the opening and closing movements of the bucket, said mixer having a hopper disposed below said runway.

5. In apparatus of the class described, the combination of a clam-shell grab bucket a carriage therefor, means whereby said bucket is movable sidewise about a vertical axis, separate means to raise and lower the bucket, separate means including a manually operated controller and an endless belt of which said carriage forms a link, to move the bucket horizontally toward and away from said axis, and separate means to control the opening and closing action of the bucket.

6. A structure as specified in claim 5, said means for moving the bucket horizontally comprising a traveling carriage forming a link in said belt, a flexible connection arranged to pull said carriage back and forth, and single hand-operated means for operating said flexible connection, in both directions.

7. In apparatus of the class described, the combination of a runway, a carriage on said runway, and endless belt carried on said runway to operate said carriage, a bucket supported on said carriage, means separate from said endless belt for raising and lowering said bucket, wheels on said runway to support said belt, and manually controlled means for rotating one of said wheels, whereby to operate said belt.

8. A structure as specified in claim 7, said runway being mounted to swing laterally.

9. A structure as specified in claim 7, said means comprising an endless belt which hangs within reach of the operator or attendant, and a sprocket wheel operable by said hanging belt and operatively connected with said carriage operating belt.

Signed by me at Chicago, Cook County, Illinois, this 12th day of February, 1918.

JAMES C. FRENCH.