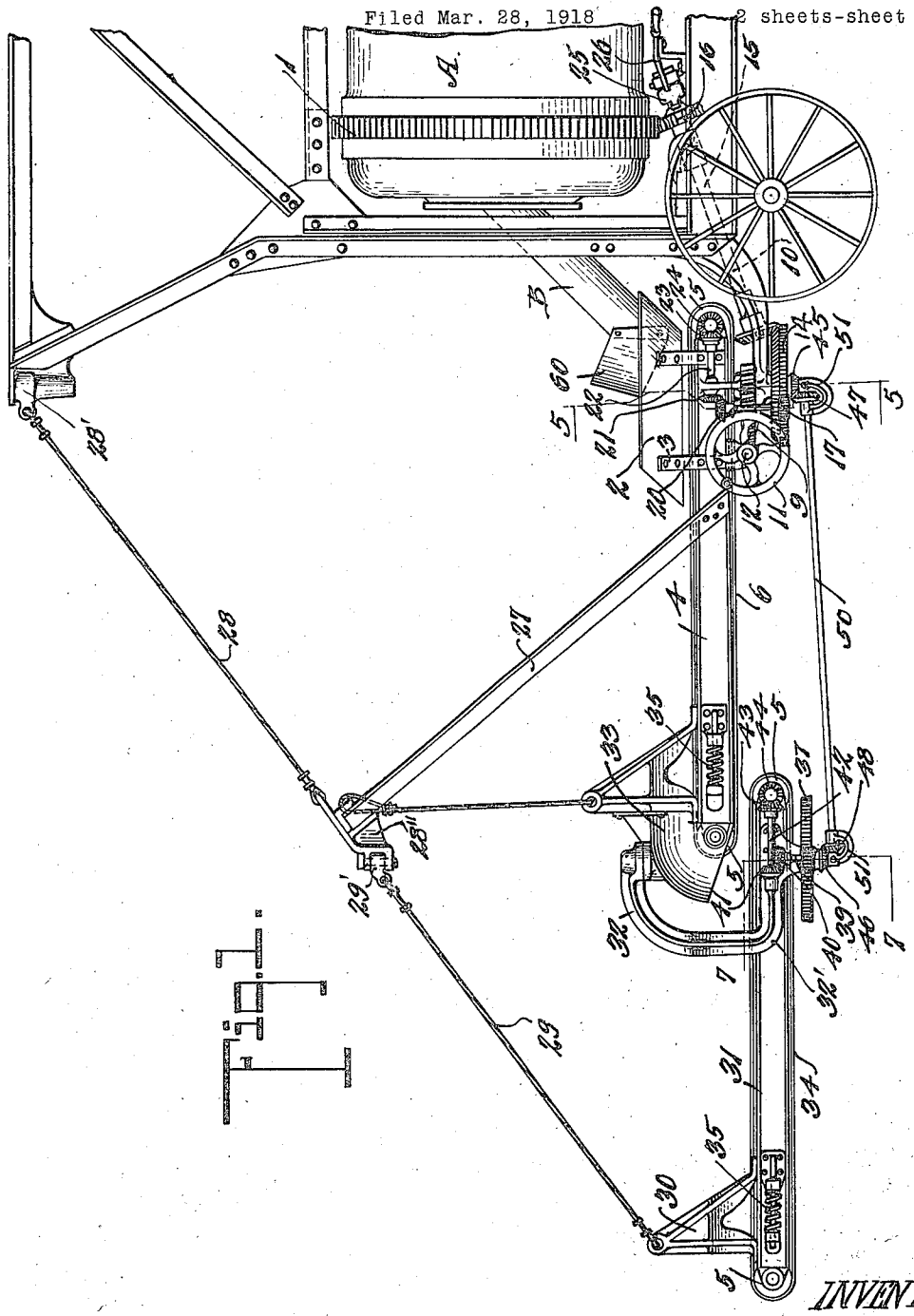
Feb. 20, 1923. 1,446,124

E. H. LICHTENBERG

CONCRETE DISTRIBUTING MACHINE

Filed Mar. 28, 1918 2 sheets-sheet 1



WITNESS:
E. H. Wagner.

INVENTOR
E. H. Lichtenberg
BY Robb & Robb
ATTORNEYS

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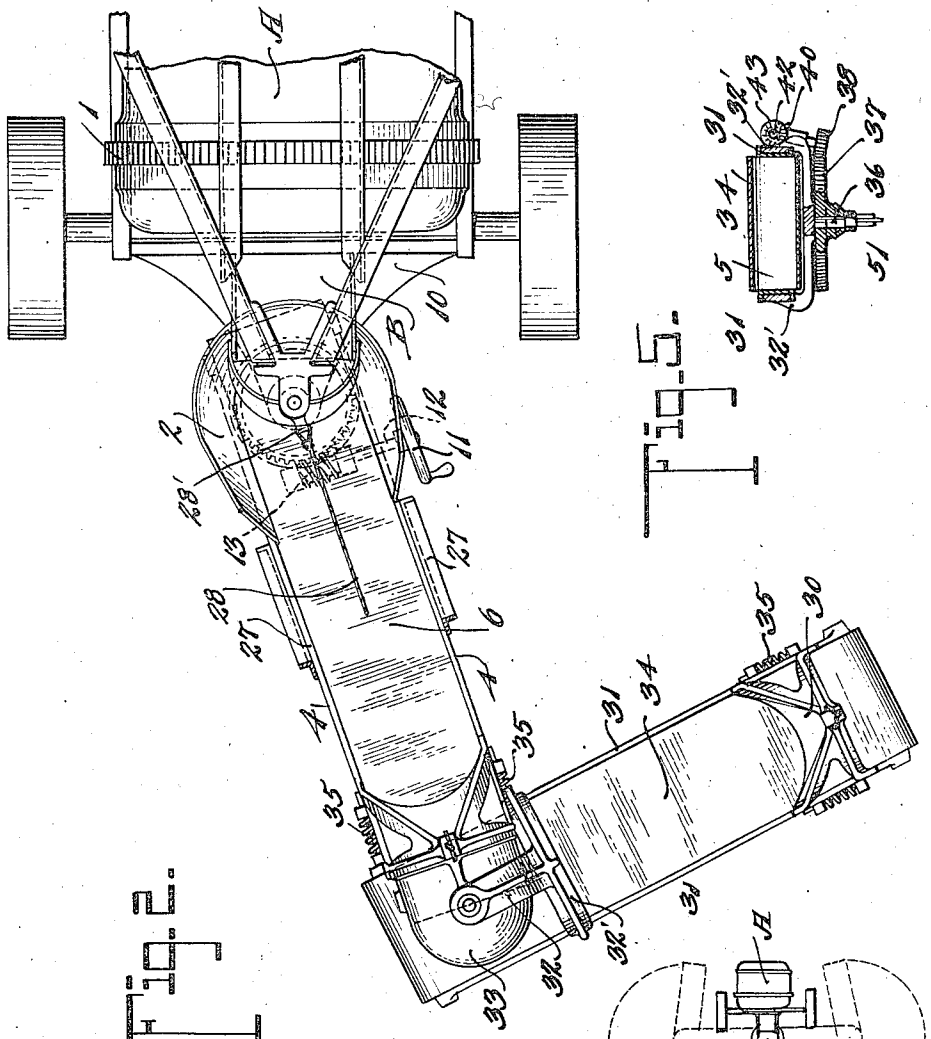

Fig. 2.

Fig. 5.

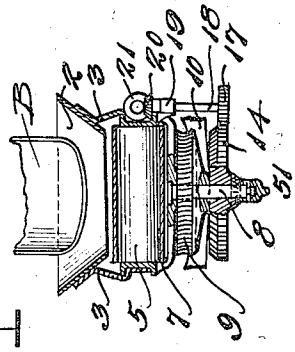

Fig. 3.

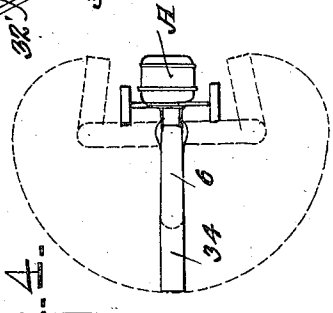

Fig. 4.

WITNESS:
E. H. Wagner.

INVENTOR
E. H. Lichtenberg
BY Potts & Potts
ATTORNEYS

Patented Feb. 20, 1923. 1,446,124

UNITED STATES PATENT OFFICE.

ERICH H. LICHTENBERG, OF MILWAUKEE, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO KOEHRING COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

CONCRETE-DISTRIBUTING MACHINE.

Application filed March 28, 1918. Serial No. 225,253.

To all whom it may concern:

Be it known that I, ERICH H. LICHTENBERG, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Concrete-Distributing Machines, of which the following is a specification.

This invention has to do with machines designed for use in connection with portable concrete plants for facilitating the distribution of mixed concrete aggregates over areas to be paved with the mixed materials. Machines for the purpose stated have come into use largely for the paving of roads, streets and alleys and their advantages from the viewpoints of time and labor saved are too well known to require special mention, as respects the types of machine known as boom and bucket and chute distributers.

The improvements hereof embody primarily a novel type of endless belt distributer attachment for concrete mixing machines. Such attachments, broadly speaking, have been heretofore proposed but have never gone into general use because not adapted to economically handle the concrete aggregates by efficiently conveying these aggregates to the point of deposit, without disturbing the required condition of the mixer; also such of these machines as heretofore proposed have not been so constructed as to afford any great flexibility of action as regards the capability of varying the point of deposit of the distributer to conform with actual conditions of service.

The distributer of this invention is of the endless type and is comprised of main and auxiliary distributing sections so arranged relatively as to carry the mixed materials from the relatively high point of discharge from the mixer, to the considerably lower point of deposit at the level of the grade being paved, without liability of materially affecting the homogeneousness of the mixed mass being distributed. Furthermore, the distributer of sectional form of this invention affords the important advantage of adjustability of its parts such that a wide radius of distributing action is obtained, and such that the distributer may be adjusted for a longer radius of action essentially necessary where the machine is being operated in close quarters, so to speak, as when paving narrow roads or alleys where obstructions are often located at opposite sides of the area upon which the concrete aggregates are being deposited.

The invention likewise involves other more specific phases of construction and operation having to do primarily with the supporting, driving and adjusting instrumentalities employed and all of which will be fully apparent upon reference to the following detailed description, supplemented by the accompanying drawings, in which:

Figure 1 is a side elevation of an endless belt distributer embodying the essential features of the invention and including an auxiliary section pivotally mounted upon the main section;

Figure 2 is a top plan view of the distributer of Figure 1, some parts omitted for the purpose of clearness and an angular adjustment of the distributing sections being illustrated;

Figure 3 is a sectional view taken about on the line 5—5 of Figure 1;

Figure 4 is a diagrammatic view illustrative of the range of adjustment of the sections of the distributer attachment shown in Figures 1 and 2; and

Figure 5 is a vertical sectional view approximately on the line 7—7 of Figure 1.

Throughout the following detail description, and on the several figures of the drawings, similar parts are referred to by like reference characters.

The distributing means of this invention is in the form of an attachment for concrete mixers. For this reason the construction of the distributer is especially devised with a view to extreme lightness, appropriate strength or rigidity and ease of operation so far as driving of distributing elements is concerned.

In the drawings A denotes a conventional type of concrete mixer, only partially illustrated, the drum of the mixer being equipped with the drive gear 1 forming a part of the means whereby the drum is driven or revolved from the power plant of the mixer, which plant is not illustrated. A discharge chute B leads off from the discharge end of the mixer drum and extends to a hopper 2 supported by brackets 3 attached to a boom 4. The boom 4 comprises spaced channels suitably connected together

to afford a rigid construction and having mounted thereon and therebetween at opposite ends rollers 5 about which the distributing belt 6 passes. The boom 4 is supported by a bracket 7 opposite sides of which are secured to the channels of the boom, said bracket extending from the sides of the boom beneath the same and having a trunnion 8 rigid therewith. On the trunnion 8 is a gear segment 9 integral with or rigidly secured to the trunnion. The trunnion 8 passes through a supporting bracket 10 rigidly attached to the frame or truck of the mixer A at a point beneath the chute B.

In the above manner the boom 4 is rotatively supported upon the bracket 10 by the trunnion 8. I utilize a hand wheel 11 on a shaft 12, equipped with a worm 13, for turning the boom, the worm 13 engaging the segment 9 for this purpose and the shaft 12 being supported by a bracket extending from one of the channels of the boom. The shaft 12 is preferably though not necessarily manually operated.

Below the portion of the trunnion 8 received by the bracket 10 there is loosely mounted upon the trunnion a combined bevel and spur gear 14. A drive shaft 15 is suitably supported on the truck of the mixing machine and has a bevel gear at its lower end engaging the bevel portion of the gear 14. At its upper end the shaft 15 has a bastard pinion 16 which meshes with the drive gear 1 on the drum of the mixer A. A small spur gear 17 meshes with the spur teeth of the gear 14 and is carried by a vertical shaft 18, see Figure 3, mounted in a bracket 19 depending from the boom. At the upper end of the shaft 18 is a bevel gear 20 meshing with a corresponding gear 21 of a horizontal shaft 22 carried by the inner end of the boom 4. A bevel gear 23 on the rear end of the shaft 18 meshes with a corresponding gear 24 on one end of the supporting shaft or axle of the innermost roller 5. By the train of gearing just described, motion is adapted to be transmitted from the gear 1 of the mixer A to the distributing belt 6 of the boom 4. The driving of the train of gearing, and therefore the belt 6, is controlled through the provision of a clutch member 25 operable by a lever 26 to operatively connect the bastard pinion 16, normally loose on the shaft 15, with said shaft. This clutch is conventional and may take one of many customary forms.

Extending diagonally upwardly and outwardly from the boom 4 is a brace 27 the upper end of which is connected by a guy wire 28 with the upper portion of the framework of the mixer. The brace 27 has a bracket 28'' at its upper end connected by a guy wire 29 with a bracket 30 on the outer end of an auxiliary boom 31 which is supported by the main boom 4. The connection between the booms 4 and 31 comprises the swinging bracket 32 pivotally supported at its upper portion upon a hood or casing 33 which is carried by the outer end of the boom 4. The bracket 32 extends downwardly and has divergent arms 32' projecting at opposite sides of the boom 31, the latter not being specifically described because it is comprised of parts substantially corresponding with the parts of the main boom 4. The boom 31 carries the auxiliary distributing belt 34 and in respect to the belts of both booms described, the outer rollers 5 are acted upon in a yielding manner by reason of the provision of springs 35 coacting with movable arms on which the outer rollers are directly journaled at the outer ends of the booms. The springs 35 tend to keep the belts 6 and 34 taut.

The divergent arms 32' of the bracket 32 are rigidly attached to opposite sides of the boom 31, and one of the arms 32' is extended downwards and provided with a trunnion 36 supporting a large spur gear 37. With this gear there meshes a gear 38 on a vertical shaft 39 having at its upper end a bevel gear 40. The gear 40 meshes with a corresponding gear 41 on a horizontal shaft 42 having a second bevel gear 43 meshing with a similar gear 44 on one end of the axle which supports the innermost roller 5 of the auxiliary distributing boom 31. Rigid with the gears 14 and 37 at the inner ends of the respective booms 4 and 31 are the bevel pinions 45 and 46 respectively. These pinions are in mesh with the pinions 47 and 48 respectively on opposite ends of a transmitting shaft 50. The shaft 50 is supported in bearings of curved brackets 51 which are secured to the lower ends of the trunnions 8 and 36.

It will be apparent, therefore, that motion is not only transmitted from the shaft 15 to the belt 6 of the inner main distributing boom 4, but to the belt 34 of the auxiliary outer distributor boom 31. Furthermore, the driving of the said belts is maintainable notwithstanding a shifting of the position of the boom 4 through the operation of the manual device 11, and a shifting of the boom 31 by pushing the same to any desired angular adjustment relatively to the boom 4, the range of adjustment of the booms being apparent on reference to Figure 2. The guy member 29 supporting the outer end of the boom 31 is attached in a pivotal or swivel manner to the bracket 28'' by the pivoted hanger 29' seen best in Figure 1, the axis of said hanger being coincident with the axis of the bracket 32 for obvious reasons. A similar hanger 28' connects the guy member 28 with the main frame of the mixing machine and is likewise coaxial with the boom 4

As seen in Figure 1, I preferably provide a guard 60 at the lower end of the chute B and above the hopper 2 to somewhat confine the mixed materials as they pass from the chute to the hopper, thus affording a somewhat enclosed receptacle-like space receiving the materials preliminary to their actual carrying off by the belt 6.

Obviously the arrangement of the distributing belts of the booms or sections of the distributer of this invention and mode of discharging the materials on said belts, affords a gradual lowering of the materials from the point of discharge from the mixer to the point of deposit; the condition of the materials therefore when laid in the paving operation is practically unchanged as compared with the condition in which they leave the mixer. A nicety of control of the operation of the distributing means is also obtained by the driving of the distributing belts from the boom of the mixer A. The load of driving the distributer may therefore be discontinued during the mixing operation should this be desired.

Having thus described my invention, what I claim as new is:

1. In a concrete distributing machine, the combination of supporting frame work, distributing mechanism thereon comprising a main horizontally swinging boom, an auxiliary horizontally swinging boom carried by the main boom, brace means intermediate the booms and intermediate the booms and said supporting frame work comprising a brace extending upwardly and outwardly from the main boom to a point above the outer end of the latter, a guy member connecting the upper end of said brace with the outer end of the auxiliary boom, and a second guy member connecting the upper end of said brace with the frame work aforesaid, and conveying devices carried by the booms, that of the auxiliary boom adapted to receive materials from that of the main boom.

2. In a concrete distributing machine, the combination of supporting frame work, distributing mechanism thereon comprising a main horizontally swinging boom, an auxiliary horizontally swinging boom carried by the main boom, brace means intermediate the booms and intermediate the booms and said supporting frame work comprising a brace extending upwardly and outwardly from the main boom to a point above the outer end of the latter, a guy member connecting the upper end of said brace with the outer end of the auxiliary boom, a second guy member connecting the upper end of the brace with the upper portion of the frame work aforesaid, hangers pivoted to the upper portion of the frame work and to the upper end of the brace and having the upper and lower guy members aforesaid attached thereto, a connection between the upper end of the brace and the outer end of the main boom, a pivotal connection between the frame work and the main boom permitting the swinging movement of said boom, a pivotal connection between the main boom and the auxiliary boom permitting swinging movement of the latter, said pivotal connections being beneath the upper and lower hangers respectively, and conveying devices carried by the main and auxiliary booms, one conveying device adapted to supply materials to the other.

3. In a concrete distributing machine, the combination of supporting frame work, main and auxiliary booms carried by said frame work, adjacent ends of said booms being superposed, distributing devices carried by the booms for conveying materials to the outer end of the auxiliary boom, a hood on the outer end of the main boom above the inner end of the auxiliary boom, a bracket pivotally mounted on said hood and extending downwardly and having bifurcated portions attached to opposite sides of the auxiliary boom, a bracket projecting from the frame work and on which the inner end of the main boom is journaled, gears attached to the main boom and auxiliary boom and coaxial with the swinging pivotal points of said booms, driving connections between said gears, a train of gearing connecting each gear for driving the distributing device carried by the boom to which said gear is attached, and mechanism for driving the gear of the main boom and thereby communicating driving action to the gear of the auxiliary boom.

In testimony whereof I affix my signature.

ERICH H. LICHTENBERG.