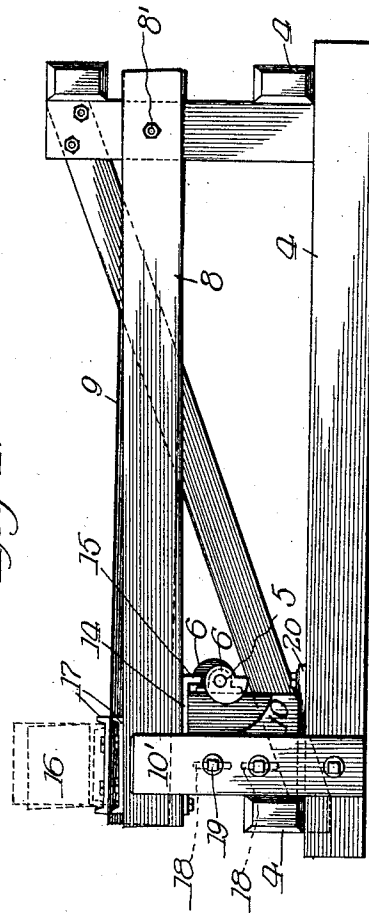
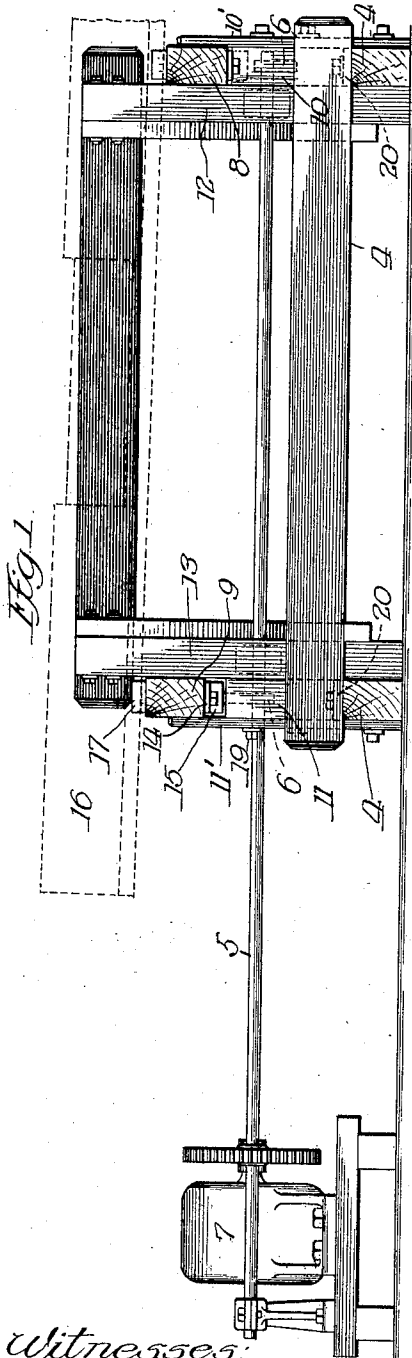


A. J. BATES.
METHOD OF TREATING CONCRETE MIXTURES.
APPLICATION FILED DEC. 1, 1911.

1,062,949.

Patented May 27, 1913.

2 SHEETS—SHEET 1.



Witnesses:
Geo. O. Linnow
M. A. Kiddle

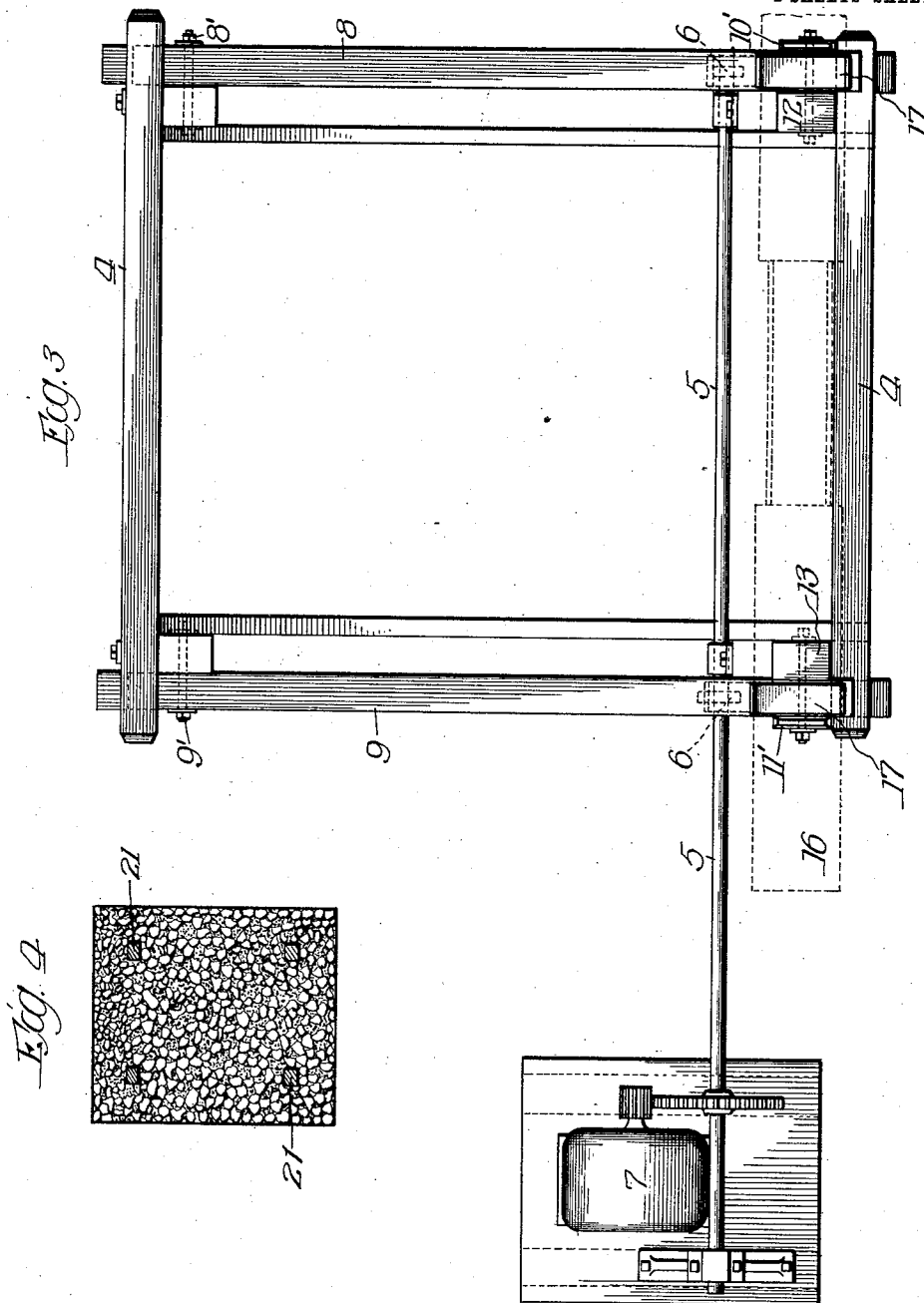
Inventor:
Albert J. Bates
By Linthicum Bell & Fuller
Attys.

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Geo. C. Duncanson
M. A. Kiddie

Inventor:
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UNITED STATES PATENT OFFICE.

ALBERT J. BATES, OF CHICAGO, ILLINOIS.

METHOD OF TREATING CONCRETE MIXTURES.

1,062,949.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed December 1, 1911. Serial No. 663,296.

To all whom it may concern:

Be it known that I, ALBERT J. BATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Methods of Treating Concrete Mixtures, of which the following is a specification.

This invention relates to an improved method of mixing concrete in molds for making railway ties or other articles and its object is to produce a solid mass of stone aggregate with all the voids completely filled with cement mortar.

A further object of the invention is to reduce the cost of manufacture of molded concrete articles, such as railway ties, by precipitating the stone aggregate of the concrete into a solid mass with the voids between the stones filled with cement mortar, thereby increasing the volume of stone aggregate and correspondingly decreasing the volume of cement mortar.

My invention contemplates jarring the mold in a violent and peculiar manner and at the same time imparting a slushing movement of the mortar both lengthwise and sideways of the mold, whereby the stone aggregate is caused to settle into place in a compact mass and the cement mortar is caused to fill the voids between the stones and to be pushed up by the stones until any surplus mortar will run over the edges of the mold.

My invention may be carried out by various means as, for example, by the jogger machine which forms the subject of a concurrent application and is illustrated in the accompanying drawings, referring to which—

Figure 1 is a front elevation of the jogger showing in broken lines a railway tie mold mounted thereon. Fig. 2 is an end elevation of the jogger. Fig. 3 is a top plan view. Fig. 4 is a cross sectional view of a railway tie showing the disposition of the stone aggregate and the cement mortar therein.

The jogger comprises a frame 4 in which is mounted a cam shaft 5 carrying cams 6 and driven by a motor 7. Two oscillating arms 8, 9, are pivotally mounted at the rear end of the main frame on pivot pins 8', 9', and these arms project forwardly to engage the upper ends of the posts 10, 11, being guided between the posts 12, 13, and the plates 10', 11', fastened to the posts 12,

13, and the frame. On the underside of each of the oscillating arms, near the forward end thereof, plates 14 are fastened and each of these plates has a downwardly extending projection 15 at its rear end. The cams 6 are fastened on a drive shaft 5 so that when the high point of one cam is up the high point of the other cam will be down and these cams are arranged to engage the projections 15 on the plates 14.

The mold 16, which may be of any suitable size and shape for making any desired article, is rested in suitable guide plates 17 on the oscillating arms 8, 9, at the forward ends thereof, and it may be filled with the concrete mixture before or after it is placed in position on the jogger.

In practice, the cams engage the projections 15 and raise and lower the arms 8, 9, alternately, thereby imparting an oscillating movement to the arms. When the high point of the cam passes beyond the projection 15 the arm falls until it engages the post, thereby imparting a violent jar to the mold, especially at that part thereof immediately above the arm which falls. This is repeated in rapid succession, first at one end of the mold and then at the other end and I have found that good results are obtained by driving the shaft at the rate of two hundred revolutions per minute, thereby imparting four hundred jars per minute to the mold. This violent jarring of the mold causes the stone aggregate therein to settle in a compact mass with the mortar intimately distributed throughout the mass. It will be observed that during the jarring movement of the mold it is also subjected to an endwise and a sidewise oscillation, as indicated in broken lines in Fig. 2, and this double oscillation causes the mortar to slush endwise and sidewise of the mold whereby it is thoroughly distributed through the mass of stone and completely fills all the voids between the stones. The jarring causes the stone aggregate to precipitate through the mortar until it comes in contact either with the bottom of the mold or with stone which has already reached a fixed position in the mold. This movement of the stone displaces its equivalent in volume of the mortar and the latter rises in the mold until finally the mold is filled with stone and all the voids are filled with mortar. The jarring also breaks any air bubbles which may exist in

the concrete and forces the air to escape upwardly through the mortar to the atmosphere.

My improved method consists essentially in violently jarring the mold first at one end and then at the other in rapid succession to precipitate the stone aggregate, and at the same time imparting a slushing movement to the cement lengthwise and sidewise within the mold to cause the cement to thoroughly and completely fill all the voids between the stones. The jarring movement causes the stones to settle into a compact mass, at the same time pushing the cement upward, and the slushing movement causes the cement to thoroughly fill the voids between the stones, the surplus cement rising to the top of the mold and flowing over the edges thereof. This method produces a molded concrete article of strong and substantial character in which the stone aggregate is compacted in a solid mass, the stones being thoroughly coated with the cement mortar and the voids between the stones being completely filled with the cement mortar. This compact mass of stone aggregate materially lessens the volume of cement mortar required and correspondingly decreases the cost of manufacture.

The posts 10, 11, may be adjusted vertically to vary the limit of the downward movement of the arms 8, 9, and thereby control the degree of the jar imparted to the mold and its contents. For this purpose slots 18 are provided in the posts 10, 11, to accommodate the bolts 19 which fasten the plates 10', 11' to the posts 12, 13, and shims 20 of various sizes are placed on the frame beneath the posts 10, 11. Thus the posts 10, 11, can be moved vertically and relatively to the posts 12, 13 and the plates 10', 11' and the shims will sustain the posts 10, 11 in their adjusted position.

The cross sectional view of the railway tie in the mold illustrated in Fig. 4 shows the disposition of the stone aggregate and the mortar in the completed tie which is molded upside down in the mold so that the upper face of the tie while in the mold becomes the lower face of the tie in use and consequently any roughness which may be present on this face of the tie will not be objection-

able but rather an advantage in seating itself in the roadbed. These ties may be provided with reinforcements of various kinds which need not be more specifically referred to and are indicated generally at 21.

I claim:

1. The method of treating concrete mixtures, which consists in placing the same in a mold and imparting an arcuate movement simultaneously to the ends of the mold about a common axis of oscillation which is substantially parallel to the longitudinal axis of the mold when the same is in normal position, whereby the mixture is subjected to a slushing action from end to end and from side to side of the mold.

2. The method of treating concrete mixtures, which consists in placing the same in a mold and alternately elevating the ends of the mold in an arcuate path about a common axis of oscillation which is substantially parallel to the longitudinal axis of the mold when the same is in normal position, and alternately dropping the said ends from elevated position, whereby the mixture is subjected simultaneously to a slushing action from end to end and from side to side of a mold and to a succession of violent bodily jars.

3. The method of treating concrete mixtures which consists in placing the same in a mold and simultaneously imparting an arcuate movement to the ends of the mold alternately in opposite directions about a common axis of oscillation, whereby the mixture is subjected to a slushing action from end to end and from side to side of the mold.

4. The method of treating concrete mixtures which consists in placing the same in a mold and simultaneously imparting an arcuate movement to the ends of the mold alternately in opposite directions and subjecting the said mold to a series of violent bodily jars, whereby the mixture is kept continuously agitated and is subjected to a slushing action from end to end and from side to side of the mold.

ALBERT J. BATES.

Witnesses:

M. A. KIDDIE,
H. BODE.