(No Model.) 2 Sheets—Sheet 1.

W. S. HOTCHKINS.

CONCRETE MIXING MACHINE.

No. 467,170. Patented Jan. 19, 1892.

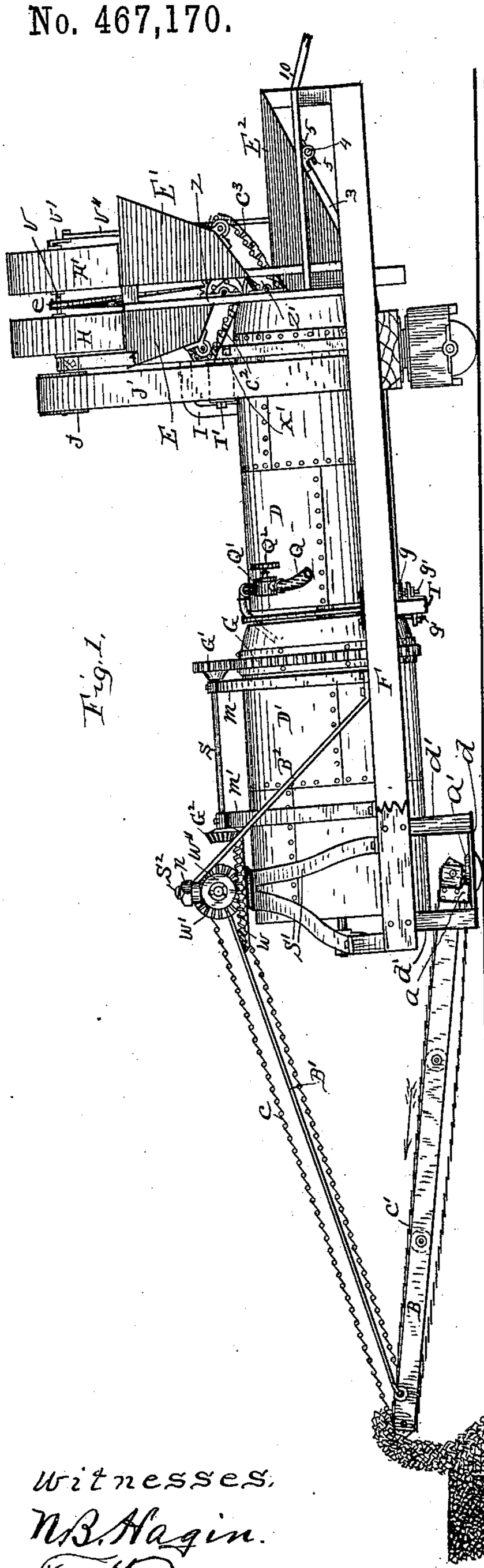

Fig. 1.

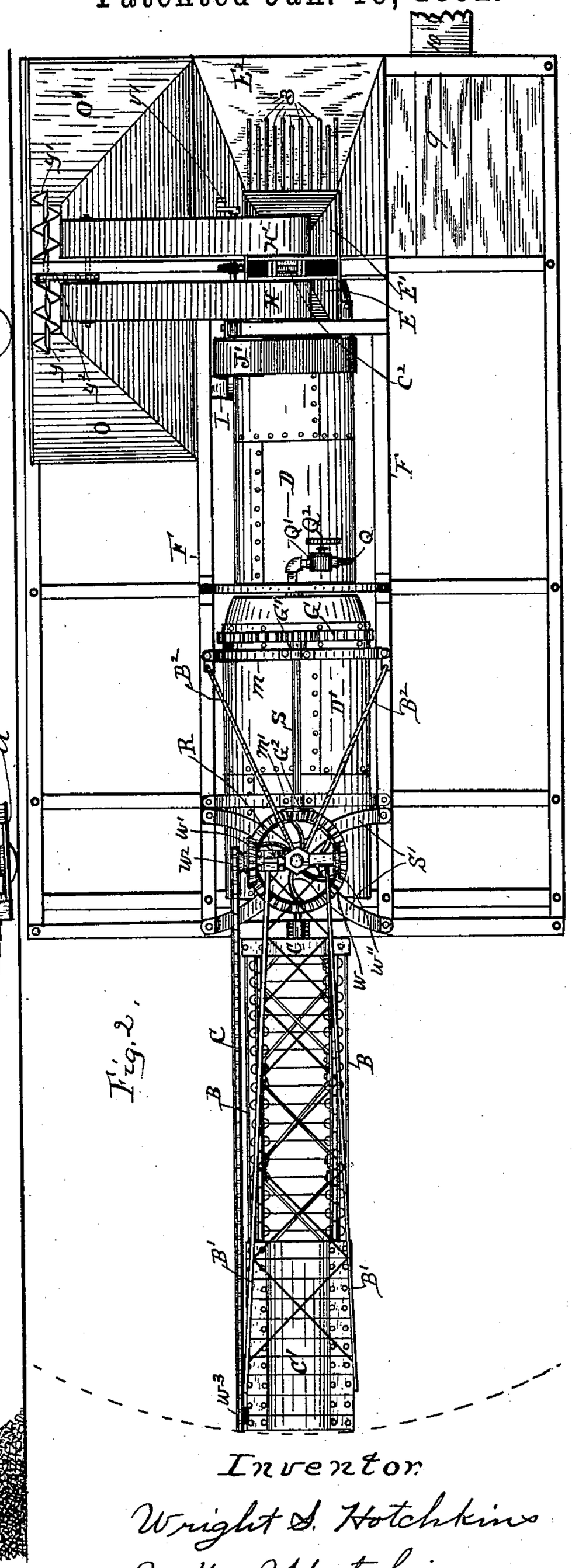

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 7.

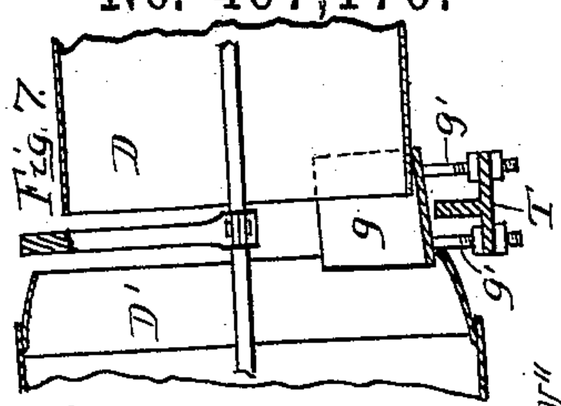


Fig. 6.

Fig. 12.

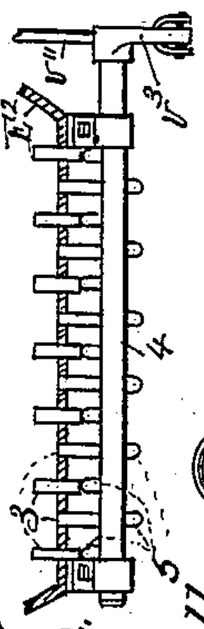


Fig. 11.

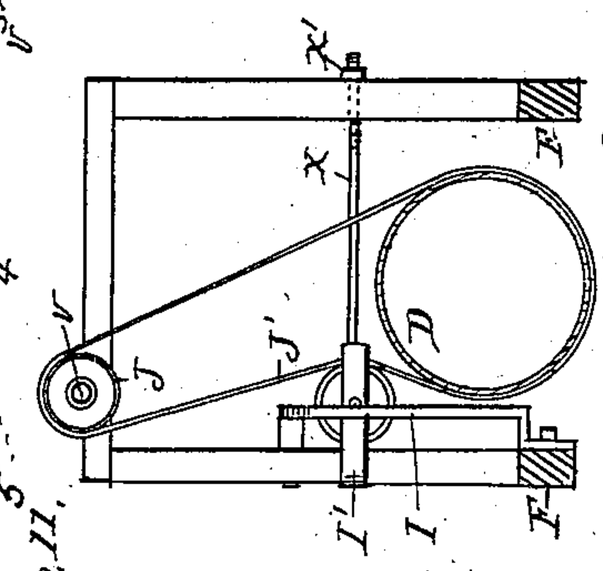


Fig. 13.

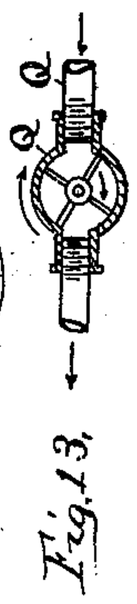


Fig. 10.

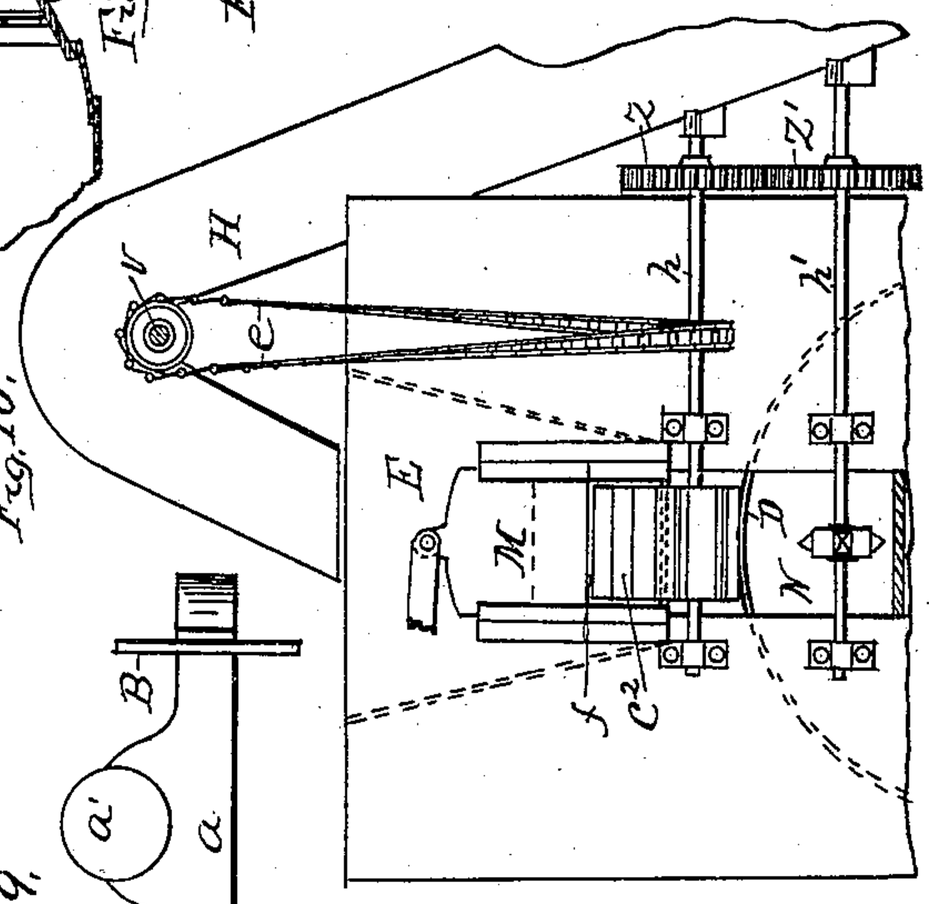


Fig. 4.

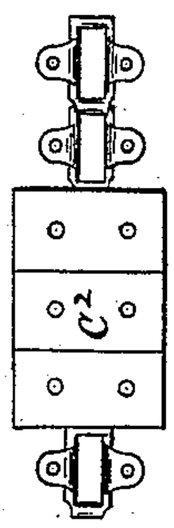


Fig. 5.

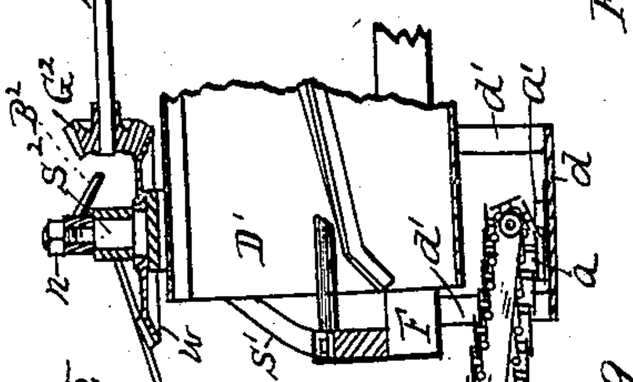


Fig. 9.

Fig. 3

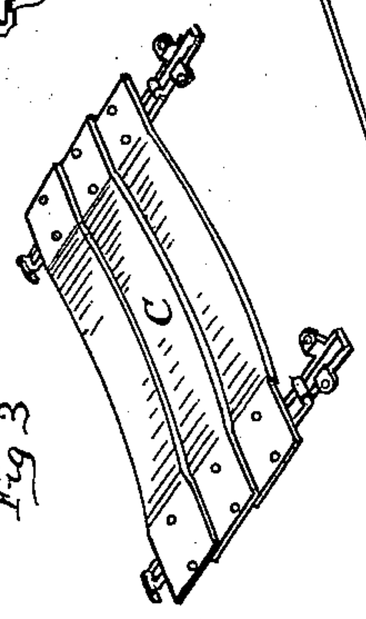
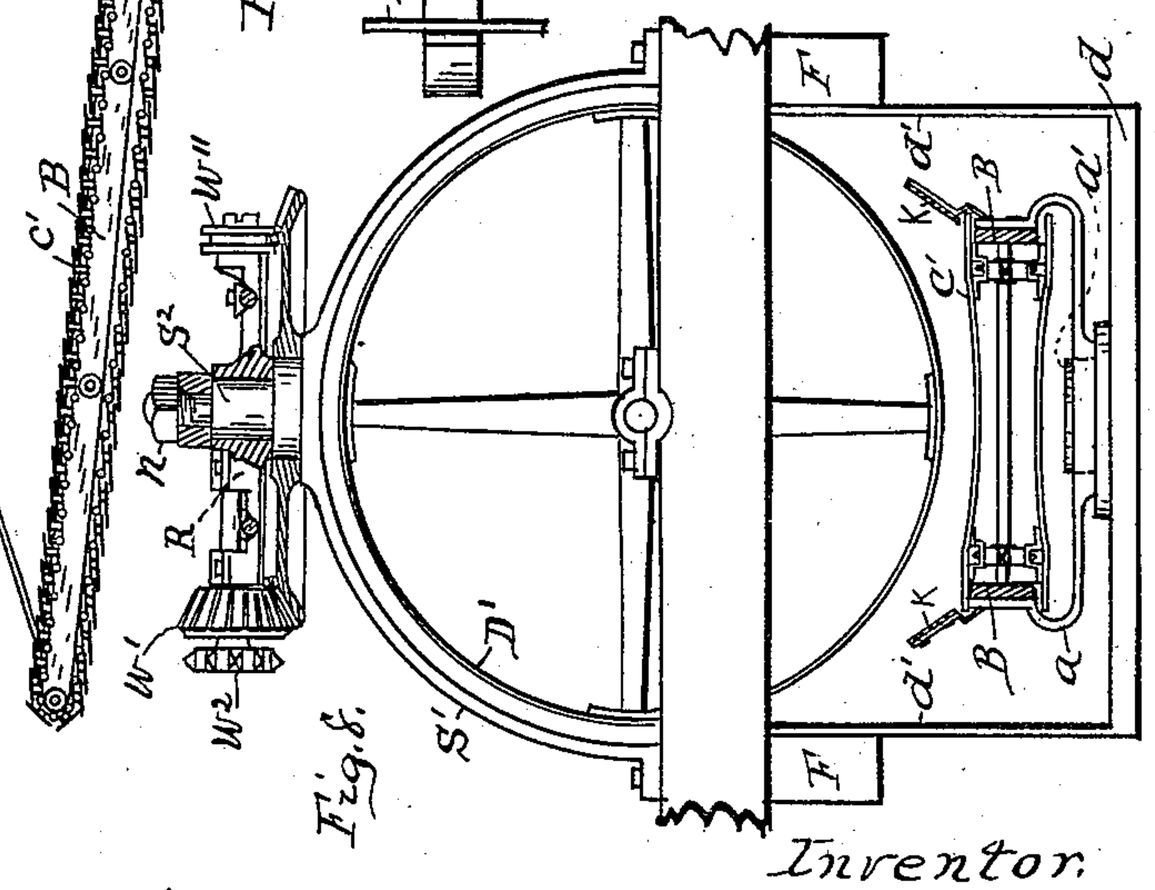


Fig. 8.



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UNITED STATES PATENT OFFICE.

WRIGHT S. HOTCHKINS, OF WICHITA, KANSAS.

CONCRETE-MIXING MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,170, dated January 19, 1892.

Application filed January 21, 1891. Serial No. 378,510. (No model.)

To all whom it may concern:

Be it known that I, WRIGHT S. HOTCHKINS, a citizen of the United States of America, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Concrete-Mixing Machines, of which the following is a specification, reference being had therein to the accompanying drawings and the letters and figures of reference thereon, forming a part of this specification, in which—

Figure 1 is a side elevation of the machine having my improvements applied thereto. Fig. 2 is a top plan of the same. Fig. 3 is a detailed perspective of a section of the slatted carrier-apron of the swinging delivery-carrier of the machine. Fig. 4 is a similar view of a section of the hopper-carrier mechanism. Fig. 5 is a vertical longitudinal section of the rear end portion of the machine. Fig. 6 is a similar view of the front end portion of the machine. Fig. 7 is a similar view of the center portion of the machine. Fig. 8 is a rear end elevation of the machine, showing the delivery-carrier mechanism in section. Fig. 9 is a detailed top plan of the lower supporting parts of said carrier mechanism. Fig. 10 is a cross-section of the forward end portion of the machine on a line between the two upright hoppers thereof, looking toward the rear. Fig. 11 is a similar view in rear of said hoppers, showing the elevator-driving belt and the tightener mechanism thereof. Fig. 12 is a similar view through the forward or stone hopper of the machine, and Fig. 13 is a detailed side plan of the water-supply valve interior.

This invention relates to certain improvements in a concrete-mixing machine especially designed as an improvement in my former invention in this class, which is described and claimed in Letters Patent of the United States numbered 441,563, and bearing date the 25th day of November, 1890, which improvements are fully set forth and described in the following specification and claims.

In my former invention the mixing mechanism has proved after severe tests to be a practical success, and the delivery of compounded concrete at the rear of the machine has been successful; but, however, it has been demonstrated that my former hopper mechanism for delivering the concrete materials to the mixing-cylinders, and also my former means for disposing of the compounded concrete was incomplete and not such as to permit the machine to be operated to its full capacity; and the object of this invention is to provide means whereby the former difficulties and incompleteness shall be remedied and the machine equipped in such manner as to be automatic and uniform in feeding materials to the mixing-cylinders and in delivering the compounded concrete upon the street or other place where it is to be finally laid; also, in other respects I have improved upon my former invention in such manner as to facilitate in the perfect operation of the machine, which features will hereinafter be set forth.

Referring to the drawings, the frame F, the mixing-cylinders D D′ and their shaft and bearings, the machine-trucks, and the elevator mechanism are the same, essentially, as in my former invention, which parts require no further description of construction or means of operation. I will therefore proceed to describe my improvements, and first will describe the hopper mechanism, as follows:

O O′ represent, respectively, the cement and sand primary hoppers, into which said materials are first placed, and E and E′ represent, respectively, the hoppers above the mixing-cylinders, into which said materials are elevated from their primary hoppers by means of the elevators H H′, which hoppers E E′ are supported in the manner shown in Figs. 1 and 6, and as a means of gathering the materials in the hoppers O O′ so that such materials may be taken by the elevator mechanism I have provided the screw conveyers y y' one in each hopper, fixed on a common shaft, which is suitably boxed and provided with a chain-wheel and driven through the agency of a chain belt y^2 from a similar wheel of the lower elevator-shaft, as shown.

The hoppers E E′ are so arranged that a space or chamber is made between them, which chamber terminates at its lower part with a chute N, (see Fig. 6,) which leads into the dry mixing-cylinder D, and each hopper is provided with a gateway, as shown at f f', Fig. 6, and with a vertically-sliding gate actu-

ated by lever mechanism, one of which gates is shown at M, Fig. 10, which gateways lead into the intermediate chamber, so that delivery from the hoppers will be into said chamber and from thence jointly from the chute N into the mixing-cylinder D.

Heretofore I have experienced difficulty in the delivery of the materials from the hoppers, caused by the materials not flowing freely from the hoppers at times and by too rapid flow at other times; and to avoid such difficulty I have provided in the bottom of the hoppers the endless carriers shown at c^2 and c^3, one in each hopper, which carriers consist of a chain belt carrying a series of plates or slats, as shown in Fig. 4, the chains of which are arranged on sprocket-wheels so that they may be operated to traverse the bottom of the hoppers and carry on their plates the materials contained in the hoppers through the gateways thereof and deposit them in the chute N, and thereby carry the said materials from their hoppers instead of permitting them to flow of their own will, and during such delivery of the carriers the sliding gates (shown at M) of the gateways ff' are adjusted to act as a striker-off for each hopper to regulate the quantity of material delivered by each carrier. Said carriers are operated by their inner wheels, which are respectively fixed on the cross-shafts h and h', (shown in Fig. 10,) the upper one of said shafts being driven from the upper elevator-shaft V by means of a chain belt arranged operating over corresponding chain-wheels of said shafts, and the lower shaft h' being driven through the agency of the spur-gears Z Z', which are fixed on said shafts h h' and arranged in mesh, as shown in Fig. 10.

E^2 represents the stone-hopper, and is of the general form and provided with a gate f'', leading into the lower portion of cylinder D, substantially as described in my former invention; but heretofore I have experienced difficulty therein insomuch that the stone would not fully and readily slide down into the cylinder D, and to obviate this difficulty I have provided a series of longitudinal slots in the hopper-bottom and have arranged therein a corresponding number of bars 3 of a size to fill the slots, which bars I have pivotally secured at their lower end by sleeving them on a fixed cross-bar 8 and resting them on a cross-shaft 4 at their upper end, which cross-shaft I have supported by means of boxings secured to the hopper-bottom. I have further provided this cross-shaft with a series of alternating pins 5, so arranged with relation to the bars 3 that when the shaft is oscillated one way one set of pins, consisting of each alternate pin throughout the shaft, will engage each alternate bar and quickly raise said bars so they will extend up into the hopper, as shown by dotted lines in Fig. 6 and full lines in Fig. 12, and by a reverse oscillation of the shaft the reverse set of pins will engage the remaining set of bars and likewise raise them, and thus by the oscillation of said shaft said bars are caused to be operated and agitate the stone in the hopper in such manner as to cause the stone to freely and readily move along into the mixing cylinder D, and as a means of oscillating said shaft I have provided it with a crank-arm V^3, which is connected, through the agency of a connecting-rod V'', with a crank V' of the elevator-shaft V. (See Figs. 1 and 2.)

Secondly, I will proceed to describe the delivery mechanism at the rear of the mixer, as follows:

d is a platform suspended below the discharge end of wet-mixer D' by means of the hanger-arms d', and a' is a center stud fixed to said platform.

B is an endless carrier-frame consisting of two side bars, preferably of metal, and provided with intermediate cross truss bars, as shown in Fig. 2, and with a depending socketed supporting-frame a, which bears in its socket against stud a', and thereby supports the lower end of the carrier-frame.

Fixed to the machine-frame F is an arched standard S', which is provided with an upright stud S^2 centrally over the stud a', and arranged on this stud is a large bevel gear-wheel W. Above said gear is a pivoted cross-head R, also sleeved on said stud, and supports at one end by means of a short shaft boxed thereto a bevel gear-wheel W' in mesh with wheel W, and beyond said gear a sprocket-wheel W^2 and at its opposite end a grooved traveling wheel W'', which travels when the cross-head is rotated or when gear W is turned upon an upright annular flange of the gear, as shown in Fig. 8, the purpose of said wheel W'' being to relieve the stud S^2 from excessive wear and the cross-head from excessive strain in holding the gears W and W' into mesh. Sleeved on the stud S^2 above the cross-head is a collar having formed therewith or attached thereto a pair of braces B^2, which extend forward and downward to and are secured to the machine frame as a supporter to said stud and its standard, and turned upon the screw-threaded end of said stud is a nut n, which retains said parts on the stud. Fixed to and leading rearward from the cross-head R is a pair of rods B', which are attached to and support the outer-extending end of the carrier-frame B, and as a means of giving rigidity to said rods they are provided with cross truss bars, as shown in Fig. 2. At each end of the carrier-frame B is a cross-shaft upon which are fixed sprocket-wheels, and about which wheels are arranged a pair of opposite chain belts; and to these chain belts are attached the series of overlapping hollowed cross slats or plates c, as shown, which slats or plates form the endless carrier-apron, and upon which the compounded concrete is delivered from the mixing-cylinders, and by means of which the said concrete is delivered upon the street or

other desired place, and by means of the pivotal supports of said carrier, as described, it is adapted to be turned or swung laterally in either direction, as indicated by the dotted lines in Fig. 2, so that the concrete may be evenly deposited upon all parts of the street where the machine is used, within the limits, however, of the swinging limit of the carrier. At the inner end of the carrier I have provided at each side a fender or side board K, for the purpose of preventing the concrete from being improperly delivered upon the carrier.

As a means of driving the carrier-apron *c'*, I have provided a shaft S, suitably supported above the cylinder D' by means of the standard-boxes M M', and upon one end of said shaft I have fixed a spur-gear G', in mesh with the annular gear G of said cylinder, and upon the opposite end of said shaft I have provided a bevel gear-wheel G^2 in mesh with wheel W, and on the extending end of the cross-shaft at the outer end of the carrier-frame B, I have provided a sprocket-wheel W^8 in gear by means of the sprocket-chain C with the sprocket-wheel W^2 of the cross-head R, and thus through the agency of said gears, when the cylinder D' is rotated, said endless carrier-apron *c'* will be likewise operated.

Also, in my former invention I experienced difficulty in arranging the apron between the two mixing-cylinders, so there would be no leak of material at that place, and to overcome the difficulty I have provided said apron, as shown at *g* in Figs. 1 and 7, with both forward and rear depending screw-threaded arms, as shown at *g'*, which arms I have arranged through corresponding holes in a cross-beam T below the apron, and upon each arm I have arranged two nuts, one above and one below the beam-flange, and by adjusting said nuts I am able to so adjust the apron as to force up its forward side and draw down its rear side both close to their respective cylinder, and thereby practically close said spaces and avoid leakage; and I have heretofore experienced difficulty in the slipping of the elevator-belt J' on the elevator-pulley J, and to avoid such difficulty I have provided a belt-tightener mechanism, as shown in Fig. 11, consisting of a frame I, fixed to the machine-frame, and a sliding frame I' at one side in a recess in frame I and at its opposite side in a corresponding recess in one of the posts of the machine, and within this frame I have fixed a shaft upon which is an idler-pulley bearing against the belt J', and as a means of bringing said pulley hard to bear against the belt I have provided the said sliding frame I' with an extending screw-threaded arm X, which I have arranged through a corresponding hole of a post of the machine, and have turned a nut X' upon said arm, and by tightening the nut the frame I' may be moved and thereby regulate the bearing of the idler-pulley against the belt J'.

I have further experienced difficulty in properly supplying water to the wet-mixing cylinder D', and have therefore provided a rotary valve Q', (shown in Figs. 1, 2, and 13,) arranged intersecting the water-supply pipe Q, which valve consists of a cylindrical case having a port on two opposite sides thereof, which ports are provided with annular screw-threads into which the supply-pipes are turned, as shown. Within this case is arranged a rotary hub or head having fixed thereto the four radial wings, as shown, which are provided with suitable packing, so that water may be retained by them, and they therefore have bearing against the walls of the case. Extending from said hub or rotary valve-head is a shank or spindle upon which is fixed a wheel Q^2, which is arranged bearing against the cylinder D, and by means of the rotary action of said cylinder said wheel is rotated by its frictional contact therewith, and the valve-wings are therefore likewise rotated and in use the water in the supply-pipe is under pressure from some foreign source, and therefore as said wings rotate they permit the water to pass through the valve or case thereof at a speed in proportion to the speed of the rotary movement of the cylinder, and hence by means of such valve the water-spray supply is automatically regulated to at all times properly supply a quantity of water to wet the materials within the wet-mixing cylinder, and when the machine is not in operation the water-supply is checked or cut off by reason of said valve-wings remaining idle.

Having thus described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is as follows:

1. In the concrete-mixing machine described, the combination, with the mixing-cylinders, of the swinging endless-carrier deliverer pivotally stepped below the delivery end of the mixing-cylinder and supported at its extending end by means of rods pivotally connected to the machine above the said cylinder, and the gearing mechanism for operating the said carrier, substantially as and for the purpose set forth.

2. In the concrete-mixer described, the combination, with the cylinder provided with the annular spur-gear, and with the swinging endless carrier, of the shaft boxed longitudinally above the cylinder and provided with the gears G' G^2, the arched standard S', arranged over the cylinder and provided with the upright stud S^2, the gear-wheel W and cross-head R, arranged upon said stud, the gear-wheel W', the traveling wheel W'', and sprocket-wheel W^2, supported by said cross-head, and the chain C, whereby the endless carrier is driven by means of the rotary movement of the cylinder through the agency of said gearing mechanism, substantially as set forth.

3. In the concrete-mixer described, the

swinging delivery-carrier, consisting of the combination of the side bars B, provided with the cross shafts and wheels at their ends and trussed by means of the cross-braces, as shown, the sprocket-chains arranged about said wheels, and the overlapping slats or plates C, fixed to said chains, substantially as set forth.

4. In the concrete-mixing machine described, the combination, with the wet-mixing cylinder, of the swinging endless carrier pivotally stepped at one end below the discharge end of said cylinder and supported at its outer end by means of swinging hangers, substantially as set forth.

5. In the concrete-mixing machine described, the combination, with the hoppers E E′, of the endless carriers c^2 c^3, respectively, operating in the bottom of said hoppers and arranged at one end about idler-wheels and at their opposite end about driven wheels, the cross-shafts $h h'$, arranged supporting and operating said driven wheels and geared together to operate jointly, and the means for driving said shafts, substantially as and for the purpose set forth.

6. In the concrete-mixing machine described, the combination, with the hopper E^2, provided with the series of longitudinal slots, as specified, of the series of bars arranged in said slots, pivotally secured at their lower end and arranged resting upon a cross-shaft at their opposite upper end, and the series of alternating pins fixed in said shaft, adapted to engage and vibrate said bars when said shaft is oscillated, substantially as and for the purpose set forth.

7. In the concrete-mixing machine described, the combination, with the two mixing-cylinders D D′, and the apron *g* for conducting the materials from one cylinder to the other, provided with the depending screw-threaded arms arranged through corresponding holes of flanges, of a cross-beam below said apron, and the nuts for adjusting and holding said apron, substantially as set forth.

8. In the concrete-mixing machine described and in the water spray or supply mechanism for melting the materials in the wet-mixing cylinder, the rotary supply-valve arranged intersecting the water-supply pipe and operated to regulate the flow of water into the cylinder by means of the rotary action of the cylinder, in the manner substantially as set forth.

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Witnesses:
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