W. H. INSLEY AND A. C. RASMUSSEN.

BOOM SKIP GRAVITY PLANT FOR CONCRETE DISTRIBUTION.

APPLICATION FILED JULY 29, 1918.

1,324,900.

Patented Dec. 16, 1919.

3 SHEETS—SHEET 1.

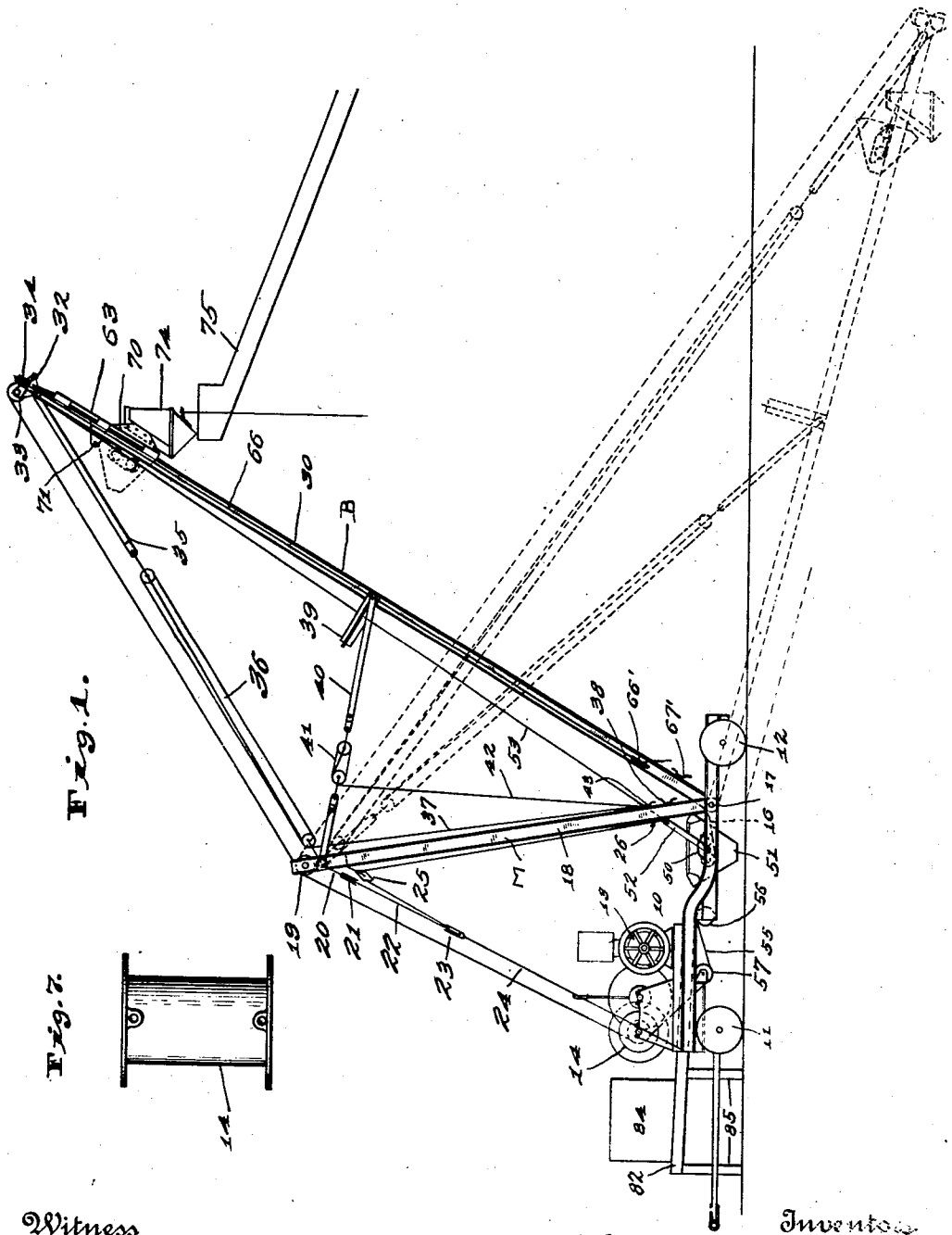


Fig. 1.

Fig. 2.

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Fig. 3.

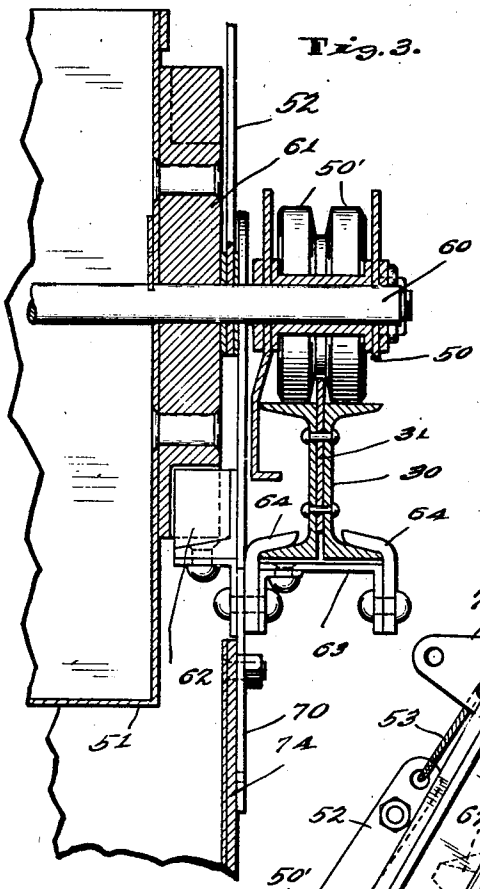


Fig. 2.

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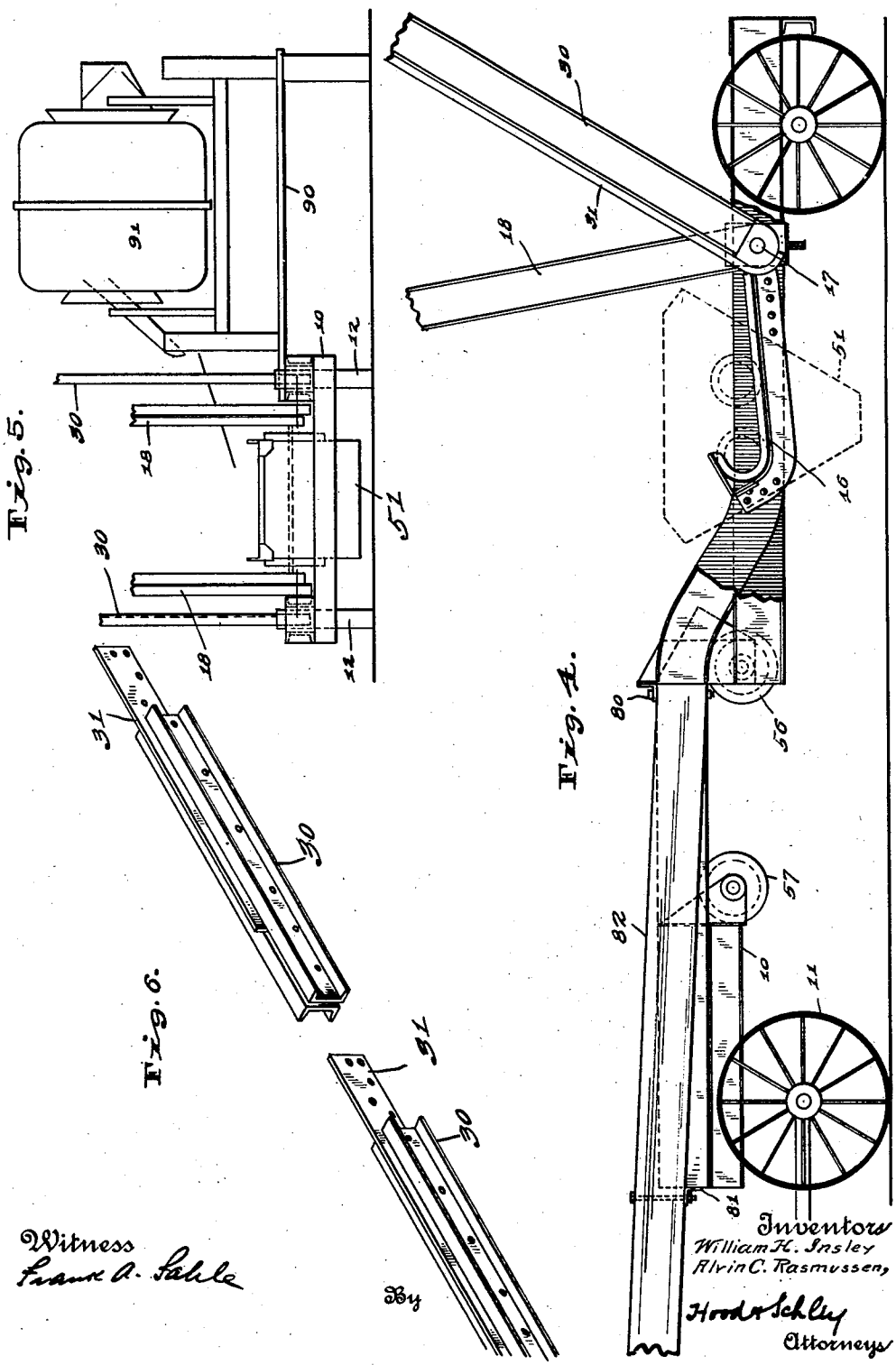
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UNITED STATES PATENT OFFICE.

WILLIAM H. INSLEY AND ALVIN C. RASMUSSEN, OF INDIANAPOLIS, INDIANA, ASSIGNORS TO INSLEY MANUFACTURING COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

BOOM-SKIP GRAVITY PLANT FOR CONCRETE DISTRIBUTION.

1,324,900. Specification of Letters Patent. Patented Dec. 16, 1919.

Application filed July 29, 1918. Serial No. 247,141.

To all whom it may concern:

Be it known that we, WILLIAM H. INSLEY and ALVIN C. RASMUSSEN, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Boom-Skip Gravity Plants for Concrete Distribution, of which the following is a specification.

At the present time, it is the general practice, in the erection of reinforced concrete buildings, to deliver the fresh concrete mixture to the forms by means of a "chuting" plant which comprises a vertically stationary tower erected alongside the building site, a hopper carried by the tower, a swinging boom carried by the tower and carrying articulated chute sections, and an elevator mounted in the tower to hoist the concrete mixture to the hopper. Such a structure is generally too expensive to erect unless the building is of considerable size and height and the object of our present invention is to produce a simple, readily-portable and comparatively cheap apparatus for chuting concrete in connection with comparatively small structures, either below or above ground level.

The accompanying drawings illustrate our invention. Figure 1 is a side elevation, also showing an associated anchor platform; Fig. 2 a detail of the upper end of the boom and the hopper and bucket; Fig. 3 a section on line 3—3 of Fig. 2; Fig. 4 a fragmentary side elevation in partial vertical section of the portable truck; Fig. 5 an end elevation showing an associated mixer and supporting platform; Fig. 6 a fragmentary perspective illustrating the manner of lengthening the boom; and Fig. 7 a fragmentary elevation of the drum.

In the drawings, 10, 10 indicates side frames which are depressed at their rear ends and are connected together to form a truck body supported by wheels 11 and 12. The forward elevated end of the truck frame supports a power plant comprising an engine 13 most conveniently of the internal combustion type, and hoisting drum 14. The rear ends of side bars 10 carry tracks 16 which are conveniently inclined slightly downwardly and forwardly. Extending across between the rear ends of the side bars 10, closely adjacent the rear ends of tracks 16, is a shaft 17, upon which are pivoted the lower ends of two channels 18, 18 which are connected at their upper end to form a mast M provided with a pulley 19 at its upper end. Near the upper end mast M carries a shackle 20 provided with a block 21, receiving a cable 22 which is passed through a block 23 carried by an anchor cable 24 attached at its lower end to the forward end of frame 10. Cable 22 is carried through a second block 25 carried by mast M and from thence down to a belaying pin 26 carried by one of the mast legs 18 near its lower end within convenient reach from the ground, the arrangement being such that the mast 18 may be held in any desired angular position.

Also pivoted upon shaft 17 is a boom B which comprises parallel members formed by pairs of channels 30, 30 with an interposed plate 31 which extends above the upper flanges of the channels, for a purpose which will appear. The plates 31 extend beyond the channels at one end and fall short of the channels at the opposite end, as clearly shown in Fig. 6, so that the length of the boom B may be varied by the use of sufficient sections. The upper ends of the side members of the boom B are connected by a cross head 32 carrying two pulleys 33 and 34 and a shackle or link 35. Connecting link 35 with the upper end of mast M is a block and tackle 36, the cable 37 of which is carried to a belaying pin 38 on mast M, the arrangement being such that the boom B may be adjusted readily. Boom B is also preferably provided midway of its length with a yoke 39 which connects the two legs so as to stiffen the same and a yoke or shackle 40 is connected to the boom B at this intermediate point and supported from the upper end of mast M by a block and tackle 41, the cable 42 of which is carried to a belaying pin 43 on mast M.

The legs of boom B are arranged to supplement tracks 16 and mounted so as to roll upon these tracks are two carriages 50 (only one of which is shown), between which is pivotally mounted a dumping bucket 51. Carriages 50 comprise supporting wheels 50′ which are circumferentially grooved, as shown in Fig. 3, so that the wheels may roll upon the upper flanges of channels 30 with the projecting upper edge of plate 31 projected into the circumferential groove so as

to retain the carriage in place upon the boom. Connecting the two carriages 50 is a yoke or bail 52 to which is attached a cable 53 extended upwardly and over pulley 33, thence downwardly and rearwardly over pulley 19 to drum 14. Each carriage 50 is provided at its rear end with an ear 54 to which is attached a cable 55 which is extended downwardly over a pulley 56 mounted on the truck frame and from thence to the winding drum 15.

Bucket 51 carries upon each side, concentric with the shaft or trunnion 60, a gear segment 61 which is adapted to come into mesh with a rack 62. Each rack 62 is carried by a sliding member 63 provided with fingers 64 arranged to embrace the lower flanges of the channels 30 and slide upon the same. The upper ends of the slides 63 are connected by a cross head 65 carrying a sheave 65′ over which is passsed a cable 66 extending down to a belaying pin 66′ carried by one leg of boom B. Attached to the rear end of each slide 63 is a cable 67 which is carried down to a belaying pin 67′ on the appropriate leg of boom B. Each slide 63 carries plates 70 and 71 which are arranged in a vertical plane and provided with a plurality of uniformly spaced perforations 72 arranged in a series such that bolts 73, 73, carried by hopper 74, may be inserted through any desired pair of perforations so that any desired angular position of the hopper relative to the boom may be obtained, thereby making it possible to have the hopper stand substantially vertical, no matter what the adjusted position of the boom B may be, as clearly indicated in Fig. 1. Attached to the hopper 74, preferably by a swivel connection in the usual manner, is the initial or receiving element of a chute 75.

The power plant which is mounted upon the forward end of the truck frame, will quite likely not be sufficiently heavy to serve as an adequate counterweight for the overhanging boom B. An effective counterweight may, of course, be produced by any material readily picked up around a building site, and in order to avoid the necessity of transportation of such counterweight, we provide the truck frame with transverse channels 80 and 81, so arranged that beams 82, either of wood or metal, may be bolted thereto, the forward ends of the beams being inserted beneath cross bar 80 and extending rearwardly and resting upon cross bar 81. These beams 82 will extend considerably forward of the forward ends of side bars 10 and may, if desired, be supported by temporary legs 85. A counterweight 84 may then be mounted upon these forwardly-extending beam ends, said counterweight being formed by any convenient material, as, for instance, a pile of stone, a box of sand, bags of sand, etc. In order to conveniently deliver the fresh concrete mixture to bucket 51, a temporary platform 90 may be erected alongside of the truck frame and a mixer 91 mounted thereon, in position to deliver to the bucket 51 when said bucket has been lowered to a position between tracks 16, as illustrated in dotted lines in Fig. 4.

The apparatus just described may be readily transported from place to place and boom B elevated to any proper height, depending upon the work which is to be produced, so as to give the necessary gravity fall for the concrete mixture. The hopper 74 will then be adjusted in the manner already described so as to properly receive the mixture from a bucket 51 and deliver it to the chute 75. The bucket 51 will then be raised and lowered along the boom and will automatically dump its contents into the hopper when the hopper is reached, returning from that point either by gravity or by a pull exerted upon cable 55, depending upon the position at which the boom B has been adjusted.

We claim as our invention:

1. A concrete chuting plant comprising a readily transportable main body, a boom adjustably mounted on the main body and forming a carriage track, means for holding the boom in various positions of adjustment, a carriage movable along the boom, means for moving the carriage along the boom, a dumping bucket carried by the carriage, a dumping slide mounted upon the boom and formed to coöperate with the bucket to dump the same, means for holding the dumping slide in various positions of adjustment and a hopper mounted upon the dumping slide and angularly adjustable thereon about a substantially horizontal axis.

2. A concrete chuting plant comprising a readily transportable main body, a mast adjustable thereon about a horizontal axis, means for holding the mast in various positions of adjustment, a boom adjustable on the main body about a horizontal axis, means connecting the mast and boom for holding the boom in various positions of angular adjustment relative to the mast, a carriage movable along the boom, a receptacle for concrete carried by said carriage, and means for moving the carriage along the boom.

3. A concrete chuting plant comprising a readily transportable main body provided with a carriage track, a boom mounted to swing upon a horizontal axis relative to the main body and arranged to form an extension of said carriage track, a carriage mounted to move along said track and boom, means for holding the boom in various positions of adjustment, means for shifting

the carriage along the track and boom, a receptacle for concrete carried by said carriage, a hopper mounted upon the boom, and means for angularly adjusting said hopper relative to the boom about a substantially horizontal axis.

4. In a concrete chuting plant, an angularly adjustable boom forming a carriage track, a carriage mounted on said boom, a concrete receptacle carried by the carriage, a dumping slide longitudinally adjustable upon the boom, a hopper carried by said dumping slide, coöperating means carried by the dumping slide and bucket for automatically dumping the contents of the bucket into the hopper, and means for angularly adjusting the hopper relative to the boom about a substantially horizontal axis.

In witness whereof, we have hereunto set our hands at Indianapolis, Indiana, this 26th day of July, A. D. one thousand nine hundred and eighteen.

WILLIAM H. INSLEY.
ALVIN C. RASMUSSEN.