

DEVICE FOR PLACING CONCRETE IN FORMS.

APPLICATION FILED FEB. 6, 1911.

1,036,068.

Patented Aug. 20, 1912.

2 SHEETS—SHEET 1.



Witnesses:
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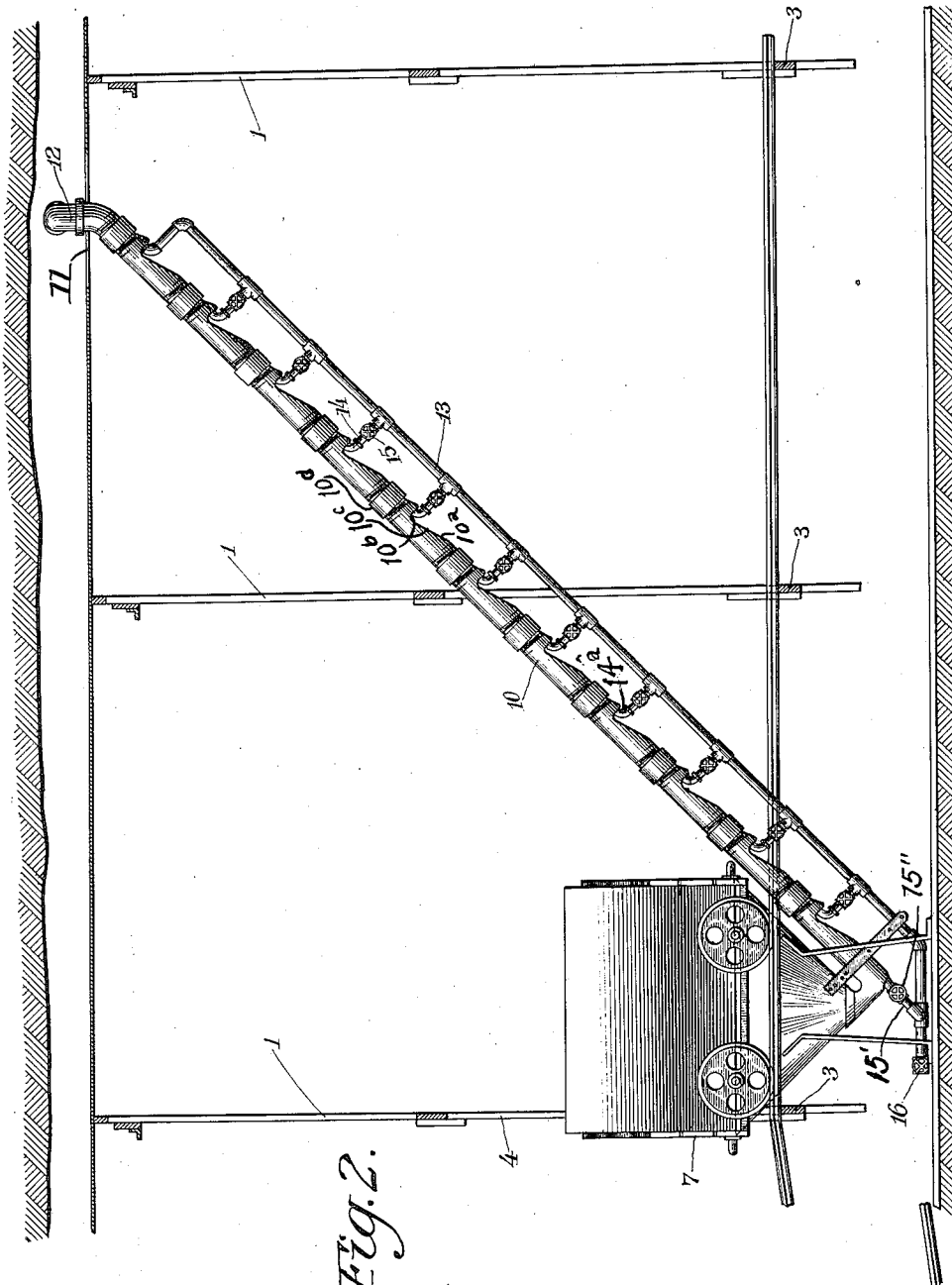


Fig. 2.

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UNITED STATES PATENT OFFICE.

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DEVICE FOR PLACING CONCRETE IN FORMS.

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Specification of Letters Patent.

Patented Aug. 20, 1912.

Application filed February 6, 1911. Serial No. 606,700.

To all whom it may concern:

Be it known that I, LAWRENCE CALVIN BRINK, of Elmsford, in the county of Westchester and in the State of New York, have
5 invented a certain new and useful Improvement in Devices for Placing Concrete in Forms, and do hereby declare that the following is a full, clear, and exact description thereof.

10 My invention relates particularly to a device for placing concrete in forms which is so constructed that the concrete can be conveyed by means of compressed air under a low degree of pressure.

15 My device is especially adapted for the placing of concrete in tunnel forms, piers, bridge abutments, retaining walls, etc.

I have described my invention more particularly in connection with a device for
20 placing concrete in tunnel forms as the advantages of said device in that connection clearly illustrate the utility of said device in the placing of concrete in concrete constructions in general. Hitherto, in the placing of
25 concrete in tunnel forms, it has been customary to provide a platform upon the upper braces of the tunnel forms, to construct a long incline up to said platform so that the cars containing the concrete might be drawn
30 up to the same, and to provide a special hoisting engine for drawing the cars of concrete up to the platform. Not only has this been the case but after the cars have been drawn up to the upper platform and dumped thereon, it has been customary to provide
35 hand-labor for shoveling the concrete back of the forms, with the upper portions of the forms removed for this purpose. This has only provided a means for inserting the
40 concrete back of the forms at the lower levels, it subsequently becoming necessary to place the upper forms in position and then finish the placing of concrete by inserting a body of concrete back of these upper forms.
45 This method of construction has required not only an elaborate temporary construction including a hoisting engine of considerable power, but what is of more importance still, an exceedingly large amount of hand-
50 labor for finally placing the concrete in position back of the forms.

By means of my apparatus it is merely necessary to run the cars containing concrete up to a platform constructed on the
55 lower braces of the tunnel forms, to discharge the cars at this point into a hopper

supported at the bottom of the tunnel and then, by providing a supply of compressed air at low pressure, to completely place the entire body of concrete back of the tunnel forms, while all of the forms are retained
60 in position, with the exception of the key-plate at the top of the tunnel.

My apparatus comprises, in general, a platform placed upon the lower braces of
65 the tunnel forms upon which the cars of concrete are received after having been drawn up a gentle incline. At one side of the tracks located upon this platform, there is provided a hopper to receive the concrete
70 which is dumped from the cars. The hopper has somewhat the shape of a funnel, the lower part thereof leading to an inclined discharge pipe which passes upwardly to the top of the tunnel through an opening
75 left by omitting the key-plate, where the pipe is provided with a reverse turn to discharge the concrete downwardly back of the forms. At intervals along said pipe, there are provided inlets for compressed air at
80 a low pressure, the air being discharged into the pipe in the direction of movement of the body of concrete. The pipe is made up of a plurality of sections which are connected together at their ends by any suitable means,
85 each of said sections being provided with a transversely directed wall to receive the air inlet nozzle, and an inclined wall leading up to the transversely directed wall to prevent materials from becoming lodged opposite
90 the air inlet nozzle. The valves in the pipes used to supply the compressed air at intervals along the supply pipe, are regulated so as to merely carry the body of concrete from the vicinity of each of the discharge nozzles
95 to the next succeeding one. By this means, the concrete is carried to the top of the tunnel without the necessity of providing compressed air at a high pressure. The disadvantages of the use of compressed air at a
100 high pressure in this connection are practically prohibitive in their nature. By using compressed air at a high pressure for this purpose, there is a danger of serious injury to the workmen who are working inside of
105 the forms, especially in case of any damage to the forms during the placing of the concrete. The use of high pressure compressed air for this purpose is furthermore, exceedingly expensive as there is frequently a waste
110 of air when the pipe is not filled with concrete completely, and as in most cases a cen-

tral power house must be provided for providing such a supply of compressed air. In the case of low pressure compressed air, however, such as used by me, a small blower operated by an electric motor, can be used for providing the supply of compressed air.

I have shown one embodiment of my invention in the accompanying drawings, in which—

Figure 1 is a cross-section of a tunnel provided with my apparatus, and Fig. 2 is a longitudinal section of the same.

In the drawings, 1 represents a series of tunnel forms provided with an upper set of braces 2 and a lower set of braces 3. Vertical braces 4 extend between the upper and lower braces 2 and 3. A platform 5 is provided upon the lower braces, said platform carrying a set of tracks 6 to receive a dump car 7. The dump car 7 is designed to dump the load of concrete into the hopper 8, supported by standards 9 upon the floor of the tunnel. A pipe 10 leads from the lower portion of the hopper 8 and extends upwardly through an aperture 11 at the top of the tunnel in the tunnel forms, the pipe 10 having at its end a reversely directed nozzle 12 to direct the concrete downwardly around the forms and the pipe 10 is made up of a plurality of pipe sections 10^a, the ends of which are screw-threaded so as to connect said sections together. Each of the sections 10^a has a transversely directed wall 10^b and an inclined surface 10^c leading up to the wall 10^b. The pipe sections 10^a are kept together by means of screw-threaded couplings 10^d.

A compressed air pipe 13 is run parallel to the pipe 10 and at intervals along the latter, is provided with a branch pipe 14 having a valve 15, said branch pipe leading into the pipe 10 in such a manner as to discharge a supply of compressed air upwardly in the direction of the moving body of concrete. The branch pipes 14 have nozzles 14^a which extend at right angles to said branch pipes, and into the pipe sections 10^a through the transversely directed walls 10^b. This arrangement is provided so that the nozzles may be extended in a direction parallel with the conveying pipe 10, while, at the same time, no chance is allowed for the escape of concrete which is being conveyed. The inclined surface 10^c is used in order to avoid the presence of abrupt obstructions in the interior of the conveying pipe 10. By this means, I provide a construction in which the air pipe occupies its most efficient position with regard to the conveying pipe 10, while, at the same time, any abrupt obstructions in the pipe are avoided and the pipe sections 10^a are not so changed as to prevent them from being connected by means of screw-threaded couplings in the usual manner. It will be noted that a branch pipe 15

is provided, having a valve 15'' which leads directly into the bottom of the pipe 10 to perform, in general, the same functions as the branch pipes 14. A valve 16 is located at the lower end of the compressed air pipe 13 to provide a supply of compressed air to the same.

In the operation of said device, a dump car 7 or a train of dump cars is carried upwardly on to the platform 5. The cars 7 are dumped one after another into the hopper 8. The valves 15 and 15'' are then adjusted so as to supply the proper amount of compressed air to convey the concrete from each of the branch pipes 14 to the next succeeding branch pipe 14. The supply of compressed air provided by the pipe 15'' is of great importance in the elevation of the body of concrete as the body of compressed air supplied by this pipe not only tends to force the concrete forwardly along the pipe 10, but also is effective in elevating the body of concrete in the hopper 8 so as to permit the concrete which is carried in the lowermost end of the pipe 10 to be forced forwardly without interference. By this means, the body of concrete is finally elevated to the top of the tunnel where it is discharged from the nozzle 12. By this means, the entire opening at the sides of the tunnel forms is filled by a body of concrete without the necessity of conveying the concrete at any time by means of hand-labor.

The advantages of my device are numerous, and they may be classified as follows:

- (1.) It dispenses with the necessity of a long incline and a hoisting engine for pulling the cars up the same and in the place thereof, requires only a gentle incline which permits the cars to be drawn up by the ordinary power used for propelling the same.
- (2.) It dispenses with the enormous amount of hand-labor required for shoveling the concrete into the forms.
- (3.) It effects a saving in the handling of forms.
- (4.) It operates with an economical supply of compressed air owing to the low pressure used.

While I have described one embodiment of my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit of my invention.

I claim:

1. In a means for conveying materials, a conveying pipe comprising a plurality of sections having means for fastening them together, said sections having transversely directed walls and inclined surfaces leading up to the same, and an air supply pipe leading into said sections through the transversely directed walls.

2. In a means for elevating a body of concrete, an upwardly directed conveying pipe comprising a plurality of screw-threaded sections, said sections having between the

screw-threaded portions transversely directed walls and inclined surfaces leading up to the same, and an air supply pipe leading into said sections through the transversely directed walls and located at the lower sides thereof.

3. In a means for conveying a body of concrete, a conveying pipe comprising a plurality of screw-threaded sections, said sections having between the screw-threaded portions transversely directed walls and inclined surfaces leading up to the same, and an air supply pipe leading into said sections through the transversely directed walls and located at the lower sides thereof, the air discharge outlets on the air supply pipe being parallel with the conveying pipe.

4. In a means for conveying a body of

concrete, a hopper, a conveying pipe comprising a plurality of screw-threaded sections, said sections having between the screw-threaded portions transversely directed walls and inclined surfaces leading up to the same, and an air supply pipe leading into said sections through the transversely directed walls and located at the lower sides thereof, the air discharge outlets on the air supply pipe being parallel with the conveying pipe.

In testimony that I claim the foregoing I have hereunto set my hand.

LAWRENCE CALVIN BRINK.

Witnesses:

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ROMOLO D'ALOIA.