Nov. 23, 1965 B. L. LARSEN ETAL 3,218,944

CURB AND GUTTER MOLDING MACHINE

Filed Dec. 21, 1962 2 Sheets-Sheet 1

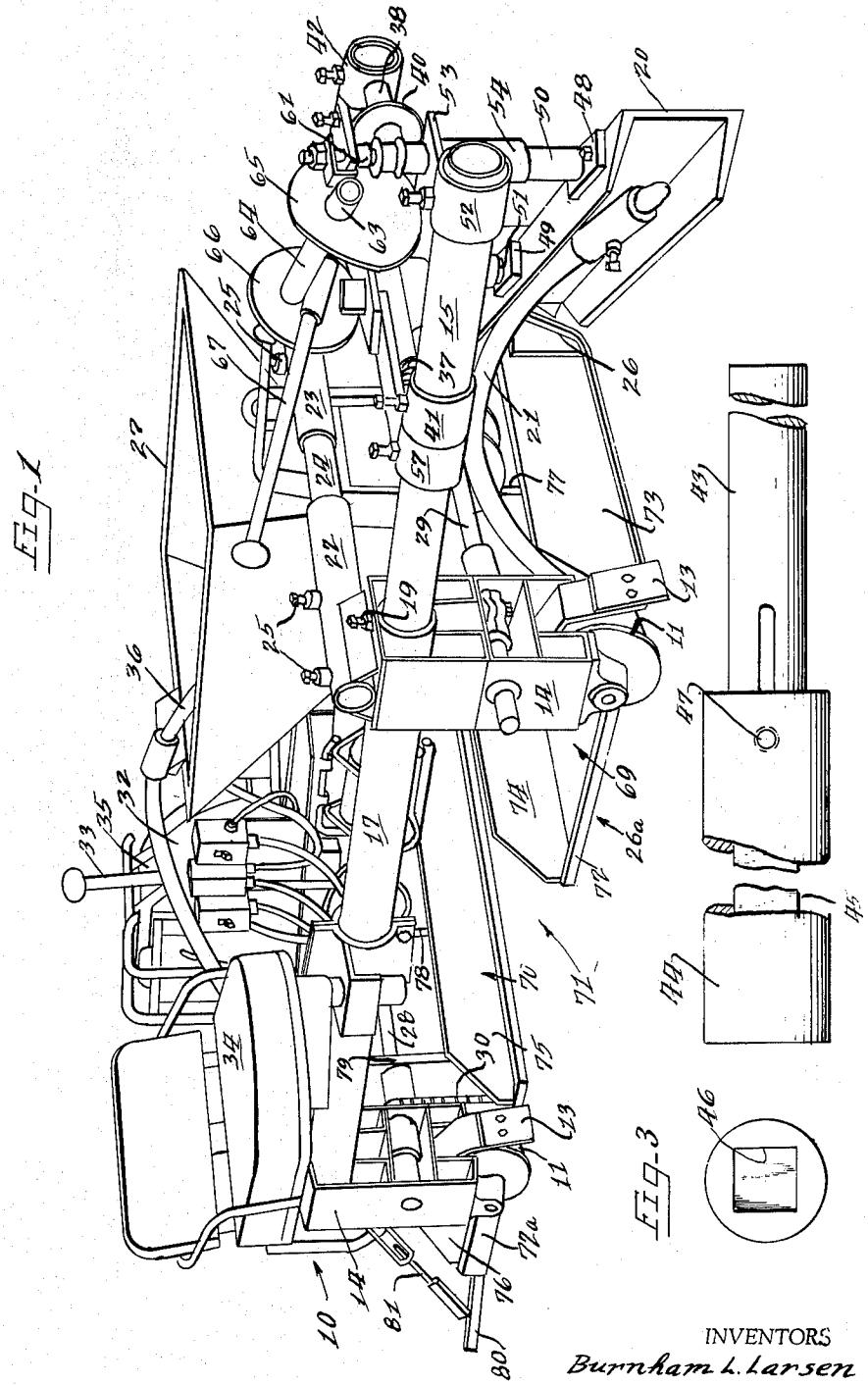


FIG-1

FIG-3

INVENTORS
Burnham L. Larsen
BY Bernard J. Larsen
Hill, Sherman, Meroni, Gross & Simpson
ATTORNEYS

Nov. 23, 1965 B. L. LARSEN ETAL 3,218,944

CURB AND GUTTER MOLDING MACHINE

Filed Dec. 21, 1962 2 Sheets-Sheet 2

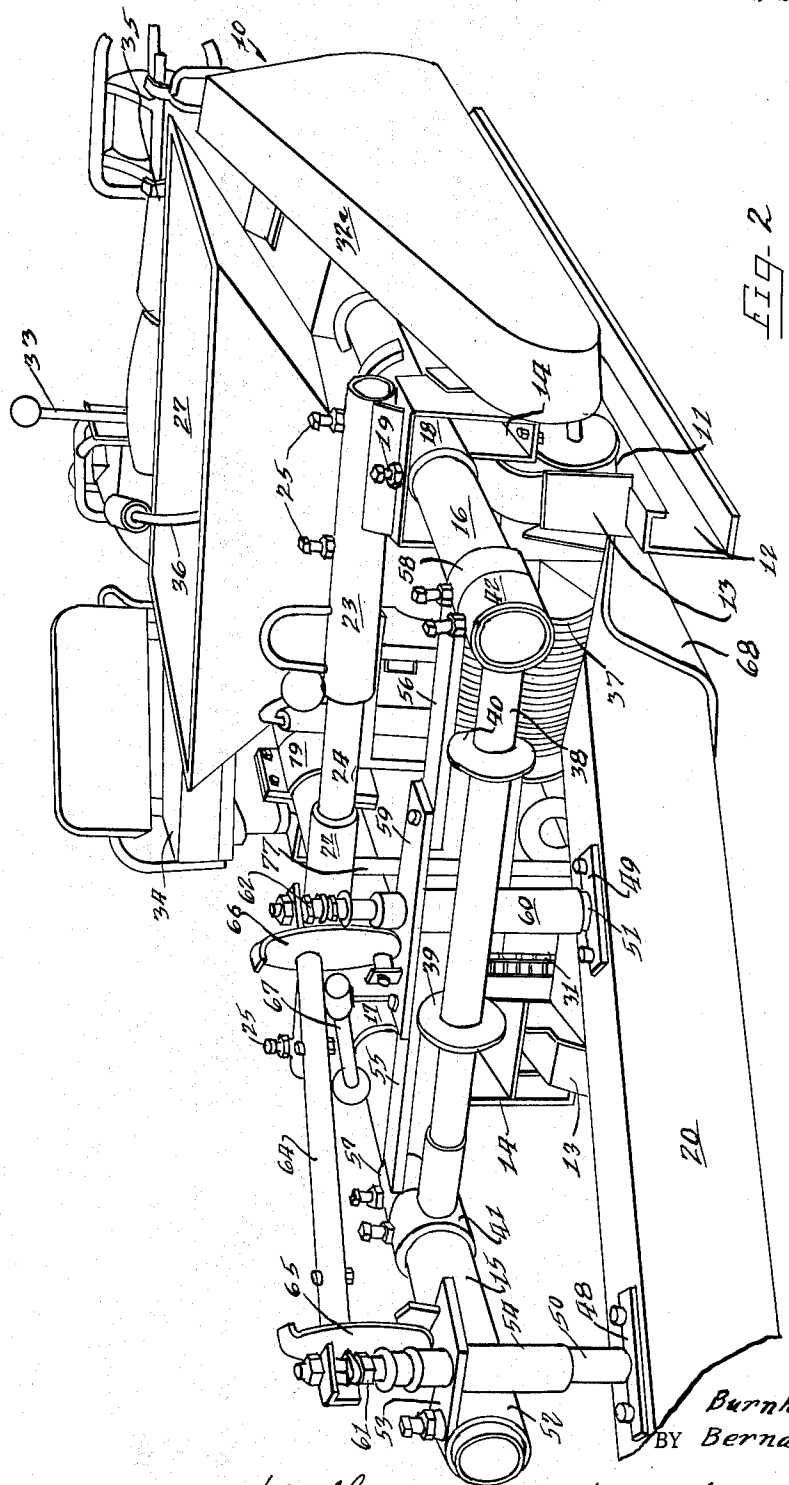


FIG. 2

INVENTOR.
Burnham L. Larsen
BY Bernard J. Larsen

Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

United States Patent Office 3,218,944 Patented Nov. 23, 1965

3,218,944

CURB AND GUTTER MOLDING MACHINE

Burnham L. Larsen and Bernard J. Larsen, Cedar Falls, Iowa, assignors to Curbmaster of America, Inc., Cedar Falls, Iowa, a corporation of Iowa

Filed Dec. 21, 1962, Ser. No. 246,484
4 Claims. (Cl. 94—46)

This invention relates to an improved machine for building concrete curbs and gutters, and which can be used for widening and other related operations.

More particularly, the invention pertains to an improved machine designed to completely build curb and gutter, widening and similar constructions in one pass.

Heretofore, a problem has existed in such operations in that air entrained in the top material has been locked in during the finishing procedure, in the form of bubbles, so that the resultant surface was not as long-lasting as would otherwise be the case. The present invention overcomes this problem by means of a screed construction utilizing front and rear pan portions such as to define an opening therebetween which affords release of the entrained air, thereby permitting a better finish on the concrete.

Further in accordance with the invention, a stainless steel trowel is provided at the rear of the machine for producing a final finish in cooperation with the novel screed construction described.

Another advantage of the invention resides in the facility with which widening operations can be obtained, since previously it had been necessary to replace power shafts for widening purposes. The present invention utilizes a clip joint power shaft construction wherein a square shaft on one side of the machine interfits within a square on the other side, the shafts thus fitting inside each other to transmit power from one side of the machine to the other. Accordingly, the need for utilizing a longer shaft for widening, with the previous shafts having joints connected together, has been eliminated.

It is therefore an object of the present invention to provide a finishing and shaping apparatus as described which is unusually effective in forming a good finish on concrete or other material.

Another object of the invention is to provide a machine as described which can be utilized in varying widths with minimal difficulty.

Another object of the invention is to provide a full length curb mule or finishing structure which can be changed in minutes.

Another object is to provide a gutter pan which may be used on various cross-sections.

Another object of the invention is to provide a rubber wheel traction for the machine wherein the wheels have steel flanges removable for traveling on adjacent slabs.

Another object of the invention is to provide a vibratory front screed for striking off concrete and vibrating it in one operation, to afford one pass production with minimal effort required.

Another object of the invention is to provide a machine as described which can be operated by a single operator, and which can be readily loaded and controlled as desired.

Other objects and advantages of the invention will become apparent as the description proceeds in accordance with the drawings in which:

FIGURE 1 is a perspective view of a machine according to the present invention;

FIGURE 2 is another perspective view of the machine of the invention; and

FIGURE 3 is a view of a shaft structure for use in the machine of the invention.

Referring now to the drawings, a machine **10** is shown according to the present invention which may be utilized in building curb and gutter in a single pass. The machine includes rubber wheels **11** at front and rear, riding with good traction on forms **12** which provide rails, the wheels having flanges of steel or the like which are removable for traveling on adjacent slabs. Guards **13** are secured in support portions **14** which journal the wheels. The machine **10** is characterized by a strong tubular construction mounting the supports **14** and which enables the machine to be extended for any curb width or for any width widening, with or without curb. Thus the frame includes a pair of tubular, longitudinally extending frame members **15** and **16** slidable in rear tubular members **17** and **18** for adjustment by bolts **19**. It will be seen that the tubular member **15** is extended beyond the tubular member **16** in the form shown so that the head portion of the device can support an electric vibrating screed **20** which strikes off concrete and vibrates it in one operation. A vibrator **21** is secured to the screed **20** for this purpose, the screed **20** having a channel-shaped or U-shaped construction with beveled ends and receiving the vibrator **21** therein. The rear tubular members **17** and **18** likewise are connected to the supports **14** as shown. Interconnecting the longitudinal members thus described is a transverse frame construction including outer tubular members **22** and **23** telescopically receiving an inner tubular member **24** to be secured by bolts **25**, or the like.

Behind the vibrating screed **20** is a molding form or mule **26** which is supplied cement from a hopper **27**. Thus the mule **26** is mounted on a screed structure **26*a*** according to the invention and as hereinafter described, the mule being a full length curb structure which can be changed in minutes as a result of its simple mounting and placement.

In accordance with the invention, the drive arrangement for the machine **10** includes rear and forward cross power shafts **28** and **29**. The rear shaft supports a raised rear wheel suitably driven by a chain (not shown) and a chain **30** is driven by the rear shaft **28** to drive the lower rear wheel **11**, suitable sprockets being provided for the chains.

The cross shaft **29** at the front end of the machine supports the front wheel **11** shown in FIGURE 2 and drives a chain **31** to drive the opposite front wheel **11**. The rear and forward cross shafts **28** and **29** are driven by suitable chains (not shown) powered by an electric motor **32** which affords smooth and even power. The construction thus provided is such that the machine **10** may move in either direction at the turn of a switch and no expensive clutch and transmission switch means are needed, so that wear and breakdown is minimized. The chain means for driving the rear and forward cross shafts **28** and **29** may be actuated through a speed reducing unit connected to the electric motor **32** and the mechanism is controlled by a lever **33** handled by an operator who sits on a seat **34** on the frame. A guard **32*a*** may be provided for the chains.

The motor **32** receives electrical power from a motor-

generator shown generally at **35**, mounted on the rear of the machine and which also provides electrical energy for vibrating the screed **20** and for operating a vibrator **36** for the cement hopper **27**.

Also mounted on the cross shaft **29** is a winch drum **37** which normally may idle on the shaft but which can be shifted over a dog (not shown) so that the drum will be driven. The drum can carry a cable which may be secured to an anchor at the top of an incline, for steep inclines wherein the wheels might slip on the tracks, but it is again noted that the rubber construction of the wheels afford a high degree of traction. The cable is normally wound so as to be taken off the drum from the bottom and a guide rod **38** is provided to keep the cable at a desired elevation. The rod has side flanges **39** and **40** and is removably mounted on the ends of the frame tubes **15** and **16** by sleeves **41** and **42**.

In accordance with the invention, and as shown in FIGURE 3, the shafts **28** and **29** include sections **43** and **44** with the sections **43** having reduced square portions **45** telescoping in a square bore **46** of the sections **44** to be adjustably engaged by a set screw (not shown) threaded into a radial bore **47** perpendicular to one of the sides of the square bore **46**. Whereas previously it has been necessary to replace shafts in widening, the present invention, wherein a square shaft on one side fits into a square bore on the other side, affords a clip joint power shaft which obviates this requirement, the interfitting shafts transmitting power from one side of the machine to the other. This represents a marked saving in time for adjustment as well as in the elimination of the need for variously dimensioned replacement shafts as previously necessary.

The vibrating screed **20** is supported by attachment brackets **48** and **49** on vertical rods **50** and **51** which can be raised to lift the screed. A sleeve **52** is slid over the outwardly extending tubular member **15** and locked thereon; and for supporting and lifting the screed, a plate **53** is secured to the sleeve **52** and has a guide housing **54** for the rod **50**. Correspondingly, supports **55** and **56** are mounted on sleeves **57** and **58** on the tubes **15** and **16** and carry a plate **59** mounting a housing **60** for the rod **51**. It will be appreciated that the width of the structures **55**, **56** and **59** may be variable. The operating height of the screed **20** is controlled by height adjusting nuts or the like **61** and **62** turned on the rods **50** and **60**, which are threaded at their upper ends. The nuts **61** and **62** press against the upper ends of the guide housings and associated structure.

For raising the screed **20**, the upper ends of the rods **50** and **60** are secured to bearing sleeves such as **63** journaled on the ends of a lift shaft **64**. The lift shaft **64** has lift cams **65** and **66** at its ends and when the shaft is turned, by an arm **67**, the cams **65** and **66** will bear down on the plates **53** and **59** and thereby lift the screed to a non-operating or other position, as desired.

The screed **20** has a shaped end **68** to conform to the shape of the curb to be formed. Rubber mounting elements may be provided in the screed support means to reduce vibration to the machine, and the screed strikes off concrete and vibrates it in one operation, the excess gutter concrete being moved into the curb mule.

The screed structure **26*a*** on which the curb mule is releasably mounted provides a particular advantage in affording an improved finish for air-entrained concrete. To this end, it comprises two pan sections **69** and **70** which are longitudinally separated by a space or opening **71** of sufficient dimension to release bubbles entrained on the top surface, which otherwise would be locked in. The front screed **69** thus gives an initial finish and the rear screed **70** gives substantially a final finish. The screeds **69** and **70** may have side flanges **72** and **72*a*** and front and rear flanges of substantial height, **73**, **74** and **75**, **76**. They may be mounted on the machine by suitable vertical supports such as indicated at **77**, **78** and **79** or the like.

Further in accordance with the invention, a stainless steel trowel **80** is mounted at the rear of the machine which is effective to provide a final finish. This structure may be connected to the machine, as to the supports **14** at the rear thereof, by turn buckle shafts **81** affording adjustment of the inclination of the trowel.

It will thus be seen that I have provided a machine which is exceptionally efficient and effective in affording a better finish than has been available previously, and is readily adjustable as to width to this end.

Although I have herein set forth and described my invention with respect to certain specific principles and details thereof, it will be understood by those skilled in the art that these may be varied without departing from the spirit and scope of the invention as set forth in the hereunto appended claims.

We claim as our invention:

1. A slab and curb finishing machine comprising an elongated frame having a curb side and a slab side opposite said curb side and having wheels for riding on forms for concrete or the like, a finishing pan structure for forming and finishing a slab mounted on and extending transversely across said frame and comprising a forward finishing pan portion and a rear finishing pan portion spaced longitudinally from said forward finishing pan portion a substantial distance such as to permit release of air entrained in concrete finished thereby, a continuous curb mold for forming and finishing a curb along one side of the slab mounted on said machine and extending longitudinally along one side of said finishing pan structure, and an angled screed mounted on the front of the frame and inclined backwardly toward said curb mold.

2. A curb and gutter molding machine comprising in combination:

a main frame having front and rear supports on a curb side and front and rear supports on a gutter side with supporting wheels adapted to ride on side concrete form rails,

a horizontal vibratory screed mounted on the frame and extending laterally across the front of the machine at a predetermined angle with the end on the gutter side of the machine ahead of the trailing end on the curb side of the machine so that excess gutter concrete is moved toward the curb side as the machine advances,

said screed having a lower horizontal planar leveling surface with the curb end having a raised shaped downwardly concave recess,

a curb molding form having a downwardly facing concave surface and shaped to conform to and mounted in the recess in the curb end of said screed for forming and smoothing a concrete curb,

protruding frame portions mounted on said frame supporting the screed in its predetermined angled position relative to the longitudinal axis of the machine and accommodating vibration thereof, said screed having vertically adjustable means mounting it on said frame portions, said means being longitudinally positionable on the frame portions without changing said predetermined angle of said screed, a vibratory drive means and vibrator attached to the screed,

and pan means mounted on the frame on the gutter side of the machine having a lower horizontal surface extending rearwardly from the molding form for providing a finishing operation on the gutter behind the horizontal surface of the screed.

3. A curb and gutter machine as claimed in claim **2** wherein said pan means comprises a first pan and a second pan secured at their inner edges to the curb form and being free of attachment to each other so that a space is formed therebetween.

4. A curb and gutter machine as claimed in claim **3**

wherein said pan means includes first and second adjustment means between the main frame and said first and second pans for independent vertical adjustment of the pans.

References Cited by the Examiner

UNITED STATES PATENTS

1,662,257	3/1928	Valerio	94—45
2,054,263	9/1936	McCrery	94—45
2,096,699	10/1937	Shaw	94—45
2,185,645	1/1940	Mosel	94—45
2,187,080	1/1940	Heltzel	94—45
2,203,529	6/1940	Harvey	94—45
2,226,466	12/1940	Heltzel	94—45
2,244,297	6/1941	Heltzel	94—45
2,297,978	10/1942	Oswald	94—45
2,881,683	4/1959	Konway	94—45

CHARLES E. O'CONNELL, *Primary Examiner.*

JACOB L. NACKENOFF, *Examiner.*