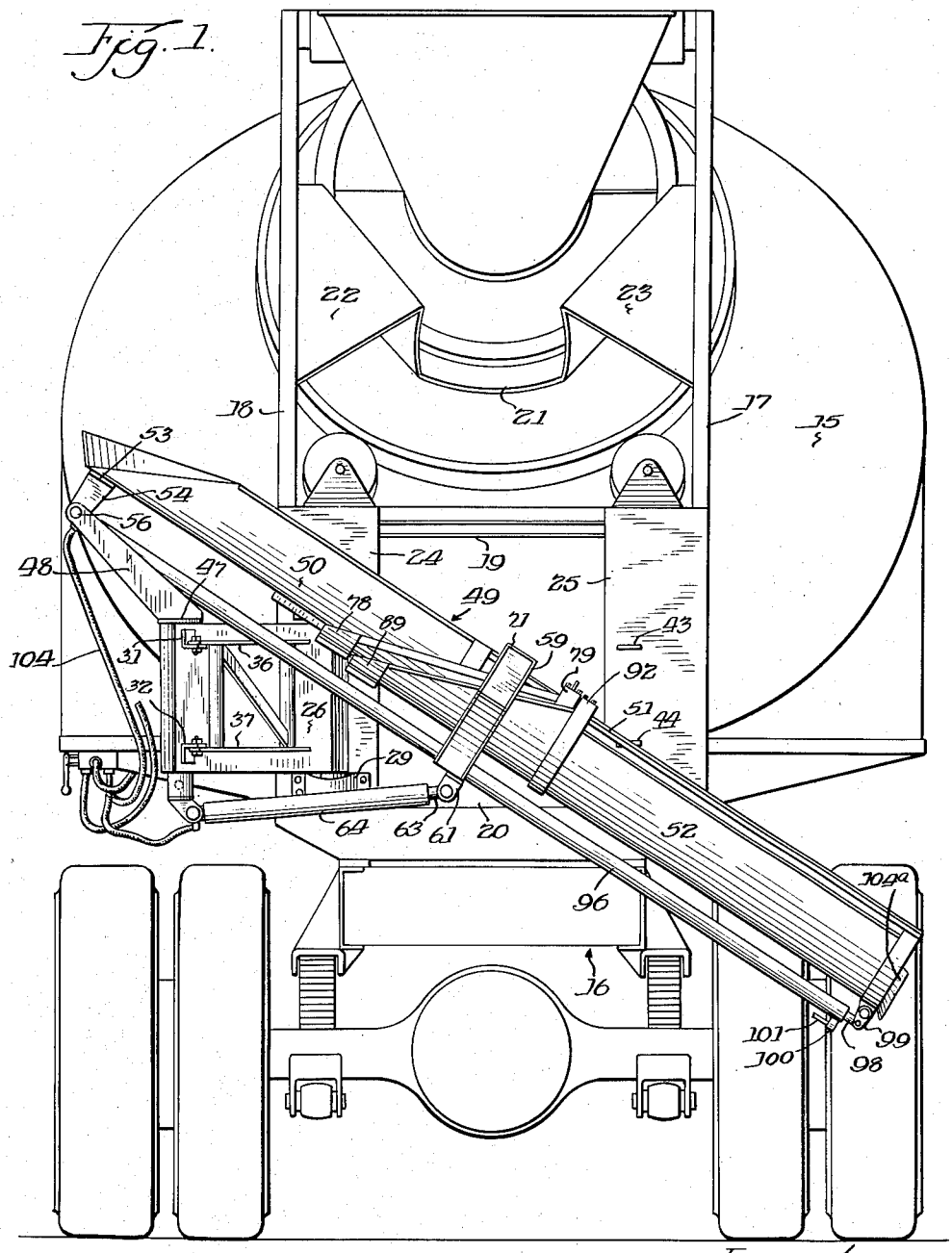
Jan. 17, 1961 J. F. OURY 2,968,382

TELESCOPIC CHUTE

Filed Dec. 2, 1957 5 Sheets-Sheet 1

Fig. 1.



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TELESCOPIC CHUTE

Filed Dec. 2, 1957 5 Sheets-Sheet 2

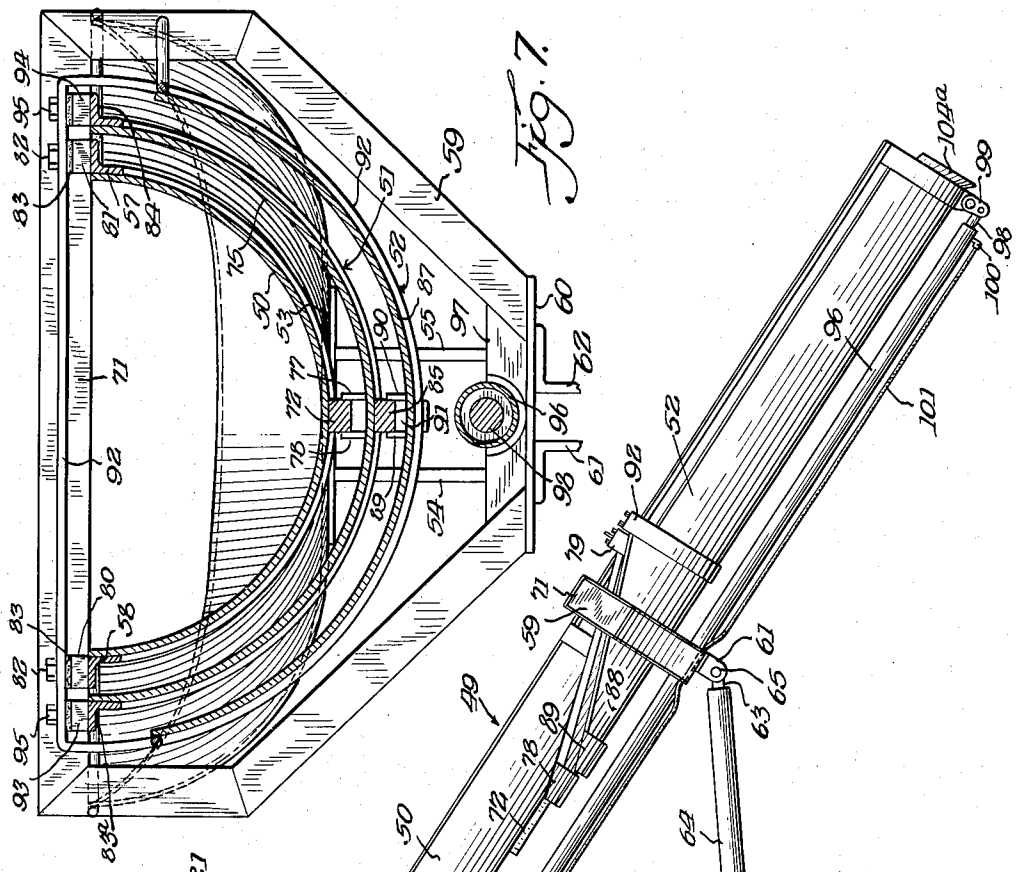

Fig. 7.

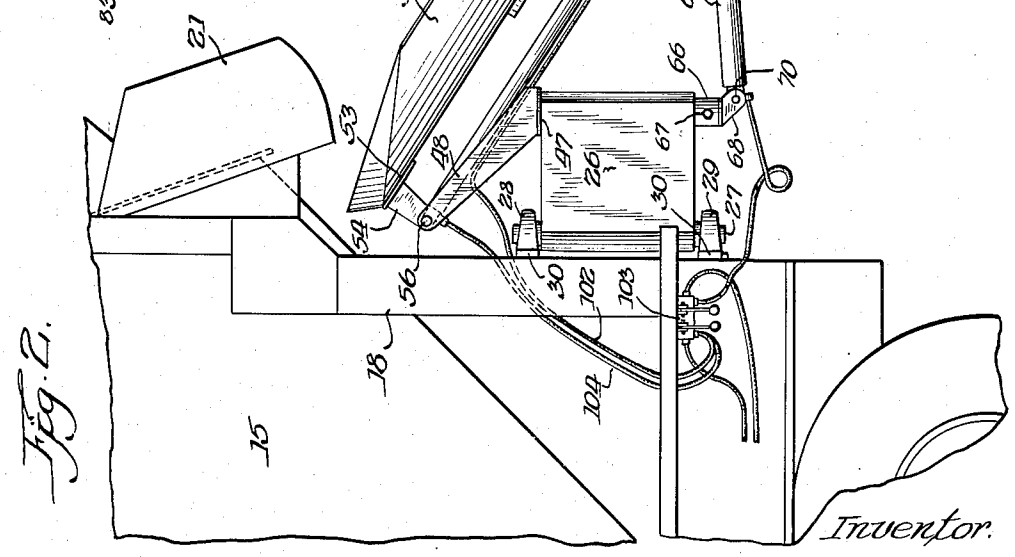

Fig. 2.

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TELESCOPIC CHUTE

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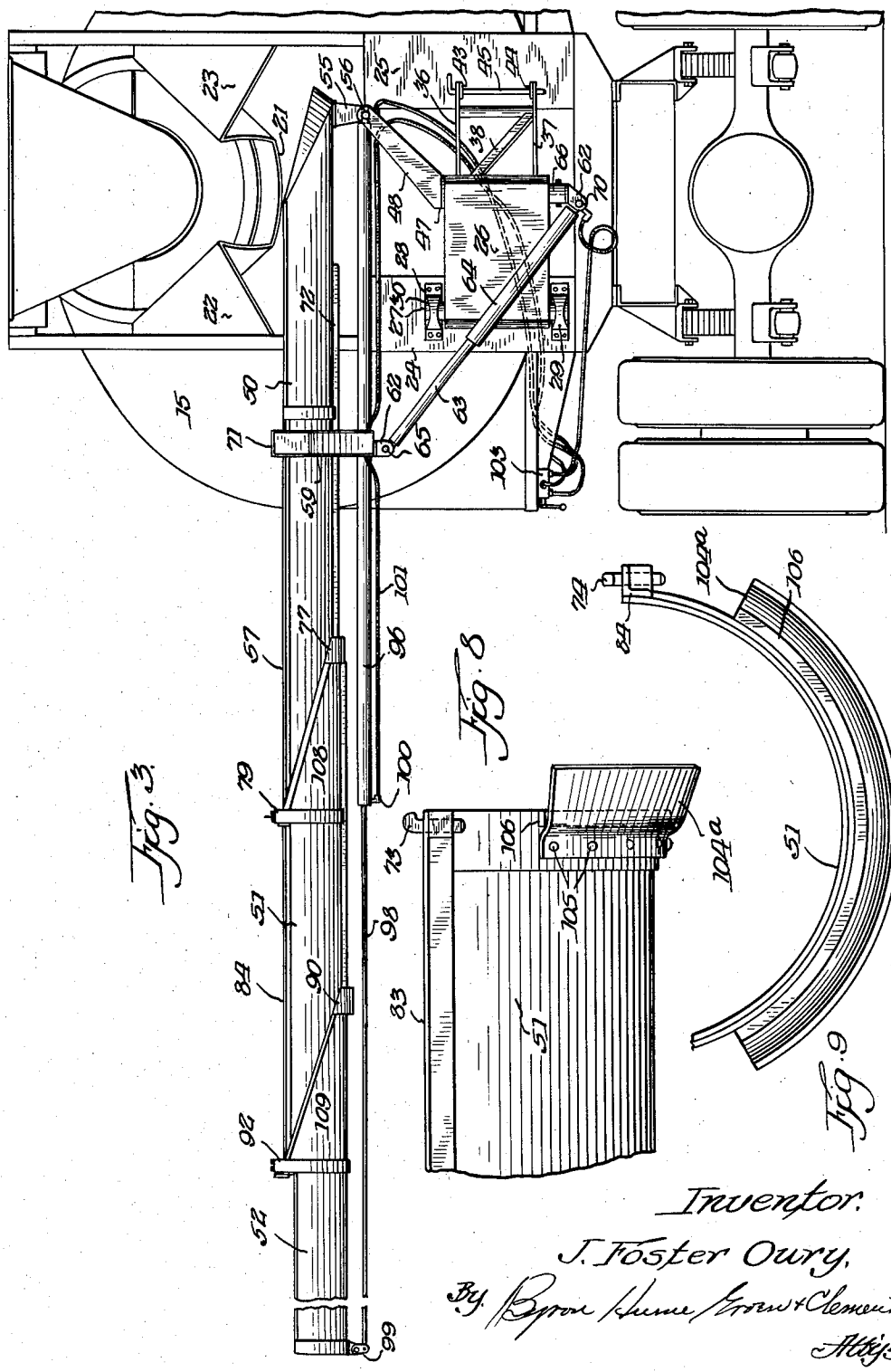

Fig. 3.

Fig. 8

Fig. 9

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TELESCOPIC CHUTE

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Fig. 4.

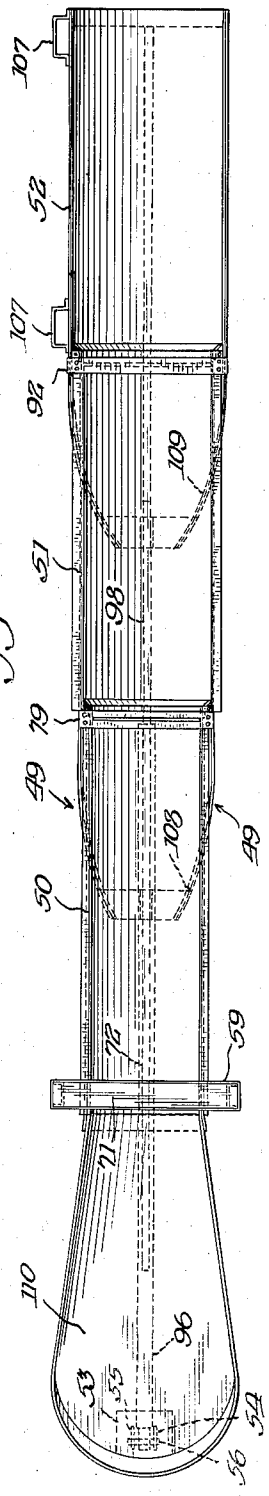


Fig. 5.

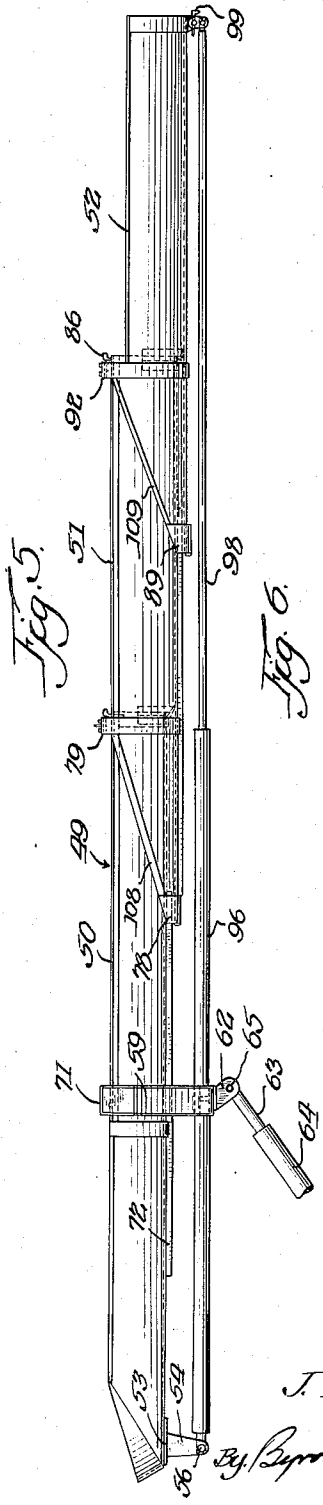
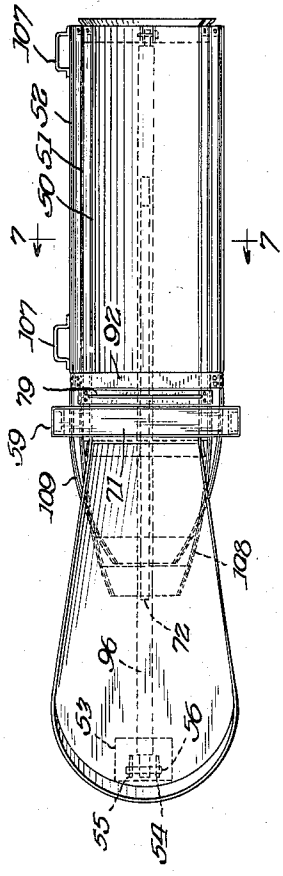


Fig. 6.



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Jan. 17, 1961 J. F. OURY 2,968,382

TELESCOPIC CHUTE

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Fig. 10.

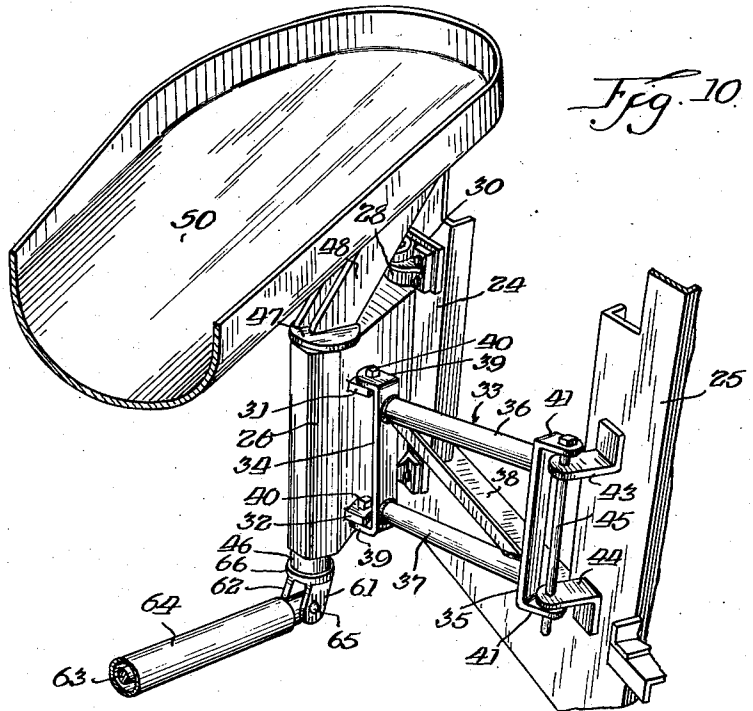
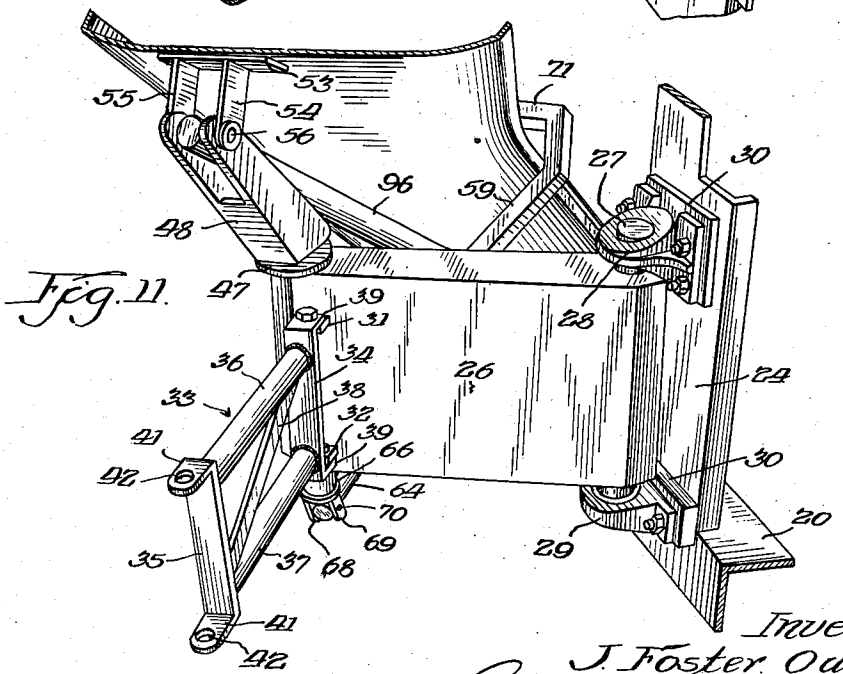


Fig. 11.



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2,968,382

TELESCOPIC CHUTE

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Filed Dec. 2, 1957, Ser. No. 700,172
2 Claims. (Cl. 193—10)

My invention relates to a transit mixer telescopic conveying chute for transit concrete mixers and mountings therefor and has particular reference to a power actuated transit mixer conveying chute which is mounted at the discharge end of a transit mixer and is adapted to be contracted into compact form so that when mounted at the rear end of a transit mixer, it is within the width of the transit mixer and does not project beyond the sides thereof, thereby permitting the legal movement of the trucks over highways, streets, and the like, and which when extended, conveys the concrete discharged from the mixing drum of the transit mixer by gravity for a distance, if desired, up to twenty feet or so from the end of the mixing drum thereby depositing the concrete mixture into many positions to which it would have to be moved by some other conveying means, usually through the use of wheelbarrows and manual labor, thereby saving both time and labor in the laying of concrete for roads, streets, foundations, and the like.

Another object of my invention is the provision of a conveyor chute adapted to be attached to a transit mixer and which is useful particularly in the laying of sidewalks paralleling a street and separated from the street by a parkway, in the laying of fairly wide sidewalks which can be laid in sections with the concrete mix being conveyed over the outer sections either before or after the concrete mix has been laid in such sections, in the putting down of concrete slabs for use as garage floors and in many instances, in the laying of concrete foundations without movement of the concrete and in which instances, the concrete is discharged at a point very close to where it is ultimately laid and tamped into final form without being manually moved as by shovels from one location to another.

Another and further object of my invention is the provision of a telescopically arranged chute which is mounted upon the transit mixer by a cantilever arrangement and without auxiliary support means so that the outer end of the chute, when in extended position, is at a distance of eighteen or twenty feet from the discharge end of the mixing drum and in which the chute can be moved in a radial direction on the pivot point of the chute so that the concrete can be discharged either directly behind the transit mixer or on either side of the transit mixer as may be desired or necessary to make a deposit of the mixture without moving the mixer or manually moving the material after it has been discharged from the mixing drum.

Another and further object of my invention is the provision of a telescopically arranged chute which can be tilted to various inclined positions by power mechanism and also in which both the contraction and extension of the telescopically arranged chute is power controlled, preferably by hydraulic means which is under the control of the operator so as to make the deposit of the mixture in the proper location.

Another and further object of my invention is the provision of a telescopic chute preferably semi-circular

in cross-section and composed of a plurality of such sections which are nested together and so mounted that they may be moved telescopically with relation to each other into both contracted and extended positions and in so doing, the loose concrete is removed from the surfaces of at least two of the sections during the contracting operation of the chute thereby avoiding the necessity of immediate cleaning of the sections of the chute to prevent concrete from hardening therein and to avoid the necessity of washing out these sections of the chute which might be necessary if this cleaning element were omitted.

Another and further object of my invention is the provision of a telescopic conveying chute made up of a plurality of sections or units which normally are in either complete nested position or partially nested position, but which can easily be separated and one section removed from the other for cleaning purposes if desired.

These and other objects of my invention will be more fully and better understood by reference to the accompanying drawings and in which:

Fig. 1 is an end elevational view of a transit mixer truck with the conveyor chute mounted thereon in contracted position for support purposes;

Fig. 2 is a side elevational view of the end of the transit mixer and chute shown in Fig. 1 with the chute in contracted position extending rearward from the transit mixer;

Fig. 3 is an elevational view of the rear end of a transit mixer showing the discharge chute mounted thereon in fully extended position to deliver the concrete mixture to one side of the rear of the transit mixer;

Fig. 4 is a top plan view of the chute in extended position;

Fig. 5 is an elevational view of the chute in extended position;

Fig. 6 is a top plan view of the chute in contracted position;

Fig. 7 is a cross-sectional view through the chute in contracted position on lines 7—7 of Fig. 6;

Fig. 8 is a view of the discharge end of one of the sections making up the chute showing the cleaning element and stop mounted thereon;

Fig. 9 is a partial end view of the section shown in Fig. 8;

Fig. 10 is a perspective view showing the mounting mechanism supporting the chute in discharge position; and

Fig. 11 is a perspective view showing the mounting mechanism in unlatched position preliminary to being placed in transit position as shown in Fig. 1.

Referring now specifically to the drawings and in which like reference characters refer to like parts throughout, a transit mixer drum **15** is shown mounted upon a truck chassis designated as a whole as **16** which chassis has a pair of vertical frame members **17** and **18** thereon at the rear end with an upper cross brace **19** and a lower cross brace **20** connecting the frame members **17** and **18** and a collecting discharge chute **21** having side portions **22** and **23** which receives and directs the flow of concrete mix as it flows from the drum **15** during the discharge operation of the drum through the usual rear end opening. Support plates **24** and **25** are mounted on the frame members **17** and **18** and to the cross braces **19** and **20** for the support of a telescopic chute hereinafter described.

A mounting block **26** is secured to the support plate **24** by means of a shaft **27** which extends through the block **26** and has projecting end portions which are mounted in bearings **28** and **29** secured to pillow blocks **30**, **30** welded or otherwise secured to the support plate **24** to form a firm pivotal mounting for the block **26**. Ears **31** and **32** are provided on one side of the block **24** to which a frame **33**

is mounted, the frame 33 consisting of end channel sections 34 and 35, pipes 36 and 37 welded at each of their ends to the channel sections 34 and 35 respectively with a cross brace 38 being provided to strengthen the frame 33. The channel section 34 has flanges 39, 39 thereon at its ends with bolts 40, 40 passing through the flanges 39, 39 and the ears 31 and 32 on the block 26 providing a pivotal mounting for the frame 33 on the block 26. The channel section 35 has flanges 41, 41 thereon with openings 42, 42 therein, the flanges 41, 41 being adapted to co-operate with brackets 43 and 44 welded to the support plate 25 and projecting outward therefrom with a pin 45 extending through the openings 42, 42 in the flanges 41, 41 and through holes in the brackets 43 and 44 by means of which pin 45, the frame 33 is removably hinged to the support plate 25 and anchors the block 26 against radial movement about the shaft 27 and provides a base for supporting the upper end of the telescopic chute hereinafter described in both its operative and inoperative positions.

A chute pivot shaft 46 is rotatably mounted in the outer end of the block 26 having a bearing plate 47 thereon which rests in the upper edge of the block 26 and a bifurcated arm 48 being secured to the pivot shaft 46 and movable therewith. The telescopic chute designated as a whole as 49 comprises an upper primary section 50, an intermediate secondary section 51 and a lower end section 52, each of the body portions of the said sections of the chute being substantially semi-circular in cross-section, with the intermediate section 51 being supported by the primary section 50 in both the contracted and extended positions of the chute 49, while the end section 52 is supported by the intermediate section 51.

The primary section 50 of the chute has a plate 53 welded to its underside with arms 54 and 55 extending outward therefrom on each side of the arm 48 with a pin 56 connecting the arm 48 and the arms 54 and 55 thereby providing a pivotal support for the rear end of the primary chute 50. The chute section 50 has angle rails 57 and 58 along its side edges which are secured to the body of the section 50 by being welded thereto, and a yoke 59 is provided which extends entirely around the section 50 intermediate its ends at a point preferably one-half of the distance between the ends of the section 50. The yoke 59 has a bottom section 60 secured thereto to which spaced angles 61 and 62 are secured and to which a piston rod 63 forming a part of a hydraulic ram 64 is secured by a pin 65 which extends through the end of the rod 63 and the angles 61 and 62. A cap 66 is secured to the lower end of the pivot shaft 46 by a pin 67, the cap 66 having spaced ears 68 and 69 thereon to which the rear end of the ram 64 is secured by means of a pin 70 thereby securing the ram 64 in operative position to raise and lower the chute 49 upon the pin 56 in the upper end of the arm 48. The yoke 59 has a top portion 71 to which the angles 57 and 58 are welded thereby securing the yoke 59 and primary upper section of the chute 50 together. A guide bar 72 is welded to the underside of the section 50 and extends longitudinally of the said section partially of its length while in the innerside at the edge of the section 51 at the lower end thereof, removable stop blocks 73 and 74 are provided which act as stops for the outward movement of the intermediate chute section 51 as hereinafter described.

The intermediate section 51 of the chute 49 has a body portion 75 generally semi-circular throughout the major portion of its length but is tapered towards its end adjacent the mixer to a somewhat narrow arcuate end and has guide plates 77 and 78 thereon extending for the length of the narrowest portion of the intermediate section 51 and adapted to operate in sliding engagement with the guide bar 72 secured to the primary section 50. A D-shaped member 79 is welded to the body 75 of the intermediate section 51 of the chute 49 and extends across the open side of the body portion 75 and has bearing blocks 80 and 81 mounted thereon by means of bolts 82, 82 with resilient pads 83, 83 being interposed between the blocks 80 and 81 and the member 79. The slide blocks 80 and 81 are spaced for sliding engagement upon the angles 57 and 58 along the top edges of the primary chute section 50 for movement of the intermediate chute section 51 into extended and contracted position during the operation of the chute 49. The intermediate section 51 has angles 83*a* and 84 welded to its edges throughout its length for strengthening purposes and to form tracks on which the end section 52 of the chute operates as hereinafter described.

The body 75 of the section 51 has a guide bar 85 thereon at its bottom which functions to keep the end section 52 in proper alignment with the chute 50. Removable stop blocks 86, 86 are secured to the angles 83*a* and 84 at the outer end of the section 51 which act as stops for the outward movement of the end section 52 of the chute 50 and for movement of the section inward to contracted position of the chute 49 and for outward movement of the chute 49 to extended position.

The end section 52 of the chute 49 is composed of a body member 87 semi-circular in form for the major portion of its length but having a tapered end portion 88 with guides 89 and 90 thereon which engage the guide bar 85 at each of its sides with a bearing block 91 being secured on the body of the section 52 which slides on the guide bar 84 during the inward and outward movement of the end section 52 of the chute 49. A D-shaped member 92 is secured to the body portion 87 of the chute section 52 and has slide blocks 93 and 94 secured thereto by means of bolts 95, 95 which slide blocks 93 and 94 ride the angles 83*a* and 84 on the intermediate section 51 in the inward and outward movement of the end section 52 of the chute 49.

A hydraulic ram 96 is provided which is mounted upon the pin 56 at its upper end and is supported by a saddle 97 intermediate its ends mounted on the yoke 59 and has a piston rod 98 therein secured to a bracket 99 in the outer end of the section 52 with a pipe connection 100 being attached to the hydraulic ram 96 having a pipe 101 with a hose 102 connecting the pipe 101 and a valve 103 under the control of the operator. A second hose 104 is connected to the hydraulic ram at its upper end through which hydraulic fluid is admitted to the upper end of the ram 96 for forcing the piston rod 98 outward.

Attached to the discharge ends of each of the chute sections 50 and 51 (Figs. 8 and 9) is an arcuate shaped wiping pad 104*a* preferably made of rubber or some other resilient material and secured by rivets 105 passing through the wiper pad 104*a* along one of its edges to the sections 50 and 51 with a bar 106 being placed between the wiper pad and the sections 50 and 51 to produce an outward flair to the wiper pad so as to bring the forward edge of the wiper pad 104*a* into close contact with the inner surface of the sections 51 and 52 as they are telescoped together when the sections of the chute are brought into contracted position from extended position thus scraping these surfaces and freeing them of the concrete mix and preventing the freezing together of the sections because of the hardening of concrete left therein.

Handles 107, 107 are provided in the end chute section which are grasped by workmen for rotating the chute 49 in its axial shaft 46 whereby concrete mix is deposited in different areas rearward of the transit mixer. The rear ends 108 of the intermediate chute 51 is narrower than is the body of the chute by having its side walls reduced in height so the surface friction of the surfaces of the two chute sections 50 and 51 in sliding engagement with each other is reduced, thereby permitting easier operation of the chute 49, while the rear end 109 of the end section 52 is similarly reduced, while the receiving end 110 of the section 50 is widened somewhat to pan shape to better receive the concrete mix discharged from the transit mixer drum 15.

The operation of the device is extremely simple and

generally is controlled by the operator standing at the rear of the truck adjacent the valve **103**. Assuming that the driver has delivered the mixture to an appropriate location for discharging the contents of the drum, his first move is to unlatch the holding mechanism for holding the chute from swinging outward during transit, not shown in the drawings, and rotate the holding block **26** in a direction towards the center line of the transit mixer and secure the bracket **33** to the brackets **43** and **44** by dropping the pin **45** through the openings of the bracket and thereby anchoring the block **36** against lateral movement in either direction. In this position, the shaft **46** is directly behind the center of the discharged chute **21** and the chute can be moved by rotating it on the shaft **26** to any desired position within a radius of 180° to the rearward of the transit mixer. In the position of the chute shown in Fig. 1 of the drawings, the entire length of the chute is fitted into a position within the width of the adjacent truck so that there is no projecting parts of the chute extending to either side of the truck, a condition normally prohibited on state highways and city streets. If it is desired to deliver the concrete mix onto some frame of transmitting mechanism the chute is left in contracted position because usually the transit mixer can be positioned closely enough to such a transmission device so that an extension of the chute is not necessary. However, for the delivery of the concrete mixture at a point somewhat remote from the discharging end of the concrete drum the operator, by manipulating the valve **103** admits pressure fluid into the upper end of the hydraulic ram **96** which through the action of the piston rod **98**, pushes the end section **52** of the chute outward and as the end section **52** moves outward, the slide blocks **93** and **94** engage against the stops **73** and **74** on the section **51** thereby moving the sections **51** and **52** outward and in a position shown in Fig. 1. If the operator desires to lift the end of the chute, this movement is accomplished through the use of the ram **64** which pushes the piston rod **63** outward thereby lifting the chute about the pin **56** as an axis. If the operator wishes to extend the chute to its full length, he continues to admit pressure fluid to the ram **96** until the chute is extended to its complete length for delivery of the concrete mix to a sidewalk spaced from the street by a parkway, or the like, or over the outer section sidewalk for pouring the concrete to the inside section of a wide sidewalk such as is commonly used along main streets, or the like. In this position the angle of the chute is controlled by the operator manipulating the valve through the ram **64** thereby keeping the inclination of the extended chute at a sufficient angle so that concrete mix flows by gravity out of the chute and is discharged therefrom at the selected place of deposit or use of the concrete mix. The workmen who are spreading the concrete and tending to tamping it into position, by grasping the handles **107** on the side of the outer chute section **52**, remove the entire chute in a radial direction so that the mix can be deposited in an area rearward of the mixer both immediately behind the transit mixer and to each side thereof. For the pouring of concrete foundations, the transit mixer can be backed into position fairly close to the walls and enough of the movement of the chute can be obtained so that either the walls or the basement floor of such a building can be poured into position without material movement of the concrete mix used for making the walls, floor, or the like. The mounting of applicant's device is of such character so that it is pivotally supported on a vertical direction on the pins **65** and **56** with the end of the chute beyond the yoke **59** extending the outward frame on a cantilever type of structure so that the concrete mix can be delivered remote from the mixer in a very large number of instances without the necessity of shovelling the discharged mix into the position where it is finally tamped into position, or moved to the desired point by wheelbarrows or some other mode of conveyance. This is particularly true as respects slabs of concrete laid for foundations of garages where an entire slab of concrete can be poured without handling any of the concrete mix by hand and substantially at one operation.

If the operator wishes to contract the chute, he reverses the valve action which admits hydraulic fluid through the valve **103** through the pipe **101** to the lower end of the ram **96** which slides the end section **52** into position where the member **92** abuts against the member **79** on the intermediate chute section **51** and slides these sections back into contracted position with the pads **104***a*, **104***a* which are mounted on the ends of the primary chute **50** and secondary chute **51**, scraping the loose concrete from the inside surface of these chute sections so that the loose concrete and the like is removed from these sections as they are closed and the parts wiped free of the concrete mix which, if allowed to harden, interfere with the operation of the chute. When the chute sections are restored back to their contracted positions, the unit is unlatched by the removal of the pin **45** and swung to one side of the concrete mixer latched into position when the transit mixer is ready to return for filling of the concrete mix to its base plant.

The cleaning of the entire chute may be advisable at the close of the day, or perhaps once a month, depending upon the use to which the transit mixer is subjected and if this is desired, the pin connecting the piston rod **98** with the bracket **99** is removed and the pins **73** also removed when both the end section **52** can be disengaged from the intermediate section **51** and, likewise, intermediate section **51** of the chute can be disengaged from the primary chute **50** and the entire chute cleaned and particles of concrete removed therefrom as may be desired. After the cleaning operation is performed, the chute can be reassembled by placing the intermediate chute in position over the end of the primary chute **50** making sure that the guides **77** are fitted at each side of the rail **72** on the primary chute **50** and this section, pushed into position with the end section **52** is thereupon fitted over the end section **52** in the same manner as heretofore described with respect to the intermediate section **51** and the rod **98** of the hydraulic ram **96** connected to the bracket **99** when the device is completely reassembled. In many instances it may not be necessary to extend the chute fully, or perhaps only the primary section may be used which may be at least eight feet in length may be sufficient to deposit the concrete mix to the point desired. The carrying of the contracted chute so the ends do not project beyond the sides of the mixer truck is important which I am able to accomplish because of the pivoted mounting of the block **26** and the downward inclination of the chute **49**.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

What is claimed is:

1. In combination with a concrete transit mixer, a laterally movable pivotally mounted support block, a frame on said block detachably connected with the transit mixer whereby the support block is held in fixed position, a chute pivot shaft mounted on said support block, a primary chute section, a yoke on said primary chute section intermediate its ends, an arm on said chute pivot to which the primary chute section is pivotally connected for vertical movement of the said chute section, a hydraulic ram secured to the lower end of the chute pivot at one of its ends and to the said yoke at its other end, a plurality of secondary chute sections telescopically connected with each other and with the primary section and a hydraulic ram connected to the arm supporting one end of the primary chute to the free end of the end secondary chute

whereby the said chute is extended and contracted and a resilient wiper member secured to the discharge end of the primary chute for engagement with the inner surface of the adjacent chute as the chute is contracted.

2. In combination with a concrete transit mixer, a laterally movable pivotally mounted support block, a frame on said block detachably connected to the transit mixer whereby the support block is held in fixed position, a chute pivot shaft mounted on the said support block, a primary chute section, a yoke on said primary chute section intermediate its ends, an arm on the pivot shaft pivotally connected to the said primary chute section whereby the primary chute section is vertically movable, a hydraulic ram secured to the said pivot shaft at one of its ends and pivotally connected with the said yoke at its other end, an intermediate chute telescopically secured to the primary section, an end section telescopically secured to the intermediate section, each of said intermediate and end sections being tapered at one of their ends, members encompassing the said intermediate and end sections having slide blocks thereon for engagement with the top edges of adjoining chute sections, guide rails on the sides of the tapered ends, guide rails on the adjacent nesting sections with which the guide plates are in engagement by the encompassing member on the end chute section, a hydraulic ram secured to the said end section at one of its ends and to the primary chute at its opposite end whereby the said chute may be extended and contracted, and compressible wiper pads secured to the outer surfaces of the primary and intermediate chutes adjacent the ends thereof for wiping engagement with the inner surface of the adjacent chutes.

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