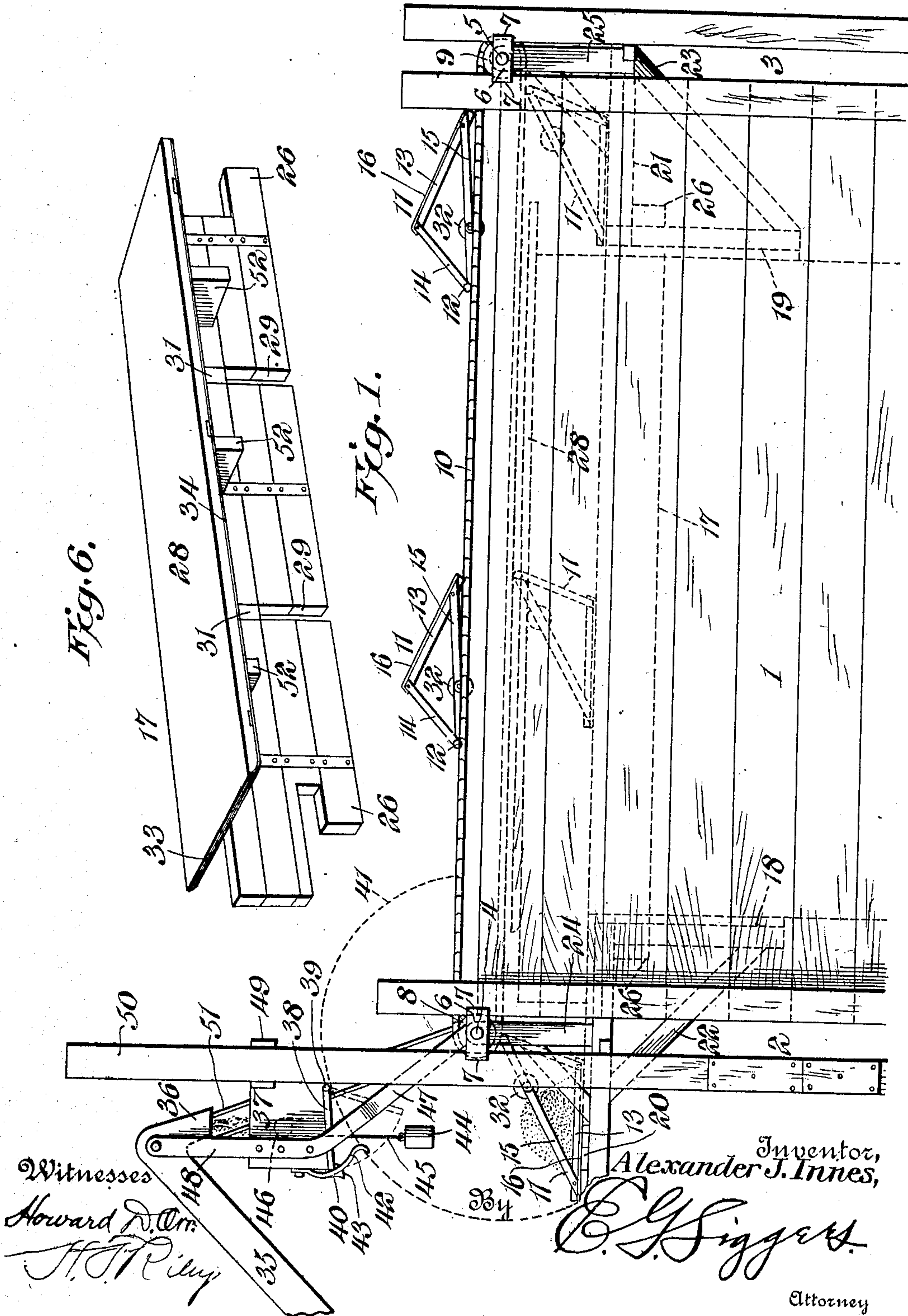


925,912.

A. J. INNES.  
MACHINE FOR MAKING CONCRETE WALLS.  
APPLICATION FILED AUG. 17, 1908.

Patented June 22, 1909.

4 SHEETS—SHEET 1.



Witnesses  
Howard D. Orr  
H. J. Riley

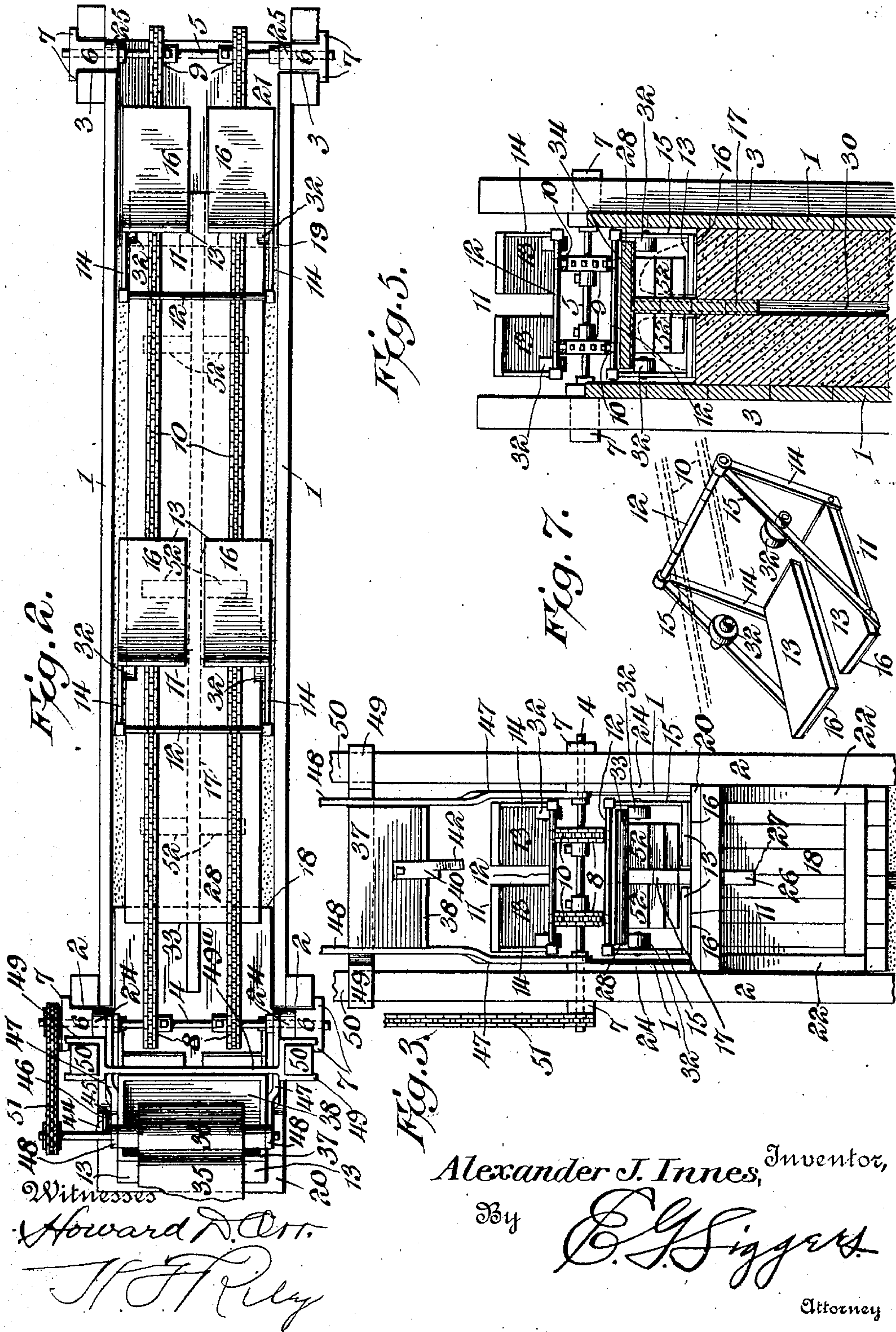
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4 SHEETS—SHEET 2.





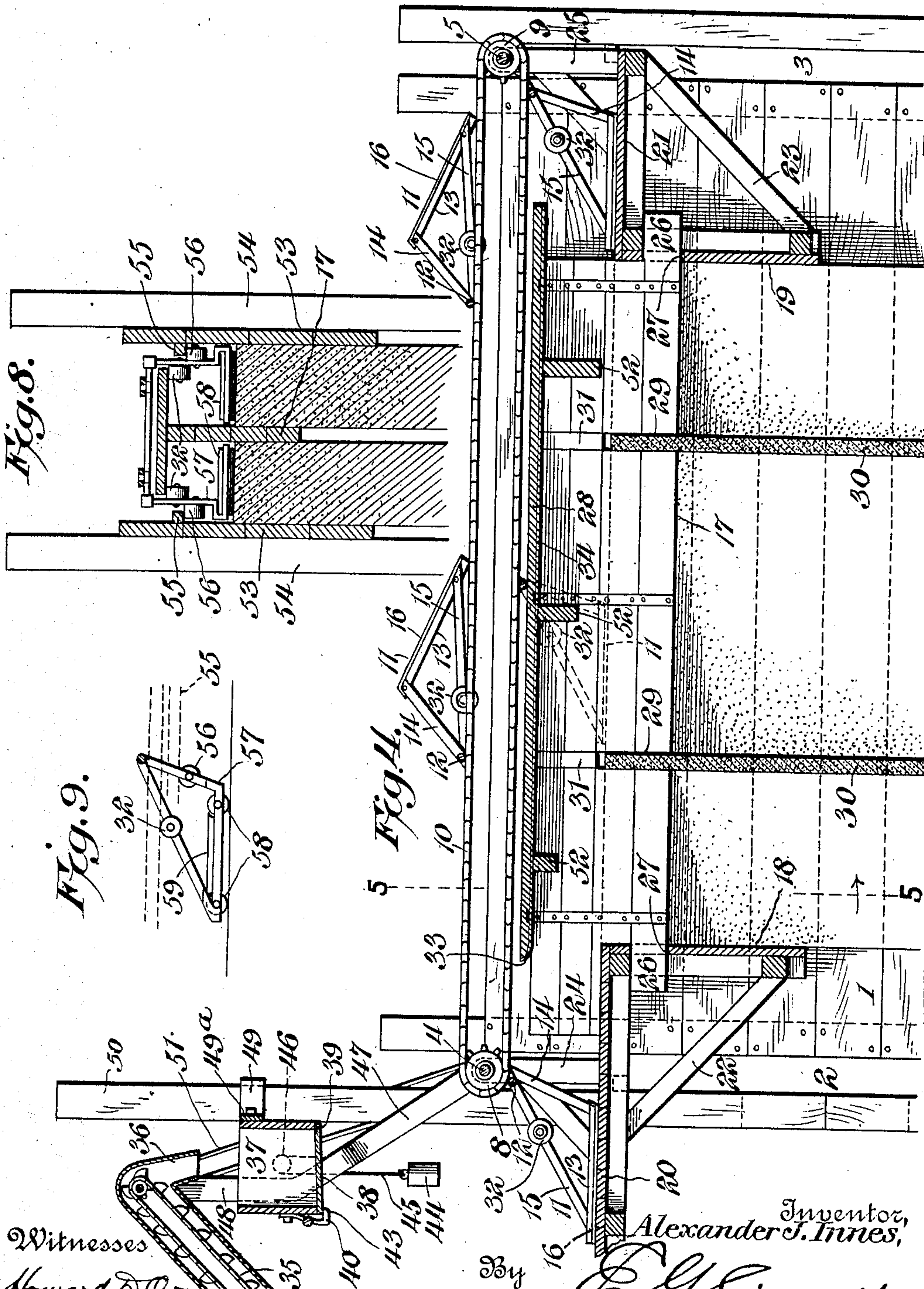
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4 SHEETS—SHEET 3.

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4 SHEETS—SHEET 4.

Fig. 10.

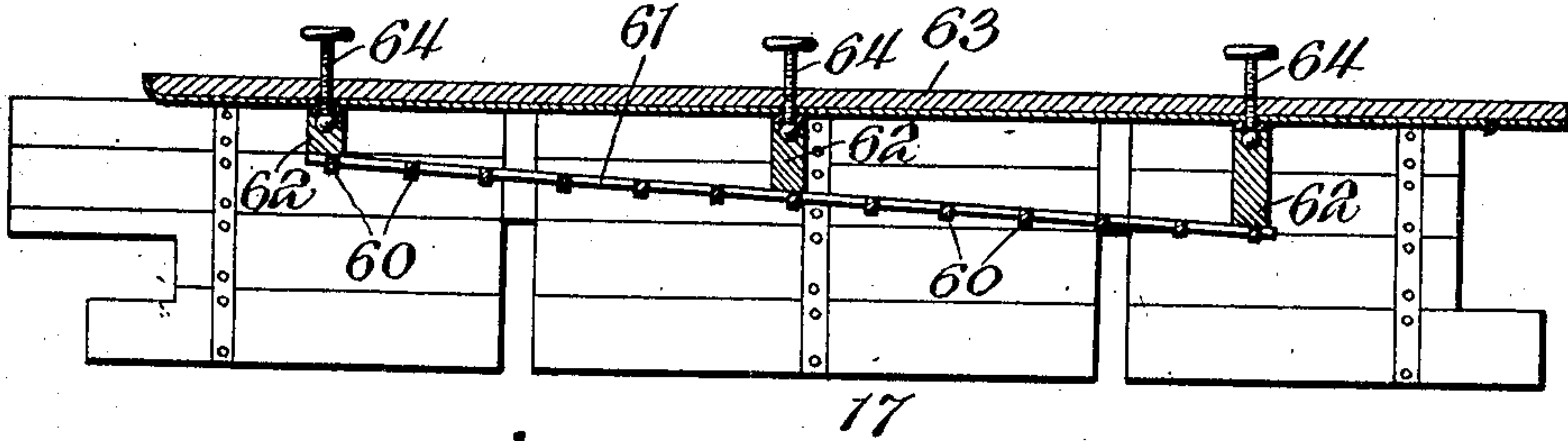


Fig. 11.

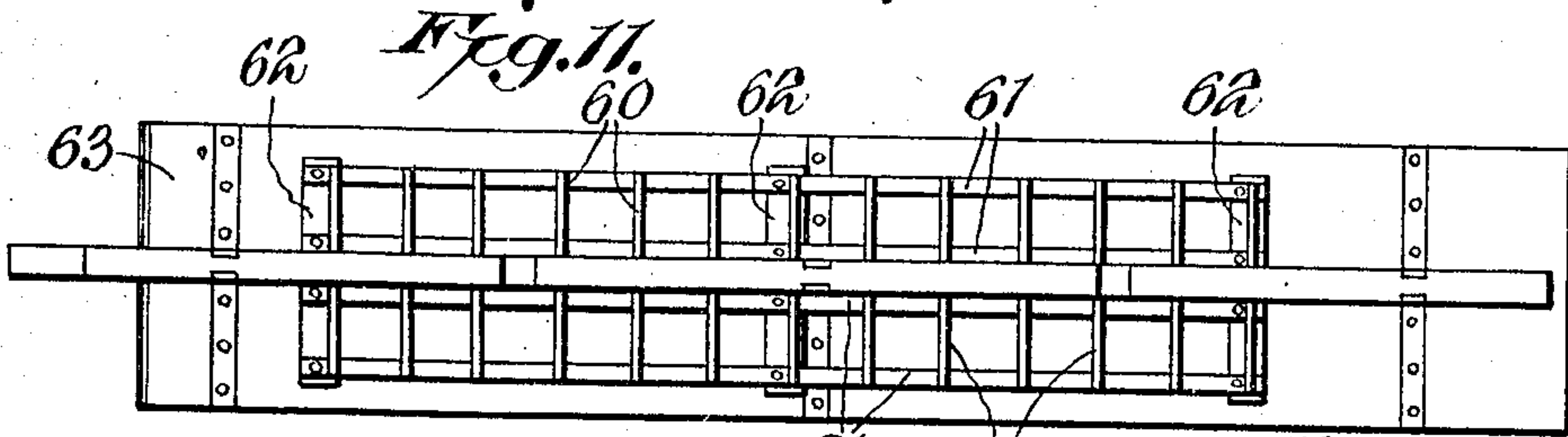


Fig. 12.

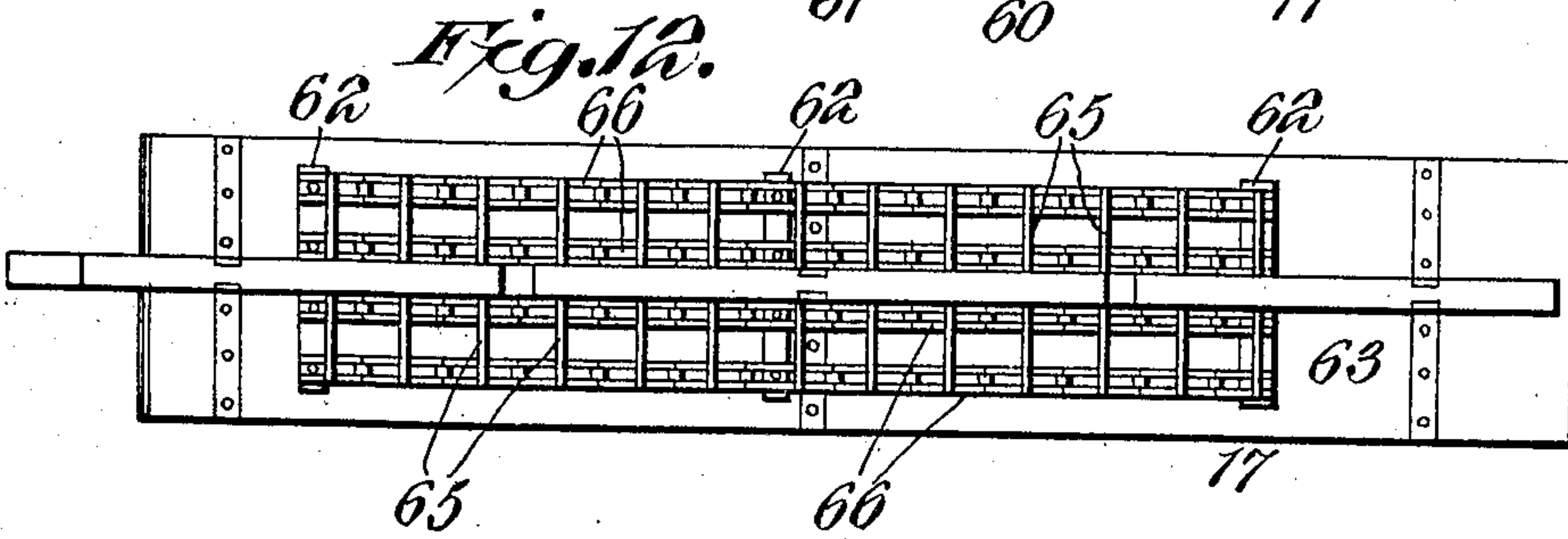


Fig. 13.

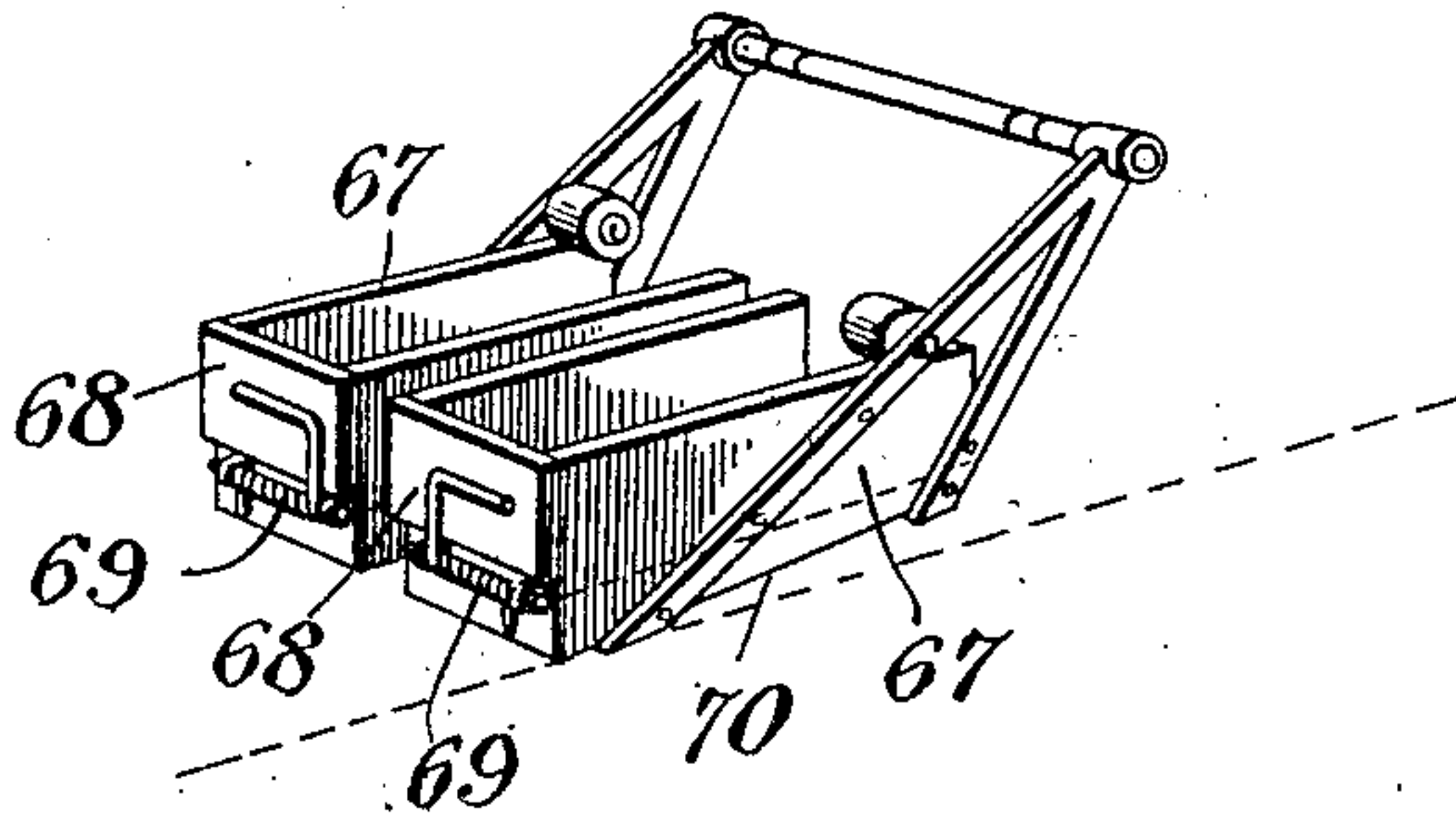
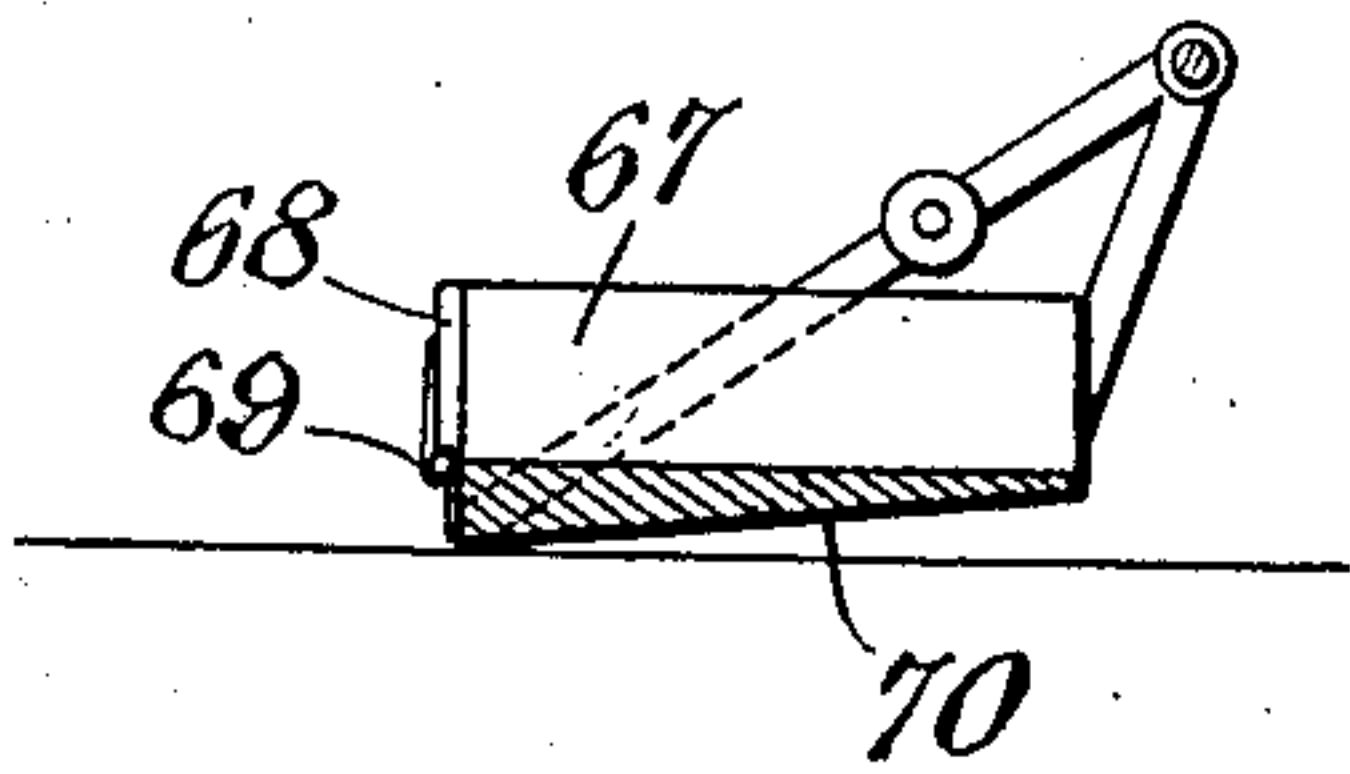


Fig. 14.



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# UNITED STATES PATENT OFFICE.

ALEXANDER J. INNES, OF SUTHERLAND, IOWA.

## MACHINE FOR MAKING CONCRETE WALLS.

No. 925,912.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed August 17, 1908. Serial No. 448,850.

*To all whom it may concern:*

Be it known that I, ALEXANDER J. INNES, a citizen of the United States, residing at Sutherland, in the county of O'Brien and State of Iowa, have invented a new and useful Machine for Making Concrete Walls, of which the following is a specification.

The invention relates to improvements in machines for making concrete walls.

10 The object of the present invention is to improve the construction of machines for making concrete walls, and to provide a simple and comparatively inexpensive molding machine of this character, adapted to enable  
15 a hollow concrete wall to be easily, rapidly and economically erected.

A further object of the invention is to provide an automatic machine of this character, adapted to receive concrete or other plastic  
20 material from an elevator, and capable of carrying the material to and distributing it along a wall under construction, and simultaneously leveling, packing and smoothing the material, whereby the wall is automatic-  
25 ally built up by the machine.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying  
30 drawings, and pointed out in the claims here-to appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to with-  
35 out departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a side elevation of a concrete wall molding machine, constructed in accordance with this inven-  
40 tion. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation of the machine. Fig. 4 is a longitudinal sectional view. Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 4. Fig. 6 is a detail perspective  
45 view of the vertically movable core member for forming the dead air space. Fig. 7 is a detail perspective view, illustrating the construction of the car or carrier, shown in Figs. 1 to 5 inclusive. Fig. 8 is a transverse sec-  
50 tional view, illustrating an embodiment of the invention equipped with vertically adjustable molds. Fig. 9 is a detail view of the car or carrier, shown in Fig. 8. Fig. 10 is a longitudinal sectional view of a core, illus-

trating a modification of the invention and 55 equipped with vertically adjustable scrapers. Fig. 11 is a reverse plan view of the core and the adjustable scrapers shown in Fig. 10. Fig. 12 is a reverse plan view, illustrating another modification of the invention and showing a  
60 core provided with a flexible series of adjustable scrapers. Fig. 13 is a detail perspective view of a car, illustrating a modification of the invention. Fig. 14 is a vertical longitudinal sectional view of the car shown in  
65 Fig. 13.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention illus- 70 trated in Figs. 1 to 6 inclusive, the mold or molding frame includes spaced sides 1, designed to be constructed of ordinary lumber, when the vertical faces of the wall are to be smooth, but it will be readily apparent that  
75 the sides of the molding frame may be provided with any desired design for decorative purposes. The molding frame in the present form of invention is fixed or stationary, being built up as the wall increases in height, and  
80 the said frame is designed to be removed from the concrete wall after the material has set and hardened, like the molding frames or sections of a concrete wall molded in the ordinary manner. The machine is provided  
85 at the end of the molding frame with vertical guides or ways 2 and 3, preferably formed by spaced timbers arranged in pairs at opposite sides of the molding frame and adapted to guide horizontal end shafts 4 and 5, pro-  
90 vided at their ends with slides 6, arranged in the said vertical ways. The slides 6, which consist of rectangular blocks, have bearing openings and are provided at their outer ends with projecting horizontal flanges 7, extending  
95 in opposite directions and fitting against the outer faces of the vertical bars or timbers, which form the sides of the guides or ways 2 and 3. The horizontal shafts 4 and 5 carry sprocket wheels 8 and 9, preferably arranged  
100 in pairs and receiving endless sprocket chains 10, but one or more endless belts or bands of any preferred form may be employed to adapt the machine to the width of the wall or other analogous structure to be erected.  
105 The endless sprocket chains, which are arranged horizontally, consist of upper and lower flights, and are equipped with cars or



carriers 11, arranged at intervals and designed to be varied in number to suit the length of the wall to be molded.

The car or carrier, which is connected at opposite points with the sprocket chains by a transverse rod 12, consists essentially of spaced bottom sections 13 and sides connecting the bottom sections with the transverse rod 12. The sides are preferably composed of bars or members 14 and 15, arranged at an angle to each other and extending upward from the ends of the bottom sections of the car or carrier, and connected at their upper terminals to the transverse rod 12. The bars or members 14 and 15 form approximately triangular sides and may be constructed of any suitable material, either wood or metal. The bottom sections may, as illustrated in the accompanying drawings, be constructed of wood and have their lower faces covered with sheets 16 of steel, or other suitable material to enable them to withstand the wear incident to the friction produced by the grout. The sections of the bottom, which are spaced apart to travel at opposite sides of a vertically disposed core 17, operate to level, pack and smooth the cement by traveling over the same at the upper face of the wall, the necessary pressure being applied through the cars or carriers by the means hereinafter described. The dividing of the car into spaced opposite side portions forms practically two cars, and any number of separate series or sets of cars may be employed to mold a wall or structure of the desired thickness, and a plurality of cores arranged in parallelism may be utilized for forming the necessary hollow spaces at the desired points. The bottom sections carry the concrete or other plastic material, and the cars or carriers distribute the material along the wall and smooth and tamp the said material. The flat lower faces of the sections of the bottom of the car are particularly effective and operate with a troweling action in smoothing the cement.

The top of the molding frame is open, and the ends are closed at the upper portion of the wall by means of vertically movable or adjustable end members 18 and 19, arranged vertically between the sides of the molding frame and equipped with outwardly extending horizontal platforms 20 and 21. The end members 18 and 19 and their platforms are preferably constructed of wood, but they may be made of any desired material, and the outer portions or platforms are supported by inclined braces 22 and 23. The end members and their platforms are raised automatically by the means, hereinafter described, as the wall is constructed, and they are connected with and suspended from the transverse shafts 8 and 9 by vertical side bars 24 and 25, secured at their lower ends to the platforms at the side edges thereof and

provided at their upper ends with bearing openings for the said shafts 8 and 9. The end members are also connected with the vertically movable or adjustable core 17, which is provided at the bottom with terminal projections 26, arranged horizontally and extending through slots 27 of the end members 18 and 19. By this construction the core and the end members are connected and are mutually supporting. The core also operates to space the end members and prevents undue pressure at the ends of the wall.

The core 17, which is arranged in a vertical plane, extends longitudinally of the wall, and is composed of separate detachable sections, connected by a horizontal top member 28 and spaced apart at their adjacent edges to provide slots 29. The cement is laid and molded at opposite sides of the core 17, which forms dead air spaces, and the slots 29 permit the cement to flow through the core 17, so that the opposite portions of the wall will be united at intervals by transverse vertical webs 30, which divide the dead air space into separate cells or passages. The stability of the core may be increased by blocks or pieces 31, arranged in the slots 29 between the upper portions of the sections of the core, and the latter are adapted to be detached to permit the core to clear a framed portion or space, where it is desired to provide a window, door or the like. Also by this means arches or other openings may be formed in a wall, or other concrete structure, and the slots or openings 29 will admit of the arrangement of the rods or other means for reinforcing the cement.

The horizontal top member 28, which extends laterally from opposite sides of the core, is supported and raised by the cars or carriers, which are equipped at opposite sides with inwardly extending anti-friction rollers or wheels 32, mounted on pivots or spindles, which are carried by the inclined side bars 15 of the cars or carriers. The lower flights or stretches of the endless sprocket chains are located directly above the horizontal top member of the core, and the sides of the cars or carriers extend slightly above the top member, the anti-friction devices 32 being located intermediate of the ends of the said side bars 15 and arranged to pass beneath the top member 28. The front edge 33 of the top member 28 is beveled at its lower face to provide an incline to enable the anti-friction devices to pass readily beneath the said top member 28, whereby the latter is lifted and carried upward by the cars or carriers 11. The cars or carriers by engaging and supporting the top member of the core are subjected to the weight of the said core, the end members and the gearing for operating the cars or carriers. The lower face of the horizontal top member 28 is provided with a covering



34 of sheet steel, or other material to prevent it from being worn by the rollers or wheels of the cars or carriers.

The material is delivered to the machine  
 5 by means of an inclined elevator 35 of any preferred construction, having a discharge spout 36 at the top, located above a hopper 37. The hopper 37 is provided with a bottom 38, hinged at its inner edge 39 and detachably held in its closed position by a  
 10 catch 40, mounted on the body of the hopper and engaging the free outer edge of the bottom, as clearly illustrated in Fig. 4 of the drawings. The cars or carriers are moved  
 15 from the front end of the machine to the rear end thereof by the lower flights of the endless chains, and during such movement distributes the concrete and levels, packs and smooths the same. They are inverted when  
 20 they are transferred from the lower to the upper flights of the endless chains at the rear end of the machine, and advance toward the front of the machine in an inverted position, as illustrated in Fig. 1 of the drawings.  
 25 When a car or carrier arrives at the front of the machine, it swings through an arc indicated by the dotted line 41 and during such movement engages an arm 42 of the catch 40. The movement of the car or carrier  
 30 through the said arc at the front of the machine returns it to its normal, upright or operative position, which it assumes in time to receive a charge of concrete from the hopper. The catch 40 preferably consists of a  
 35 spring secured at its upper end to the exterior of the hopper, and provided with a lower engaging head 43, having an upper shoulder for locking the bottom of the hopper in its closed position, and provided with a lower  
 40 beveled or inclined face to enable the bottom of the hopper in closing to automatically engage it. The hopper is automatically closed by means of a weight 44, secured to one end of a flexible connection 45, which has its  
 45 other end attached to the hinged bottom of the hopper. The flexible connection passes around a pulley 46, mounted upon the exterior of one of the sides of the hopper. The weight of the material contained within the  
 50 hopper overbalances the weight 44 and opens the bottom of the hopper, and as soon as the material is discharged from the hopper the weight 44 quickly swings the hinged bottom 38 to its closed position.  
 55 The hopper is secured to a pair of supporting bars or members 47, connected at their lower ends with the front horizontal shaft 4, and composed of lower inclined portions and upper vertical portions. The lower inclined  
 60 portions extend upwardly and outwardly, and the hopper is secured to the upper vertical portions, which support the upper end of the elevator, as clearly illustrated in Figs. 1 and 4 of the drawings. The upper ends 48  
 65 of the supporting bars 47 are pivoted to the

elevator, and the hopper is provided with operating yokes 49, slidably embracing vertical extensions 50 of the outer bars or members of the front guides or ways 2. The yokes 49, which are disposed horizontally, 70 are connected by a horizontal bar or member 49<sup>a</sup>, secured to the hopper. By this construction the hopper and the upper end of the elevator are carried upward with the mechanism for spreading, smoothing and 75 packing the concrete along the top of the wall. Motion may be communicated to the endless chains by means of an inclined belt or chain 51, extending from one end of the front shaft 4 to the top shaft of the elevator, but any 80 other suitable means may be employed for operating the machine. When, however, the machine is driven from the elevator, the gearing for communicating motion to the machine, is not affected by the vertical move- 85 ment of the machine incident to the building or molding of the wall.

Each car or carrier operates on the cement spread upon the wall by the preceding car or carrier, and in order to secure a uniform dis- 90 tribution of the cement throughout the length of the wall, the core is equipped at each side with a series of graduated scrapers 52, consisting of blocks or pieces depending from the top plate or member and gradually 95 increasing in size from the front to the back of the core. Any suitable number of scrapers may be included in the series. The core, shown in the accompanying drawings, is equipped with front, rear and intermediate 100 scrapers, but in practice the scrapers will be arranged at short intervals, say, about six inches apart. The front scraper removes a portion of the material from the car or carrier, the intermediate scraper removes an- 105 other portion of the material, and the rear scraper removes the rest of the material. The concrete is thus delivered upon the top of the wall in a plurality of separate portions, arranged at regular intervals, and the next 110 succeeding car operates to level, pack and smooth the concrete. It will thus be seen that the wall will be gradually molded, each car or carrier conveying a portion of the material to the wall, and that the cars or car- 115 riers, besides operating to deliver the material to the wall and level, pack and smooth the concrete, also serve to automatically raise the machine as the wall is erected.

In Figs. 10 and 11 of the drawings is illus- 120 trated a modification of the invention, the core being equipped at each side with an inclined series of adjustable scrapers 60, consisting of transverse slats or bars secured at intervals to the lower faces of the inclined 125 longitudinal straps or bars 61 carried by vertically adjustable pieces 62. The vertically adjustable pieces 62, which extend transversely of the top member 13, gradually increase in size being progressively larger to 130



support the series of scrapers at an inclination. The straps or bars 61 are secured to the lower faces of the transverse pieces 62, and the latter are adjusted by means of screws 64, mounted in threaded perforations of the top member 63 and provided at their lower ends with ball-shaped heads, which are swiveled to the pieces 62, as clearly shown in Fig. 10 of the drawings.

In Fig. 12 of the drawings the transverse scrapers 65 are secured to chains 66 to form a flexible series of scrapers for enabling different portions of the series to be adjusted independently of the other portions. This construction is designed for use at points where spaces are to be left open for windows, doors, etc., and the scrapers at these points are adjusted so as to render them ineffective. The flexible series of the scrapers will also operate to uniformly distribute the concrete at the places where the wall is being constructed.

In Figs. 13 and 14 is illustrated a modification of the car, which is provided with inner and outer side walls 67 and rear doors 68, hinged at the bottom and yieldably maintained closed by springs 69, which permit the doors to be gradually lowered or opened by the scrapers. The bottom portions 70 of the cars are tapered or wedge-shaped to present inclined faces to the concrete. This will enable the cars to ride over the top of the concrete and will enable them to smooth, pack and level the material without clogging or causing the concrete to accumulate in front of the car.

Instead of employing a fixed molding frame, the machine may be equipped with a vertically movable molding frame 53, as illustrated in Fig. 8 of the drawings. The molding frame, when vertically movable and adapted to be carried upward with the rest of the machine, is composed of two sides, arranged between vertical guiding timbers 54. Each side is composed of three or four boards, in order to provide a comparatively light construction, adapted to be easily carried by the machine, but sides of any desired height may of course be employed. The sides are provided at their inner faces with horizontal rails or guides 55, which are engaged by rollers or wheels 56, mounted on the sides of the cars 57 at the outer faces of the contiguous side bar, as clearly illustrated in Fig. 8 of the drawings. The anti-friction devices 56 run beneath the sides of the mold and support and carry the same upward as the wall is molded. The sides of the vertically movable mold may be connected by any suitable means for maintaining them in spaced relation, and when building a wall in this manner, it will of course be necessary to operate so as to permit the concrete to set and harden before the sides of the mold are raised above the same. Instead of leveling,

smoothing and packing the concrete by means of the horizontal bottom troweling sections of the cars or carriers, illustrated in Figs. 1 to 4 inclusive, the cars may, as shown in Figs. 8 and 9, be equipped with transversely disposed bottom rolls 58, arranged to engage the cement at the top of the wall. The transverse rolls 58 are spaced apart to operate at opposite sides of the core, and the car 57 is also provided with supporting bottom sections 59, having their upper faces arranged in substantially the same plane as the tops of the transverse rolls and adapted to receive and carry the cement. The employment of the smoothing and tamping rolls does not interfere with the operation of the scrapers in removing the concrete from the cars or carriers.

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

1. A machine of the class described including a mold, and an endless series of cars or carriers having means for delivering plastic material to the mold and for smoothing and packing the same.

2. A machine of the class described including a mold, an endless band, and a car or carrier connected with and operated by the endless band and arranged to carry the plastic material to the mold and adapted to smooth and pack the material.

3. A machine of the class described including a mold open at the top, and a car or carrier arranged to travel across the top of the mold for conveying plastic material to the same, said car or carrier having a bottom forming a support for the plastic material and having a lower smooth face to smooth and pack the said material.

4. A machine of the class described including a mold, a car arranged to convey material to the mold and movable along the same and having a bottom forming a support for the material, and means for automatically discharging the contents of the car at intervals along the mold.

5. A machine of the class described including a mold open at the top, a car arranged to travel along the top of the mold to convey plastic material to the same and having a bottom to support the material and also to level and pack the said material, and means for automatically discharging the material from the car at intervals.

6. A machine of the class described including a mold, a car arranged to convey material to the mold and movable along the same and having a bottom for supporting the material, and means arranged in the path of the car in position for successively removing portions of cement from the car to discharge the contents automatically at intervals.

7. A machine of the class described including a mold, a car or carrier for conveying



plastic material to the mold, and a plurality of graduated scrapers arranged in the path of the car in position for discharging portions of the plastic material at intervals along the mold.

8. A machine of the class described including a mold open at the top, and a car or carrier movable along the mold and provided with a bottom for carrying plastic material and for also leveling, smoothing and packing the said material.

9. A machine of the class described including a mold open at the top, a car for conveying plastic material to the mold and for smoothing the said material, and a core for forming an interior space within the molded material, said core being arranged to be supported by the car or carrier, whereby the latter is caused to pack the plastic material.

10. A machine of the class described including a mold open at the top, an endless band operating in the mold, a plurality of cars or carriers mounted on and carried by the endless band to convey plastic material to the mold and to smooth the same, and a core for forming an interior space within the molded material, said core being arranged to be supported by the cars or carriers and subjecting the same to pressure for packing the plastic material.

11. A machine of the class described including a mold open at the top, a core arranged within the mold and having spaced vertical portions for forming hollow spaces within the molded material, and a car having opposite portions arranged to travel at opposite sides of the core for delivering plastic material to the mold.

12. A machine of the class described including a mold, a core arranged within the mold and having spaced vertical portions, and a car having spaced side portions arranged to travel at opposite sides of the core for delivering plastic material to the mold and supporting the said core, whereby pressure is communicated to the car or carrier for packing the plastic material.

13. A machine of the class described including a mold, a core having a vertical portion for forming a hollow space within the molded material, said core being also provided with laterally projecting portions, and a plurality of cars for delivering plastic material to the mold, said cars having means arranged to travel beneath the laterally projecting portions of the core for supporting the latter.

14. A machine of the class described including a mold, a core composed of spaced sections, a top portion connecting the sections and extending laterally from the same, and cars or carriers for delivering material to the mold, said cars or carriers having means arranged to travel beneath the top portion of the core for supporting the latter.

15. A machine of the class described including a mold, a core arranged within the same and having laterally projecting portions, cars or carriers for conveying the material to the mold, said cars or carriers being provided with means arranged to travel beneath the laterally projecting portions of the core for supporting the latter, and a graduated series of scrapers mounted on the core for removing the material from the cars.

16. A machine of the class described including a mold, a core arranged within the same and having laterally projecting portions, cars or carriers for conveying the material to the mold, said cars or carriers being provided with means arranged to travel beneath the laterally projecting portions of the core for supporting the latter, and graduated scrapers located at opposite sides of the core and depending from the laterally projecting portions of the same for removing the material from the cars.

17. A machine of the class described including a mold, a vertical core provided with laterally projecting portions, cars having spaced sections arranged to travel at opposite sides of the core, and graduated scrapers mounted on the core for successively removing the material from the cars.

18. A machine of the class described including a mold, a horizontally disposed endless band operating in the mold, a core arranged in the mold below the endless band, and a plurality of cars or carriers connected with and actuated by the endless band for delivering material to the mold, said cars being provided with anti-friction rollers arranged to support the core.

19. A machine of the class described including a mold, guides, cars or carriers for delivering material to the mold and for smoothing and packing the said material, and means for actuating the cars including an endless band, and slides movable in the said guides.

20. A machine of the class described including a mold provided at its ends with vertical guides, cars or carriers for delivering material to the mold and for smoothing and packing the said material, and means for actuating the cars or carriers including an endless band, shafts, and slides having bearings for the shafts and operating in the said guides.

21. A machine of the class described including a mold open at the top and ends, cars or carriers arranged to deliver material to the mold and to smooth and pack the said material, said cars being gradually raised by the molded material, and end members movable vertically at the ends of the mold and adapted to be raised by the said cars.

22. A machine of the class described including a mold, a core, end members connected with the core, and cars or carriers for delivering the material to the mold, said cars or



carriers having means for engaging the core for raising the same and the end members as the material is molded.

23. A machine of the class described including a mold having spaced side members, vertical end members, a core connecting the end members and spacing the same, and an endless series of cars or carriers for conveying material to the mold, said cars or carriers having means for engaging the core for raising the same and the end members.

24. A machine of the class described including a mold having spaced sides, vertical end members provided with openings, a core spacing the end members and having projections extending through the openings of the same, and cars or carriers for conveying material to the mold.

25. A machine of the class described including a mold, a core movable vertically in the mold, vertical end members connected with and spaced by the core and provided with outwardly projecting horizontal platforms, and an endless series of cars or carriers movable over the said platforms and adapted to convey material to the mold.

26. A machine of the class described including a mold having spaced sides, guides arranged at the ends of the mold, a core operating in the mold, vertical end members connected with the core, cars or carriers for conveying material to the mold, operating mechanism for actuating the cars or carriers having shafts arranged in the guides, and means for suspending the end members from the shaft.

27. A machine of the class described including a mold having spaced sides, a core operating in the mold, end members connected with the core, an endless series of cars or carriers for delivering the material to the mold, said cars or carriers being arranged to smooth and pack the material and adapted to be lifted by the same for raising the core and the end members, and means also carried upward by the cars or carriers for delivering the material to the same.

28. A machine of the class described comprising a mold having spaced sides, a core operating in the mold, end members connected with the core, an endless series of cars or carriers for delivering the material to the mold, said cars or carriers being arranged to smooth and pack the material and adapted to be lifted by the same for raising the core and the end members, means for delivering material to the cars or carriers including an elevator, and a hopper located beneath the elevator and arranged to discharge its contents onto the cars or carriers.

29. A machine of the class described including a mold, an endless series of cars or carriers movable over the top of the mold for delivering material to the same, a hopper at

one end of the mold, and means located in the path of and actuated by the cars or carriers for discharging the contents of the hopper onto the same.

30. A machine of the class described including a mold, an endless series of cars or carriers movable over the top of the mold for delivering material to the same, a hopper located at one end of the mold having a hinged bottom, and a locking device for holding the hinged bottom in its closed position, said locking device having means extending into the path of the cars or carriers and arranged to be actuated by the same to unfasten the bottom of the hopper to permit the contents thereof to fall upon the cars or carriers.

31. A machine of the class described including a mold, an endless series of cars or carriers for delivering material to the mold, a hopper having a hinged bottom, a locking device for holding the hinged bottom in its closed position, said locking device having means extending into the path of the cars or carriers and arranged to be actuated by the same to unfasten the bottom of the hopper to permit the contents thereof to fall upon the cars or carriers, an elevator for delivering material to the hopper, and means for automatically closing the hinged bottom of the hopper at the end of each operation of the same.

32. A machine of the class described including a mold, an endless series of cars or carriers for delivering the material to the mold, a hopper, an elevator, means for communicating motion from the elevator to the endless series of cars or carriers, said cars or carriers being arranged to be raised by the material as the same is molded, means for connecting the hopper and the elevator with the endless series of cars or carriers, whereby the same are raised, and means for guiding the hopper in its upward movement.

33. A machine of the class described including a mold, an endless series of cars or carriers for delivering the material to the mold, a hopper, an elevator, means for communicating motion from the elevator to the endless series of cars or carriers, said cars or carriers being arranged to be raised by the material as the same is molded, means for connecting the hopper and the elevator with the endless series of cars or carriers, whereby the same are raised, vertical guides, and a loop mounted on the hopper and receiving the guides, whereby the hopper is guided in its upward movement.

34. A machine of the class described including a mold provided at its ends with front and rear guides, the front guides having vertical extensions, an endless series of cars or carriers having shafts operating in the guides, supporting bars extending upward



from one of the shafts, a hopper secured to the supporting bars and having means for engaging the extensions of the front guides, and an elevator also supported by the said bars.

35. A machine of the class described including a mold having vertical guides, a hopper provided with opposite yokes slidably embracing the guides, and an endless series of cars or carriers arranged to receive the material from the hopper and adapted to convey the same to the mold and movable upwardly by the material as the same is molded, and means for connecting the hopper with the endless series of cars or carriers.

36. A machine of the class described including a mold having spaced sides movable vertically, a car or carrier for delivering material to the mold, said car or carrier being arranged to pack the material and adapted to be raised by the same and having means for engaging and raising the mold.

37. A machine of the class described including a mold having spaced vertically movable sides provided with tracks, and a car or carrier for conveying material to the mold, said car or carrier being arranged to smooth the material in the mold and adapted to be lifted by the material and having anti-friction devices for engaging the said tracks, whereby the mold is raised and pressure is applied to the car for packing the material.

38. A machine of the class described including a mold having spaced vertically movable sides provided with rails, and a car or carrier for delivering material to the mold and provided with anti-friction devices arranged to engage the track for supporting the sides of the mold, said cars being also provided with rolls for smoothing and packing the molded material.

39. A machine of the class described including a mold having spaced vertical sides, and means movable along the space between the sides of the mold for conveying material to the latter and for smoothing and packing the said material, said means being automatically raised by the molded material as the wall is built.

40. A machine of the class described having spaced sides arranged to mold the wall, and mechanism for conveying material to the mold and for smoothing the said material, said mechanism being arranged to be supported by the material in the mold so as to apply pressure to the same and be auto-

matically raised by the material as the wall is built.

41. A machine of the class described having spaced sides arranged to mold the wall, and mechanism for conveying material to the mold and for smoothing the said material, said mechanism being arranged to be supported by the material in the mold so as to apply pressure to the same and be automatically raised by the material as the wall is built, and a core carried by the said mechanism for forming one or more hollow spaces within the wall.

42. A machine of the class described including a mold, and mechanism for delivering the material to the mold, said mechanism being arranged to rest upon the molded material to apply pressure to the same and being carried upward by the material as the same is molded.

43. A machine of the class described including a mold, and mechanism for delivering material to the mold, said machine being arranged to be supported by the material in the mold so as to apply pressure to the same and be carried upward by the material as the same is molded.

44. A machine of the class described including a mold, a core for forming a hollow space within the molded material, cars or carriers arranged at opposite sides of the core, and relatively fixed scrapers carried by the core for removing the material from the cars or carriers.

45. A machine of the class described including a mold, a core for forming a hollow space within the molded material, cars or carriers arranged at opposite sides of the core, and relatively fixed scrapers arranged at intervals at opposite sides of the core for removing the material from the cars or carriers.

46. A machine for making concrete walls, etc., including a mold, and mechanism located at the top of the mold for delivering plastic material to the same, said mechanism being arranged to be supported by the wall as the same is molded so as to apply pressure to the material.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALEXANDER J. INNES.

Witnesses:

F. N. SPURLOCK,  
R. W. SEYMOUR.