Sept. 11, 1934. W. C. MEYNCKE 1,973,440

PIPE LINING MACHINE

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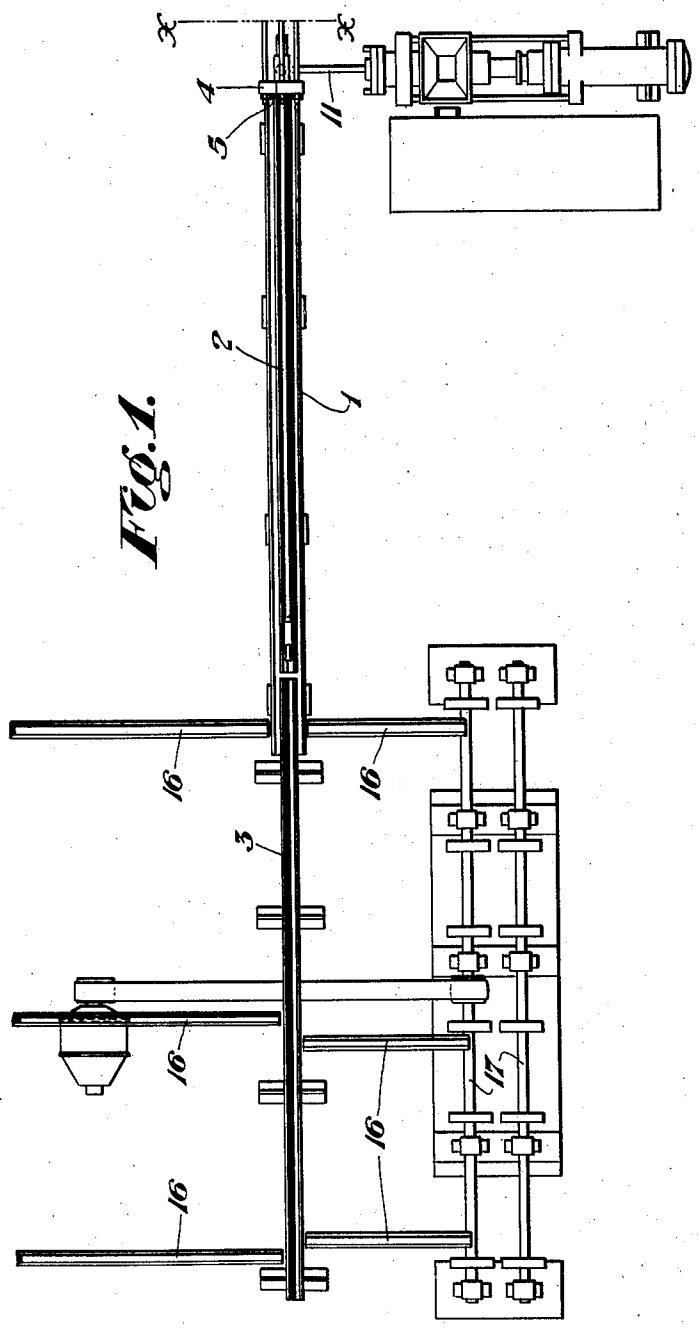


Fig. 1.

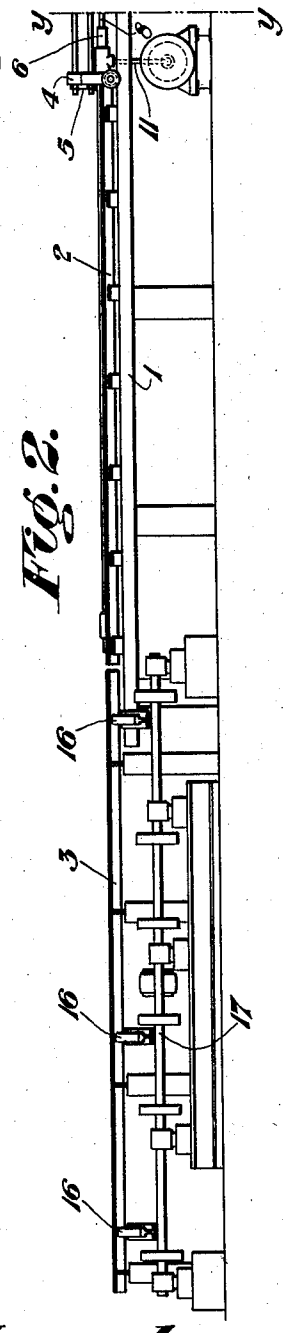


Fig. 2.

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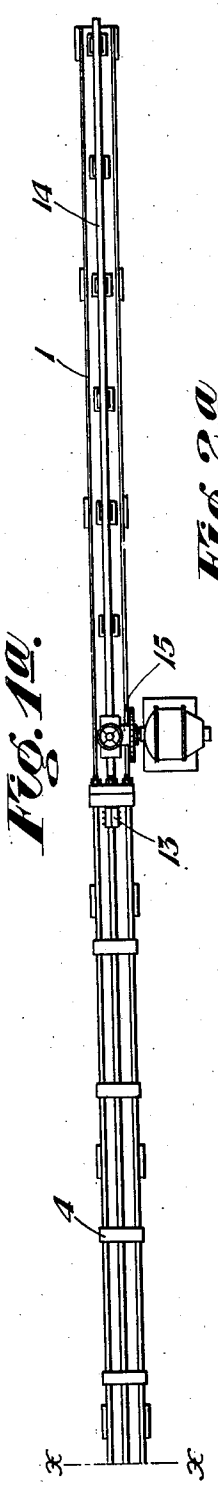


Fig. 1a.

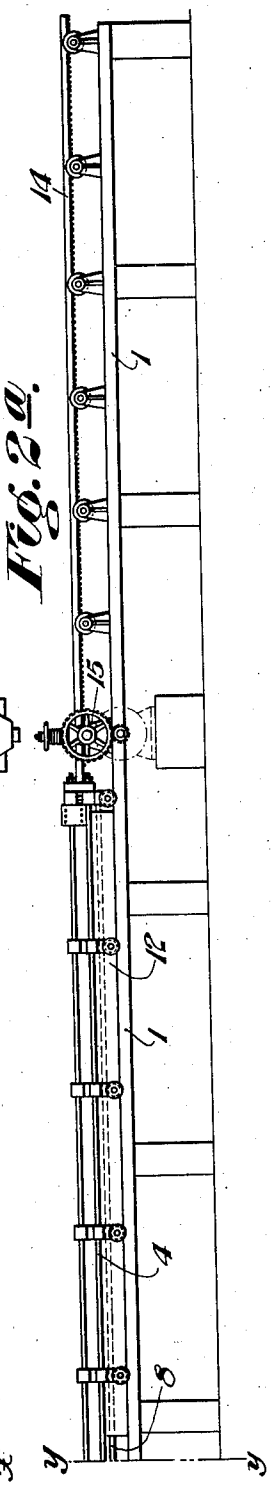


Fig. 2a.

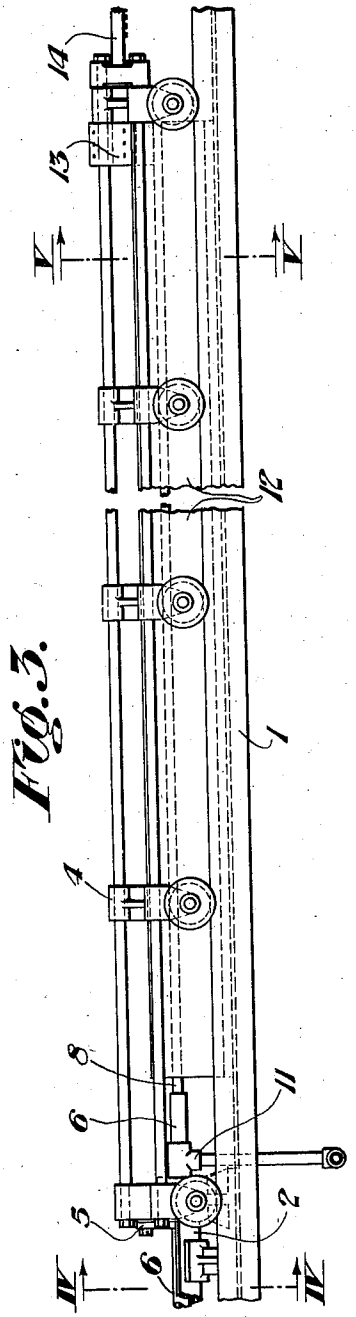


Fig. 3.

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PIPE LINING MACHINE

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Fig. 5.

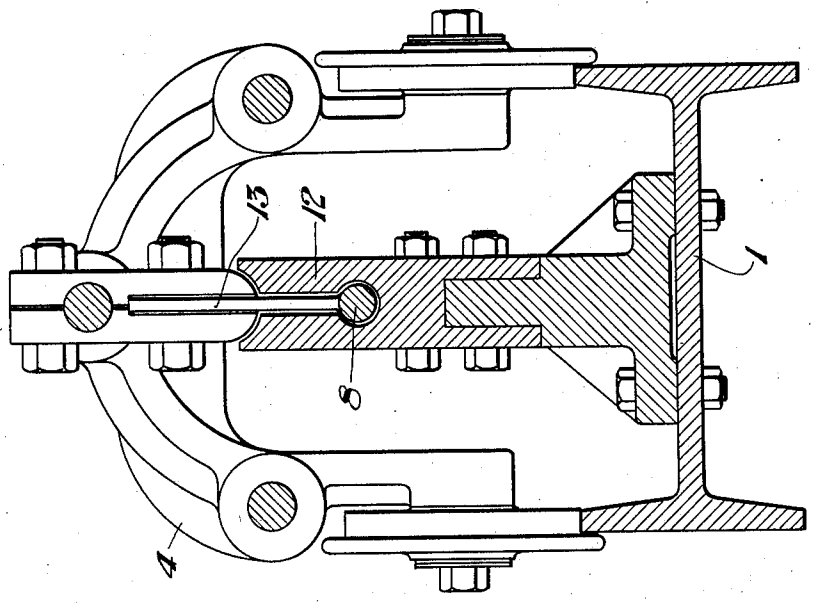
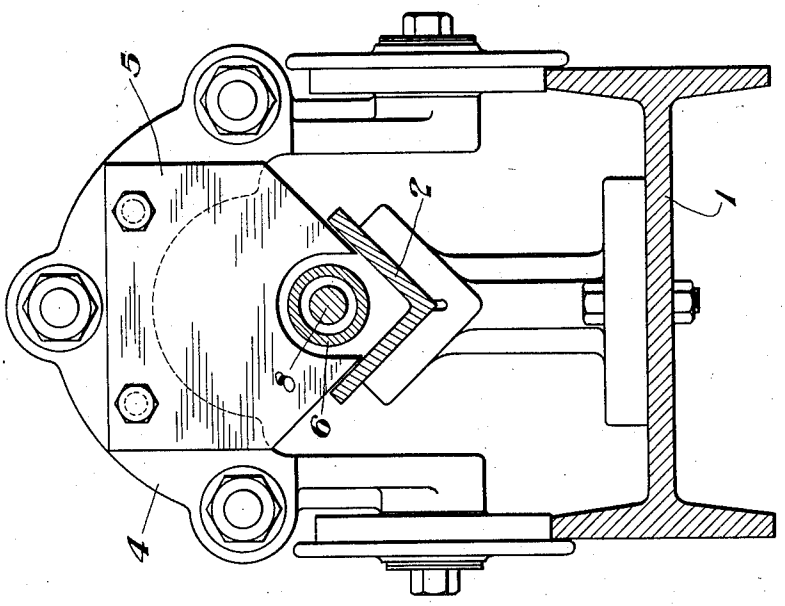


Fig. 4.



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PIPE LINING MACHINE

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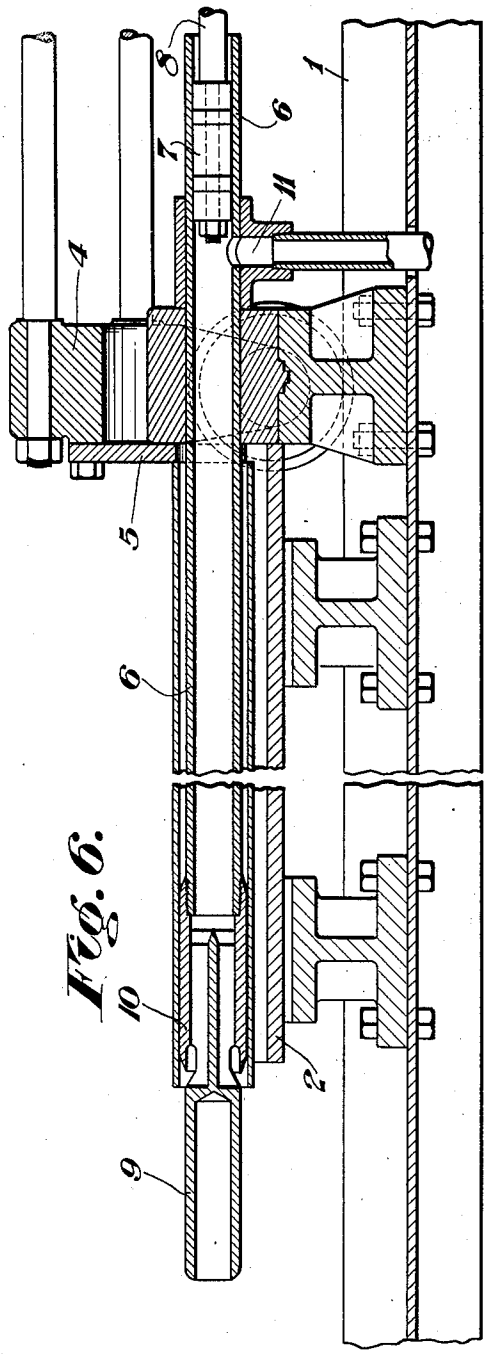


Fig. 6.

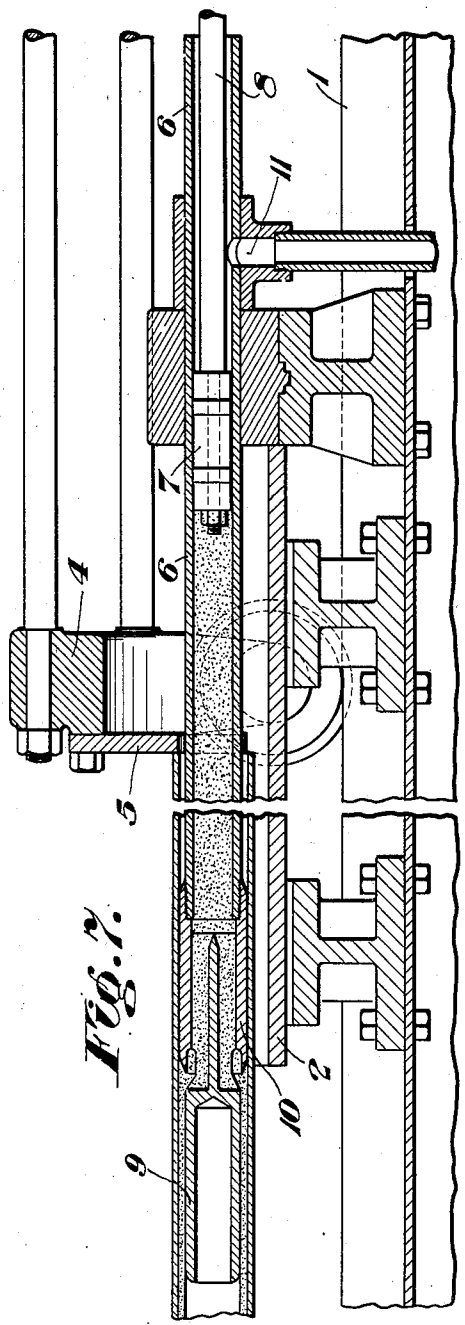


Fig. 7.

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PIPE LINING MACHINE

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Fig. 9.

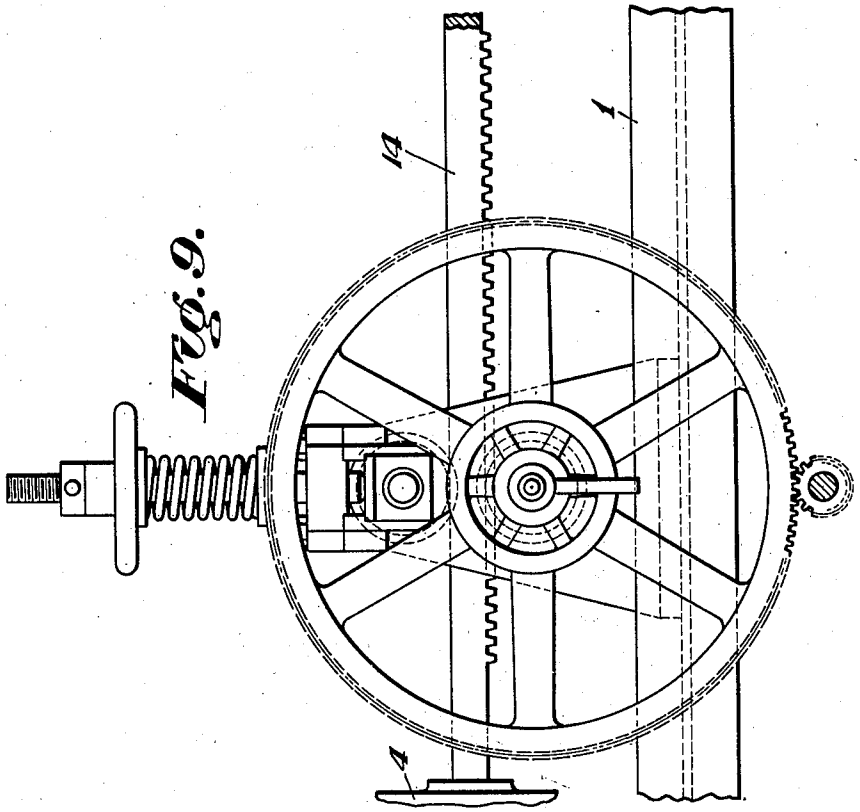
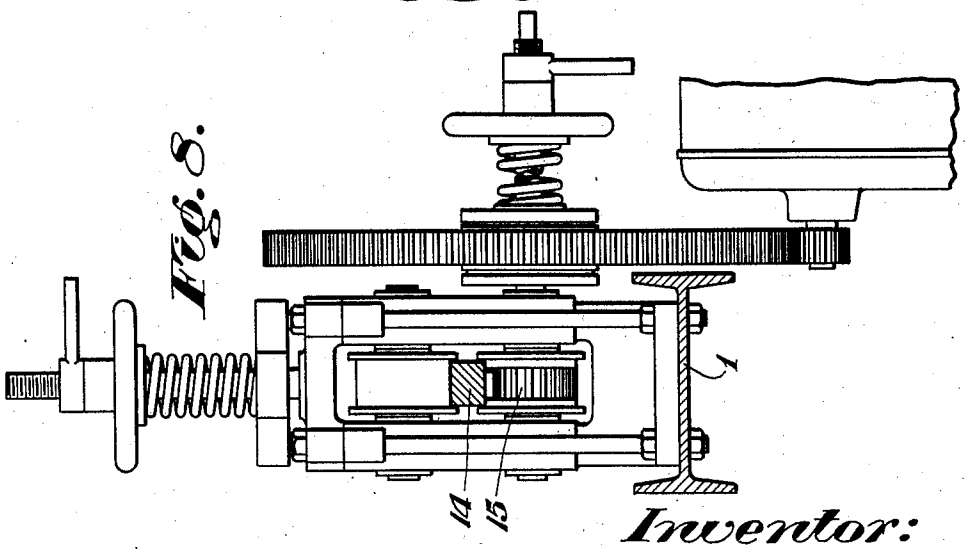


Fig. 8.



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Patented Sept. 11, 1934 1,973,440

UNITED STATES PATENT OFFICE

1,973,440

PIPE LINING MACHINE

William C. Meyncke, Glenshaw, Pa., assignor to National Tube Company, a corporation of New Jersey

Application March 1, 1932, Serial No. 596,113

9 Claims. (Cl. 25—38)

This invention relates to tube lining machines and particularly to those making linings from cementitious plastics. One of the objects is to produce a monolithic lining that has a uniform wall thickness, adheres firmly and has a smooth bore which is concentric with that of the pipe. Other objects will be understood from the following disclosure.

Having reference to the accompanying drawings, which illustrate a specific form of the invention:

Figure 1 is a plan which is continued by Figure 1*a*.

Figure 2 is a side elevation which is continued by Figure 2*a*.

Figure 3 is an enlarged side elevation of a detail in Figures 2 and 2*a*.

Figures 4 and 5 are cross-sections taken from the lines IV—IV and V—V in Figure 3.

Figures 6 and 7 are cross-sections showing an essential feature and its operation.

Figures 8 and 9 are, respectively, end and side elevations of the machine's driving mechanism.

These drawings show a horizontal track 1, directly over which are alined pipe rack sections 2 and 3, the first section 2 extending over approximately one-half of the track's length. A long carriage 4 runs on this track and is constructed to straddle the pipe rack section 2. The front end of this carriage has a depending pipe-engaging plate 5.

A tube 6 is alined with the pipe rack sections over the free portion of the track 1. A plunger 7 is in this tube and is connected to the rear end of the carriage 4 by means of a connecting-rod 8. This tube 6 carries a mandrel 9 and plastic extruding body 10, the tube having a bore whose cross-sectional area is equal to that of the annular thickness of the desired lining and the mandrel 9 having substantially the same diameter as that of this lining's bore. The plastic extruding body's maximum diameter is equal to the bore of the pipe being lined.

As illustrated, the mandrel and body are combined in a single unit, the mandrel having a reduced horizontally ribbed shank which is pressed into a bore in the body, the latter being then screwed on the tube. The body only partially receives this shank so that a space is left between it and the mandrel through which the plastics may extrude. The tube 6 has an inlet 11 at its rear end through which plastics may be introduced, the plunger 7, when in its retracted position, leaving this inlet open and preventing the plastics going through the wrong end. The plunger is arranged so that its effective stroke begins beyond this inlet, so that there is no possibility of the plastics backing out through the latter.

Because of the length of the plunger rod 8 there is a possibility of its whipping as it is pushed forward by the carriage. This is prevented by an upwardly slotted guideway 12, the carriage being fixed to the rod through a depending tongue 13 which slides in the guideway's slotted portion. The carriage itself is advanced by means of a push rod 14 operated by a power drive 15. This power drive may operate frictionally on the rod or, and this has been found preferable, by means of a pinion meshed in rack teeth cut in the rod.

Plastics may be supplied to the inlet 11 by means of any suitable pumping apparatus, one operating on the principle of the hydraulic ram being indicated because of the viscosity of the plastics ordinarily used for this purpose.

Operation of the machine will be accelerated if inclined delivering and discharging racks, generally indicated by the numerals 16, are arranged at the receiving end of the machine. A pipe whirler 17 is arranged in the discharging section of these racks for the purpose of applying centrifugal force to aid in settling the applied linings.

The pipes to be lined are laid on the delivering portion of the racks 16, the interior of these pipes being preferably somewhat rusty because the roughness resulting aids in the adhesion of the linings. The foremost one of these pipes is rolled into the rack section 3 and slid back over the section 2 and tube 6, the mandrel 9 and extruding body 10 then extending through and beyond its end. The carriage 4 and connecting plunger will naturally have to be in their extreme retracted positions to permit this. A suitable plastic is then introduced into this tube 6 through the inlet 11, its extrusion through the body 10 indicating when the tube is completely filled. The power drive 15 is then operated to move the carriage 4 forward, the pipe being carried over the mandrel and body, and the plunger 7 carried forward at exactly equal speeds.

Although a specific form of pipe lining machines has been shown and described in accordance with the patent statutes, it is not intended to limit the scope of the invention exactly thereto, except as defined by the following claims.

I claim:

1. A pipe lining machine including a mandrel

constructed to go through the pipe to be lined and provided with a preceding plastic extruding body, an elongated chamber arranged to communicate with said body and constructed with an inside cross-sectional area equal to the cross-sectional area of the thickness of the desired lining, a plunger fitting said chamber and means for moving said plunger at a speed equal to the speed said mandrel and body go through said pipe.

2. A pipe lining machine including a mandrel having a diameter substantially equal to the interior diameter of the desired lining with a reduced longitudinally ribbed shank and a short tubular part fitting said shank but having a space between it and said mandrel and having an outside diameter substantially equal to the interior diameter of the pipe to be lined.

3. A pipe lining machine including a mandrel constructed to go through the pipe to be lined and provided with a preceding plastic extruding body, a tube communicating with said body and carrying it and said mandrel, means for supporting said pipe when telescoped over said tube with said mandrel and body through and beyond its end, a plunger fitting said tube, a pushing means engaging said pipe, means for putting plastics in said tube and means for simultaneously advancing said plunger and pushing means.

4. A pipe lining machine including a mandrel constructed to go through the pipe to be lined and provided with a preceding plastic extruding body, a stationary tube communicatingly fixed to said body, means for supporting said pipe for telescopic movement over said tube, body and mandrel, a plunger fitting said tube, a rod carrying said plunger, a long carriage constructed to run parallel to said pipe and tube with its front end constructed to engage the former and its rear end fixed to said plunger rod, a plastic inlet at the rear end of said tube and means for advancing said carriage.

5. A pipe lining machine including a track, a rack parallel to the front portion of said track for carrying the pipe to be lined, a long carriage running on said track with its front end adapted to engage said pipe, a tube positioned parallel to the rear portion of said track, a plunger in said tube, a rod connecting said plunger to the rear end of said carriage, a plastic extruding body on the front end of said tube and constructed so that said pipe can telescope thereover and a plastic inlet at the rear end of said tube.

6. A pipe lining machine including a track, a rack parallel to the front portion of said track for carrying the pipe to be lined, a long carriage running on said track with its front end adapted to engage said pipe, a tube positioned parallel to the rear portion of said track, a plunger in said tube, a rod fixed to said plunger, a plastic extruding body on the front end of said tube and constructed to let said pipe telescope thereover, a plastic inlet at the rear end of said tube, an upwardly slotted guideway for said rod, a tongue depending from the rear end of said carriage through the slotted portion of said guideway and fixed to the rear end of said rod and means for moving said carriage.

7. A pipe lining machine comprising a track, a rack parallel to the front portion of said track for carrying the pipe to be lined, a long carriage running on said track with its front end adapted to engage said pipe, a tube positioned parallel to the rear portion of said track and having a cross-sectional area equal to that of the thickness of the desired lining, a plunger in said tube, a rod fixed to said plunger, a mandrel and preceding plastic extruding body on the end of said tube this mandrel having a diameter substantially equal to the inside diameter of the desired lining, a plastic inlet at the opposite end of said tube, an upwardly slotted guideway for said rod, a tongue depending from the rear end of said carriage and fixed to said rod and means for moving said carriage.

8. A pipe lining machine including a mandrel constructed for insertion in the pipe to be lined and which is relatively short as compared to the latter, means for causing relative movement between said mandrel and pipe, and means for extruding a plastic over said mandrel at the same linear speed as that resulting between it and said pipe upon relative movement of the two.

9. A pipe lining machine including a mandrel constructed for insertion in the pipe to be lined and which is relatively short as compared to the latter, means for causing relative movement between said mandrel and pipe, and means for extruding a plastic over said mandrel at the same linear speed as that resulting between it and said pipe upon relative movement of the two, said last named means constantly proportioning the extruded plastic to a predetermined volume per unit of length of said pipe.

WILLIAM C. MEYNCKE.