Dec. 23, 1958 K. Y. MESSICK 2,865,601

MEANS FOR REMOVING UNDERGROUND STREET RAILWAYS AND THEIR APPURTENANT STRUCTURES

Filed Oct. 10, 1956

2 Sheets-Sheet 1

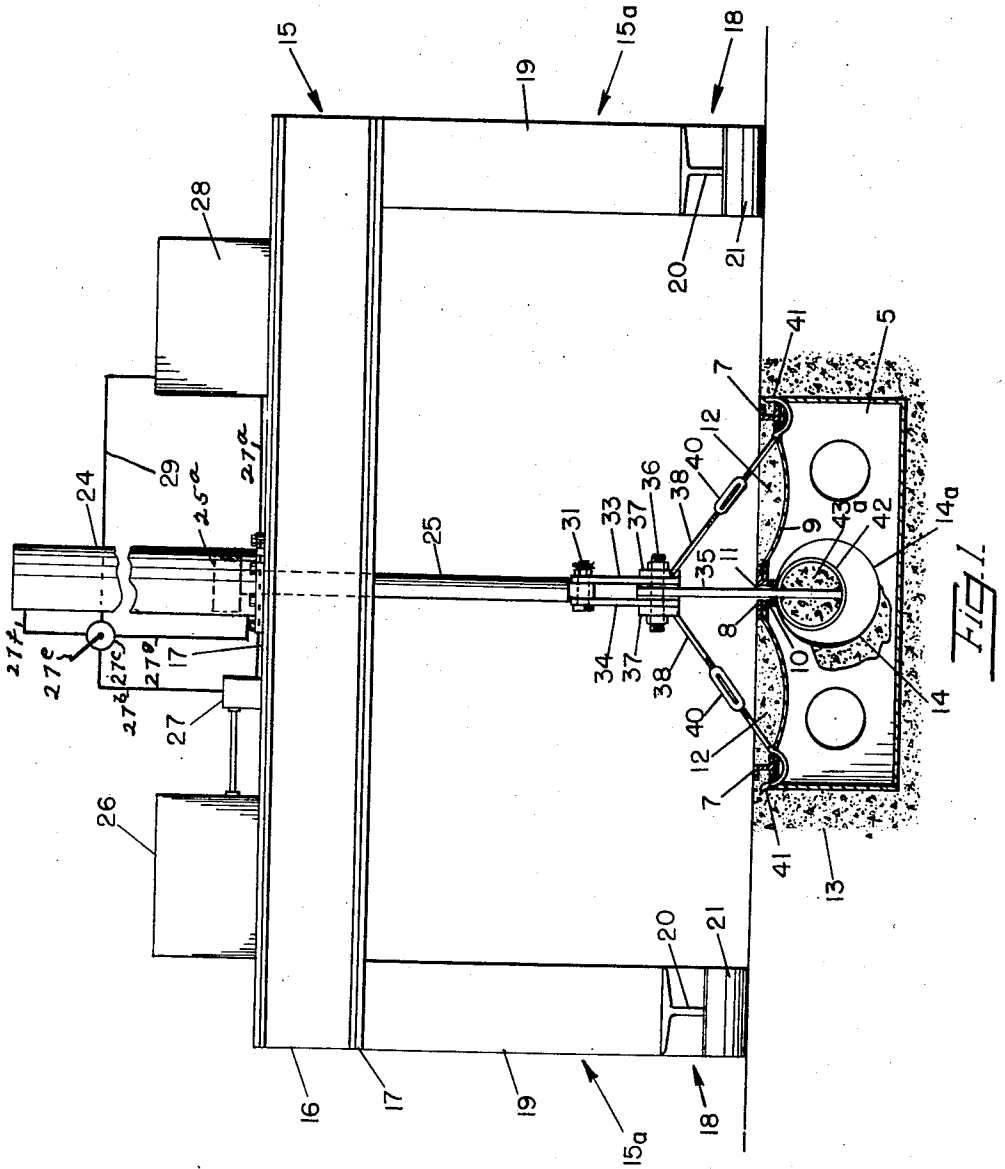


FIG. 1

INVENTOR
KIRWAN Y MESSICK

BY Shepherd Campbell

ATTORNEYS

Dec. 23, 1958 K. Y. MESSICK 2,865,601

MEANS FOR REMOVING UNDERGROUND STREET RAILWAYS AND THEIR APPURTENANT STRUCTURES

Filed Oct. 10, 1956

2 Sheets-Sheet 2

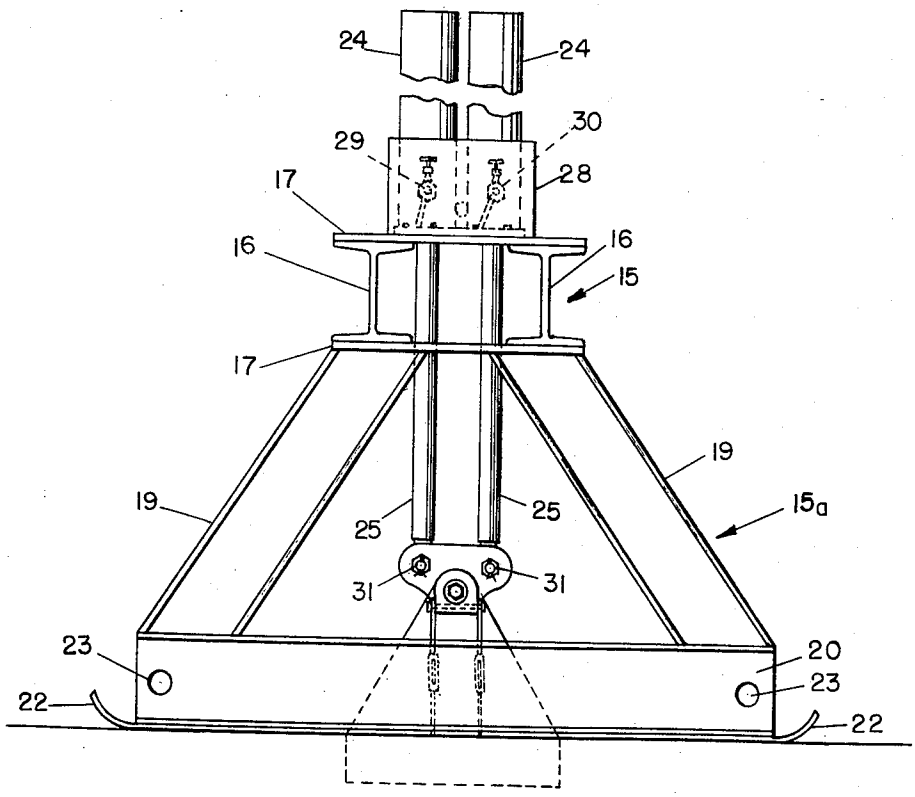


Fig. 2.

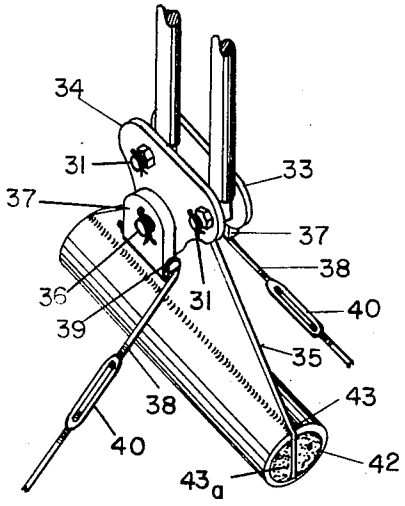


Fig. 3.

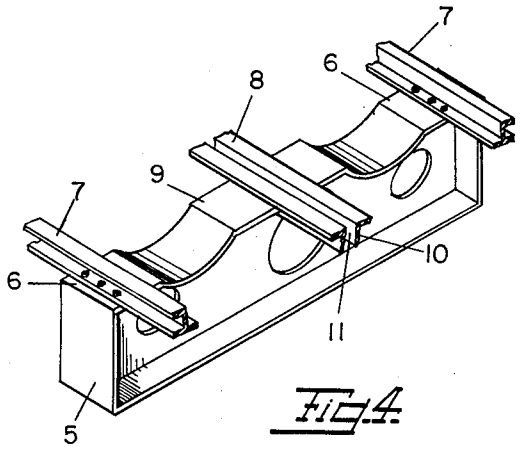


Fig. 4.

INVENTOR
KIRWAN Y. MESSICK

BY Shepherd Campbell

ATTORNEYS

United States Patent Office 2,865,601
Patented Dec. 23, 1958

2,865,601

MEANS FOR REMOVING UNDERGROUND STREET RAILWAYS AND THEIR APPURTENANT STRUCTURES

Kirwan Y. Messick, Arlington County, Va.

Application October 10, 1956, Serial No. 615,077

6 Claims. (Cl. 254—90)

This invention relates to an apparatus for removing underground street railways and their appurtenant parts, from city streets when street car lines are to be abandoned. The railways to be removed are those of the type in which the rails are exposed at the surface of the street and electric power is taken by means of plows carried by the street cars, from underground third rails, disposed in conduits extending lengthwise of and between the track rails.

The nature of the invention, its method of use and its advantages will be best understood by reference to the accompanying drawings in which:

Fig. 1 is a side view of the apparatus of my invention;

Fig. 2 is a right hand end view of the apparatus;

Fig. 3 is a perspective view of the conduit engaging plug, lift plates and part of the clamps, hereinafter described; and

Fig. 4 is a perspective view of one of the cradles which support the track rails and the angle irons which define the slot in which the current collecting plow travels, in the operation of a street car.

When electric street car lines are abandoned, as busses supersede street cars, it often becomes necessary to remove the tracks from a city's streets. The cost of such removal in the case of underground lines, runs into very large sums. In an effort to reduce noise and vibration and to provide smooth riding for the cars it has been the practice to support the rails upon heavy foundations which include large metallic cradles and many yards of concrete and macadam in which the cradles and rails are embedded.

Broadly stated the machine of the invention contemplates the provision of a large and heavy frame adapted to completely span a track and, through hydraulic power mechanism embodied therein, to impart a powerful upward pull upon a lift plug disposed in the underground conduit which formerly held the third rail. This lift plug is connected to the power mechanism by a plate upstanding from the lift plug through the plow slot of the track, to a point above ground, where it is engaged by the hydraulic power mechanism.

Railways of the character designed to be removed by the apparatus of this invention are originally laid by disposing in the ground, at suitably spaced intervals, tie forming, cradles **5**. To upper flat surfaces **6**, adjacent the outer ends of these cradles the conventional track rails **7** are bolted or otherwise secured. Horizontal portions **8** of angle irons are secured to the upper web **9** of the cradle and vertical portions **10** of said angle irons face each other but lie in spaced relation, to leave between them the usual slot **11** in which the current collecting plow of a street car may travel. The upper web **9** of the cradle is dished as indicated to leave space to receive the paving material **12**.

The cradles are embedded in masses **13** of concrete and a conduit **14** is formed in the concrete to extend lengthwise of the track and between rails **7** and into which conduit the plow slot **11**, opens. The cradles have openings **14***a* through them which align with conduit **14**. The parts so far described form no part of the invention but represent the elements that are to be removed. In effecting such removal I employ an apparatus including a very strong and heavy frame, comprising a horizontal head member **15**, and end members **15***a*. These may be made in any desired way, within the skill of the structural steel engineer. In the particular form chosen for purposes of illustration the head member is made up of a pair of stout I beams **16** which are tied together by strong plates **17**.

The end members **15***a* comprise base portions **18** and braces **19**, by which the base portions are tied to the head member. The base portions comprise the I beams **20** and they may be underlaid by skid plates **21** having upturned ends **22**, pierced by openings **23**. Said openings **23** are provided for the connection of chains or other draw devices through which tractors may be connected to the bases **18** to move the apparatus along the track as section after section is ripped out.

A pair of large and very powerful hydraulic cylinders **24** with their piston rods **25** is supported upon one of the plates **17** with the rods **25** extending downwardly between the I beams **16**. Head member **15** carries a conventional engine **26**, hydraulic pump **27** and oil reservoir **28**, within which the pressure fluid supply, oil for example, is contained. A conventional pressure fluid system has been indicated consisting of a suction or supply line **27***a* leading from reservoir **28** to the pump. A discharge pipe **27***b* leads from the pump to the casing of a conventional four way valve **27***c*, the operating handle of which is indicated at **27***e*. A line **27***f* leads from valve **27***c* to the upper end of the associated cylinder **24** and a like line **27***g* leads from valve **27***c* to the lower end of said cylinder. An exhaust line **29** leads from valve **27***c* back to reservoir **28**. Thus with handle **27***e* in one position pressure fluid from **27***b* will be discharged through the valve and through **27***g* to the lower end of cylinder **24** to elevate the piston rod **25** and its piston **25***a*, while at the same time any oil in the top of the cylinder will be exhausted through **27***f* and exhaust line **29** to the reservoir. With handle **27***c* in another position the valve will connects **27***b* with **27***f* and the pressure fluid will enter the top of the cylinder while any oil beneath the piston will pass through **27***g* to exhaust line **29**. This arrangement may be duplicated for the companion hydraulic cylinder. However, these oil circuits are conventional and form no part of the invention. Either piston rod may be actuated independently of the other, or both may be actuated at the same time. When both are actuated, great power is exerted when extra heavy work is being done while when lighter work is being done only one cylinder is used and faster action is had.

The lower ends of the piston rods pivotally engage pins **31**, which pins pass through a pair of spaced lift plates **33** and **34**. The piston rods enter between said plates and their lower ends are traversed by the said pins. The lift plates are, as shown, triangular in shape and they are connected at their lower portions with a triangular plate like web **35**, the apex of which enters between the lift plates **33** and is traversed by a stout pin **36**. This pin also passes through the lower portion of the lift plates and its ends project a material distance outwardly of the lift plates. Bearing blocks **37** are mounted upon the projecting portions of the pins and to these bearing blocks drag clamps **38** are pivotally connected at **39**. These drag clamps include turnbuckles **40** in their length for adjustment of their effective length and they are provided with upwardly facing hooks **41** at their outer ends, which hooks are adapted to hook beneath rails **7** close to the sides of the cradles. The clamps are preferably so disposed that one clamp engages its rail adjacent one

side of the cradle and the other clamp engages its rail close to the other side of the cradle.

A lift plug **42** which is carried by the web **35** is, when the track is to be ripped up, entered in conduit **14** at one of the usual man holes (not shown) which are located at spaced intervals along the railway track, the web **35** then extending upwardly through the plow slot **11**. The lift plug may be formed in any desired manner. It is here shown as being formed by slitting a section **43** of large steel pipe along one side, for the entry of the web. The web is extended to the bottom of the plug and welded securely to the pipe section, both at the bottom of the section and all along the slit in said section at the top of the plug. The pipe may then be filled with concrete **43***a* to strengthen the plug to resist crushing.

The operation of the device is as follows:

The lift plug having been disposed in the conduit and the hooks of the clamps having been engaged with the track rails as described, pressure fluid is admitted to the lower portions of one or both of the hydraulic cylinders to force the piston rods upwardly. This results in dragging a whole section of track out of the ground, including the cradle, the track rails, the slot forming angle irons and a huge mass of concrete and macadam which is adhering to the cradle. After a section has been ripped out the rails and angle irons are cut with acetylene torches or other means and the mass of concrete with adhering parts may be lifted by a crane to a truck to be carted away. The heavy end members of the main frame, with the skid plates, act, during the ripping out operation, to press downwardly upon the adjacent areas of paving, over such a considerable area and with such force as to reduce damage to adjacent areas of paving, to a minimum.

Since the cradles are embedded, as stated in huge masses of concrete, it follows that to try to remove these tracks with hand labor would involve tremendous costs in labor, even with pneumatic chisels, hammers and the like. By the use of the apparatus of my invention; moving it from section to section and ripping out said sections by means of the very powerful hydraulic cylinders, the work may be done rapidly and at greatly reduced cost.

The invention is not limited to the precise construction set forth but includes within its purview whatever changes fairly fall within the terms or the spirit of the appended claims.

I claim:

1. In a device for removing underground railways of the type having a plow slot and an underground conduit with which said slot communicates, said slot being defined by longitudinally extending, spaced angle irons, a lifting device comprising a frame of a size to span the track and to bear upon the roadway upon opposite sides thereof, lift elements comprising a hydraulic lift cylinder and a piston rod upon said frame, a lift plug dimensioned to enter the conduit and provided with an upstanding member which projects upwardly through said slot and means for engaging the lift elements with said upstanding member, said plug being of such greater transverse dimension than the plow slot and the angle irons which define said slot, that when said plug is drawn forcibly upward it engages and lifts not only said angle irons but also portions of the conduit forming materials.

2. A structure as recited in claim 1 comprising a plurality of said hydraulic cylinders and piston rods, lift plates with which both of the piston rods are engaged and means for connecting the lift plates to the upstanding member.

3. A structure as recited in claim 1 comprising a pair of cylinders and piston rods upon the frame, a pair of lift plates between which the lower ends of the piston rods are pivoted thereto, the upper end of the upstanding member entering between the lift plates and a pivot pin traversing the lift plates and the upstanding member.

4. In apparatus of the character described for removing railways of the character comprising track rails, members forming a plow slot extending longitudinally between said rails, an underground conduit extending longitudinally between the rails into which the plow slot opens, and a plurality of transverse cradles to which the track rails are attached, a frame dimensioned to span the railway and bear upon the roadway at each side thereof, an elongated stout lift plug much greater in lateral dimension than the plow slot shaped to enter the conduit, a substantially flat web carried by the plug and upstanding through the plow slot, hydraulic lift devices upon the frame, means for engaging the upstanding web with the lift devices and rail engaging clamps having rail engaging hooks at their outer ends, the inner end of said clamps being attached to the lift devices.

5. A structure as recited in claim 4 wherein the hydraulic lift devices comprise at least one vertical hydraulic cylinder and depending piston rod, a lift plate to which the lower end of the piston rod is pivoted and a pivot pin traversing the web and the lift plate.

6. A structure as recited in claim 4 wherein the hydraulic lift devices comprise at least one vertical hydraulic cylinder and depending piston rod, a lift plate to which the lower end of the piston rod is pivoted and a pivot pin traversing the web and the lift plate and a pair of rail engaging clamps pivotally supported from the pivot pin and having rail engaging hooks at their outer ends.

References Cited in the file of this patent

UNITED STATES PATENTS

262,018 Desmond ---------- Aug. 1, 1882