Sept. 1, 1970 H. B. FLEMING 3,526,387

POST PULLERS

Filed June 12, 1968 2 Sheets-Sheet 1

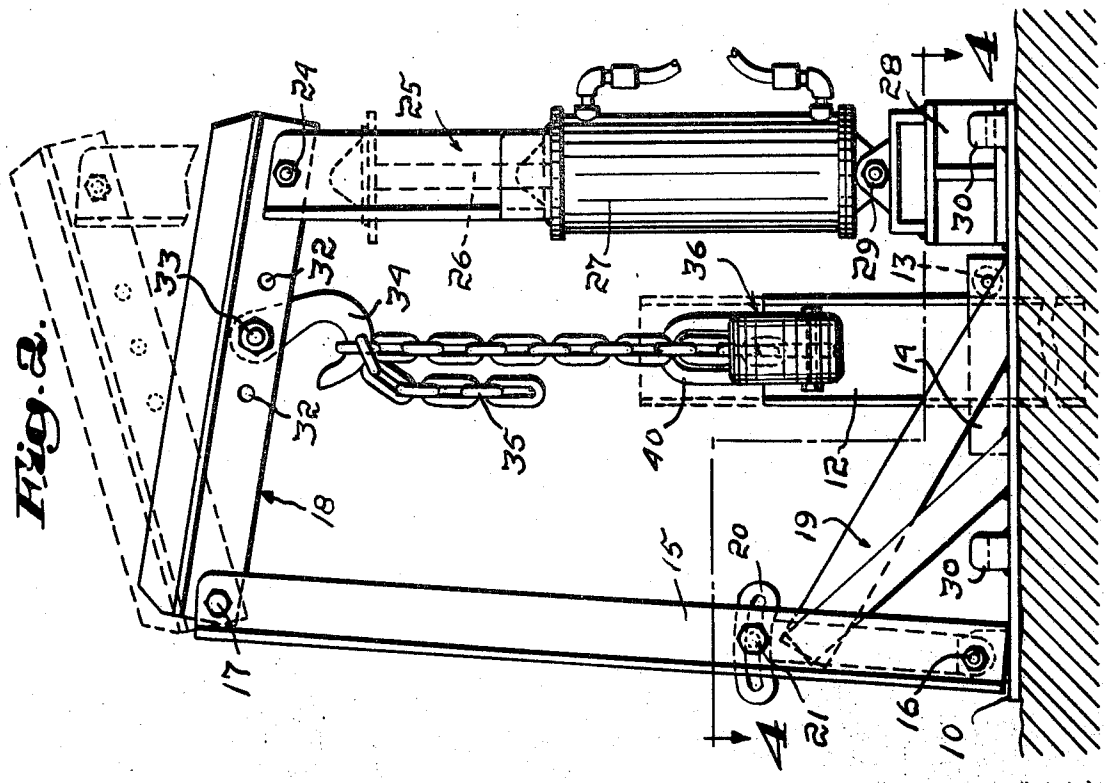


Fig. 2.

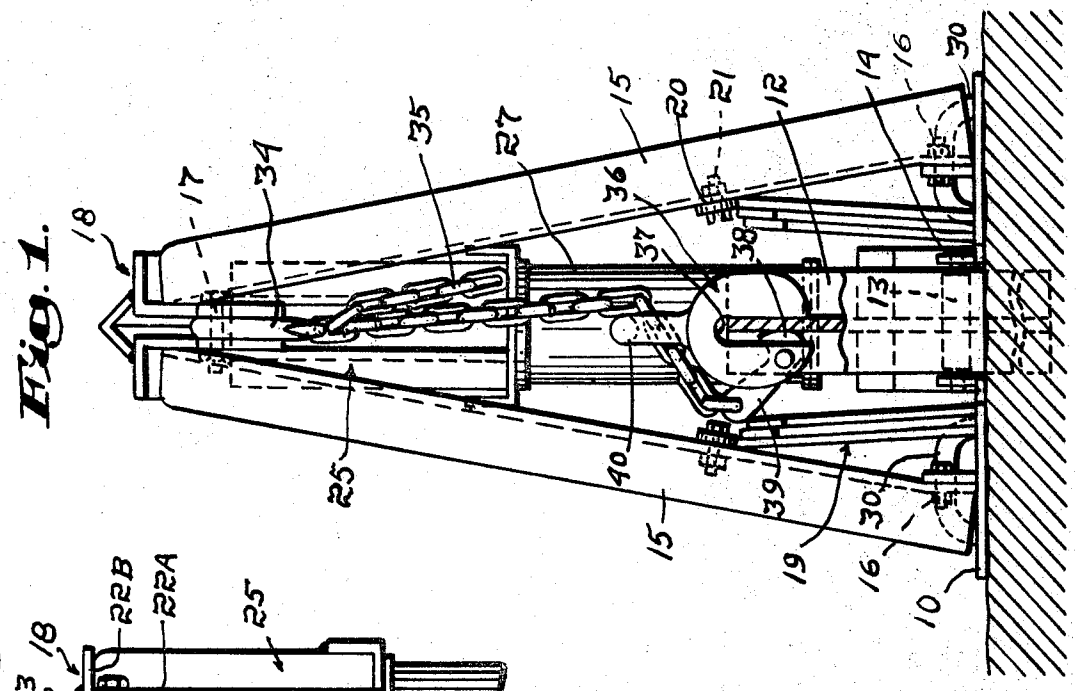


Fig. 1.

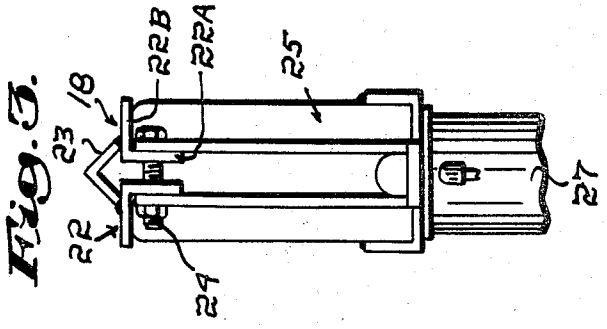


Fig. 3.

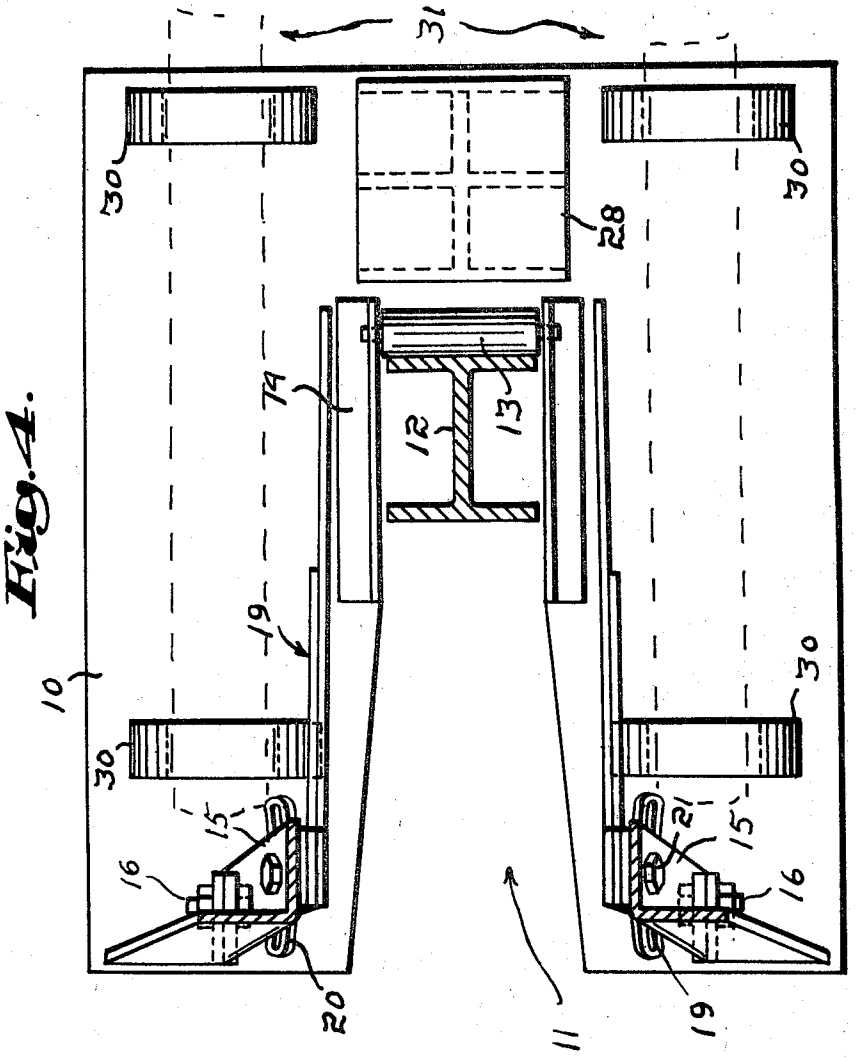
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Fig. 4.



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POST PULLERS

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U.S. Cl. 254—30 10 Claims

ABSTRACT OF THE DISCLOSURE

Post pullers adapted to be operated by the hydraulic system of a motor vehicle that may also be used to move the puller from one post to another, the puller having a base having an opening extending rearwardly of its front edge to enable it to straddle the post to be pulled. Supporting structure adjacent the front end of the base has one end of a lever arm pivotally attached thereto with the lever arm extending rearwardly above the opening and its other end pivotally connected to a ram.

The present invention relates to post pullers and particularly to post pullers adapted to be operated by the hydraulic system of a motor vehicle that may also be employed to move the pullers from post-to-post.

While post pullers vary as required by the type and dimensions of the ground entering member that is to be wholly or partly raised from the ground, typical requirements are illustrated by problems encountered in readjusting the heights of guard rail posts to meet new safety standards. Such partial pulling of posts must be rapidly effected, requiring both effective puller operation and ease in moving the puller from one post to another.

The principal objective of the present invention is to provide post pullers that will meet both of those generally indicated requirements, an objective attained with a post puller having a base provided with an opening extending rearwardly from its front end and dimensioned to enable the base to straddle the post that is to be pulled. Supporting structure adjacent the front end of the base and laterally of its opening has one end of an arm pivotally connected thereto, the arm extending length-wise above the opening with its other end pivotally connected to a ram pivotally mounted on the base rearwardly of the opening. The post-gripping means are connected to the arm intermediate its pivots so that when the ram is actuated, the arm functions as a second class lever in raising the embedded post.

The ram is desirably hydraulically operated as the base is adapted to be carried from post-to-post by a hydraulically operated pick-up device attached to a motor vehicle. With this arrangement, the vehicle may be maneuvered into a position in which the base straddles the post and the base then lowered so that it is supported by the ground. The post-gripping means are then secured to the straddled post and the ram employed to actuate the lever arm to raise the post. After the post-gripping means are released and the ram lowered, the hydraulic system of the vehicle is used to pick up the post puller and carry it to the next post.

For this purpose, a lifting fork is preferred and the base, accordingly, has loops on each side of its opening and accessible from the rear of the puller that are disposed and dimensioned to receive the fork. Desirably, the vehicle has a short wheel base so that, in most cases, the major portion of the fork will rest against the ground when the puller is positioned for use so that upwardly sloping or downwardly sloping ground is no problem. Sloping ground does, however, require adjustability of the connection between the post-gripping means and the lever

arm to insure the most effective operation whether the ground slopes in either direction or is flat. This objective is attained by providing for the attachment of the post-gripping means in any one of a plurality of positions lengthwise of the lever arm.

In the accompanying drawings, there is shown an illustrative embodiment of the invention from which these and other of its objectives, novel features and advantages will be apparent.

In the drawings:

FIG. 1 is a front view of a post puller in accordance with the invention,

FIG. 2 is a side view thereof,

FIG. 3 is a fragmentary rear view showing the connection between the ram and the lever arm, and

FIG. 4 is a section taken approximately along the indicated lines 4—4 of FIG. 3.

In the embodiment of the invention illustrated by the drawings, the puller has a base **10** in the form of a flat plate provided with a central slot **11** having a flared entrance opening through its front edge and extending a substantial distance to the rear to enable the base **10** to straddle the post **12** that is to be pulled, the post **12** being shown as a section of an H beam only by way of an example. At the rear end of the slot **11** there is a roller **13** mounted in marginal supports **14** and in practice, the puller is moved into a position in which the roller **13** is usually in engagement with the post **12**.

Uprights **15** are pivotally connected as at **16** to the base **10**, one on each side of the slot **11** and adjacent the front edge of the base. The uprights **15** are inclined inwardly towards each other and their upper ends are interconnected by the pivot **17** in support of one end of the lever arm, generally indicated at **18**. Each upright **15** is connected to outwardly inclined brace structure **19** welded to the base **10** adjacent the slot **11**. Where adjustment of the angle between the uprights **15** and the base **10** is to be varied, each brace **19** has an arcuate slot **20** through which extends the anchoring bolt **21** for the appropriate upright.

The lever arm **18** is shown as consisting of two members **22** of right angular section having their side portions **22A** held in spaced parallel relationship by a like member **23** whose edges are welded to their side portions **22B**. The side portions **22A** have transversely aligned holes at one end for the pivot **17** and like holes at its other end for the pivot **24** by which the lever arm **18** is secured to the generally indicated attachment **25** secured to the exposed end of the piston **26** of the hydraulic ram whose cylinder **27** is connected to a mount **28** secured to the base **10** rearwardly of its slot **11** by a transversely disposed pivot **29**.

The post puller shown in the drawings is to be carried from post-to-post on a hydraulically raised and lowered fork and to be operated when the fork is resting on the ground by the hydraulic system of the vehicle to which the fork is attached. The base **10** has loops **30** on each side of the slot **11** and accessible from the rear of the post puller for the arms of the generally indicated fork **31**, the loops **30** being dimensioned so that the fork arms are a loose fit therein to enable the base **10** to be supported on the ground sloping relative to the plane defined by the fork **31**.

The side portions **22A** also have a series of transversely aligned holes **32** to provide different positions lengthwise of the lever arm **18** for the pivot pin **33** which supports the hook **34** between the portions **22A**. The chain **35** for the post-gripping means is detachably secured to the lever arm **18** by the hook **34**. While the post-gripping means, generally indicated at **36**, may be of other types, it is herein shown as a body having a transverse, downwardly opening slot **37** dimensioned to receive the upper end of

the post **12**. A cam **38** pivotally connected to the body is exposed in the slot **27** for engagement with one side of the post **12** and includes an outwardly extending arm **39**. The chain **35** is connected to the arm **39** after having been passed through the upwardly disposed eye **40** so that an upward pull on the chain **35** actuates the cam **38** to clamp the post **12** securely against the opposite side wall of the slot **37**.

From the foregoing, it will be appreciated that in pulling a long series of posts, whether to remove them or to raise them to a predetermined extent, the puller is picked up by a vehicle having a hydraulically operated lifting fork **31** and the ram is connected to the hydraulic system of the vehicle. The operator of the vehicle maneuvers the vehicle into a position in which the base **10** straddles a post **12** with the post **12** at or close to the rear end of the slot **11**. The fork **31** is lowered until the base **10** rests on the ground. With the post-gripping means **36** secured to the post **12** and the chain **35** caught on the hook **34**, the hydraulic system is then employed to actuate the ram to raise or remove the post **12**. After the post-gripping means **36** are released and the puller lifted by the fork **31**, the operator moves to the next post.

It is, of course, desirable that the pull on the post **12** be vertical thereof. For that reason, if the terrain so slopes as to make a substantial variation in the direction of the pull relative to the post **12**, the hook **34** may be moved with its pivot **33** supported in different transversely aligned holes **32**, forwardly if the ground slopes upwardly and rearwardly if the ground slopes in the opposite direction. It will also be apparent that the angle of the uprights **15** relative to the base **10** may also be varied to accommodate slopes but a change in this relationship is not usually necessary.

I claim:

1. In a post puller for use with a post-gripping clamp having a supporting chain, said puller comprising a base having an opening extending rearwardly from its front end and dimensioned to enable the puller to straddle the post to be pulled, supporting structure adjacent the front end of said base and laterally of said opening, an arm pivotally connected to said structure above said opening and extending lengthwise and rearwardly thereof, a ram comprising piston and cylinder members, one member pivotally connected to said base adjacent its rear end and a pivot connecting the other member to the rear end of said arm, the intermediate portion of said arm including means by which post-gripping means may be connected thereto.

2. The post puller of claim **1** in which the connecting means for the post-gripping means provides a series of longitudinally spaced attaching positions, one in a perpendicular to the base that is inclusive of the position of a post when the puller is placed so that the straddled post is at the rear end of the opening.

3. The post puller of claim **2** in which the connecting means for the post-gripping means is a hook including a pivot and the attaching positions are pivot-receiving holes extending transversely through the arm.

4. The post puller of claim **1** and the base has forward and rearward loops accessible from the rear of the puller and shaped and dimensioned for the reception of the arms by a hydraulically operated lifting fork and the ram is hydraulically operated.

5. The post puller of claim **1** in which the arm includes a pair of parallel members of rectangular cross section arranged with a side portion of each depending and spaced from the side portion of the other, and a thread member of rectangular stock with its edges welded to the other side portions of the pair of members, the depending portions having a series of longitudinally spaced and transversely aligned holes and the connecting means is a hook including a detachable pivot, the pivot extending through transversely aligned holes with the hook depending between the side portions.

6. The post puller of claim **5** in which the ram member that is pivotally connected to the arm includes a pair of vertically disposed, parallel members of rectangular stock arranged with a side portion of each parallel but spaced apart and with the rear ends of the depending portions of the arm between them and connected thereto by the pivot.

7. The post puller of claim **1** in which the supporting structure includes a pair of uprights, one on each side of the opening, the uprights being upwardly and inwardly inclined towards each other, forward and rearward loops on each side of the opening for a lifting fork and accessible from the rear of the base, and brace means connected to the uprights and to the base, each brace means being secured to the base between the margins of the opening and the proximate loops.

8. The post puller of claim **1** in which the supporting structure includes a pair of uprights, one on each side of the opening, the uprights being upwardly and inwardly inclined towards each other, each upright being pivotally connected to the base, and brace means for each upright, each brace means being secured to said base, and means adjustably connecting each upright to its brace means to enable the angle of the uprights to the base in a lengthwise direction to be raised.

9. The post puller of claim **1** in which the opening is a slot.

10. The post puller of claim **1** in which the opening is a slot and a roller carried by the base and engageable by a post when the puller is positioned with a post at the rear end of the slot.

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