

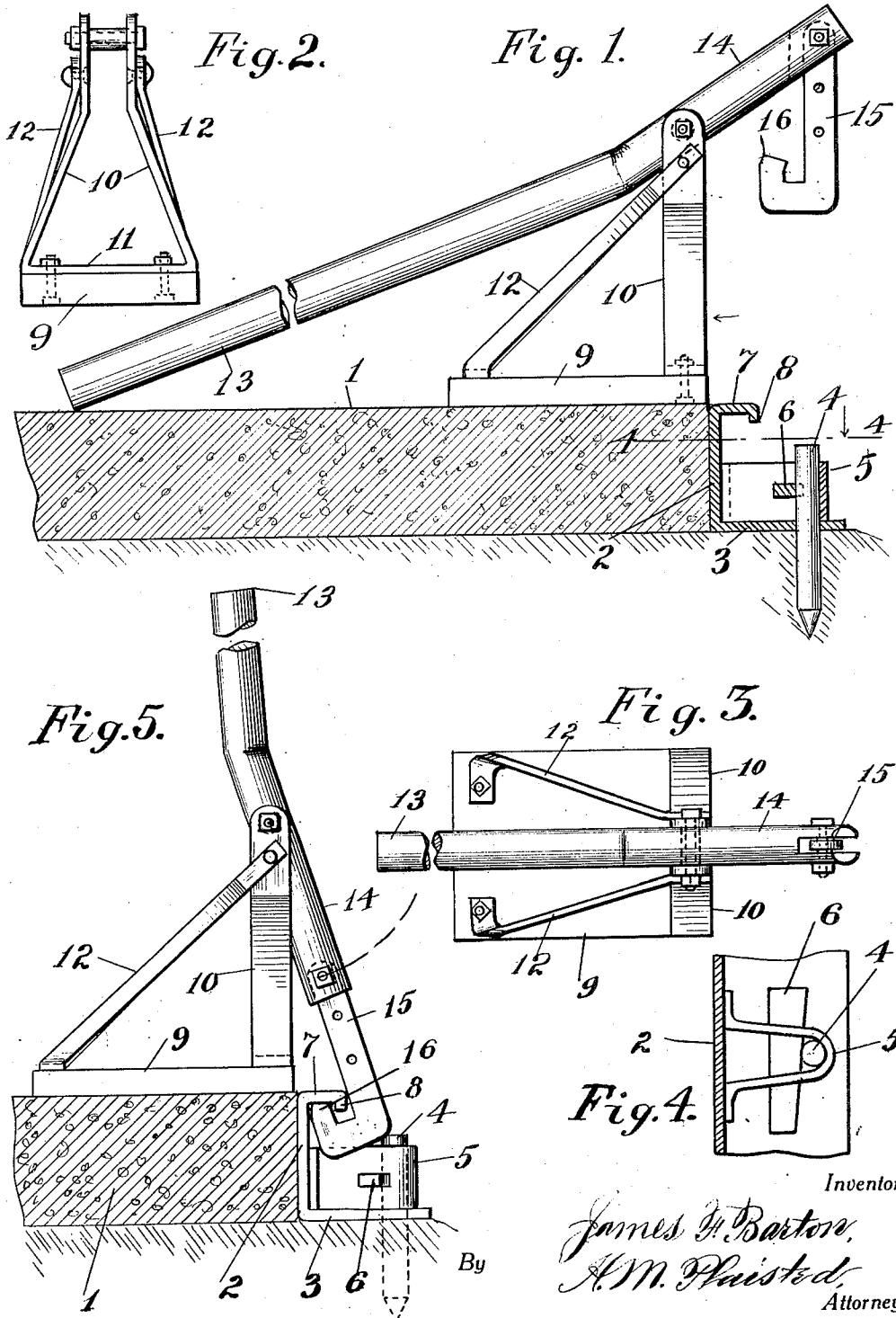
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FORM PULLER

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## FORM PULLER

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4 Claims. (Cl. 254—132)

This invention relates to certain new and useful improvements in form pullers, the peculiarities of which will be hereinafter fully described and claimed.

5 More specifically, this invention relates to improvements in means for pulling up metal forms which are staked to the ground and define areas to be filled with concrete or other material in making highway or other pavement. Such forms are usually L-shaped in cross section and the horizontal base is set on the excavated grade and staked firmly to the ground to keep the vertical plate portion perpendicular. The top of such vertical plate portion has a rectangular hook 10 which serves as a gauge for the top of the pavement. It is necessary to preserve this hook unimpaired for gauging the upper surface of the pavement, but heretofore in carelessly pulling the form after filling the defined space, this gauge hook is sometimes bent upward so that it is unacceptable to the inspector for further use as a gauge.

Also, the time required to loosen and pull the stakes incurs considerable time and expense for labor, which are so much reduced by my present form puller that a very considerable saving is obtained by the contractor using a form puller of my construction, as will be presently described.

25 The main objects of my invention therefore, are to provide means first, for pulling such forms without impairing the alinement of the gauge top; second, for pulling the stakes and form together; and third, for preserving the outline of the pavement in contact with the form, which is often marred in pulling the form by prior devices.

In the accompanying drawing in which like reference numerals indicate corresponding parts, Fig. 1 represents a side elevation of my form puller disposed above a pavement and form in section as staked to the ground; Fig. 2, a detail front elevation of the lever support with the lever removed for clearness; Fig. 3, a detail plan view of my form puller shown in Fig. 1; Fig. 4, a detail plan view of the stake fastening portion of the form, the wall plate portion being in section on the horizontal line 4—4 of Fig. 1; and Fig. 5, a side elevation of my form puller disposed on the pavement as in Fig. 1, with the shorter arm of the lever lowered nearly in the vertical plane through the wall plate of the form so that the pivot of the depending hook is over the plate portion and the hook portion is engaged with the top hook of the form and about to pull outward and upward.

55 Referring to the drawing, the numeral 1 designates a portion of a concrete or similar pavement, as filled in and retained in the making by a suitable form. A metal form often used by contractors consists of a vertical wall plate 2 having an L-shaped horizontal base 3, that rests on the excavated grade surface and is held firmly thereto by stakes 4 driven into the ground through holes in the base surrounded by U-shaped guides 5, which are slotted for wedges 6 that frictionally engage the driven stakes, or otherwise hold the base firmly to the excavated grade. The top of the vertical wall plate has a hook consisting of a horizontal offset portion 7 having a down-turned lip 8,—said top constituting the gauge for the upper surface of the pavement laid inside and defined by said form. Such forms are generally in sections of 10 ft. in length and have three or more stakes holding them in position.

My form puller consists of a portable base block 9, on which is mounted a pair of upstanding posts 10, the lower ends of which are spread apart and are preferably connected by a horizontal spacer bar 11 bolted to the base block. The upper ends are adjacent, and the posts are inclined outward and downward to afford lateral bracing. Each post is provided with a rearwardly inclined brace 12 which is bolted to the base block. The upper adjacent ends of said posts are connected by a spacer bolt on which is pivotally fulcrumed a lever of round or other shape, and of a length affording a leverage of approximately 10 to 1 for power exerted on its rearward handle end 13 for raising the shorter forward arm 14 to which is pivoted a depending hook 15 having its hook portion disposed rearward toward said posts and of sufficient length to extend below said base block and engage the gauge hook on the form when the handle end 13 is raised and the lever hook is disposed in its lowest position. The lever is preferably bent to facilitate handling.

The depending hook is J-shaped and is preferably made of rectangular bar steel having its upturned, flat-pointed end of substantially the same width as the inside width of the gauge hook between the wall plate and the down-turned lip. The lip will keep the extreme outer point of the depending hook from slipping away from its lifting position close to the wall plate as shown in Fig. 5. To facilitate such engagement of the extreme outer point of the depending hook, the flat point is slightly inclined downward toward the shank from the said outer point of the hook as shown in Fig. 5. The lever shown is of the

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first class in which the power is at one end, the weight at the other, and the fulcrum between. The base block of the fulcrum support sets on the firm pavement, the short arm of the lever extends over the form with the hook end of the lifting hook disposed toward the fulcrum support and the oppositely extending gauge hook, as shown.

This lever hook corresponds in shape and size to the inner face of the gauge hook, so that when the lever hook is fitted under the gauge hook and the upward pull is exerted by lowering the lever handle, the upward stress will act on the vertical plate portion of the form without a bending pressure on the horizontal portion 7 or the lip 8 of the form top.

The leverage obtained has been found in practice, to be sufficient to withdraw the fastening stakes along with the form. This combined pulling of the form and stakes has been found to save the applicant in his contract work, \$15.00 per day, compared with the prior method of loosening and withdrawing the stakes separately and the lifting of the forms. One or two form pullers of the present construction per section, can be used.

Another advantage of the present puller over prior devices is, that the adjacent pavement in contact with the form is left in perfect condition without crumbling of the adjacent edge of the pavement. As shown in the drawing, the base block is placed on the pavement with the end of the shorter arm extending beyond the gauge top, so that the lever hook hangs just outside of the vertical plane of the wall portion 2 and exerts the pulling stress at a slight angle away from the edge of the pavement. Therefore the frictional contact between the pavement wall and the form wall 2 is reduced to a minimum, and avoids damage to the pavement wall when the form is pulled.

When the handle end of the lever is raised and the shorter arm 14 lowers the hook end of the depending hook below the base block to engage it with the gauge hook, the two hooks and the shorter arm are brought approximately into the same vertical plane, and the beginning of the upward swing of the shorter arm will vary the vertical component of the end of the shorter arm much less than its horizontal component. Since power and speed are inversely to each other, the maximum lifting stress is thus exerted at the beginning of the upward swing of the shorter arm. Also the length of the depending hook modifies the horizontal pull of its hook end while leaving the upward pull practically at its maximum stress. The stakes and form are thus subjected to maximum lifting stress at the beginning of the operation of the lever and just when the greatest resistance is made by the stakes and form; that is to say, my device exerts its maximum lifting stress when starting the movement of the stakes and form, which is when they offer greatest resistance to movement and when greatest power is required. I have thus been able to pull the stakes and form at the same time, with the consequent saving of time, labor and expense above stated.

Supporting the above statement, reference to Fig. 5 shows the pivot of the depending hook as disposed slightly forward of the vertical plane through the wall plate portion. Starting the upward swing of the shorter arm will cause the upward pull of the hook end of said hook to be

exerted practically vertically with a slightly inclined pull forward away from the plate portion, which will tend to separate the wall plate from the adjacent pavement wall without crumbling, as above stated.

A further upward swing of the end of the shorter arm and pivot of the depending hook, will slightly cock its hook end so that its point 16 takes all the upward stress of the bearing engagement, while the lip 8 prevents this point 16 from slipping forward away from the wall plate 2. This bearing engagement of the point 16 close to the wall plate, avoids any actual bending upward of the horizontal offset 7 of the gauge hook, and attains one of the stated objects of my device.

I do not limit myself to the construction shown herein except by the appended claims.

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

1. A form puller for a concrete form having a vertical wall plate in contact with the edge of a pavement and having a projection outward from said plate ending in a downturned lip, said form puller comprising a lever, a fulcrum support therefor, and a J-shaped depending hook connected to said lever and characterized by an upturned hook end of such size and shape as to fit under said horizontal projection and substantially fill the space between the wall plate and lip in engaged position, to prevent its extreme point slipping away from the wall plate when lifted by said lever and having its end face inclined downwardly to provide a flat lifting surface, substantially as described.

2. A form puller for a form having a vertical wall plate provided with a gauge hook projecting outward at right angles from the wall plate ending in a downturned lip, said puller comprising a lever, a fulcrum support therefor, and a J-shaped depending hook having its shank pivoted to said lever and characterized by its upturned hook end operatively disposed toward the fulcrum support and having a flat point of a width to fit under said gauge hook between the wall plate and lip to avoid slipping and having its end face inclined downward toward the shank to form an extreme outer point which is maintained in lifting engagement with the form directly adjacent the wall plate by said lip, substantially as described.

3. A form puller comprising a lever, a fulcrum support therefor, and a J-shaped hook depending from said lever characterized by an upturned, flat-pointed hook end having its flat point inclined downward toward the shank from its extreme outer point, substantially as described.

4. A form puller comprising a portable base block, upstanding posts mounted on said base block and having inwardly inclined portions with adjacent upper ends, a connecting bolt joining said upper ends, a brace extending downwardly in rearward and lateral directions from each post to a lateral edge portion of the base block and secured thereto for bracing the upper end of the post, a lifting lever pivotally fulcrumed on the bolt, and a J-shaped hook depending from said lever with an upturned point having the extreme end thereof flat and inclined downwardly to provide a horizontal lifting surface to sustain the weight of the load.

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