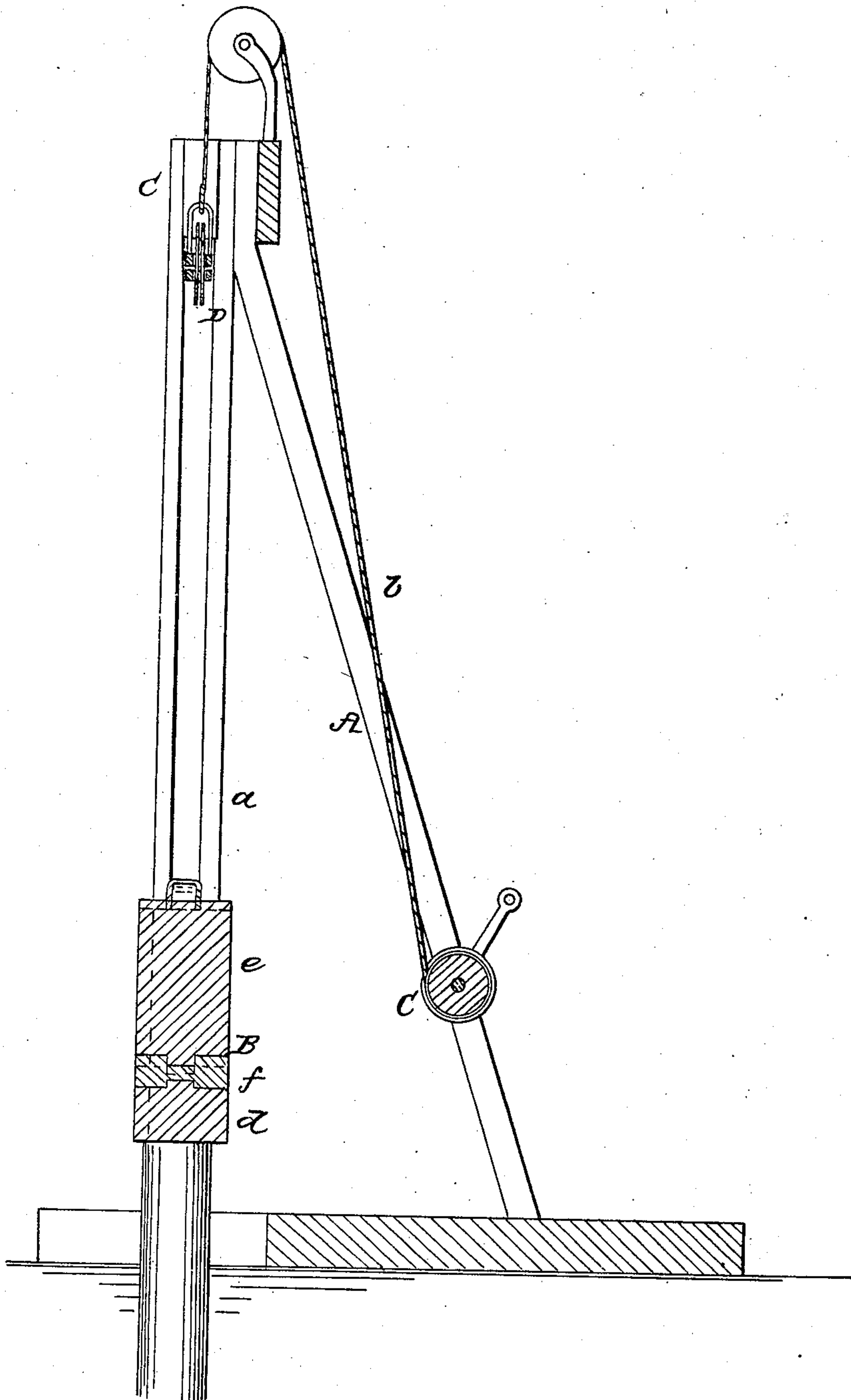


J. W. HOARD.

Pile Driver.

No. 14,502.

Patented March 25, 1856.



UNITED STATES PATENT OFFICE.

J. W. HOARD, OF PROVIDENCE, RHODE ISLAND.

PILE-DRIVER.

Specification of Letters Patent No. 14,502, dated March 25, 1856.

To all whom it may concern:

Be it known that I, J. W. HOARD, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Pile-Drivers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, making a part of this specification, said drawing being a vertical section of my improvement.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it.

The frame A, of the pile driver is constructed in the usual manner with two uprights (a), between which the weight or hammer B, is allowed to work up and down the hammer being raised by a windlass C, and having the chain or rope (b), connected to it by the usual clutch D, from which the hammer is relieved when elevated to its greatest height by beveled or inclined blocks (c), at the upper ends of the uprights. The weight or hammer B, is formed of two parts (d), (e), between which a piece of india rubber (f), or other suitable elastic material is placed the two parts (d), (e), of the hammer and the rubber (f), being attached or connected in any proper manner.

As the effect of the "ram" in pile drivers is due to its weight and velocity, it is frequently preferable where hand labor is scarce and so forth and to economize the time consumed in frequent lifts by hitching to the ram and so forth, to avoid the use of a very heavy ram having a short fall and dependent upon oft repeated action to drive in the pile, and to employ instead a lighter ram having a longer drop, but a light ram with a high velocity though it may give out a tolerably heavy force on impact has but little after effect on the pile to prevent or lessen its recoil produced by the elastic character of the pile itself and the springy nature of the ground, and to use a heavier ram at this extended drop would shatter the head of the pile when striking it, otherwise comparatively for the drop concerned, a heavy ram or weight is preferable and to prolong pressure, by action on the pile after impact, to prevent recoil, is a great object and this my improvement effects by following up the blow in a most simple and effective manner.

I propose to obviate the difficulty of bruising the heads of the piles and at the same time employ larger weights or hammers formed as above described of two parts (d), (e), with india rubber (f), between them. By this arrangement the upper part (e), of the weight or hammer does not act with its full force directly upon the pile but follows up the force of the blow of the lower part (d). This will be understood by the red line (g), which shows the downward movement of the part (e), after the part (d), has struck the pile the upper part (e), compressing the rubber (f), and descending as far as the line (g).

The upper part (e) of the hammer or block is larger and heavier, it will be seen by reference to the drawing, than the lower portion (d) of the same, and in no case should the upper part (e) be higher than the lower part (d) as while the india rubber packing (f) neutralizes to a great extent the effect of the momentum of the whole block (B) on its hitting the head of the pile, it of course does not wholly do so and there is an extra force due to percussion at the moment of impact which makes it desirable that the lesser weight (d) should strike first and the effect be followed up by the heavier weight (e) compressing the india rubber division (f). In thus dividing the freely falling "striking block" or, more properly speaking "ram" (B), a much heavier and longer action is produced on the pile without detriment to it, but if preferred, for some descriptions of work, the two portions (d and e) of the striking block, hammer or "ram" (B) may be of equal weight or thereabout, but the advantage aimed at in my improvement would be lost or seriously lessened by making the upper portion (e) the lighter (to any material extent) of the two portions of the flexibly or elastically divided striking block proper.

I am aware that in direct action steam hammers on india rubber packing has been introduced between the hammer and piston rod to avoid injury (on the hammer striking) to the piston, cylinder and machinery, also that the piston rod has been provided with a helical spring and the hammer or block at the limit of its top stroke been made to hit a padded spring beam to prevent injury and assist the return of the hammer; but in all such cases has the strik-

ing block proper been made of a solid character, none of such therefore or the mere application of a spring to a hammer (irrespective of its arrangement) do I claim: but
5 I do claim as new and useful, and desire to secure by Letters Patent,
The sectional or "ram" (B) of the driver,

constructed substantially as described for operation in the manner specified.

J. W. HOARD.

Witnesses:

WM. TUSCH,
JOHN MASON.