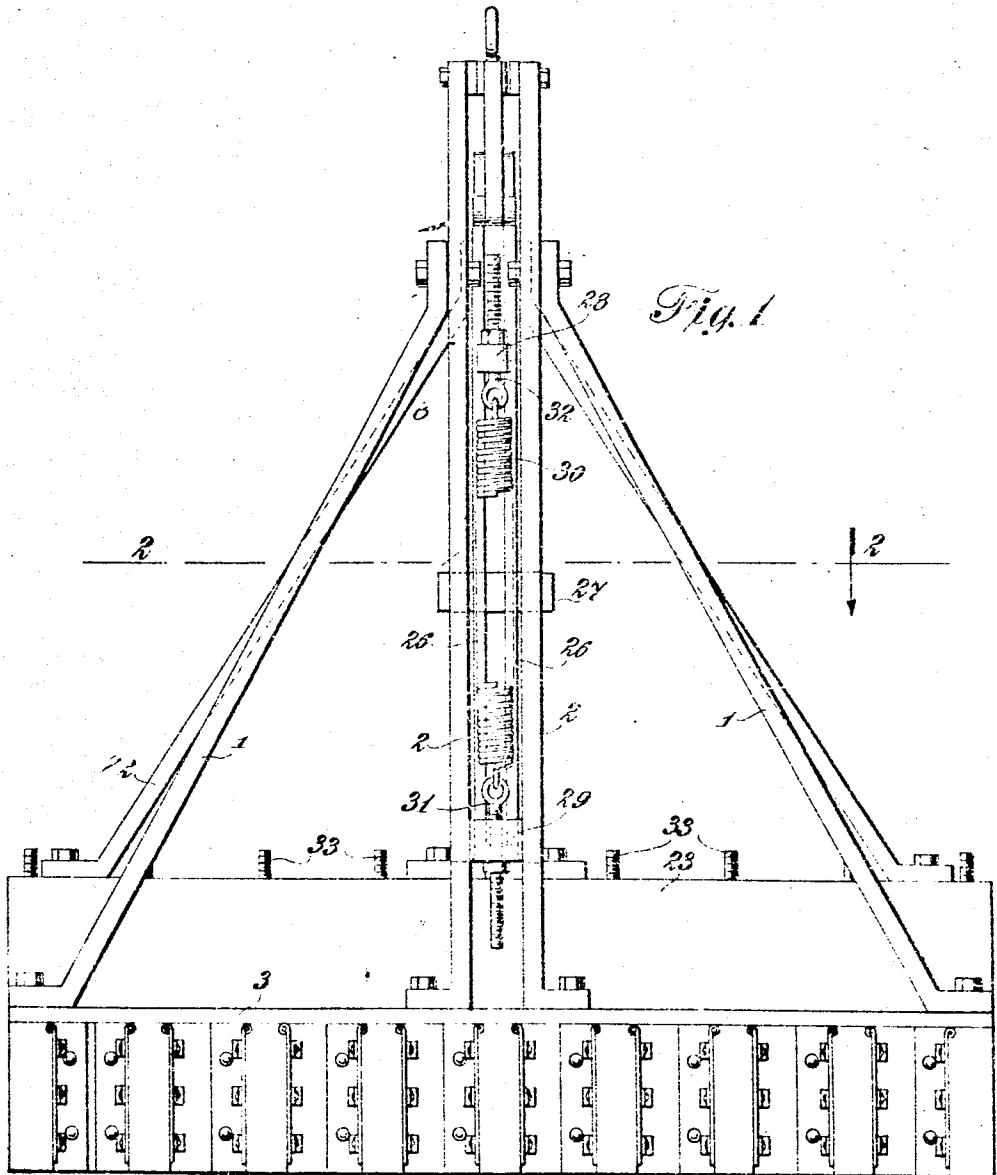


R. C. PENFIELD.
MACHINE FOR HANDLING BRICKS
APPLICATION FILED NOV. 6, 1909.

957,368

Patented May 10, 1910.

3 SHEETS-SHEET 1.



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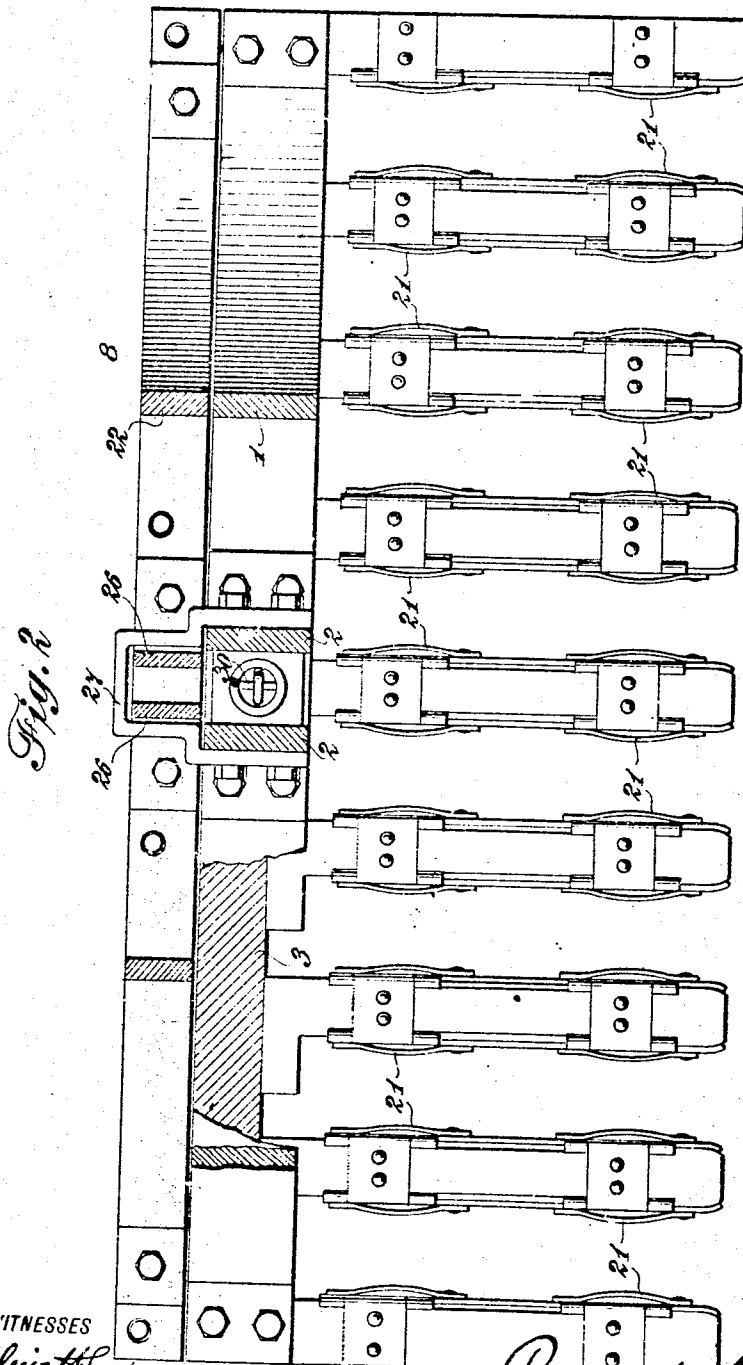


Fig. 2

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2 SHEETS—SHEET 3.

Fig. 3

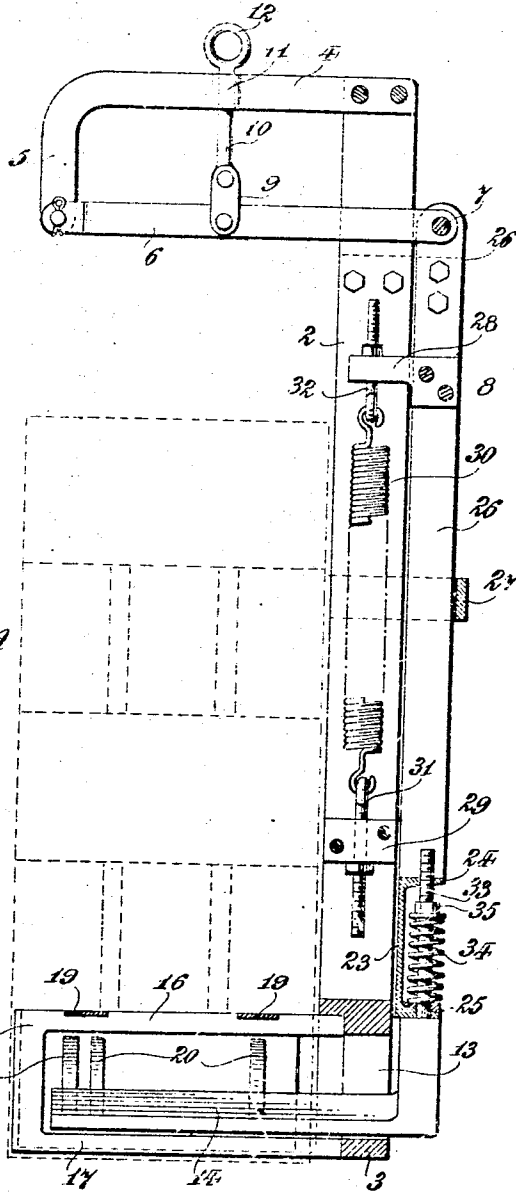
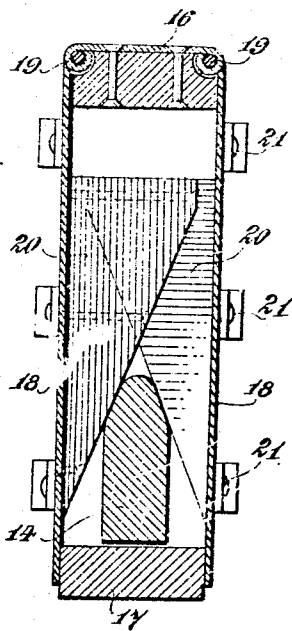


Fig. 4.



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UNITED STATES PATENT OFFICE.

RAYMOND C. PENFIELD, OF NEW YORK, N. Y.

MACHINE FOR HANDLING BRICKS.

957,368.

Specification of Letters Patent. Patented May 10, 1910.

Application filed November 6, 1908. Serial No. 461,367.

To all whom it may concern:

Be it known that I, RAYMOND C. PENFIELD, a citizen of the United States of America, residing at New York city, in the county of New York and State of New York, have invented certain new and useful improvements in Machines for Handling Bricks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a device or machine for handling bricks, the same being of the special class wherein a series of lifting members are interposed between the bricks of the lower layer of a mass of bricks set in a prearranged order, which lower layer is spaced apart to permit of this introduction of the lifting devices, said lifting devices being provided with clamps which exert a pinching strain on the units of the basic layer so as to enable the latter to be lifted simultaneously with the lifting of the mass of bricks.

The object of the invention is to simplify and perfect a device of this kind.

The invention consists essentially in a novel and ingenious mechanism for attaining the end in view, which mechanism is different from any heretofore employed, and it also comprises essentially the construction, arrangement and combination of parts and certain details and peculiarities thereof, substantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a front elevation of my improved device for lifting bricks. Fig. 2 is a sectional plan view on the line 2, 2 of Fig. 1. Fig. 3 is a sectional side elevation of the device. Fig. 4 is an enlarged cross-sectional view of one of the lifting and clamping devices.

Similar characters of reference designate corresponding parts through the different figures of the drawings.

As I have already suggested, the device to which this invention relates is intended for use with a stack formation of bricks built with the members of the basic layer spaced apart at uniform or substantially uniform distances, so that the lifting means may be inserted between the members of the basic layer for the purpose of raising the upper mass, while at the same time the members of the basic layer are gripped to enable said layer to be lifted with the rest.

In Fig. 3 I have represented at A a stack of bricks which have been backed up in the manner stated with the members of the basic layer spaced apart. This is given simply by way of illustration, in order to indicate the practical application of the invention.

The general framework of the machine may vary widely, and I do not wish to be restricted to any particular form. The specimen shown in the drawings consists of the inclined bars 1, 1 between which are the vertical center bars 2, 2. The inclined bars 1 and also the center bars 2 are securely bolted at their lower ends to a base bar 3 which is an elongated horizontal element suitably shaped and constructed to perform the function of enabling certain of the mechanical features to be arranged relatively thereto, and to operate in connection therewith in the manner which I shall presently relate. The vertical center bars 2 are bolted to the upper ends of the inclined bars 1, and also they extend above said bars; while to the upper ends of these bars 2 is secured rigidly a horizontal laterally-extending arm 4 which projects over the mass of bricks A. The end of the arm 4 is bent downwardly at 5, and to the lower extremity thereof is pivoted a lever 6, the opposite end of which is pivotally connected at 7 to the upper end of a vertically movable frame 8. To the lever 6 is pivoted a short vertical link 9 which is likewise pivoted to the lower end of a pull rod 10 working through a vertical guide 11 in the arm 4, said rod 10 being provided at its upper end with an eye 12 to which may be connected a lifting hook, crane, or other hoisting or suspension means, whereby the entire device and load of bricks may be raised and moved about. The rod 10 has a vertical rectilineal movement through its guide 11, and in such movement draws upon the lever 6 and raises or lowers the latter, the link 9 which is interposed between the rod 10 and the lever 6 allowing the rod 10 to have this right line movement so that the lifting action on the arm 4 and the frame may be applied at a proper point between the fulcrum of the lever 6 and the general framework as well as the movable frame 8, which, as we shall see, carries certain parts of the clamping mechanism at the lower end thereof, whereby a pinching strain is imparted to the units of the basic layer, and thus the lifting be performed

without disturbing the center of gravity of the machine.

The lower horizontal bar 3 which is at the bottom of the frame, as we have seen, is provided with a series of vertical slots 13 through which operate wedge bars 14 that act to spread apart the members of the pairs of clamps that grip the basic layer of bricks, said wedge bars 14 being carried by the vertically-movable frame 8. Securely fastened to the base bar 3 is a series of lifting arms or members 15 consisting of rectangular frames having an upper bar 16 and a bottom bar or foot 17. Pairs of side clamping plates 18, 18 are hinged by means of hinges 19 to the top bar 16. These clamping plates are arranged to move horizontally and grip against the adjacent bricks of the basic layer.

The detailed construction of the lifting and clamping devices is seen in Fig. 4. These lifting arms 15 are secured to or made integral with the bottom horizontal bar 3 at points opposite the vertical slots 13, so that the wedging bars 14 which pass through the vertical slots 13 may enter between the clamping plates 18 just above the foot part 17, as seen in Fig. 4, and be in a position to act in conjunction with wedges on the hinged side plates 18. The top bars 16 of the lifting members 15 are calculated to rest beneath the second layer of bricks, and by lifting thereon (see Fig. 3) to raise the superposed mass. Further, these lifting members pass between the individual units of the basic layer, as I have already explained, being of proper size to be inserted in the uniform spaces between the members of the basic layer; while the side plates 18 are adapted to be spread laterally for the purpose of gripping or clamping the members of the basic layer by a pinching strain so that when the superposed mass is lifted by the power exerted thereon by the lifting members 15, the simultaneous pinching strain on the bricks of the lower layer, caused by the lateral action of the plates 18, will lift the basic row also. On the inside face of each of the side plates 18, I place a number of wedges 20, preferably three on each inside face, those on one plate of a pair being inclined oppositely to those on the companion plate, and being so placed that they will interlock as shown in Fig. 4. The upper edge of each of the bars 14 is wedge-shaped, having inclined faces, and hence it is obvious, that as said bars 14 lift, their upper edges will come into contact with the inclined faces of the wedges 20, and the result will be that the plates 18 will be spread apart, in their movement swinging on their hinges 19. These plates 18 are preferably thin pieces of sheet metal, and are adapted to spread easily and clamp tightly against the adjacent faces of the bricks. As

the wedge bars 14 drop back, the wedge-provided plates 20 likewise drop back into their normal position which is a vertical one, the two plates 20 belonging to each lifting member being parallel to each other, as shown in Fig. 4. On the outside faces of the clamping plates 18, that is to say, the faces which come into contact with the bricks, and the faces which are opposite to where the wedges 20 are located, I find it convenient to secure a number of horizontal flat springs as 21, there being, say, three on the outside face of each plate 18. These springs 21 are preferably arranged equidistant from each other and they come into contact with the bricks when the clamping plates 18 are spread laterally. Their function is to increase the resiliency of the movable clamping plates and enhance the elastic and yielding character of the clamping action. They are usually fastened at one end, the other being left free to move.

The vertically-movable frame 8 may be constructed in any suitable manner to enable it to carry the movable wedge bars 14. One form of said frame includes the inclined bars 22 which are bolted at their lower ends to a horizontal channel bar 23 having parallel horizontal flanges 24 and 25. Between the bars 22 are two vertical bars 26, 26. The inclined bars 22 are bolted at their upper ends to these parallel vertical center bars 26, which are located in proximity to the center bars 2, 2 to which the inclined bars 1 are secured. The upper ends of the bars 26 are pivotally connected at 7 to the lifting lever 6. A strap 27 which is securely bolted to the vertical bars 2, 2 embraces the vertical bars 26 and allows the latter to reciprocate vertically therein when the movable frame adjusts itself during the operation of the machine. On said movable frame, moreover, is a horizontal projecting bracket 28 that supports an eye bolt 32 which is connected to one end of a vertical balancing spring 30, the other end of said spring being fastened to another eye bolt 31 which is held in a block 29 that is secured between the vertical bars 2, 2 as seen in Figs. 1 and 3. Both the eye bolts 31 and 32 are screw-threaded and hence are adjustable and are provided with nuts to hold them in any desired position, thereby enabling the tension of the spring 30 to be regulated. When the lever 6 acts on its pivotal point 7 and lifts the movable frame 8, the result is to expand the balancing spring 30, and said spring has a tendency to restore the parts to their normal position when the lifting agency ceases to operate.

The wedge bars 14 which constitute the means for spreading apart the two clamping plates 18, belonging to each lifting member, are provided with right-angled integral rods 33 which are furnished with

spiral springs 34 surrounding them, said springs being tensioned between nuts 35 on the rods 33 and the lower flange 25 of the channel bar 23. Rods 33 are mounted in the flanges 24 and 25 of the channel bar 23. Hence it is obvious that when the movable frame is raised, the series of wedge bars 14 will all be lifted, and when they begin to act against the wedges 20 and the clamping plates 18, the springs 34 will be compressed so that the rods 33 and the wedges 14 will be yieldingly raised, the result of which will be to spread the members of the clamping devices apart elastically. Thus the interposition of the series of springs 34 enables the clamping devices to perform their work with an elastic or yielding effect, permitting a compensation to take place correspondingly with the thickness of the bricks in the lower layer, and the width of the spaces between them, it being remembered of course that the lateral springs 22 on the clamping members 18 contribute to the completeness of this elastic or yielding clamping effect.

The operation of my improved device for handling bricks will be obvious from the foregoing description of the construction without the need of much additional detail. When the lifting crane or hoisting mechanism lays hold of the eye 12 at the upper end of the rod 10 and lifts the same, the effect will be to oscillate the lever 6 and lift the movable frame 8 simultaneously with the lifting of the main frame and the raising of the lifting members 15 against the mass of brick. The action on the clamping members 18 for the exertion of a pinching strain against the members of the basic layer takes place automatically with the initiation of the lifting movement, and through the action of the lever 6 upon the movable frame 8. The sure and certain guide 11 at a fixed point in the length of the rigid arm 4 insures that the eye 12 and the suspension means should apply its lifting power always at the same point at the top of the main frame of the device, this being accomplished through the provision of the link 9 between the guided rod 10 and the lever 6. This arrangement enables the machine to be brought up against a prearranged stack formation of brick so that the lifting members 15 may be accurately and surely introduced in the spaces between the members of the lower row. When the machine is not loaded it will hang in a vertical position in proper equilibrium, and when it is loaded it will not be deflected from the proper vertical position which it must assume to carry the brick and keep the stack formation in a vertical position so that the arrangement of the parts thereof will not be disturbed during transportation.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is:

1. A device for handling bricks, comprising a main frame, a series of lifting members on the lower end thereof adapted to be inserted between adjacent bricks of a layer, each member having a pair of clamping plates, a vertically movable frame, a series of wedges carried thereby and arranged to operate in connection with the clamping plates of the lifting members, and means for simultaneously lifting the movable frame and the main frame.

2. A machine for handling bricks, comprising a vertically disposed frame, laterally-extending lifting members each having a pair of clamping plates, a laterally-extending arm carried by the upper end of said frame, a movable frame alongside of the first-mentioned frame, a lever connecting the upper end of said movable frame with the outer end of the upper laterally-extending arm, and means on said arm for lifting the lever.

3. A machine for handling brick, comprising a vertically disposed frame, a laterally-extending arm at the upper end thereof, a lever pivoted to the outer end of said arm, a vertically movable frame alongside of the first-mentioned frame, to the upper end of which said lever is pivoted, a vertically movable rod working in a guide in said laterally-extending arm, means connecting the lower end of said rod with the said lever, supporting means engaging the upper end of said rod, and laterally-extending clamping devices at the lower end of the two frames.

4. A machine for handling bricks, comprising a vertically disposed frame, a second vertically movable frame alongside of the first, a series of lifting members carried by the lower end of the first frame and having expanding clamps, wedges carried by the vertically movable frame and operating to expand said clamps, and means for lifting the entire machine.

5. A machine for handling bricks, comprising a vertically disposed frame, a laterally-extending arm rigidly attached to the upper end thereof, a lever pivoted to the outer end of said arm, a vertically movable frame alongside of the first frame and pivotally connected to the end of said lever, means for lifting said lever, said means working through a guide on the upper arm, a spring connection between the vertically movable frame and the first-mentioned frame, a series of lifting members adapted to be inserted between adjacent bricks of a series, and means consisting essentially of wedges carried by the vertical movable frame for operating clamps carried by the lifting members.

6. A machine for handling bricks, com-

prising a main frame, a series of lifting fingers at the lower end thereof adapted to be inserted between adjacent bricks of a layer, a vertical movable frame alongside of the first mentioned frame, a series of wedge devices, springs interposed between said wedge devices and the movable frame to provide means for compensating for bricks of varying thickness, a spring connected to the main frame and also to the movable frame, and a lever device acting on the movable frame, together with suspension means for carrying the machine and its load.

7. A device for handling bricks, comprising a main frame, a series of lifting members on the lower end thereof adapted to be inserted between adjacent bricks of a layer, each lifting member having a pair of hinged clamping plates provided with wedges, a vertically movable frame, arms carried at the lower end thereof and cooperating with the said wedges, and a yielding connection between the main frame and the vertically movable frame, together with means for simultaneously lifting both frames.

8. A device for handling bricks, comprising a vertically disposed frame, a series of lifting members on the lower end thereof adapted to be inserted between adjacent bricks of a layer, a vertically movable frame, means thereon cooperating with the said lifting members for engaging the material to be lifted, a yielding connection between the main frame and the vertically movable frame, and means for simultaneously lifting both frames.

9. In a device for handling bricks, the combination with a vertically disposed frame, of lifting members at the base thereof, and a vertically movable frame alongside of the first frame, the latter frame cooperating with the lifting members for engagement with the material to be lifted, a spring con-

necting the two frames, and means for jointly lifting said frames.

10. A device for handling bricks, comprising a main frame, clamping devices thereon, a movable frame alongside of the main frame, said movable frame having means cooperating with the clamping devices, a yielding connection between the two frames, and means for jointly lifting said frames.

11. A device for handling bricks, comprising a main frame, a series of lifting members thereon each having a pair of hinged clamping plates provided with wedges, a vertically movable frame, a series of wedge-shaped arms carried thereby, and cooperating with the aforesaid wedges, yielding means for supporting said arms elastically in the movable frame, said means consisting essentially of a spring for connecting the movable frame with the main frame, and means for simultaneously lifting the movable frame and the main frame.

12. A device for handling bricks, comprising a vertically disposed frame, a series of lifting members on the lower end thereof adapted to be inserted between adjacent bricks of a layer, a vertically movable frame, means thereon cooperating with the said lifting members for engaging the material to be lifted, individual yielding means interposed between said cooperating means and the movable frame so that means may be provided that compensate for bricks of various thickness and for varying spaces between adjacent bricks of a layer, a yielding connection between the main frame and the vertically movable frame, and means for simultaneously lifting both frames.

In testimony whereof I affix my signature in presence of two witnesses.

RAYMOND C. PENFIELD.

Witnesses:

FRANK PAUL,
C. B. SCHROEDER.