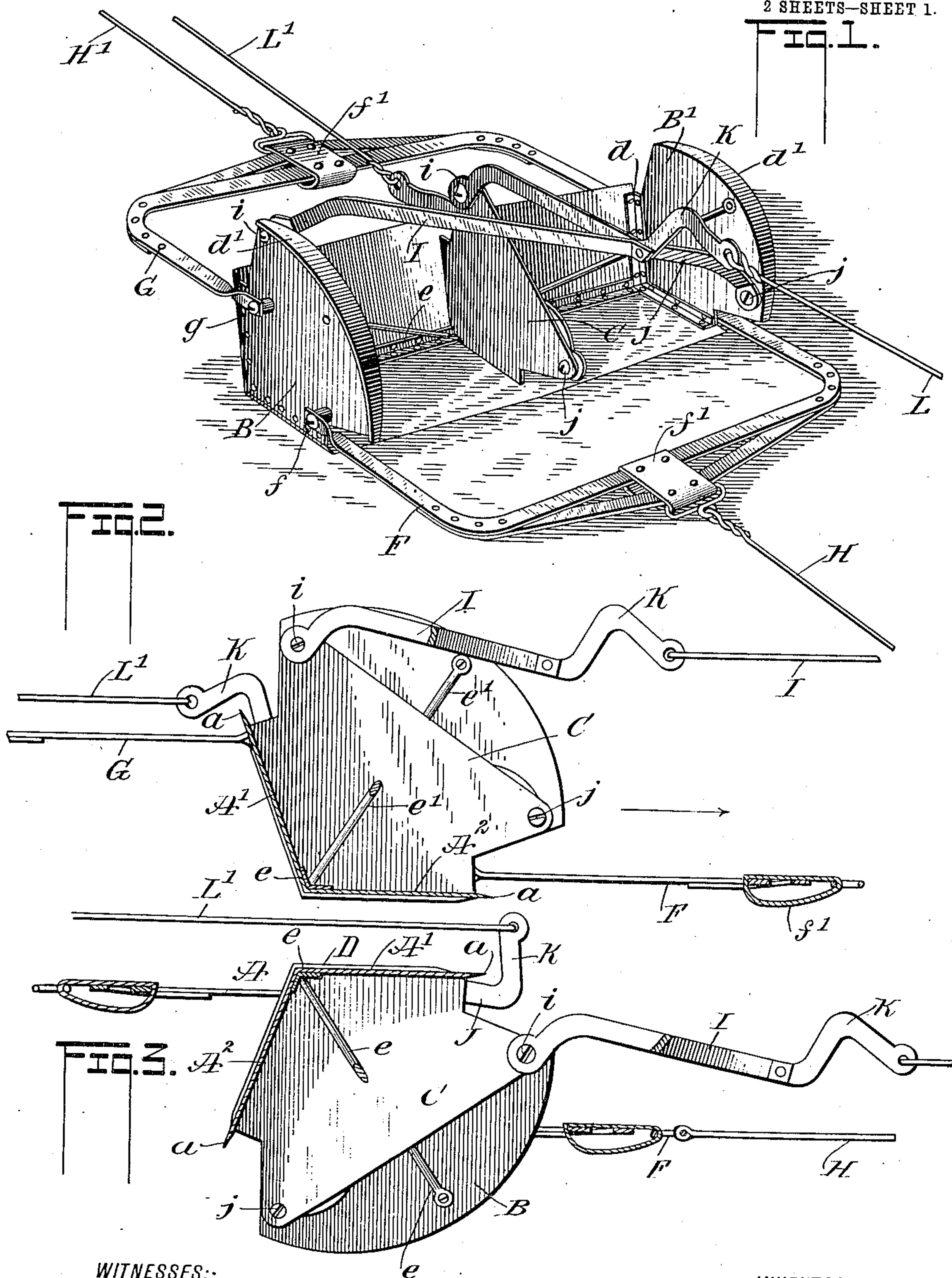


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PATENTED JULY 10, 1906.

R. B. PAGE.
EXCAVATING APPARATUS.
APPLICATION FILED AUG. 17, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

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UNITED STATES PATENT OFFICE.

RESCUE BARNEBAS PAGE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF
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EXCAVATING APPARATUS.

No. 825,553.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed August 17, 1905. Serial No. 274,528.

To all whom it may concern:

Be it known that I, RESCUE BARNEBAS PAGE, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Excavating Apparatus, of which the following is a full, clear, and exact description.

My invention relates to improvements in excavating apparatus adapted for use in ditching, dredging, building levees, leveling land, and constructing waterways and canals.

In this invention I employ a reversible scraper having two cutting edges and adapted to be hauled in an operative condition on each trip back and forth across the ditch, canal, or other ground it is desired to remove. With the scraper is associated means for holding it in the required operative condition during the excavating and loading operation and when fully loaded, said means being also effective in dumping the scraper when it reaches the point of discharge.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope thereof will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of my improved reversible scraper and adapted for use in an excavating apparatus for the purposes hereinbefore mentioned. Fig. 2 is a vertical sectional view through the reversible scraper, showing it in an operative position for the purpose of loading itself and for transporting its load to the dumping-point. Fig. 3 is a sectional view somewhat similar to Fig. 2, but showing the scraper in an inverted or dumping position; and Fig. 4 is a diagrammatic view illustrating the arrangement of mechanism for operating the scraper.

The reversible scraper A of my invention is shown by Figs. 1 to 3, inclusive, as consisting of longitudinal members A' A², the end plates B B', and an intermediate partition C. The longitudinal members A' A² are disposed at an angle to each other, and they may be made of a single piece of sheet metal

bent to the required form or in separate pieces and united in any suitable way. As shown, however, the two members are in one piece, and they extend the full length of the scraper, each member being provided with a cutting edge *a*. The end walls B B' are united to the members of the scraper in any approved way—as, for example, by the angle-pieces *d*, which are riveted to said members and to the walls, as shown by Fig. 1, said walls having curved outer edges bounded by marginal flanges *d'*. The inner surfaces of the end walls B B' are smooth to prevent the lodgment of dirt in unloading the scraper by dumping the same. The corner formed by the union of the members A' A² is reinforced by a longitudinal angle-strip *e*, which is riveted to the inside of the scraper. The partition C is secured in any desirable way within the scraper, preferably midway between the ends B B', so as to divide the scraper into two compartments. The ends or walls B B' are braced by the employment of suitable stay-rods *e'*, which are fastened to the walls and to the angle-strip *e*.

The improved scraper is adapted to be drawn in either direction by suitable power appliances, and it is reversible, so that it will load itself when drawn in one direction or the other. When the scraper is in the position shown by Fig. 2, the member A² constitutes the bottom and the member A' is the back, the scraper being movable in the direction of the arrow in said Fig. 2, so that the cutting edge *a* will cut through the soil and load the scraper on the advancement thereof. When the scraper is hauled in a backward direction, its position is reversed, so that the member A' serves as the bottom and the member A² as the back, in which case the other cutting edge *a* will remove the soil and the same will be loaded into the scraper.

To reduce the wear on the scraper due to its frictional engagement with the soil over which it travels, I contemplate the employment of metallic shoes D, which are made of metal and secured by rivets or otherwise to the outer surfaces of the members A' A². These shoes increase the strength of the scraper and minimize the wear thereon, said shoes being removable when worn and adapted to be replaced by other metallic strips which are adapted to serve the purposes of shoes.

The scraper is hauled back and forth by suitable draft appliances, each including the haulage-bails F G. The bail F has pivotal connection at *f* with the ends B B' at one corner of the scraper, while the other bail G has similar pivotal connection at *g* with the ends at the other corner of the scraper, said bails being pivoted individually to the scraper at the respective corners thereof, as shown by the drawings. Each bail may be of any suitable construction; but, as shown, it consists of two parts riveted one to the other and provided with a draft-clip *f'*, said draft-clips of the two bails affording means for the attachment of the haulage-cables H H'.

With the scraper I have associated means for dumping or tilting the same when it reaches the limit of its movement in either direction, and said means includes the clevises I J, the same extending in opposite directions from the scraper and pivoted to the ends and the partition in peculiar relation to the pivots of the draft-bails F G. The clevis I, which extends from the scraper in the same direction as the draft-bail F, has pivotal connection at *i* with one end B and the partition C, said pivots *i* being located in a plane between the pivots *f g* of the two draft-bails. The other clevis J has pivotal connection at *j* with the other end B' and the partition C, said pivots *j* being located in a plane between the pivots *f g* of the two draft-bails F G. The clevises I J are located in the respective compartments of the scraper formed by the ends B B' and the partition C, and said clevises are forked or bifurcated in order that they may straddle the spaces between the ends and the partition, thus providing for the pivotal connection of the clevises in the manner described. The clevis I, as heretofore stated, extends from the scraper in the same direction as the bail F, whereas the other clevis J extends in an opposite direction to the clevis I and in the same direction as the bail G, as shown by the drawings. Each clevis is provided at its front end with an angular arm K, and each clevis is of such length that the angular arm will project in one position around the cutting edge *a* of the scraping member and have engagement with the back of said member in a way to prevent it from coming in contact with the cutting edge and from dulling or nicking the same.

To the angular arms K of the two clevises are connected the adjusting-lines L L', which are adapted to pull on the clevises and assist in maintaining the scraper in its operative position when drawn across the ground.

In Fig. 4 of the drawings I have illustrated one embodiment of mechanism for hauling, dumping, and for keeping the scraper in its proper positions; but I do not desire to confine myself strictly to the employment of any special means for the operation of the scraper. Derrieks M N are erected or located at the

respective ends of the field of operation of the scraper or on opposite sides of the ditch or excavation from which it is desired to remove the material. The derrick M is equipped with drums *m m'* and with sheaves *m², m³, m⁴, and m⁵*. The haulage-cable H extends from the bail F over the sheave *m²* and is coiled on the drum *m*. The adjusting-line L leads from the clevis I over the sheave *m⁴*, under the sheave *m⁵*, thence over the sheave *m³*, and is coiled on the drum *m'*. The sheave *m⁵* is adapted to be pulled in a downward direction by any suitable appliance—such, for example, as a cable *m⁶*—whereby the sheave *m⁵* is movable vertically with respect to the sheaves *m³ m⁴* for the purpose of shortening the adjusting-line L. The other derrick N is similarly equipped with drums *p p'* and with sheaves *p² p³ p⁴ p⁵*. The haulage-cable H' leads from the bail G of the scraper over the sheaves *p²* and is coiled around the drum *p*. The adjusting-line L' extends from the clevis J of the scraper over the sheave *p³*, under the sheave *p⁵*, and over the sheave *p⁴*, from whence it passes through and around the drum *p'*. The sheave *p⁵* is disposed for vertical movement in a path between the sheaves *p³ p⁴* for the purpose of shortening the adjusting-line L', and the downward movement may be given to this sheave *p⁵* by any suitable appliances—such, for example, as the cable *p⁶*.

The drums on the respective derricks may be operated by an engine or motor of any suitable character, and with these drums are associated ordinary friction-clutches and other devices, which control the operation of said drums. In order to move the scraper toward the right in Fig. 4, the drums *m'* or *p'* may be driven in order to draw on the cables L or L' for moving the scraper A to the operative position. (Shown by full lines.) The drum *m* is now driven for the purpose of coiling the cable H thereon and hauling the scraper in the desired direction, and at the same time the cable L travels at the same speed as the cable H in order that the two cables H and L may be wound on the drums *m m'*, the drums *p p'* rotating at uniform speed in order to pay out the cables H' and L'. The several cables which are connected to the bails and clevises of the scraper cooperate in maintaining the scraper in the desired position during the operation of cutting through the soil and loading the excised material into the scraper; but as soon as the scraper is loaded the drum *m* is slackened somewhat in order to correspondingly slacken the cable H, and thus prevent the scraper from taking up material in excess of its capacity, after which the drum *m* is again driven at the required speed, so as to take up the loading-cable H as rapidly as the scraper is advanced toward the place of unloading. To unload the scraper, it is dumped to the

position indicated by dotted lines in Fig. 4 and by full lines in Fig. 3, and this is accomplished by slackening the cables H, H', and L'; but the drum m' is driven in order to haul on the line L and the clevis I, so as to pull the scraper over to the desired dumping position. Just before the scraper is fully inverted the drum m and the cable H are again brought into operation so as to pull on the scraper and make the haulage-cable assist the adjusting-line in emptying the scraper. The curved flanges d' on the end walls B B' of the scraper serve as shoes or runners when the scraper is inverted.

In the practical operation of the scraper the cables can be so controlled as to prevent said scraper from dumping itself when its cutting edge is in contact with extra hard ground or roots. In case the scraper encounters an obstruction the strain on the cables can be increased by the operation of the engine on one side of the ditch to overcome the tendency of the scraper to tilt or turn. It is evident that after hauling the scraper to the dumping-place adjacent to one of the derricks the other set of cables and drums can be brought into service for reversing the position of the scraper and for hauling it in an opposite direction in a way to cut through the soil and load itself with the excised material, after which the scraper in the reversed position may be dumped in the manner described, and said scraper can thereafter be reversed, so as to operate when moving in the first-named direction. (Indicated by the arrow.)

The employment of the vertically-movable pulleys m^5 or p^5 on the respective derricks is advantageous in drawing on the lines L L' to make the clevises tilt or dump the scraper, because when the scraper reaches its dumping position, to which it is hauled by the drums m m' or p p' , the cables m^5 or p^5 may be drawn taut, so as to pull the pulleys m^5 or p^5 in a downward direction, thus increasing the pull on the cables L or L' and inverting the position of the scraper without operating either of the drums m' or p' from the engine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an excavating apparatus, a reversible scraper having members arranged at an angle to each other and each provided with a cutting edge, and draft appliances connected with the scraper adjacent to the cutting edge.

2. In an excavating apparatus, a reversible scraper having members arranged at an angle to each other and provided with cutting edges, and draft appliances connected to the respective sides of the scraper.

3. In an excavating apparatus, a reversible scraper having members arranged at an an-

gle to each other and each provided with a cutting edge, a draft appliance connected with the scraper adjacent to each cutting edge, and means for tilting the scraper in either of its operative positions.

4. In an excavating apparatus, a reversible scraper having cutting edges arranged at an angle to each other, and provided with independent draft-bails for drawing the scraper in opposite directions, and with separate dumping clevises, whereby the scraper may be dumped in the direction of its travel at either end thereof.

5. In an excavating apparatus, a reversible scraper provided with draft-bails connected to the opposite corners thereof, and dumping-clevises connected to the scraper at different points from the connection of the draft-bails thereto, and arranged to dump the scraper in opposite directions.

6. In an excavating apparatus, a reversible scraper provided with draft-bails pivoted to the respective corners thereof for drawing the scraper in opposite directions, a dumping-clevis pivoted to the scraper at points between the pivotal connection with the draft-bails thereto, whereby the scraper may be dumped in the direction of its travel at either end thereof.

7. In an excavating apparatus, a reversible scraper having a draft-bail, and a dumping-clevis pivoted to the scraper and provided with an angular end, the latter being foldable around a cutting edge of the scraper.

8. In an excavating apparatus, the combination of a reversible scraper, draft-bails connected independently thereto for drawing the scraper in opposite directions, haulage-cables attached to said bails, dumping-clevises pivoted to the scraper, and arranged to dump the same in the direction of its travel at the opposite ends thereof, adjusting-lines attached to said clevises, and means for independently operating the haulage-cables and the adjusting-lines.

9. In an excavating apparatus, the combination of a reversible scraper provided with cutting edges at its respective sides, draft-bails pivoted to the scraper at opposite corners thereof, clevises also pivoted to the scraper independently of the draft-bails, and cables connected individually to said bails and clevises; said cables being controllable for maintaining the scraper in an operative position, for hauling the scraper across the field of operations and for dumping said scraper.

10. In an excavating apparatus, a scraper consisting of members arranged at an angle to each other and provided with cutting edges, a division-wall within the scraper, bails pivoted to the scraper, and clevises pivoted to the scraper and the division-wall therein.

11. In an excavating apparatus, a reversible scraper having members at an angle to each other and provided with cutting edges, wear-shoes secured externally to the members, and draft appliances connected with the scraper at opposite sides thereof.

12. In an excavating apparatus, a reversible scraper, means whereby to draw the scraper in opposite directions, and means

whereby to dump the scraper in the direction of its travel at either end thereof.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RESCUE BARNEBAS PAGE.

Witnesses:

WILLIAM A. BOWEN,

W. H. MEAD.