

A. N. McGRAY.

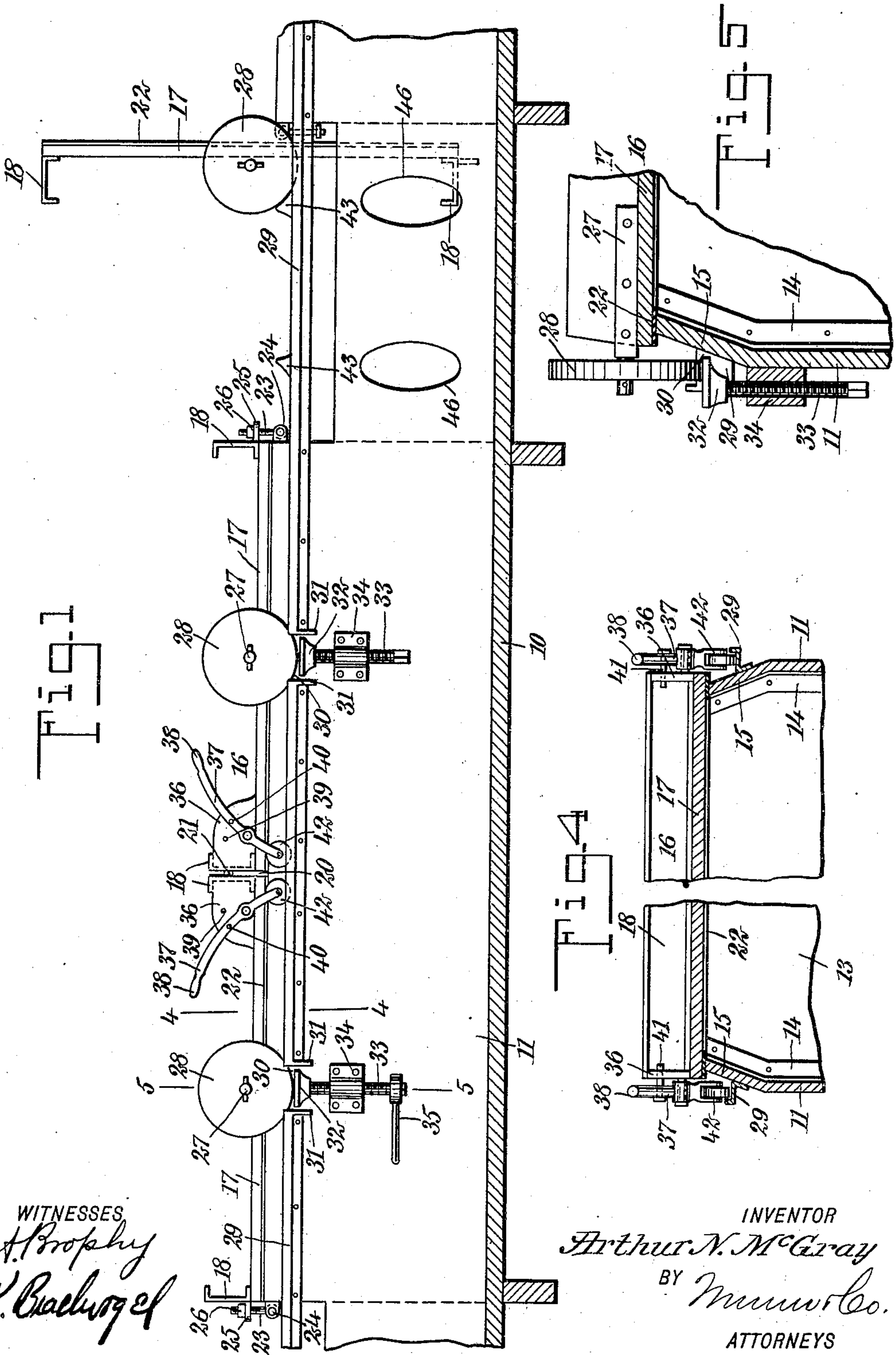
HATCH.

APPLICATION FILED AUG. 10, 1908.

934,456.

Patented Sept. 21, 1909.

2 SHEETS—SHEET 1.



WITNESSES
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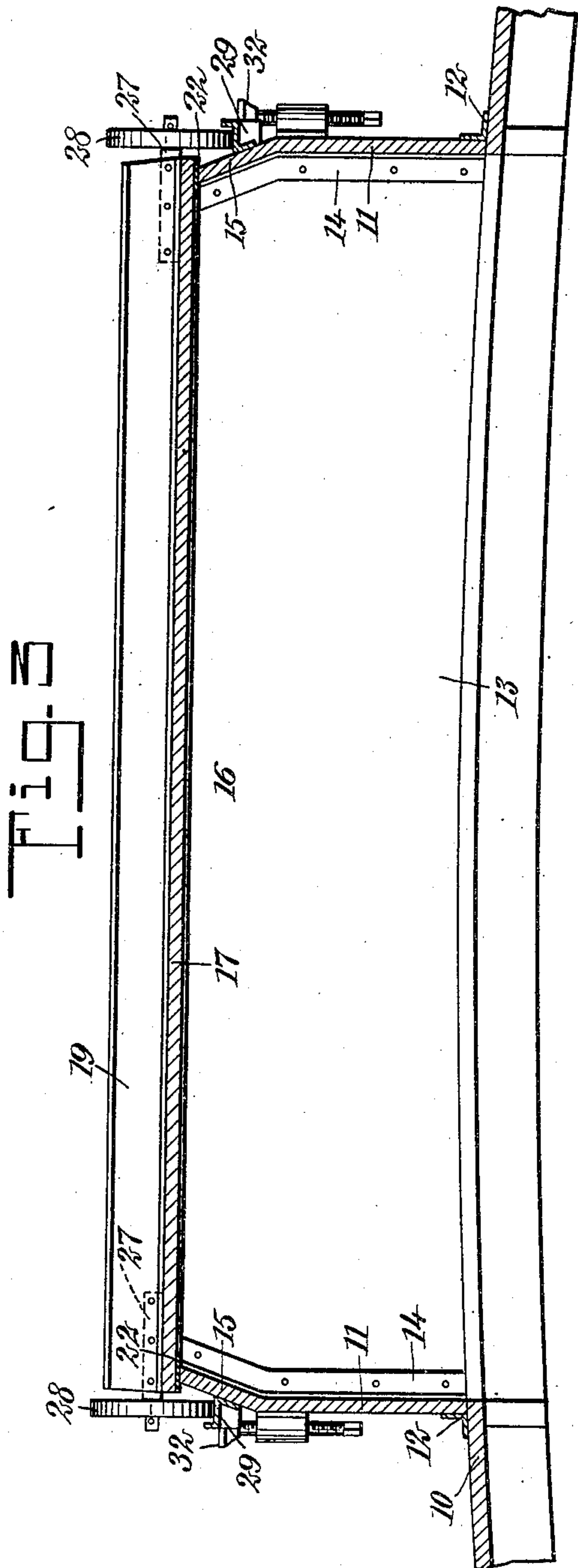
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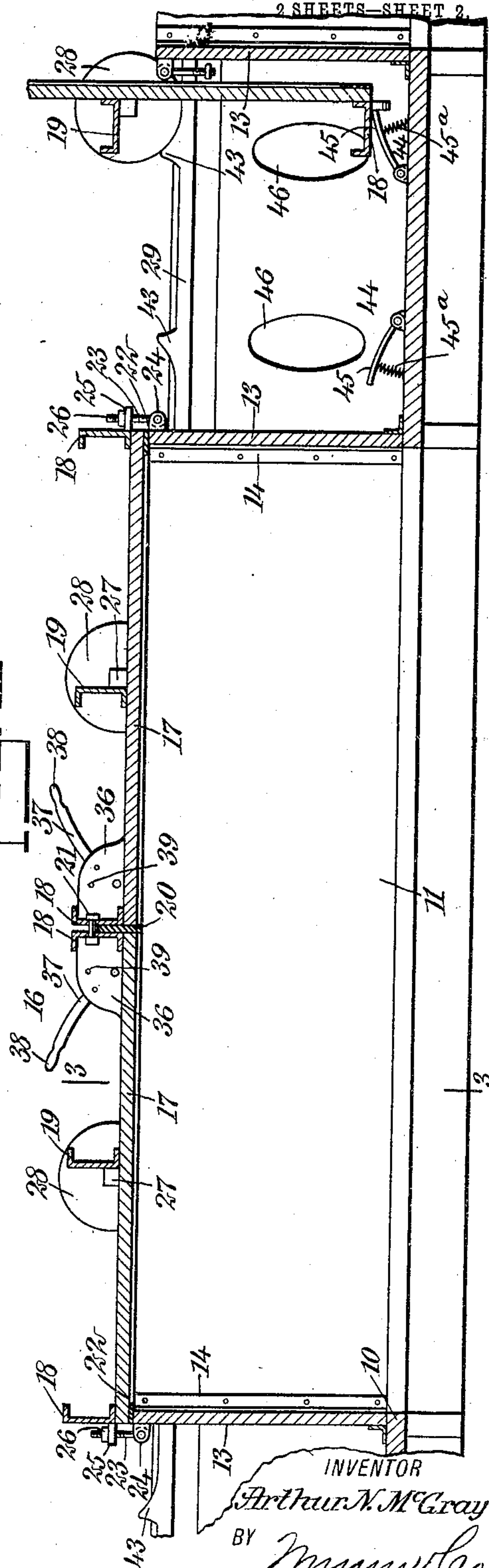
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2 SHEETS—SHEET 2.



WITNESSES

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HATCH.

934,456.

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To all whom it may concern:

Be it known that I, ARTHUR N. McGRAY, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Hatch, of which the following is a full, clear, and exact description.

This invention relates to hatches for steamships and other vessels, and more particularly to a hatch in which the hatch cover, which may consist of one or more sections, is movably supported upon hatch coamings, so that it can be rolled bodily aside and then tilted into a substantially perpendicular and inoperative position, means being provided for suitably holding the cover in the inoperative position, together with means for clamping the hatch cover in a closed or battened position upon the coaming edges. Specifically, the hatch cover is supported upon wheels arranged to roll upon trackways carried by the fore and aft or longitudinal coamings of the hatchway, the track ways having adjustable sections which permit the hatch cover to be lowered into engagement with the hatch coamings when the wheels supporting the cover are located at these sections.

An object of the invention is to provide a simple, strong and durable hatch for steamships or other vessels, in which the hatch cover can be securely battened down upon the hatchway to prevent water from entering the same if the vessel is laboring in a seaway so that the waves break upon the deck, or to confine or prevent the escape of liquid from within the vessel where a hold section has become filled by accident, or serves as a container for liquid in bulk, or is filled with liquid for ballast or stability purposes, which can be easily manipulated, and in which the "dead" space under the deck is reduced to a minimum.

A further object of the invention is to provide a hatch which is particularly useful in connection with vessels having the fore and aft hatch coamings formed by longitudinal plate stringers extending substantially the length of the vessel, and serving to increase the fore and aft strength and rigidity of the vessel frame.

A still further object of the invention is to provide a hatch, the cover of which can be

removed or can be placed in a closed position without the aid of a steam winch, a derrick, or other tackle, which leaves the deck space unobstructed, and by means of which the hatch cover can be substantially automatically battened or fastened in a closed position, the construction permitting the removal and replacing of the cover in a very short period of time, and with the expenditure of little labor.

The invention consists in the construction and combination of parts to be more particularly described hereinafter and fully set forth in the 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 views, and in which—

Figure 1 is a side elevation of an embodiment of the invention; Fig. 2 is a longitudinal section of the hatch; Fig. 3 is a cross section on the line 3—3 of Fig. 2; Fig. 4 is a cross section on the line 4—4 of Fig. 1; and Fig. 5 is an enlarged cross section on the line 5—5 of Fig. 1.

Before proceeding to a more detailed explanation of my invention, it should be clearly understood that while the same is particularly useful with large steamships designed for carrying bulk cargo, such as grain, coal and the like, and in which the longitudinal hatch coamings are formed by deck stringers extending along the length of the vessel, it can also be advantageously employed in connection with other vessels in which the hatchways are of the usual construction and have the ordinary hatch coamings. In large ships designed for bulk cargo carrying, it is customary to increase the longitudinal strength and rigidity of the vessel frame, by the provision of deep steel or iron plate stringers running the entire hatch length of the ship, one on each side of the center line. These stringers form the side or longitudinal hatch coamings, and are securely riveted to the deck beams by heavy angle irons or in any other convenient manner. The hatchways are located between these stringers, which form the fore and aft coamings, being joined by athwartship or transverse plates or stringers which form the athwartship coamings.

The latter are securely riveted at each end, to the longitudinal stringers, and if possible, to the deck beams. Suitable hatch covers are removably mounted upon the coamings and are clamped or locked in position in any suitable manner. For the expeditious loading and discharging of bulk cargoes, it is advantageous to have the vessel provided with a large number of hatchways, as less labor and expense are entailed thereby in the trimming and general handling of the cargo.

By means of my invention a large number of hatchways can be provided, and owing to the simplicity of the construction of the same, little labor and time are necessary to open and close them in accordance with the requirements of cargo handling. It will be understood that the hatch covers can of course, be securely "battened" down to insure that the hatches will be water-tight so that no water can enter the hold through the hatchways if the waves break on the deck of the ship.

When the hatchways to which my invention is applied are large, I prefer to provide the hatch covers in two sections; of course, in the case of smaller hatchways the hatch covers may be constructed in one section. In each case, the sections are movable in a fore and aft direction and are mounted upon wheels or rollers supported upon tracks carried by longitudinal stringers. When the hatch covers are movably supported by the tracks, they are practically balanced upon their wheels and thus little force is necessary to swing them into substantially perpendicular positions at the athwartship coamings of the hatchways, that is, into the inoperative position to leave the hatchways free and unobstructed for the handling of cargo. The trackways have movable sections which permit the covers to be lowered into positions in which they are supported upon the coamings, so that they can be clamped upon the coamings securely to bat-ten the covers down. Suitable rubber or fiber battening strips are provided between the covers and the coamings, to insure water-tight joints between the same.

In the preferred form of my invention, as applied to a vessel in which the longitudinal hatch coamings are formed by the longitudinal stringers, the latter have the upper portions inwardly inclined so that the side edges of the hatch covers project outwardly beyond the upper edges of the fore and aft coamings, the trackways supporting the wheels of the covers, being at the outer sides of the longitudinal stringers. The longitudinal stringers are inwardly inclined at the edges only, and consequently, the width of the hatch covers is really less than the distance between the longitudinal stringers, notwithstanding that the hatch covers pro-

ject laterally beyond the fore and aft coaming edges at the hatchways. Consequently, when the hatch covers are bodily swung into vertical positions at the athwartship coamings, they can swing downward at one end into position between the longitudinal stringers.

Referring more particularly to the drawings, 10 represents the deck of a vessel, having spaced fore and aft or longitudinal plate stringers 11 secured to the deck by means of angle irons 12 or in any other suitable manner. The longitudinal stringers 11 have hatchways located therebetween and form the fore and aft coamings of the hatchways. They are joined at suitable intervals, by cross stringers 13 likewise secured to the deck and forming the athwartship or transverse coamings of the hatchways. The stringers 13 at the ends, are secured by angle irons 14 to the longitudinal stringers. The latter have the upper portions 15 inwardly inclined for a purpose which will appear more clearly hereinafter. The decks have the hatch openings arranged between the stringers 11 and 13 to give access to the interior of the hold.

In the form of the device, shown for example, in the accompanying drawings, the hatch covers 16 comprise similar sections 17, each of which covers substantially half of the hatchway, and which project laterally beyond the edges of the inwardly inclined portions 15 of the stringers 11. The cover sections 17, at the end edges, have transverse frames 18 consisting preferably of channel irons riveted or bolted to the sections. Intermediate the end edges and substantially at the centers of the sections are center cross frames 19, which, like the frames 18 serve to strengthen the cover sections. The cross frames 18 at the adjacent ends of the hatch sections have positioned therebetween a battening strip 20, and can be secured firmly together by bolts 21 or in any other convenient manner. Suitable battening strips 22 are provided between the edges of the coamings and the under sides of the cover sections, to insure a water-tight joint when the hatchways are closed. Suitable clamps are carried by the coamings to hold the hatch sections in place, and comprise pivotal members 23 movably secured to brackets 24 of the coamings and adapted to engage between forked keepers 25 mounted at the edges of the cover sections, the members 23 being threaded and having retaining nuts 26. The battening strips 22 may be permanently secured at the under sides of the cover sections or may be secured at the edges of the coamings.

At the opposite ends of the center cross frames 19 are bolted or riveted or otherwise fastened, axle spindles 27 which project laterally beyond the cover sections and carry

cover-supporting wheels 28, one pair for each cover section. The wheels are located substantially on a center line of the cover section so that the latter is practically balanced. At the outside, the longitudinal stringers 11 at the inwardly inclined portions 15, have trackways 29 upon which the wheels can roll so that the cover sections can be moved transversely of the hatch openings. At suitable points, the trackway 29 has cut-away portions 30 at the edges of which are downwardly disposed guides 31 of the track. Fillers 32 are movably arranged in the cut-away portions 30 of the track and have threaded stems 33 engaging in correspondingly threaded openings of brackets 34 rigidly secured to the longitudinal stringers. Ratchet levers 35 are provided for rotating the spindles 33 to raise or lower the fillers 32, for a purpose which will appear more clearly hereinafter.

At the inner edges, the cover sections have extensions 36 upon which are pivoted levers 37 having hand grips 38 by means of which they can be easily manually operated. The extensions 36 have pluralities of openings 39 therethrough which are adapted to register with an opening 40 of each of the levers 37 in predetermined positions of the latter, so that a locking pin 41 can be inserted in the registering openings to hold the lever in a plurality of positions. At the lower end, each lever carries a roller 42 adapted to engage the track 29 movably to support its respective cover section. By adjusting the lever in one or the other of its possible positions, the end of the cover section can be raised or lowered with respect to the coaming edges.

The trackways 29 extend longitudinally of the stringers 11 and are continuous, so that they preferably extend from one hatchway to the next, and permit the cover sections to be moved transversely of the hatchways beyond the same. Adjacent to each hatchway, the trackways have stops 43 which are of any suitable form and which limit the movement of the cover sections. Adjacent to each hatchway, the deck carries catches 44 which consist preferably of resilient and upwardly curved bars 45 each secured at one end to the deck and supported at the free ends by a helical or other spring 45^a. Between the hatchways, the longitudinal stringers have water ports 46 to permit the water to escape from between them when the waves break upon the deck of the vessel in a heavy seaway.

The operation of my invention is as follows: If a hatchway is closed and it is desired to open the same, the bolts 21 are released to disengage the cross-frames 18 and the clamping members at the coaming edges are released by unscrewing the nuts 26 and swinging the members 23 out of engagement

with the forked members 25. The ratchet arms 35 are operated to raise the fillers 32 until their upper surfaces are level with the trackways. It will be understood that the wheels 28 which are supported by the fillers, are thus raised and carry with them the cover sections which are thereby lifted from engagement with the coaming edges. The levers 37 are then adjusted to hold the inner edges of the cover sections from engagement with the coamings and the sections are moved outward along the trackways, being rolled transversely of the hatch openings until the wheels 28 engage the stops 43. The purpose of the levers 37 is to hold the cover sections from engagement with the coaming edges to prevent injury of the batten strips. When the wheels 28 engage the stops 43 the cover sections are pivoted about the axles of the wheels into vertical positions until their lower edges are engaged by the catches 44 which serve to hold them inoperative, leaving the hatchways free for the handling of cargo. To close the hatchway, the catches 44 are depressed and the cover sections swung into substantially horizontal planes until the rollers 42 engage the track. The cover sections are then moved inwardly along the tracks until the inner edges engage, whereupon the adjacent cross frames 18 are secured firmly together by the bolts or other devices 21, after the fillers 32 have been lowered and the levers 37 adjusted until the cover sections rest upon the coaming edges. The clamping members, at the edges of the coamings are then operated to clamp the cover sections in place.

It will be readily seen that the usual method of battening the hatches by means of canvas flaps attached to the sides of the hatch covers can be advantageously employed in connection with my invention, and I wish to emphasize, furthermore, that I do not desire to limit myself to the specific details of construction shown for example, in the accompanying drawings, and that these, within the scope of the invention, can be altered to suit individual preference or special conditions.

My invention provides a hatch which meets the requirements of bulk liquid cargo carriers, such as oil or molasses freighters. Furthermore, an ordinary vessel fitted with hatches of my invention can readily embark in liquid cargo carrying; or if it becomes desirable, through preference or emergency, one section of a vessel having my hatches, can be filled with sea water to ballast or trim the ship. The hatches would easily withstand the upward liquid pressure and would confine it solidly. The latter effect is of great importance, for a loose body of liquid in a vessel's hull whether for ballast or other purposes is not only useless, but a detriment as well.

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

1. The combination, with a hatchway having coamings, of a hatch cover adapted to be removably arranged upon said coamings to close said hatchway, and means for mounting said cover whereby it can be moved bodily transversely of said hatchway and whereby it can be pivoted into an inoperative position entirely out of engagement with said hatchway.

2. The combination, with a hatchway having coamings, of a hatch cover mounted upon said coamings to move bodily transversely of said hatchway, said cover, in a predetermined position, after being moved bodily, being movable pivotally into an inoperative position whereby said coamings are left free.

3. The combination with a hatchway having coamings, and trackways on the coamings, of a hatch cover resting normally on the coamings, wheels mounted upon the cover and traveling upon the trackways, and an appliance for raising and lowering the cover, whereby the cover can be raised out of engagement with the coamings to permit it to be moved on the trackways from over the hatchway, or lowered onto the coamings of the hatchway to hold it in position and to form a tight joint with said coamings.

4. The combination, with a hatchway having coamings, of a cover movable transversely of said hatchway, and a track guidingly supporting said cover, said track having a part adjustable to permit the movement of said cover in a substantially vertical direction.

5. The combination with a hatchway having coamings, of a hatch cover adapted to close said hatchway, a track movably supporting said cover and having an adjustable part whereby said cover can be moved transversely of said track, said cover being pivotally movable when in a position on said track such that it is displaced from said hatchway, and means for clamping said cover in position at edges of said coamings.

6. The combination, with a hatchway having coamings, of a hatch cover adapted to close said hatchway, a track carried by said coamings and guidingly supporting said cover, said track having a cutaway portion, a filler movable transversely of said cut away portion, an adjustable member carried by said cover and adapted guidingly to engage said track, and means for clamping said cover in position at the edges of said coamings.

7. The combination, with a hatchway having coamings, of a hatch cover adapted to close said hatchway, trackways mounted upon the fore and aft coamings and having

cut away portions, fillers movably arranged in said cutaway portions, means for raising and lowering said fillers, wheels for guidingly supporting said hatch cover upon said trackways, adjustable members carried by said cover and having rollers adapted guidingly to engage said track ways, means for clamping said cover in position at the edges of said coamings, and means for limiting the movement of said wheels along said trackways.

8. The combination, with a hatchway having fore and aft and athwartship coamings, of a hatch cover adapted to close said hatchway, and having supporting wheels, trackways carried by said fore and aft coamings and guidingly supporting said wheels, said trackways having cut away portions, fillers movably arranged in said cut away portions, means for raising and lowering said fillers transversely of said trackways, said fillers being adapted to support said wheels whereby said cover can be raised or lowered with respect to said coamings, pivoted levers carried by said cover, means for holding said levers in a plurality of positions, rollers carried by said levers and adapted guidingly to engage said track ways, means for clamping said cover in a closed position upon said coamings, stops upon said trackways and serving to limit the movement of said wheels, said cover being pivotally movable into inoperative position, and means for holding said cover in an inoperative position.

9. The combination, with a deck having fore and aft stringers, and athwartship stringers connecting said fore and aft stringers and forming a hatchway therewith, said stringers constituting hatch coamings, of a cover movably mounted upon said stringers, said fore and aft stringers at said hatchway having the upper portions inwardly disposed, whereby said cover projects laterally beyond the same, said athwartship stringers exceeding in length the width of said cover.

10. The combination, with a deck having fore and aft stringers, and athwartship stringers connecting said fore and aft stringers and forming a hatchway therewith, of a hatch cover having supporting wheels, said fore and aft stringers having trackways guidingly carrying said supporting wheels whereby said cover can be moved bodily, longitudinally of said fore and aft stringers, said fore and aft stringers having the upper portions adjacent to said hatchway, inwardly inclined whereby said cover projects laterally beyond the same, and means whereby said cover can be moved transversely of said trackways, said cover being pivotally movable into an inoperative position such that one end thereof is located

between said longitudinal stringers at the side of one of said athwartship stringers remote from the hatchway.

11. The combination, with a hatchway 5 having coamings, of a cover movably arranged upon said coamings and projecting laterally outward beyond certain of said coamings, said cover, when in a predetermined, abnormal position, being pivotally 10 movable into an inoperative position at an angle with its normal, closed position, said cover being guidingly supported upon said coamings.

12. The combination, with a hatchway 15 having coamings, of a hatch cover movably supported upon said coamings and bodily movable in fore and aft directions to points remote from said coamings, said cover being pivotally movable into planes at angles with 20 the plane of said coamings after said cover has been moved bodily from engagement with said coamings.

13. The combination, with a hatchway 25 having coamings, of hatch cover sections independently and movably supported upon said coamings, and movable bodily in fore and aft directions to points remote from said coamings, each of said sections having means whereby said sections, after being moved 30 bodily from said coamings can be swung pivotally into planes at angles with the plane of said coamings.

14. The combination, with a hatchway 35 having coamings, of hatch cover sections movably supported upon said coamings and movable to points distant from said coamings, each of said sections having intermediate its ends, means for pivoting it into different planes.

40 15. The combination, with a hatchway having coamings, and tracks carried by said coamings, of a hatch cover having rollers guidingly supporting it upon said tracks, whereby said cover can be moved bodily

to a point remote from said coamings, said 45 rollers constituting means intermediate the ends of said cover for permitting it to be swung pivotally into different planes.

16. The combination, with a hatchway 50 having coamings, of a hatch cover adapted to be removably arranged upon said coamings to close said hatchway, and comprising independent sections, rollers for guidingly mounting said sections upon said coamings, whereby said sections can be moved bodily 55 in fore and aft directions, said sections being movable upward and downward, said rollers permitting said sections to be pivoted into inoperative positions at angles with the plane of said coamings, and locking means 60 for securing said sections one to the other when the same are in normally closed positions.

17. The combination, with a hatchway 65 having coamings, of a hatch cover adapted to be removably arranged upon said coamings to close said hatchway, and comprising independent sections, rollers for guidingly mounting said sections upon said coamings, whereby said sections can be moved bodily 70 in fore and aft directions, said sections being movable upward and downward, said rollers permitting said sections to be pivoted into inoperative positions at angles with the plane of said coamings, locking means for 75 securing said sections one to the other when the same are in normally closed positions, means for limiting the bodily movement of said sections in fore and aft directions, and further locking means for holding each of 80 said sections in inoperative position.

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

ARTHUR NEHEMIAH McGRAY.

Witnesses:

ALICE E. KILTY,

SAMUEL R. CUTLER.