

No. 881,649.

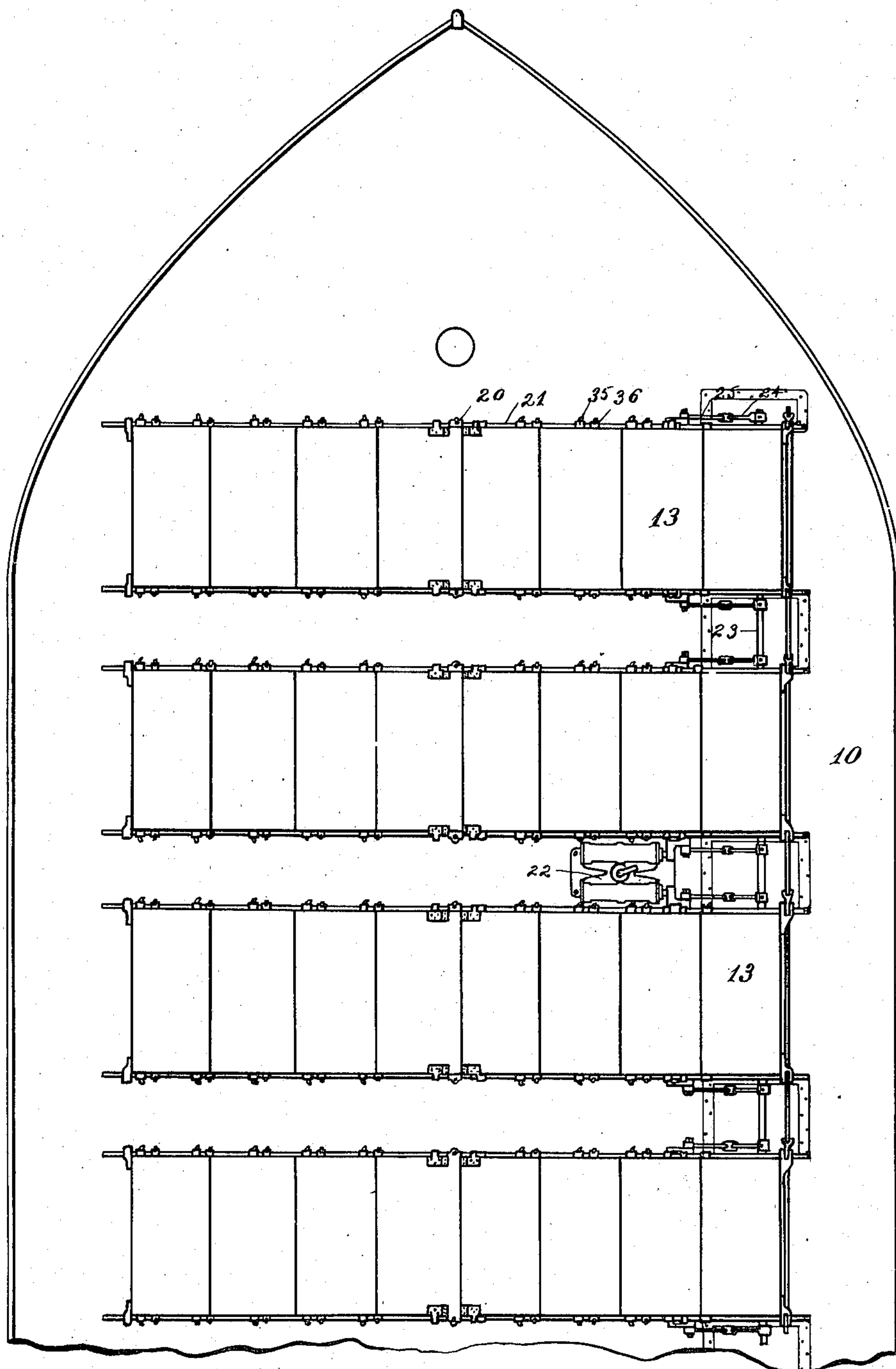
PATENTED MAR. 10, 1908.

T. B. ARMSTRONG.

MECHANISM FOR MOVING HATCH COVERS.

APPLICATION FILED MAR. 11, 1907.

3 SHEETS—SHEET 1.



WITNESSES:

Forrester & West.

Nathan J. Fretter.

FIG. 1

INVENTOR

Tulley D. Armstrong,
BY Bates, Foulis & Hall
ATTYS.

No. 881,649.

T. B. ARMSTRONG. PATENTED MAR. 10, 1908.

MECHANISM FOR MOVING HATCH COVERS.

APPLICATION FILED MAR. 11, 1907.

3 SHEETS—SHEET 2.

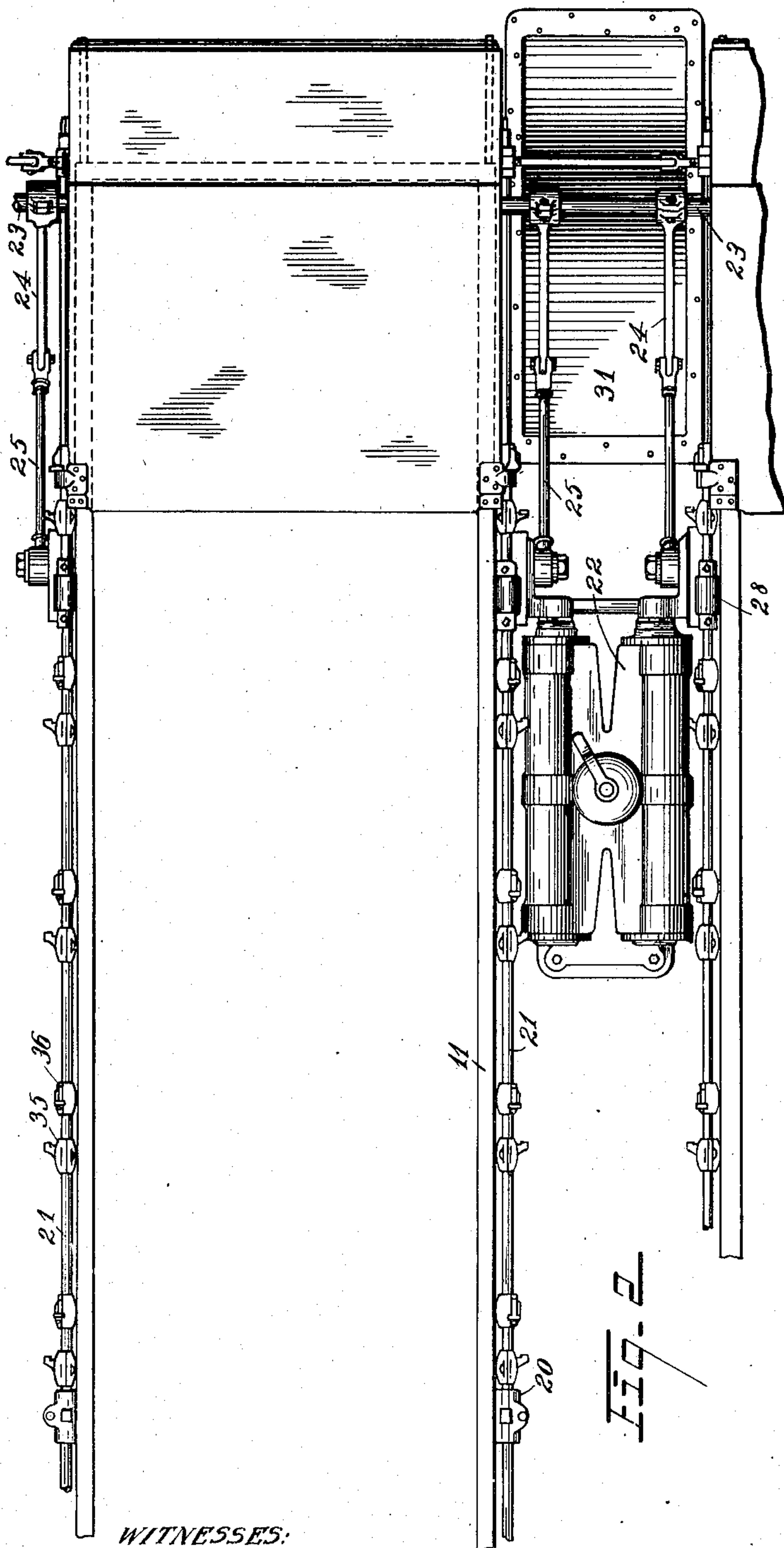


FIG. 2

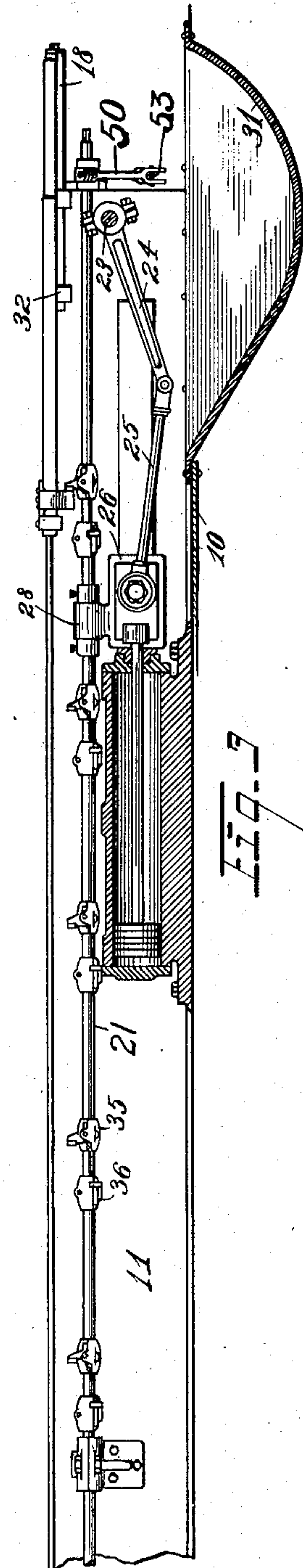


FIG. 3

WITNESSES:

Brennan & West.
Nathan F. Fretter.

INVENTOR,
Tully B. Armstrong,
BY Bates, Gould & Hull, ATTYS.

No. 881,649.

PATENTED MAR. 10, 1908.

T. B. ARMSTRONG.
MECHANISM FOR MOVING HATCH COVERS.

APPLICATION FILED MAR. 11, 1907.

3 SHEETS—SHEET 3.

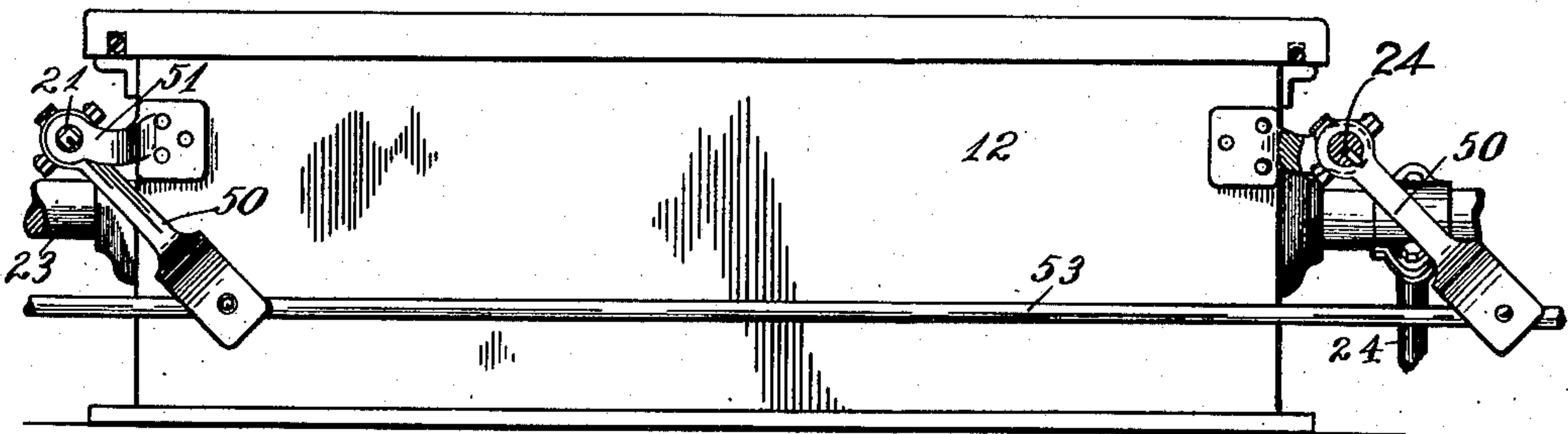


Fig. 4

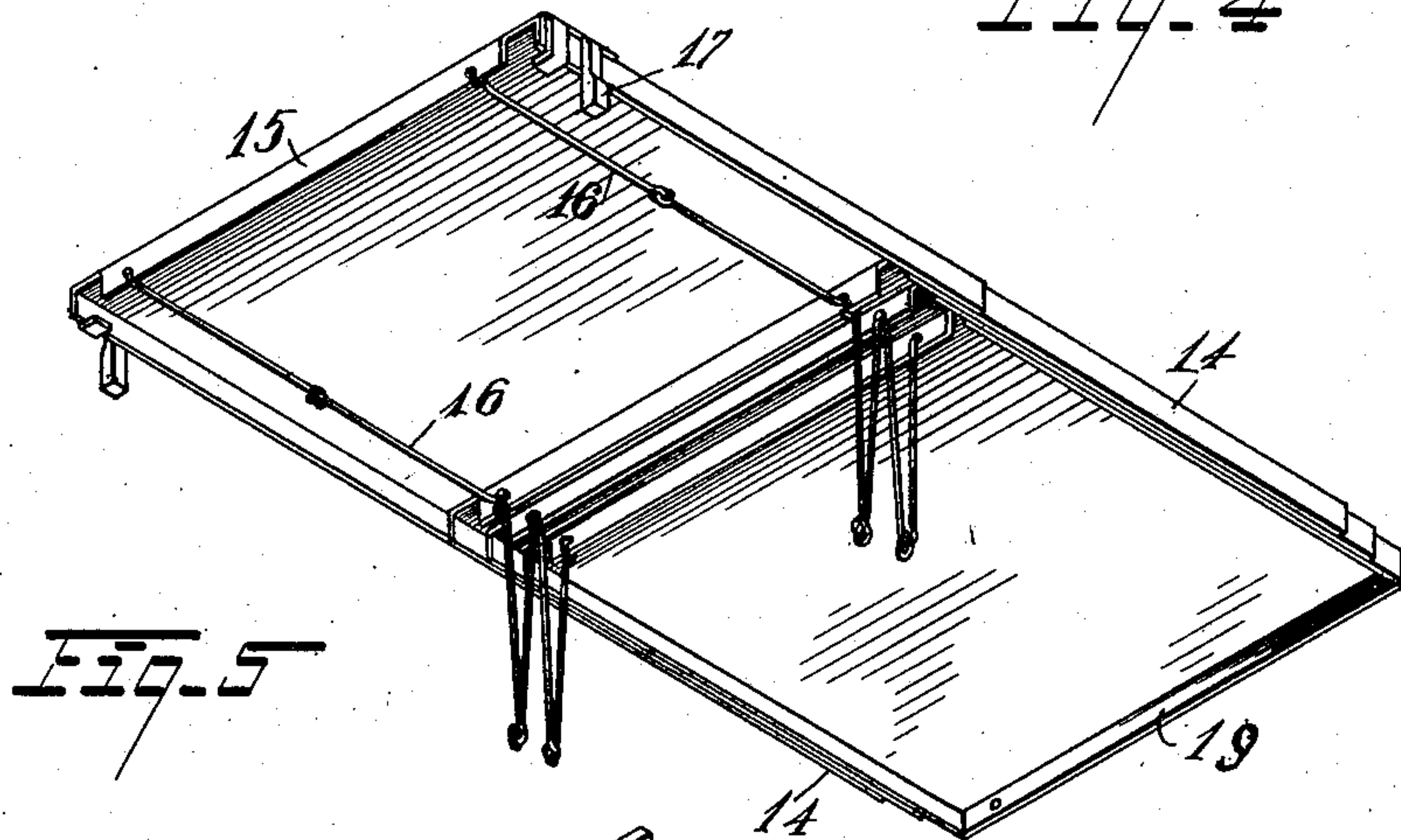


Fig. 5

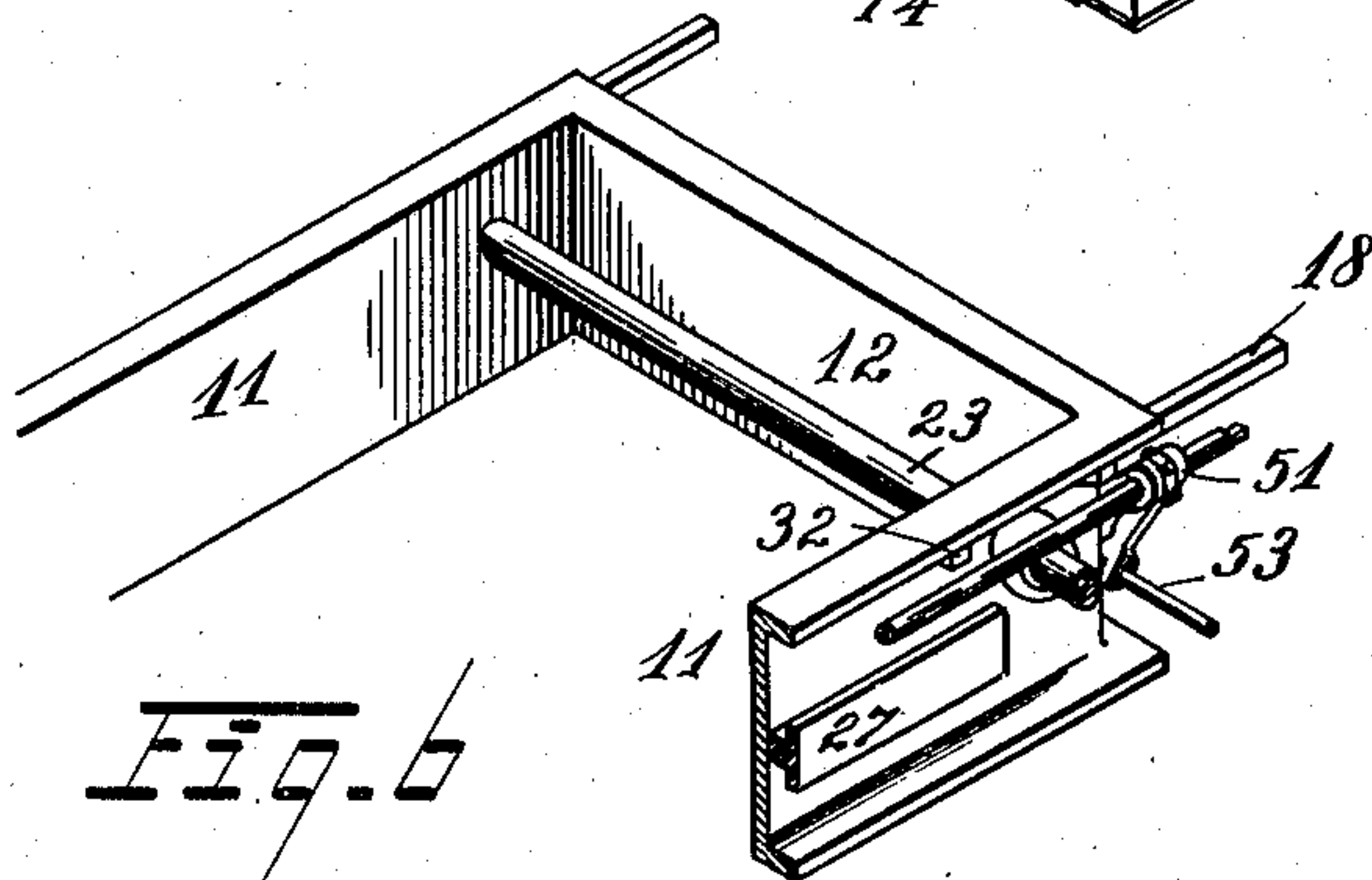


Fig. 6

WITNESSES:

Forrenant West.

Nathan F. Fretter.

INVENTOR,

Julius B. Armstrong,

BY Bates, Gouta & Hall

ATTYS.

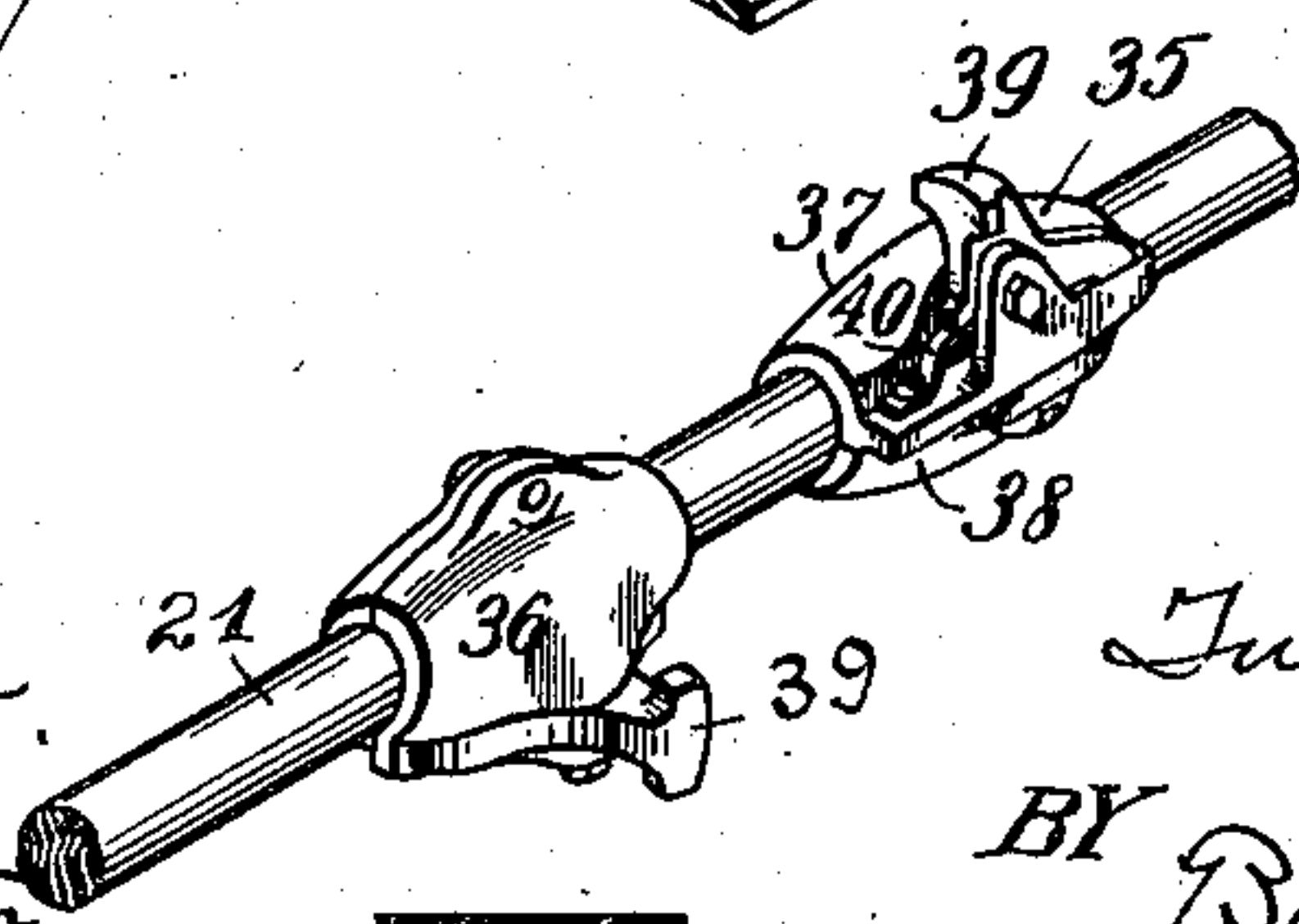


Fig. 7

UNITED STATES PATENT OFFICE.

TULLEY B. ARMSTRONG, OF LAKEWOOD, OHIO.

MECHANISM FOR MOVING HATCH-COVERS.

No. 881,649.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed March 11, 1907. Serial No. 361,671.

To all whom it may concern:

Be it known that I, TULLEY B. ARMSTRONG, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Mechanism for Moving Hatch-Covers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide simple and efficient mechanism adapted for installation on a vessel and capable of moving the hatch covers to either close or open the hatch. The mechanism is adapted to be operated by a suitable engine or motor.

The mechanism comprises the combination with telescoping covers, of a reciprocating member extending athwartship, and having a ratchet engagement with one of the covers. In its preferred form the invention provides a shaft extending athwartship; mechanism for reciprocating this shaft; dogs on the shaft, and means on the hatch covers adapted to be engaged by said dogs. I provide two series of these dogs, one for feeding the covers in one direction and the other in the other; the shaft being adapted to be rocked to bring either series into operation, whereby the covers may be moved in the direction to open the hatchway or close it as desired. These and other features of invention will be hereinafter more fully described.

In the drawings, Figure 1 is a plan of a portion of the deck of a vessel having its hatches equipped with my hatch covers and operating mechanism. Fig. 2 is an enlarged plan of the mechanism associated with portions of two adjacent hatchways. Fig. 3 is an elevation of the mechanism taken on a plane passing athwartship. Fig. 4 is an elevation on the plane extending fore-and-aft, and looking at the end of one of the hatch coamings. Fig. 5 is a bottom perspective view of several cooperating covers. Fig. 6 is a perspective view of the hatch coaming near one end. Fig. 7 is a perspective view of a portion of the operating shaft, showing two of the operating dogs.

Referring to the drawings by reference numerals, 10 represents the deck of a vessel which is provided with hatchways extending athwartship. Each hatchway has a hatch coaming, the sides of which are designated 11 and the ends 12. This coaming is shown

as a channel beam with its flanges facing outwardly.

The hatch covers are designated 13. They are preferably made of sheet metal and are provided with downward flanges 14 at their edges. They rest on the upper surface of the hatch coaming and overlap each other so that they may be telescoped together or drawn outwardly. The covers are designed to be drawn from each end of the hatch toward the center so that the covers on each side of the center overlap the covers which are nearer the gunwale on that side. As clearly appears from Fig. 5, the successive covers increase in width sufficiently to allow their flanges 14 to extend over those of the adjacent cover.

The forward edges of the covers (that is the fore-and-aft edge on the side toward the central plane of the vessel) have downturned flanges 15 as shown in Fig. 5. The flanges of the cover are connected with the flanges of the adjacent cover by suitable means, that shown being pairs of links 16. The result is that when the forward cover has been moved toward the center of the ship, a distance slightly less than the width of the cover (measured athwartship) the links become taut and continued movement of the forward covers is communicated to the next cover. The movement of this latter cover, when it has moved its proper distance, is communicated to the cover next to it, and so on.

It will thus be apparent that if the forward covers on each side be engaged and moved to the central plane of the vessel, the hatch will be covered. Conversely, when the hatch is covered, if these forward covers are engaged and moved outwardly, the downward flange 15 on each cover will engage the downward flange on the adjacent cover successively, thus causing the covers to telescope, one passing on top of the other, the covers thus accumulating in a pile at the extreme ends of the hatch.

To enable the hatch covers to be piled up at the extreme end of the hatch, I provide extension bars 18 which are loosely slidable in lugs 32 carried by the hatch coaming 11 near its ends. These extension bars are secured at their outer ends to a downturned flange 19 on the endmost cover. When the covers are in closed position, the flange 19 of the end cover is drawn up against the end hatch coaming 12. As the covers are moved

into their outermost position, the final movement carries the pile thereof beyond the coaming 12, and this movement draws out the slidable bars 18 to support the covers in this position.

I will now describe the mechanism I have provided to cause the forward covers on the two sides to be engaged and moved toward or from the center of the vessel as above described.

Mounted in bearings 20 secured to the outer sides of the hatch coamings 11, are shafts 21 extending athwartship. These various shafts are adapted to be reciprocated by a suitable engine or motor. The shafts on several hatches may be operated by the same motor. I have shown in the drawing one double-cylinder engine or motor 22, which is adapted to drive the shafts 21 of four hatches. This is accomplished as follows:

Extending fore-and-aft is a rock shaft 23 on which are mounted rock arms 24 connected by links 25 with cross heads 26 which are slidably mounted on guides 27 secured to the outer sides of the hatch coamings 11. Each of these cross heads have lugs 28 connected to the corresponding shaft 21. As shown, the shaft passes through the lug, and collars are provided on opposite sides of the lug. The driving motor or engine 22 has its pistons connected to rock the shaft 23. This may be easily accomplished by mounting the engine between certain hatches and connecting its piston rod directly to the corresponding cross head 26. To provide space in which the rock arm 24 may swing, I cut out a portion of the deck 10 and in place thereof supply the dished member 31 closing the opening, but having a recess in which the arm may swing.

To enable the reciprocation of the shafts 21 to operate the covers, I provide dogs upon the shaft adapted to engage a shoulder on the forward covers. There are two series of these dogs designated respectively 35 and 36,—one series facing in the opposite direction from the other, and each series having those of its members which are on one side of the central plane of the vessel facing oppositely to those on the other side. Each shaft 21 is arranged to be rocked, as hereinafter explained, to bring either series of dogs into active position, so that the covers may be fed in either direction.

The dogs designated 35 are those which feed the covers toward the center to close the hatchway, and the dogs 36 feed the covers in the opposite direction to open the hatchway. Each dog comprises a pair of body portions 37 and 38 (adapted to be held together around the shaft 21 and clamp that shaft,)—a pawl 39 pivoted to the body member 37, and a spring 40 acting on such pawl.

Depending at the edge of each of the forward covers are lugs 17. Now, assuming

that the hatch is entirely open, when the movement of the shaft 21 moves the endmost dog 35 toward the center of the vessel, the pawl 39 on this dog engages the lug 17 and moves the forward hatch cover on that side forward a distance substantially equal to the distance from the rearmost dog to the next dog 35. As the shaft reciprocates in the opposite direction, the covers of the set just acted on retain their position and the forward cover of the other set is advanced; then at the end of such movement of the shaft, the next dog 35 on the side first engaged coacts with the first lug 17, and the forward reciprocation again advances this hatch cover. The continuation of this movement draws out all the telescoping covers until the forward covers meet at the center of the hatch, one of the forward covers having a raised edge to overlap the other at this point. It is to be understood that the dogs 35 on each side of the central fore-and-aft plane face toward that plane, and when they move away from that plane may pass idly under the lugs 17. The other set of dogs 36 are similar to the dogs 35, except that the set faces in the opposite direction, that is, on each side of the central fore-and-aft plane, they face away from that plane. These dogs 36 have their pawls 39 projecting in a plane which may be about at right angles to the plane the pawls of the dogs 35 occupy. The dogs 36 are thus idle when the dogs 35 are acting. If, however, the shaft 21 be rocked about 90°, the pawls of the dogs 36 are swung into active position, and the dogs 35 come into idle position. When this has been done the reciprocation of the shaft 21 communicates the reverse movement to the covers,—the lug 17 being engaged on its forward side by the pawls of the dogs 36, and the successive reciprocations serving to shove backward the forward cover, and with it the other covers successively accumulating beneath it.

To rock the various shafts 21 simultaneously, I mount on them rock arms 50 which are contained between the forks of a bearing 51 secured to the end hatch coaming 12. The shafts 21 are freely slidable through these rock arms but have a tongue and groove connection therewith so that they rock together. As shown, there is a groove in the shaft and a tongue on the arm entering the same. The various rock arms are connected by a rod 53 extending fore-and-aft. The simple shifting of this rod by hand or otherwise in one direction or the other brings one set of dogs or the other into action so that the operation of the motor moves the cover to either open or close the hatch as desired.

It will be seen from the above description that the pivoted pawls of the dogs and the lug on the cover constitute in effect a ratchet device adapted to communicate movement

in one direction but not in the other. The two sets of pawls may be characterized as giving the mechanism a double faced ratchet effect. As has been stated, when the covers on one side are being moved by the corresponding dogs, the covers on the other side are stationary, the dogs moving in the idle direction. The mechanism therefore is called upon to give only half the power which would be necessary if the covers on both sides were moved simultaneously. My double faced ratchet arrangement with my means for controlling which face is in action, is adapted for a very simple installation and at the same time, one which is effective in service.

Having thus described my invention, I claim:

1. In a mechanism of the character described, the combination with hatch covers, of reciprocating mechanism extending athwartship and adapted to periodically engage and release the covers and thereby move them in one direction or the other, as desired.

2. The combination with the hatch coaming, of mechanism carried thereby and adapted to reciprocate alongside of the hatch coaming, hatch covers, and means carried by said mechanism for periodically engaging and releasing and thereby moving the covers.

3. The combination with the hatch coaming, of a shaft guided to reciprocate alongside of the hatch coaming, hatch covers, and mechanism carried by the shaft for periodically engaging and releasing and thereby moving the covers.

4. The combination with hatch covers, of reciprocating mechanism having a ratchet connection with the covers whereby the covers are moved step by step.

5. The combination with a hatch coaming and hatch covers, with mechanism carried by the coaming for moving the hatch covers, said mechanism having a ratchet connection with one of the covers.

6. The combination with a hatchway and covers adapted to be moved from each end of the hatchway toward an intermediate plane, and mechanism extending substantially from one end to end of the hatchway for alternately acting on the covers on the opposite sides of said plane and moving them step by step toward or from said plane.

7. The combination with telescoping hatch covers arranged in two sets on opposite sides of the center of the hatchway, and mechanism extending substantially from one end of the hatchway to the other and arranged to reciprocate alongside of the hatchway for periodically moving the covers alternately in the two sets.

8. The combination with a hatchway and covers therefor arranged to be fed from each end to the center, a reciprocating member extending athwartship, and ratchet mechanism

connecting said member with covers at each side of the center thereof.

9. The combination with telescoping hatch covers connected so that each cover may drag the one behind it, reciprocating mechanism carried alongside of the hatch coaming, and ratchet devices carried thereby and adapted to engage a shoulder on the forward cover.

10. The combination with a hatchway, hatch covers adapted to be moved from the two ends of the hatchway toward the center to cover the hatchway, a reciprocating member extending athwartship, and means whereby the movement of said member feeds the covers alternately from one side and the other toward or from the central plane.

11. The combination with a hatchway and hatch covers, with mechanism for moving the hatch covers, said mechanism having a double faced ratchet engagement with one of the covers, and means for changing the action from one face to the other.

12. The combination with telescoping hatch covers arranged in two sets and double faced ratchet operating mechanism adapted when either face is in action to move the covers alternately first of one set then the other, and means for changing said mechanism to bring the other ratchet face into operation to move the covers in the opposite direction.

13. The combination with a hatchway, hatch covers adapted to be moved from the two ends of the hatchway toward the center to cover the hatchway, a reciprocating member extending athwartship and carrying a series of mechanisms adapted to feed the covers alternately from one side and the other toward or from the central plane, and means for causing the reciprocation of said member to feed the covers away from the central plane.

14. The combination with telescoping hatch covers, a reciprocating member, and pivoted pawls carried by said member and adapted to engage one of the hatch covers.

15. The combination with the hatch coaming of telescoping hatch covers, a reciprocating shaft carried by the coaming, and pivoted pawls carried by the shaft and adapted to engage one of the hatch covers.

16. The combination with a hatchway, a reciprocating member extending along the same, ratchet dogs carried thereby, and hatch covers adapted to be engaged by said dogs.

17. The combination with a hatchway, a reciprocating member extending along the same, dogs carried thereby, and hatch covers adapted to be engaged by said dogs, said dogs facing in opposite directions on opposite sides of the central plane, whereby the covers are fed toward or from the central plane alternately on opposite sides thereof.

18. The combination with a hatchway, a shaft extending along the same, mechanism for reciprocating said shaft, dogs secured to said shaft and carrying pivoted pawls, and hatch covers, one of which has a shoulder adapted to be engaged by said pawls in one movement of the shaft, the pawls passing the shoulder idly in opposite movement.

19. The combination with a hatch coaming, covers adapted to slide over the same, said covers being connected together, a reciprocating member alongside of the hatch coaming, and pivoted pawls carried by said member and adapted to engage a shoulder on the forward cover.

20. The combination with hatch covers arranged to telescope in two sets toward or from the intermediate portion of the hatchway, a shaft adapted to reciprocate along the hatchway, pivoted pawls carried by said shaft, the pawls on opposite sides of the central plane facing in opposite directions, whereby the reciprocation of the shaft moves the covers first on one side of such plane and then on the other.

21. The combination with a hatchway and covers, of a reciprocating operating shaft carrying pivoted pawls adapted to move a cover on one movement of the shaft, the pawls passing idly in opposite movement, and a second set of pawls facing in the opposite direction to the pawls first mentioned and projecting into a different radial plane from those pawls, and means for rocking the shaft to change the presentation of the pawls from one set to the other.

22. The combination with a hatchway, a reciprocating member extending along the same, ratchet dogs carried thereby, and hatch covers adapted to be engaged by said dogs, said dogs facing in opposite directions on opposite sides of the central plane whereby the covers are fed toward or from the central plane alternately on opposite sides thereof, and a second set of dogs on said member facing in the opposite direction to the first set for feeding the covers in the opposite direction, and mechanism for changing the action from one set of dogs to the other.

23. The combination with a hatchway, a shaft extending along the same, mechanism for reciprocating said shaft, dogs secured to said shaft and carrying pivoted pawls, hatch covers, one of which has a shoulder adapted to be engaged by said dogs in one movement of the shaft, the pawls passing the shoulder idly in opposite movement, and a second set of dogs on said shaft having pawls facing in the opposite direction to the pawls first mentioned and projecting into a different radial plane from those pawls, and means for rocking the shaft to change the presentation of the pawls and shoulder from one set to the other.

24. The combination with a hatchway, of covers telescoping on each side of the center of the hatchway, said covers being connected together, whereby the forward cover may draw the others, said forward cover having an engageable shoulder, a shaft extending adjacent to the hatchway, two series of dogs carried by said shaft, either series being adapted to engage alternately covers on opposite sides of said central plane, the two series of dogs facing in opposite directions, and means for moving said shaft to bring either series of dogs into action whereby the covers may be moved in either direction.

25. The combination with a series of hatchways, members extending athwartship alongside of the hatchways, a fore-and-aft shaft, rocker arms on said shaft connected with the members athwartship, hatch covers, and mechanism operated by the members athwartship for moving said covers.

26. The combination with a series of hatchways, shafts extending athwartship alongside of the hatchways, a fore-and-aft shaft, rocker arms on said last mentioned shaft connected with the shafts athwartship, hatch covers, mechanism operated by the shafts athwartship for moving said covers, and means for rocking the shafts athwartship to change the presentation to the covers.

27. The combination with the hatch coaming, of a shaft slidably guided alongside of the coaming on its outer side, a fore-and-aft rock shaft, mechanism connecting the rock shaft with the shaft first mentioned, mechanism for rocking the rock shaft, hatch covers, and ratchet mechanism carried by the athwartship shaft and adapted to engage a cover.

28. The combination with a hatchway, a motor, a rock shaft extending across a plurality of hatches near their ends, a driving connection between said rock shaft and motor, members mounted to reciprocate along the hatchways, driving connections between said members and rock shaft, dogs carried by said members, and hatch covers, some of which are adapted to be engaged by said dogs.

29. The combination with a hatchway, a motor, a rock-shaft extending across a plurality of hatches near their ends, a driving connection between said rock-shaft and motor, shafts mounted to reciprocate along the hatchways, driving connections between said shafts and rock shafts, dogs carried by said shafts, hatch covers, means thereon adapted to be engaged by said dogs, said dogs being arranged in two series facing in opposite directions and located at different radial planes, rock arms connected with said shafts to rock the same to change the presentation of the dogs from one side to the other, said rock arms not interfering with the reciprocation of the shafts, and a connection between the rock arms of adjacent hatches.

30. The combination with a hatchway, of covers telescoping on each side of the center of the hatchway, said covers being connected together, whereby the forward cover may
5 draw the others, said forward cover having an engageable shoulder, a shaft extending adjacent to the hatchway, two series of dogs carried by said shaft, either series being adapted to engage alternately covers on op-
10 posite sides of said central plane, the two series of dogs facing in opposite directions, rocker arms mounted to have a sliding connection with said shafts though rocking with them, and a rod connecting said rocker arms
15 for simultaneously rocking a plurality of shafts to change the presentation of the dogs from one series to the other.

31. The combination with hatch covers, of a reciprocating member extending alongside
20 of the hatchway and carrying a series of mechanisms adapted to engage a cover to give it a step by step movement.

32. The combination with a hatch coaming, of a member carried thereby and guided
25 to reciprocate alongside of the coaming, said member carrying a series of mechanisms, and hatch covers, one of which said mechanisms are adapted to engage.

33. The combination with a hatchway, of

telescoping covers therefor arranged in two
30 sets, each set being so connected that the forward cover may move the others, a member guided to reciprocate alongside of the hatch coaming, and a series of mechanisms
35 carried by said member and adapted to periodically engage the forward covers in the two sets and thereby move such sets.

34. The combination with a vessel having a series of hatchways, of a series of individual reciprocating members, one for each hatch-
40 way, mechanism for concurrently reciprocating a plurality of said members, and means carried by said members for periodically acting on the hatch covers.

35. The combination of a hatchway, mem-
45 bers on opposite sides thereof extending athwartship, and adapted to reciprocate, telescoping covers for the hatchway, means carried by said members for engaging the covers, and means for simultaneously recip-
50 rocating said members.

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

TULLEY B. ARMSTRONG.

Witnesses:

ALBERT H. BATES,
H. MILLER.