

J. H. MARTIN.
CURRENT MOTOR.

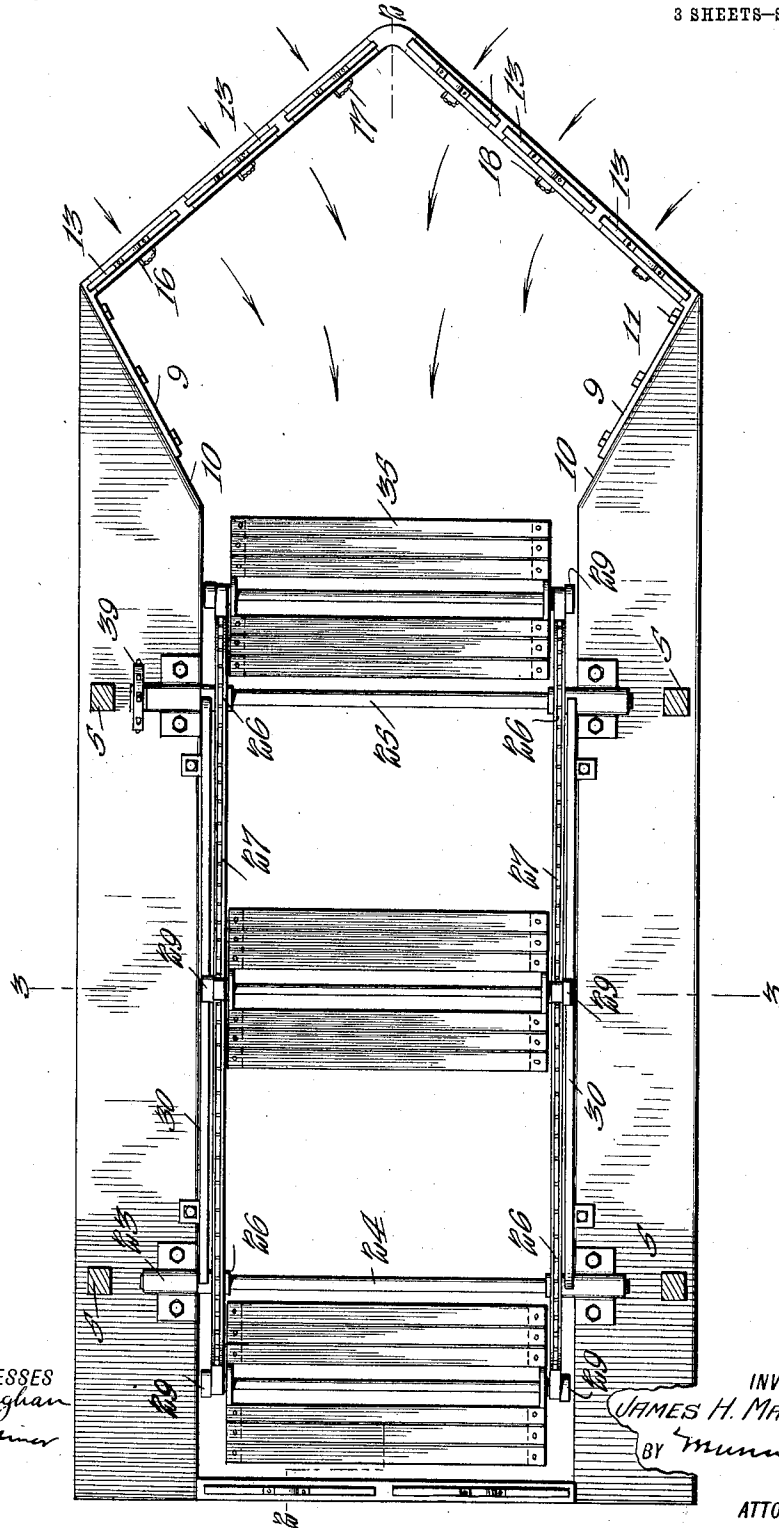
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1,056,704.

Patented Mar. 18, 1913.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
C. M. Callaghan
C. E. Trainer

INVENTOR
JAMES H. MARTIN,
BY Munroe & Co.

ATTORNEYS

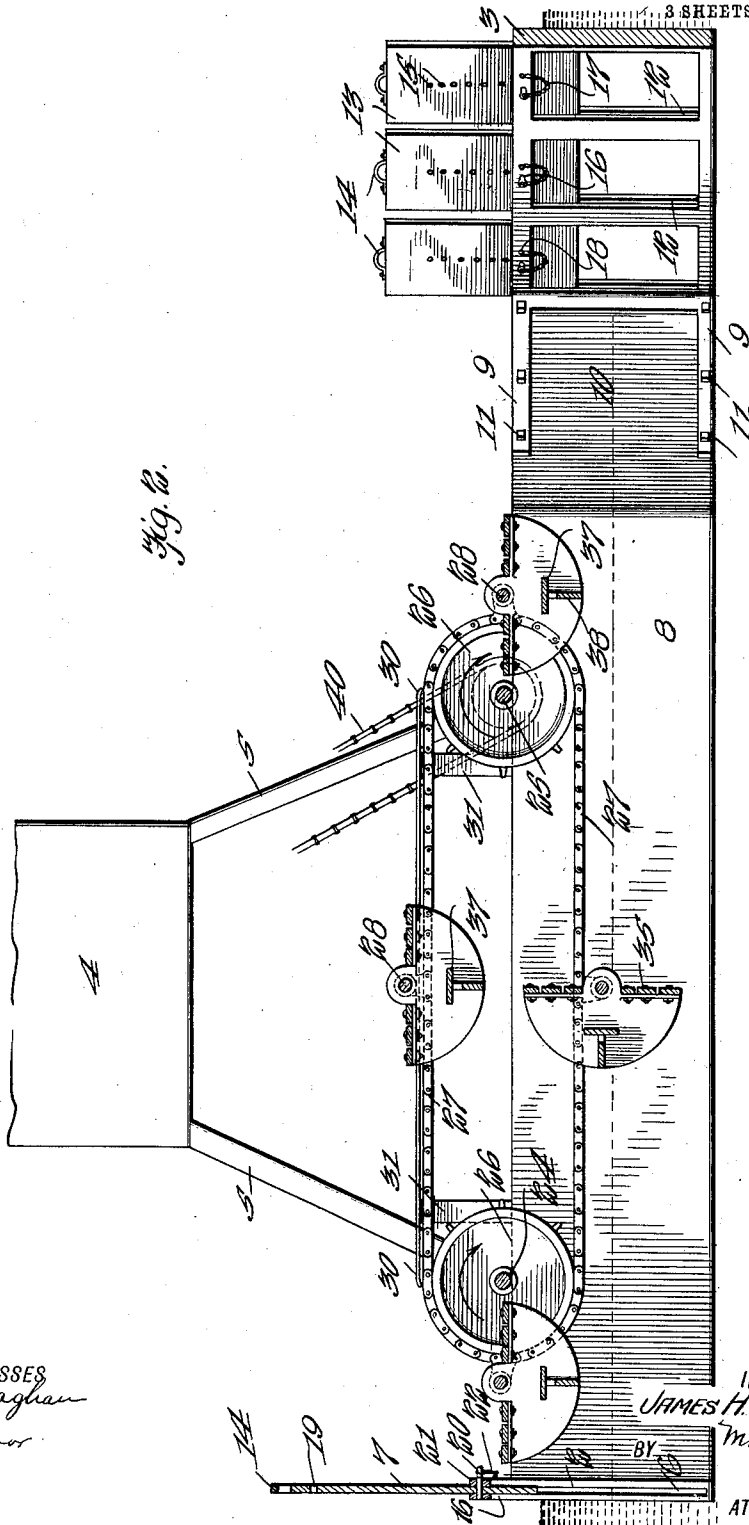
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3 SHEETS-SHEET 2.

Fig. 2.



WITNESSES
E. H. Callaghan
C. E. Danner

INVENTOR
JAMES H. MARTIN,
Munroe.

BY
ATTORNEYS

J. H. MARTIN.

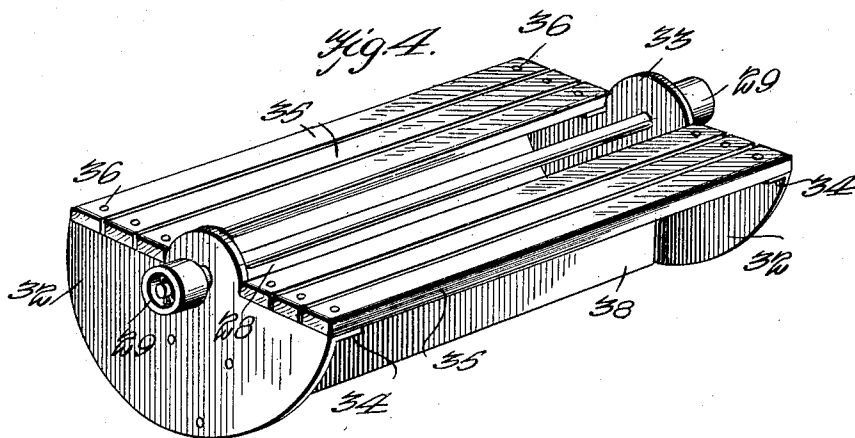
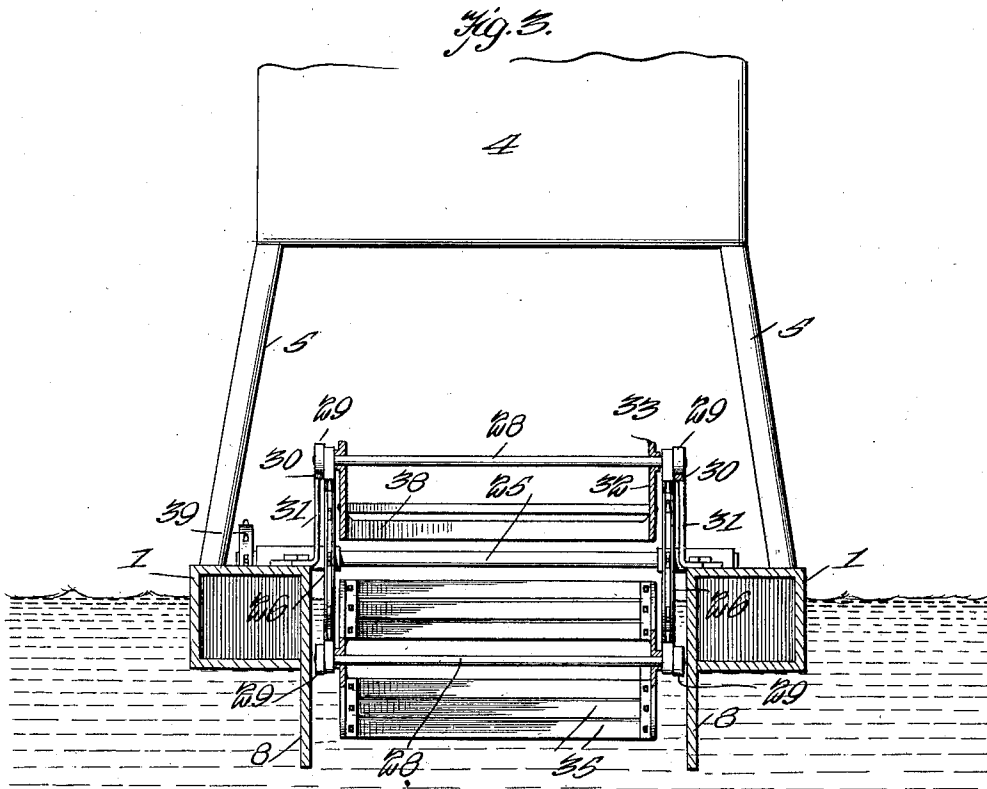
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3 SHEETS—SHEET 3.



WITNESSES
E. J. Callaghan
O. E. Trainer

INVENTOR
JAMES H. MARTIN,
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES H. MARTIN, OF SPRINGFIELD, MISSOURI.

CURRENT-MOTOR.

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To all whom it may concern:

Be it known that I, JAMES H. MARTIN, a citizen of the United States, and a resident of Springfield, in the county of Greene and State of Missouri, have made new and useful Improvements in Current-Motors, of which the following is a specification.

My invention is an improvement in current motors, and has for its object the provision in a motor of the character specified, of an improved form of vane, which will automatically take a position at right angles to the direction of movement of the current when the vane is in the water, and a position parallel with the direction of movement of the vane when out of the water, and wherein the change in position of the vane is caused by the action of the water, and wherein no extraneous mechanism is necessary for making the change in position.

A further object is to provide an improved form of gate for shutting off the current from the motor, so arranged that the amount of water admitted to the motor may be regulated, and so arranged that float-sam will be deflected from the motor.

Referring to the drawings forming a part thereof: Figure 1 is a plan view of the improved motor; Figs. 2 and 3 are sections on the lines 2-2 and 3-3 respectively of Fig. 1; and Fig. 4 is a perspective view of one of the vanes.

The present embodiment of the invention consists of two floats 1 arranged alongside each other in parallel relation, and held in such relation by means of brackets 2 and 3. The floats are hollow, and are arranged to displace sufficient water to support the motor, and the superstructure 4 in which the utilizing mechanism of the power is placed. The said superstructure is supported on standards 5, each having one end secured to the adjacent float in any suitable manner, and the other end connected with the superstructure.

The bracket 2 is at the rear of the float and the said bracket engages the rear ends thereof. The bracket is provided with a plurality of pairs of oppositely arranged guideways 6, and a gate 7 is mounted to slide in each pair of guideways. It will be noted from an inspection of Fig. 3, that the inner sides of the floats are extended below the bottom of the floats, as indicated at 8,

for a purpose to be presently described, and the brackets 2 and 3 extend to the bottom of the said extension 8.

The front bracket 3 is approximately V-shape, consisting of two integral portions arranged at approximately a right angle to each other, and each portion is provided at its outer end with a plurality of angular straps or plates 9. The front inner corner of each float is beveled, as shown at 10, and the straps 9 are lapped along the beveled ends of the floats, and are secured to the floats by means of bolts 11.

Each portion of the bracket 3 is provided with a plurality of oppositely arranged pairs of guideways 12, and a gate 13 is slidable vertically in each pair of guideways. Each gate 7 and 13 is provided with a handle 14 at its upper edge, and each of the gates 13 is provided with a longitudinal series of alined openings 15. A pin 16 is provided for each gate 13, and each pin is connected to the bracket 3 by means of a chain 17, or other suitable flexible means. The pin 16 is adapted to be passed through an opening 18 in the bracket, and through one of the openings 15 of the adjacent gate, to hold the said gate in adjusted position, as shown more particularly in Fig. 2.

The gate 7 is provided with two openings 19, one near its top and one near its bottom, and a pin 20 is adapted to be passed through an opening 21 in the bracket 2 and through one of the openings 19 in the gate, to hold the said gate either in elevated position or in lowered position. The said pin 20 is connected to the bracket by means of a chain 22 or the like.

Bearings 23 are provided on the floats, in the present instance two bearings for each float, and the said bearings are arranged near the ends of the float. The bearings of each float are in alinement with the bearings of the opposite float, and shafts 24 and 25 respectively are journaled in the pairs of bearings. A sprocket wheel 26 is secured to each shaft near each end thereof, and endless chains 27 pass over the registering sprocket wheels. The chains are connected at spaced intervals by means of rods 28, and the said rods are extended beyond the sprocket wheels and chains, as shown, and a wheel 29 is journaled on the extended end of each rod. On the upper runs of the chains

the wheels 29 run upon tracks or rails 30 supported above the floats by means of bracket arms 31.

Four shafts 28 are provided in the present instance, and the said shafts are arranged at spaced intervals on the chains. A vane is connected with each shaft. Each vane is composed of end or cheek pieces 32 of approximately semi-circular shape, and at the center of the straight face of each plate a bearing 33 is provided, for receiving the adjacent shaft 28. On each side of the bearing the said straight edge is provided with an angular inwardly extending flange 34, and slats or strips 35 of wood or like light material are secured to the said flanges 34. The strips connect the cheek pieces, each strip having its ends secured to the flange by means of rivets 36 or the like, and the said slats are spaced apart from each other slightly, as shown more particularly in Figs. 1, 3 and 4. It will be understood that as many slats may be used as may be found best, and the said slats are spaced in accordance with their width. As for instance in slats of an inch in width, the space between the slats would be one-fourth of an inch. In wider slats the spacing would also be wider but the increase in width of the spacing would not be in proportion to the increase in width of the slats.

It will be noticed that the slats are omitted on each side of the shaft to form an opening at the center of the main portion of the vane, and directly opposite this opening an auxiliary vane or portion in the form of a plate or slat 37 is arranged between the cheek plates, the wide dimensions of the plate 37 being parallel with the plane of the slats 35, and the width of the said plate 37 is approximately equal to the width of the open space at the shaft. End pieces 32 of each vane are connected directly behind the plate 37 by means of a plate 38. The widest dimensions of the said plate 38 being perpendicular to the plane of the slats 35, and to the greatest width of the plate 37. The vanes are journaled loosely on the shafts 28, so that the said vanes may swing freely with respect to the shafts, in order that they may take the position shown in Fig. 2, during their travel around the shafts 24 and 25.

In operation, the device is arranged in a suitable position, and is held in any suitable manner. The weight should be so calculated, that the floats are almost submerged, as shown in Figs. 2 and 3. The shaft 25 is extended beyond the bearing at one of the floats, and a sprocket wheel 39 is secured to the extended end. A sprocket chain 40 connects the wheel 39, with a suitable utilizing device, as for instance an electric generator arranged within the superstructure 4. The gates 7 are first opened, and afterward the gates 13 are lifted to a height, such that the

lower ends thereof will be just below the surface of the water. If there is no flotsam, the gates may be raised to their full extent, and the gates 7 are arranged with their lower edges above the surface of the water, to offer no obstruction to the outflow of the water from between the floats. The beveled ends of the floats act as deflectors, to increase the flow of the current between the floats. As the vanes enter the water, they will take the position at the right of Fig. 2, with the plane of the slats 35 horizontal to the surface of the water. As soon as the plate 38 dips below the surface the vanes will begin to swing as a whole on the shaft 28, to bring the plane of the slats 35 perpendicular to the direction of travel of the current. The position of the vanes when in the water is shown on the lower runs of the chains in Fig. 2. The force of the current bearing against the plates 38 and 37 will hold the vanes with the plane of the slats 35 perpendicular to the direction of travel of the current, until the vanes begin to pass around the sprocket wheels of the shaft 24. As the vanes pass out of the water around the shaft 24 the weights of the plates 37 and 38 will swing the vanes until the vanes take a position with the plane of the slats 35 parallel with the surface of the water, and the vanes will occupy this position during their rearward travel on the upper run of the chains, and until they again enter the water.

With four vanes, one vane is always in the water. On the upper runs of the chains, the wheels 29 run on the rails 30, and prevent sagging of that portion of the chains between the shafts 24 and 25.

It will be noticed that each vane is in effect composed of a central and side portions, the central portion being the plate 37 and the side portion the slats 35, and that the side portions are in the same plane and offset laterally from the central portion. The central portion of the vane is so arranged to cause the vane to take the position shown on the lower run of the chains at approximately a right angle to the current. It is obvious that the said plate will serve this purpose, but it is assisted by the plate 38. The said plate 38 is in effect, a weight for holding the vane in the position shown on the upper run of the chains when the said vane is not in the water. The plate 38 also assists in holding the vane perpendicular when in the water. It will be obvious that the force of the current passing through the central opening of the vanes and striking the vanes of the plate 37 will have a tendency to hold the vane in vertical position.

The vane may be considered as being composed of a main and auxiliary portions, the main portion consisting of the two portions 35 and the auxiliary portion consisting of the portion 37. The main portion has an

approximately central opening, that is, the space between the vanes, and the auxiliary portion is arranged in front of the opening and in offset relation with respect to the plane of the main portion. Preferably the auxiliary portion is parallel with the main portion although it is obvious that minor variations would not affect the efficiency of the portion.

I claim:—

1. In a current motor, the combination with the spaced approximately parallel floats, each being beveled on its front end to deflect water into the space between the floats, the inner side of each float being extended below the float to form a passage between the floats of greater depth than the floats, a bracket connecting the rear ends of the floats, said bracket having a plurality of substantially rectangular openings, a gate slidable in each opening, means for holding the gates in raised or lowered position, a bracket of substantially V-shape connecting the front ends of the floats, the apex of the bracket being at approximately the center of the space between the floats, said bracket having a plurality of openings, a gate in each opening, means for holding each gate in adjusted position, shafts connecting the floats near their front and rear ends, a sprocket wheel near each end of each shaft, one of the said shafts being extended at one end, a sprocket wheel on the extended end, an endless chain adjacent to each float and supported on the sprocket wheels adjacent to the float, rods connecting the chains at spaced intervals, and a vane on each rod, each vane comprising substantially semi-circular end pieces, each end piece having a bearing at the center of its straight side, a plurality of strips or slats connecting the end pieces and arranged on each side of the rod, and spaced apart from the rod to form an opening at the center of the vane, a plate arranged parallel with the slats and connecting the end pieces and in spaced relation from the shaft, and a second plate connecting the end pieces and arranged with its wide dimensions perpendicular to the first-named plate, said last named plate being spaced apart from the first named plate to permit the passage of water.

2. In a current motor, the combination with the spaced approximately parallel floats, of shafts connecting the floats near their front and rear ends, a sprocket wheel near each end of each shaft, an endless chain adjacent to each float and supported on the sprocket wheels adjacent to the float, rods connecting the chains at spaced intervals, and a vane on each rod, each vane comprising substantially semi-circular end pieces, each having a bearing at the center of its straight side, a plurality of strips or slats connecting the end pieces and arranged on

each side of the rod and spaced apart from the rod to form an opening at the center of the vane, a plate arranged parallel with the slots and connecting the end pieces and in spaced relation from the shaft, and a second plate connecting the end pieces and arranged with its wide dimensions perpendicular to the first named plate.

3. In a current motor, the combination with the spaced approximately parallel floats, of shafts connecting the floats near their front and rear ends, a sprocket wheel near each end of each shaft, an endless chain adjacent to each float and supported on the sprocket wheels adjacent to the float, rods connecting the chains at spaced intervals, and a vane on each rod, each vane being journaled on the rod and having a longitudinal central opening at the rod, and a plate parallel with the vane at the rod and offset rearwardly from the plane of the vane, and a second plate arranged perpendicular to the first named plate and longitudinally of the rod.

4. In a current motor, the combination with the spaced approximately parallel floats, of shafts connecting the floats near their front and rear ends, a sprocket wheel near each end of each shaft, an endless chain adjacent to each float and supported on the sprocket wheels adjacent to the float, rods connecting the chains at spaced intervals, and a vane on each rod, each vane consisting of a central portion and side portions, the side portions being in the same plane and offset laterally from the central portion, and a weight on the opposite side of the central portion from the main portion.

5. In a current motor, a pair of parallel laterally spaced endless chains, means for supporting the chains for longitudinal movement, rods connecting the chains at spaced intervals, and a vane journaled on each rod, each vane consisting of a central and side portion, the side portions being in the same plane and being offset laterally from the central portion, and a plate arranged perpendicular to the central portion on the opposite side thereof.

6. In a current motor, a pair of parallel laterally spaced endless chains, means for supporting the chains for longitudinal movement, rods connecting the chains at spaced intervals, and a vane journaled on each rod, each vane consisting of a central and side portion, the side portions being in the same plane and being offset laterally from the central portion.

7. In a current motor, a vane consisting of a central and side portions, the side portions being in the same plane and offset laterally from the central portion, and a rod journaled between the side portions, and a weight on the opposite side of the central portion from the side portions.

8. In a current motor, a vane consisting of a central and side portions, the side portions being in the same plane and offset laterally from the central portion, and a rod 5 journaled between the side portions.

9. In a current motor, a vane consisting of a central and side portions, the side portions being in the same plane and offset laterally from the central portion.

10 10. In a current motor, a vane consisting of a central and side portions, the side portions being in the same plane and offset laterally from the plane of the central portion, said central portion being parallel with the 15 side portions, and a weight adjacent to the central portion.

11. In a current motor, a vane consisting of a central and side portions, the side portions being in the same plane and offset laterally from the plane of the central portion, 20 said central portion being approximately parallel with the side portions.

12. In a current motor, a vane consisting of a main portion having an approximately central opening and an auxiliary portion arranged in laterally spaced relation with respect to the main vane at the opening. 25

JAMES H. MARTIN.

Witnesses:

C. E. TRAINOR,

D. W. GALL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."