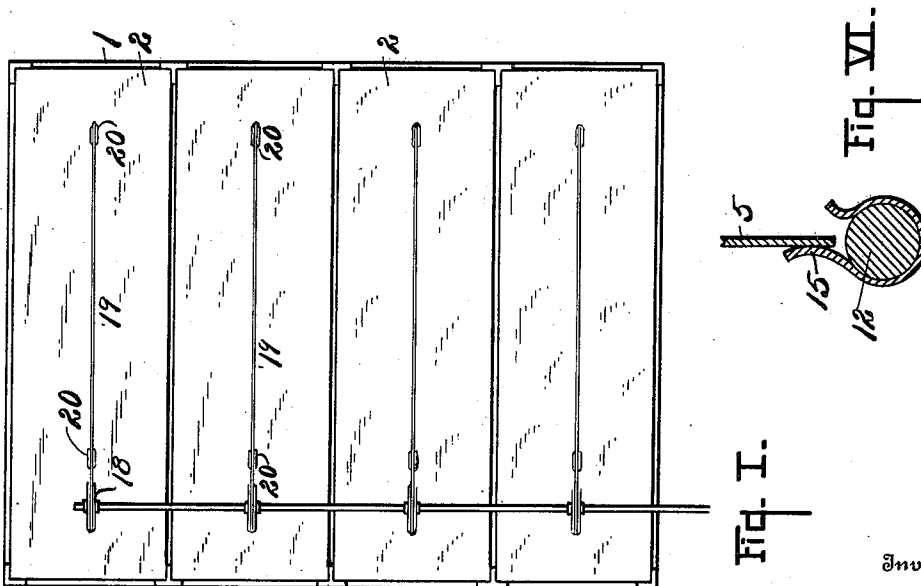
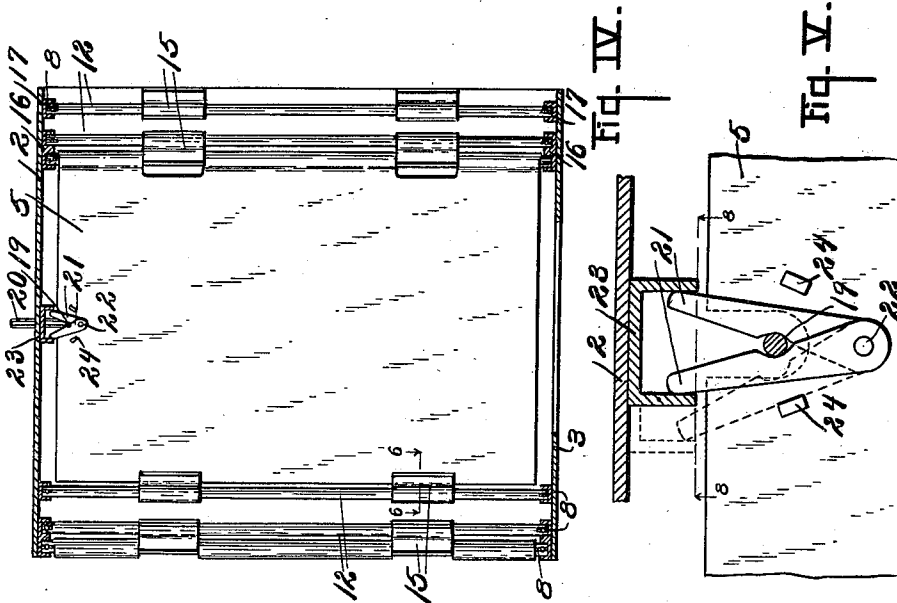


W. NAPIER.
CURRENT MOTOR.
APPLICATION FILED APR. 8, 1911.

1,008,668.

Patented Nov. 14, 1911.

3 SHEETS—SHEET 1.



Witnesses
M. P. Woodruff
L. E. Greenfield

334

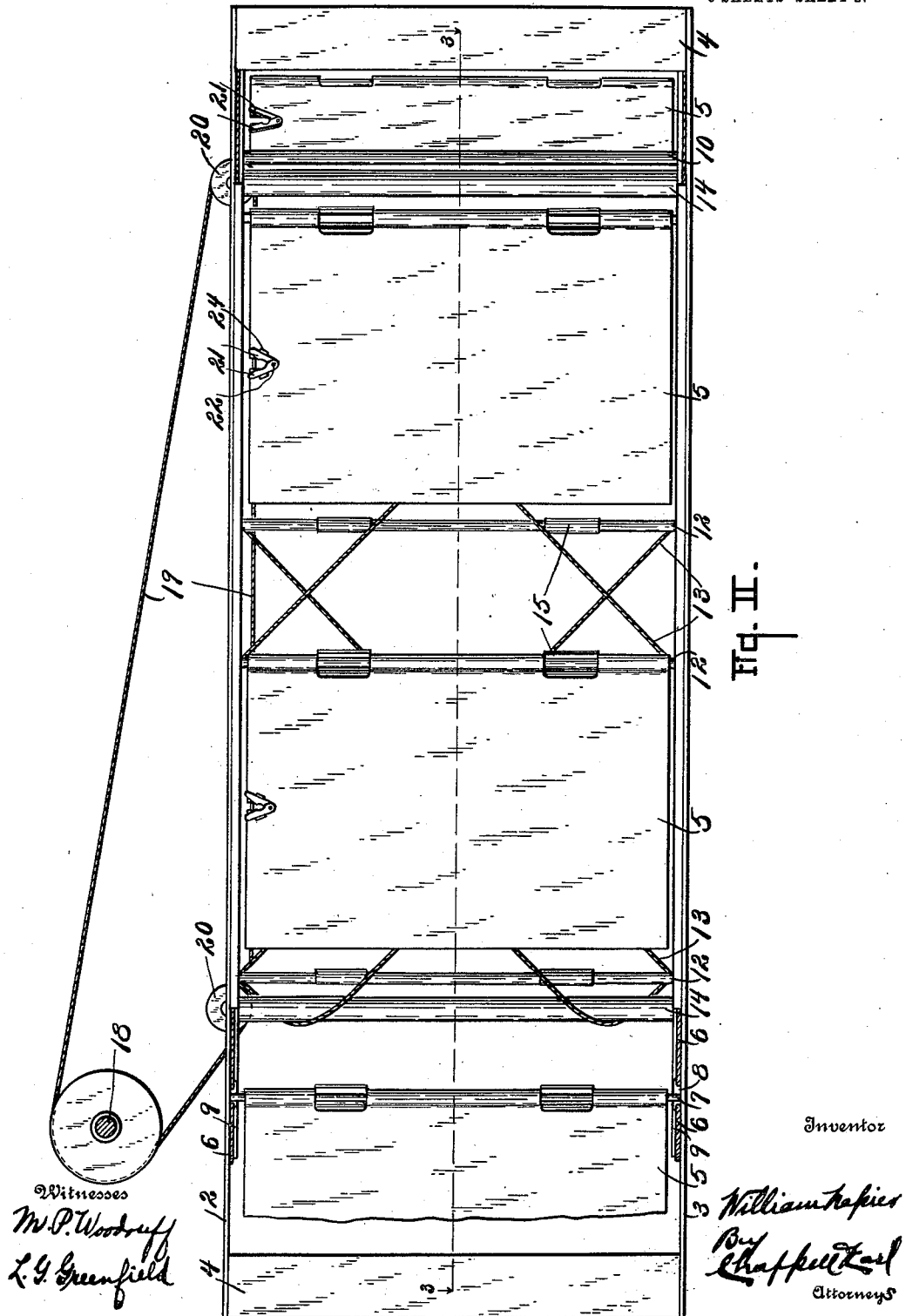
William Napier
Chappell & Co.
Attorneys

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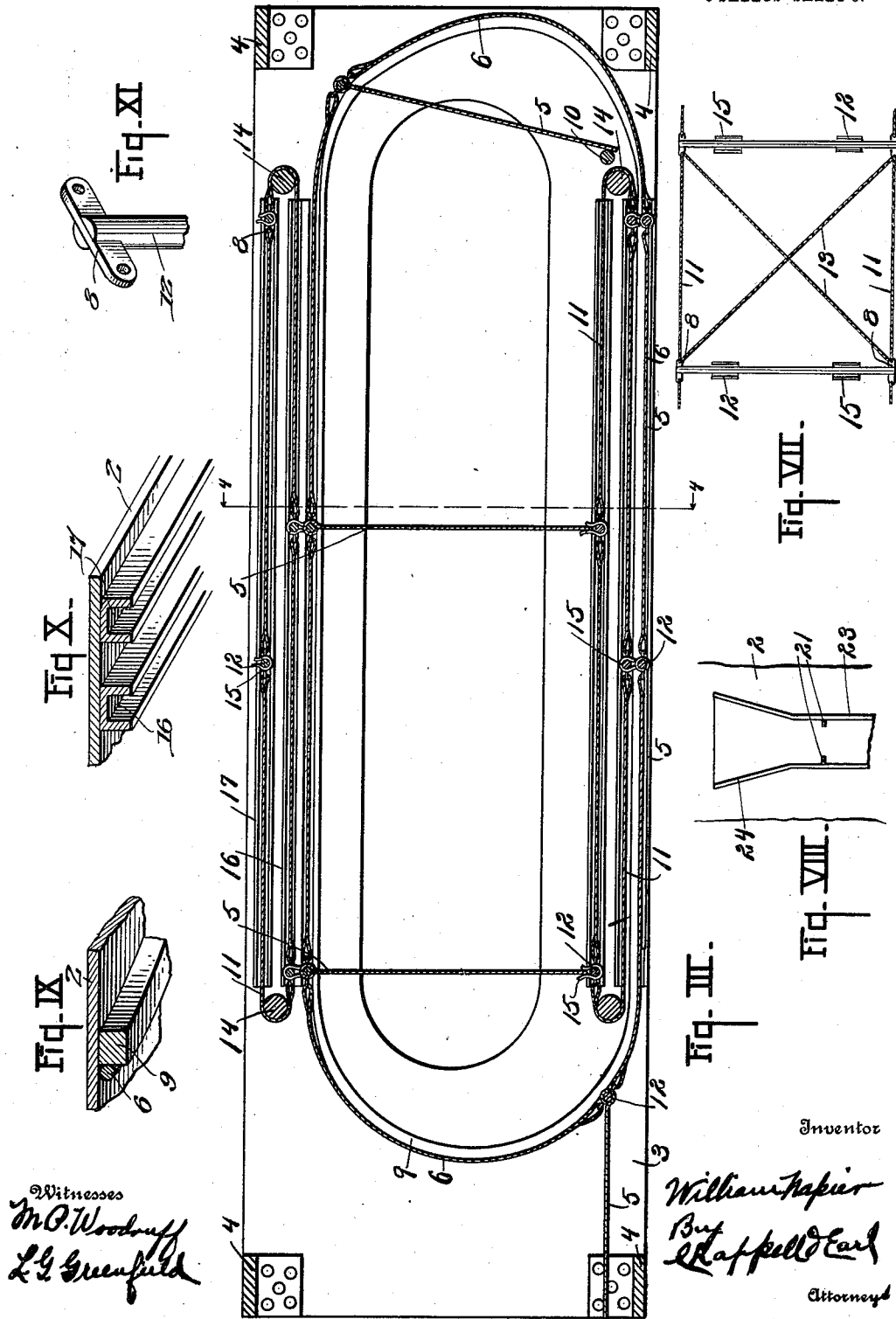


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3 SHEETS—SHEET 3.



Witnesses
M. O. Woodruff
L. G. Greenfield

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UNITED STATES PATENT OFFICE.

WILLIAM NAPIER, OF RIVES JUNCTION, MICHIGAN.

CURRENT-MOTOR.

1,008,668.

Specification of Letters Patent.

Patented Nov. 14, 1911.

Application filed April 8, 1911. Serial No. 619,727.

To all whom it may concern:

Be it known that I, WILLIAM NAPIER, a citizen of the United States, residing at Rives Junction, Jackson county, Michigan, have invented certain new and useful Improvements in Current-Motors, of which the following is a specification.

This invention relates to improvements in current motors.

The main objects of this invention are: First; to provide an improved current motor. Second; to provide in a current motor an improved blade carrier. Third; to provide in a current motor an improved means of supporting the blades in their operative position. Fourth; to provide in a current motor an improved means for transmitting the power. Fifth; to provide an improved current motor which is comparatively simple in structure and not likely to get out of repair.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a plan view of a structure embodying the features of my invention, the parts being shown largely in conventional form. Fig. II is a detail side view of one of the elements of the structure shown in Fig. I. Fig. III is a horizontal section taken on a line corresponding to line 3—3 of Fig. II. Fig. IV is a vertical transverse section taken on a line corresponding to line 4—4 of Fig. III. Fig. V is an enlarged detail section showing the cable grips and the actuating means therefor. Fig. VI is an enlarged detail section taken on a line corresponding to line 6—6 of Fig. IV, showing the structural details of the blade engaging members of the blade supports. Fig. VII is a detail side elevation of one of the blade supports. Fig. VIII is a detail section taken on a line corresponding to line 8—8 of Fig. V. Figs. IX to XI show details.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are

taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, 1 represents a main frame having a set or series of 4 motor elements. As each of these motors are complete in themselves, I have illustrated only one in detail and will confine my description to that one, except to point out their arrangement, when a plurality of these motor elements are used, as is my intention shall be done under ordinary conditions, the number being of course varied as circumstances require.

The frame 1 serves as a support for the several motor elements. The motor element frames consist of top members 2 and bottom members 3 connected by vertical pieces 4, arranged at the corners as illustrated. These frames are supported in the frame 1, side by side, as shown.

I provide a plurality of the blades 5 for each motor element, the element illustrated having 5 blades, the number of the blades may be varied as circumstances require. These blades 5 are supported on an endless traveling carrier, consisting of cables or belts 6 and cross pieces 7, the cross pieces in the structure illustrated being in the form of rods having cable connecting members 8 at their ends. The blades 5 are pivotally supported on these cross pieces. The cables are supported on ways 9 on the top and bottom frame members 2 and 3. These ways are provided with parallel sides and have curved ends. (See Fig. III). The forward end of the way is irregularly or eccentrically curved, the object being to swing the blades 5 into operative position with less current resistance. The blades are carried backward and forward by this traveling carrier and are swung to their operative position at the forward end of the carrier by means of the rod 10. (See Fig. III).

The blades are supported in their operative position by means of endless traveling supports consisting of cables 11, arranged in pairs and connected by cross pieces 12. These cables are further connected by the diagonally disposed tie cables 13 between the cross pieces, the object being to keep the cross pieces upright and in proper spaced relation to each other.

The cross pieces 12 are provided with connecting members 8 the same as the cross pieces on the carriers. These blade supports are mounted on rollers 14 so that they

are parallel with the side reaches of the carrier. One of the blade supports is arranged within the carrier and the other without, as clearly shown in the drawings. The blade supports are provided with blade engaging members 15 (see Fig. VI). The blade engaging members of the support arranged within the carrier are adapted to engage the swinging ends of the blades when they are in their erected position and their pivoted ends on the forward movement of the blades, thus making a driving connection for the blade supports with the carrier. The blade engaging members of the support arranged without the carrier are adapted to engage the pivoted ends of the blades as illustrated. By this arrangement the blades are supported when in their operative position and by providing the driving connection for the carrier to the support the parts are kept in their proper coacting relation. The blade supports are preferably provided with ways 16 and 17, disposed between the rollers 14. These ways keep the parts in proper engaging relation.

The power is transmitted to the power shaft 18 through the cables 19. These cables are supported by pulleys 20, arranged at the front and rear ends of the blade carrier so as to be engaged by cable grips on the blades. These grips in the structure illustrated consist of pairs of members 21 pivoted at 22 and a channel shaped actuating member 23 mounted on the top frame member 2. This channel has an expanded mouth or forward end 24 which when the blades are swung into their operative position, engages the grip members 21 and clamps them upon the cable as shown in Fig. V. At the rear end of the carrier these grip members passing from the channel 23 are released from the cable and drop against the rests 24.

In operation when the blades are released at the rearward end of the carrier, they swing into the current and on the forward movement are carried edgewise to the current. When the blades reach the front end of the carrier they are swung into position as described and engaged by the supports so that they are held in their operative or extended position.

I have illustrated and described my improved current motor in detail in a simple embodiment. Numerous variations or modifications in structural details are possible but as such variations or structural modifications will no doubt be readily understood by those skilled in the art to which this invention relates, I have not attempted to illustrate or describe the same herein. I wish however to be understood as claiming my invention specifically in the form illustrated as well as broadly within the scope of the appended claims.

Having thus described my invention, what

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

1. In a current motor, the combination with the frame comprising top and bottom members, of a plurality of blades; an endless traveling carrier for said blades comprising a pair of cables, and cross pieces on said cables, said blades being pivoted on said cross pieces, ways for said carrier cables arranged on said top and bottom frame members; a blade-extending member arranged at the forward end of said carrier ways to extend the blades to their operative position as they are carried along by said carrier; blade support rollers; endless traveling supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carriers, and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions, one of said blade supports being arranged within the carrier to engage the swinging ends of the blades, the other being arranged without said carrier to engage their pivoted ends; ways for said support cables arranged on said top and bottom frame members between said rollers; a power cable; supporting pulleys therefor arranged at the ends of said carrier to support the cable above said blades when they are in their operative position; cable grips on said blades, and means for automatically engaging and disengaging said cable grips.

2. In a current motor, the combination with the frame comprising top and bottom members, of a plurality of blades; an endless traveling carrier for said blades comprising a pair of cables, and cross pieces on said cables, said blades being pivoted on said cross pieces, ways for said carrier cables arranged on said top and bottom frame members; a blade-extending member arranged at the forward end of said carrier ways to extend the blades to their operative position as they are carried along by said carrier; blade support rollers; endless traveling supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carriers, and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions, one of said blade supports being arranged within the carrier to engage the swinging ends of the blades, the other being arranged without said carrier to engage their pivoted ends and ways for said support cables arranged on said top and bottom frame members between said rollers.

3. In a current motor, the combination with the frame comprising top and bottom members, of a plurality of blades; an endless traveling carrier for said blades com-

prising a pair of cables, and cross pieces on said cables, said blades being pivoted on said cross pieces, ways for said carrier cables arranged on said top and bottom frame members; a blade-extending member arranged at the forward end of said carrier ways to extend the blades to their operative position as they are carried along by said carrier; blade support rollers; endless traveling supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carriers, and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions, one of said blade supports being arranged within the carrier to engage the swinging ends of the blades, the other being arranged without said carrier to engage their pivoted ends; a power cable; supporting pulleys therefor arranged at the ends of said carrier to support the cable above said blades when they are in their operative position; cable grips on said blades and means for automatically engaging and disengaging said cable grips.

4. In a current motor, the combination with the frame comprising top and bottom members, of a plurality of blades; an endless traveling carrier for said blades comprising a pair of cables, and cross pieces on said cables, said blades being pivoted on said cross pieces, ways for said carrier cables arranged on said top and bottom frame members; a blade-extending member arranged at the forward end of said carrier ways to extend the blades to their operative position as they are carried along by said carrier; blade support rollers; an endless traveling support for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carriers and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions, one of said blade supports being arranged within the carrier to engage the swinging ends of the blades, the other being arranged without said carrier to engage their pivoted ends.

5. In a current motor, the combination with the frame, of a plurality of blades; a traveling carrier on which said blades are pivotally mounted, means for extending the blades, blade support rollers; endless traveling supports for said blades comprising cables; cross pieces on said cables spaced to correspond to the spacing of the blades on said carrier, diagonally-disposed tie cables between said cross pieces, and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions and to release them at the rear end of the carrier, one of said blade supports being arranged with-

in the carrier to engage the swinging ends of the blades and having driving connections to the carrier, the other being arranged without said carrier to engage the pivoted ends of the blades; a power cable supported above said blades when they are in their extended or operative position, cable grips on said blades and means for automatically engaging and disengaging said cable grips.

6. In a current motor, the combination with the frame, of a plurality of blades; a traveling carrier on which said blades are pivotally mounted, means for extending the blades arranged at the forward end of said carrier, blade support rollers; endless traveling supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carrier, diagonally-disposed tie cables between said cross pieces and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions and to release them at the rear end of the carrier, one of said blade supports being arranged within the carrier to engage the swinging ends of the blades and having driving connections to the carrier, the other being arranged without said carrier to engage the pivoted ends of the blades.

7. In a current motor, the combination with the frame, of a plurality of blades, a traveling carrier on which said blades are pivotally mounted, means for extending the blades arranged at the forward end of said carrier to extend the blades to their operative position as they are carried along by said carrier, blade support rollers, supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said blade carriers, diagonally-disposed tie cables between said cross pieces and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions, one of said blade supports being arranged within said carrier to engage the swinging ends of the blades, the other being arranged without said carrier to engage their pivoted ends and ways for said support cables arranged between said rollers.

8. In a current motor, the combination with the frame, of a plurality of blades, a traveling carrier on which said blades are pivotally mounted, means for extending the blades arranged at the forward end of said carrier to extend the blades to their operative position as they are carried along by said carrier, blade support rollers, supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said blade carriers and blade engaging members on said cross pieces adapted to engage said blades

when they are in their extended or operative positions, one of said blades supports being arranged within said carrier to engage the swinging ends of the blades, the other being arranged without said carrier to engage their pivoted ends.

9. In a motor, the combination with the frame, of a plurality of blades, a traveling carrier on which said blades are pivotally mounted, traveling endless blade supports arranged parallel with the side reaches of said carrier, one being arranged within said carrier and the other without, the blade support arranged within said carrier being provided with blade-engaging members adapted to engage the swinging ends of the blades on their forward movement, the other blade support being adapted to engage the pivoted ends of the blade supports on their rearward movement, a power cable and means for automatically connecting and disconnecting said blades and cable for the purpose specified.

10. In a motor, the combination with the frame, of a plurality of blades, a traveling carrier on which said blades are pivotally mounted, traveling endless blade supports arranged parallel with the side reaches of said carrier, one being arranged within said carrier and the other without, the blade support arranged within said carrier being provided with blade-engaging members adapted to engage the swinging ends of the blades on their rearward movements, and their pivoted ends on their forward movement, the other blade support being adapted to engage the pivoted ends of the blade supports on their rearward movement.

11. In a current motor, the combination with the frame comprising top and bottom members, of a plurality of blades, an endless traveling blade carrier comprising a pair of cables, cross pieces on said cables, said blades being pivoted on said cross pieces, ways on said top and bottom frame members for said blade carrier cables, a power cable, supporting pulleys therefor arranged at the ends of said blade carrier to support the cable above said blades when they are in their operative positions, cable grips on said blades and means for automatically engaging and disengaging said cable grips.

12. In a current motor, the combination with the frame comprising top and bottom members, of a plurality of blades, an endless traveling blade carrier comprising a pair of cables, cross pieces on said cables, said blades being pivoted on said cross pieces and ways on said top and bottom frame members for said blade carrier cables.

13. In a current motor, the combination of a plurality of blades, a traveling carrier on which said blades are pivotally mounted, means for extending the blades to their op-

erative positions, traveling supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carrier, diagonally-disposed tie cables between said cross pieces and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions and their pivoted ends on their return movement.

14. In a current motor, the combination of a plurality of blades, a traveling carrier on which said blades are pivotally mounted, means for extending the blades to their operative positions, traveling supports for said blades comprising cables, cross pieces on said cables spaced to correspond to the spacing of the blades on said carrier and blade engaging members on said cross pieces adapted to engage said blades when they are in their extended or operative positions and their pivoted ends on their return movement.

15. In a motor, the combination with the frame, of a plurality of blades, a blade carrier on which said blades are pivotally mounted, means for extending said blades to their operative position at the forward end of said carrier, a traveling endless blade support provided with blade-engaging members adapted to engage the swinging ends of the blades on their rearward movements, and their pivoted ends on their forward movement, a power cable and means for automatically connecting and disconnecting said blades and cable for the purpose specified.

16. In a motor, the combination with the frame, of a plurality of blades, a blade carrier on which said blades are pivotally mounted, means for extending said blades to their operative position at the forward end of said carrier; a traveling endless blade support provided with blade-engaging members adapted to engage the swinging ends of the blades on their rearward movements, and their pivoted ends on their forward movement.

17. In a current motor, the combination with the frame, of a plurality of blades, a traveling blade carrier on which said blades are pivotally mounted, means for extending said blades to their operative position at the forward end of said carrier, a traveling blade support having blade-engaging members adapted to engage the swinging ends of the blades when they are in their operative position, said support having driving connection with said carrier; a power cable supported above said blades, pivoted grip members on said blades adapted to engage said cable and a channel shaped grip-actuating member coacting therewith as specified.

18. In a current motor, the combination with the frame, of a plurality of blades, a

traveling blade carrier on which said blades are pivotally mounted, means for extending said blades to their operative position at the forward end of said carrier, a traveling blade support having blade-engaging members adapted to engage the swinging ends of the blades when they are in their operative position, said support having driving connection with said carrier, a power transmitting means independent of said blade carrier and blade support, and means for automatically connecting said blades thereto when the blades are in their operative positions.

15 19. In a current motor, the combination with the frame, of a plurality of blades, a traveling blade carrier on which said blades are pivotally mounted, means for extending said blades to their operative position at the forward end of said carrier, a power cable supported above said blades; pivoted grip members on said blades adapted to engage said cable and a channel shaped grip-actuating member coacting therewith as specified.

20 20. In a current motor, the combination with the frame, of a plurality of blades, a traveling blade carrier on which said blades are pivotally mounted, a traveling blade support having blade-engaging members adapted to engage said blades when they are in their operative position, said support having driving connection with said carrier; a power cable and means for connecting and disconnecting said blades and cable, for the purpose specified.

21. In a current motor, the combination with the frame, of a plurality of blades, a traveling blade carrier on which said blades are pivotally mounted, means for bringing said blades to their operative or extended position at the forward end of said carrier, a traveling blade support having members thereon adapted to engage said blades when they are in their extended or operative position, said blade support having driving

connection with said carrier, a power transmitting means independent of said blade carrier and blade support, and means for automatically connecting said blades thereto when the blades are in their operative positions.

22. In a current motor, the combination with the frame, of a plurality of blades, a traveling blade carrier on which said blades are pivotally mounted, means for bringing said blades to their operative or extended position at the forward end of said carrier, a traveling blade support having members thereon adapted to engage said blades when they are in their extended or operative position, a power transmitting means independent of said blade carrier and blade support, and means for automatically connecting said blades thereto when the blades are in their operative positions.

23. In a current motor, the combination with the frame, of a plurality of blades; an endless traveling carrier on which said blades are pivotally mounted; means for extending the blades at the forward end of said carrier; endless traveling blade supports, one of the blade supports being arranged within the carrier to engage the swinging ends of the blades and the other being arranged without said carrier to engage their pivoted ends.

24. In a current motor, the combination with the frame, of a plurality of blades; an endless traveling carrier on which said blades are pivotally mounted; and an endless traveling blade support for the swinging end of said blades when in their extended position, arranged within said carrier.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

WILLIAM NAPIER. [L. s.]

Witnesses:

LENA SMITH,
MARY C. PERRINE.