

No. 721,561.

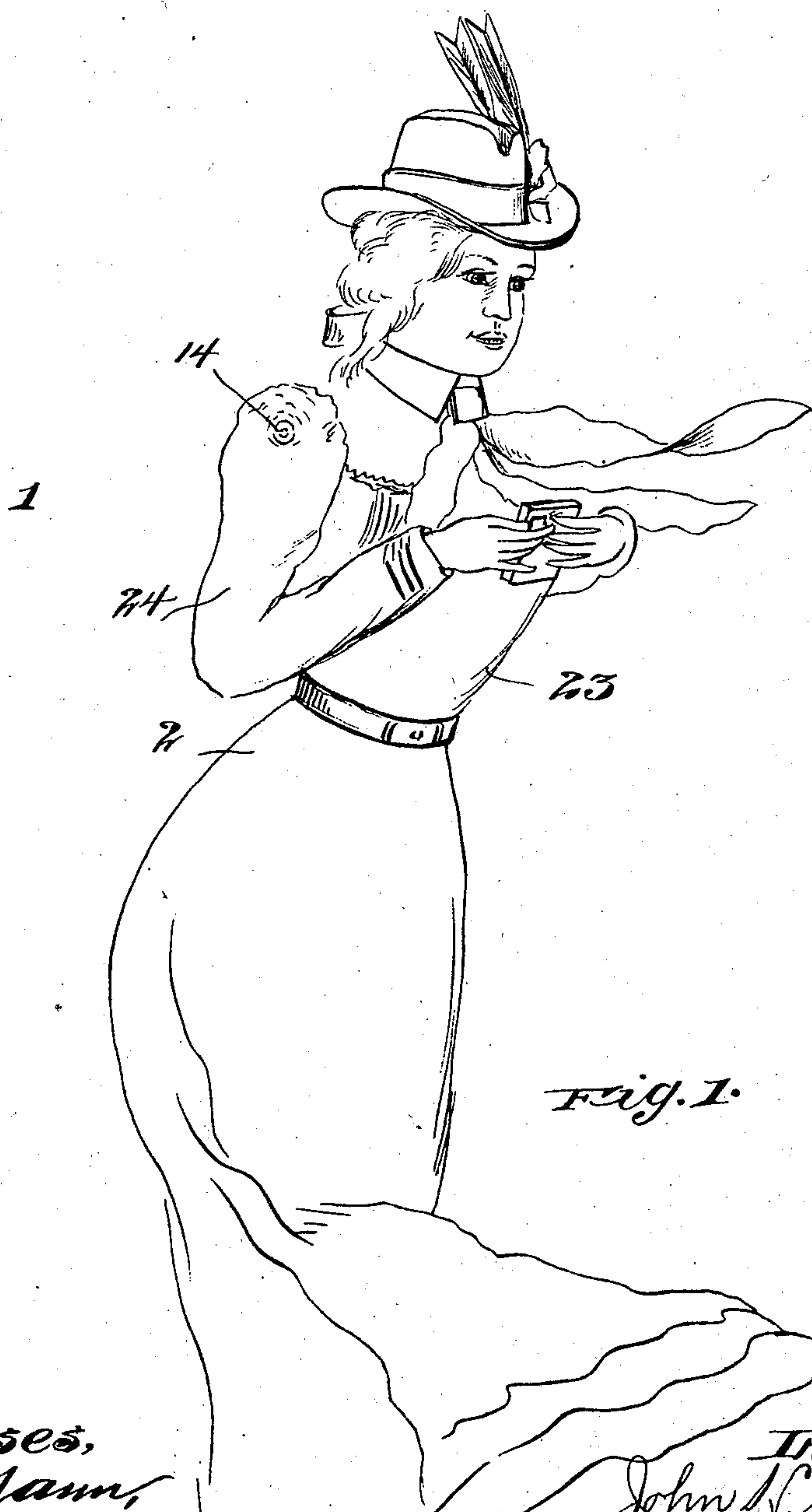
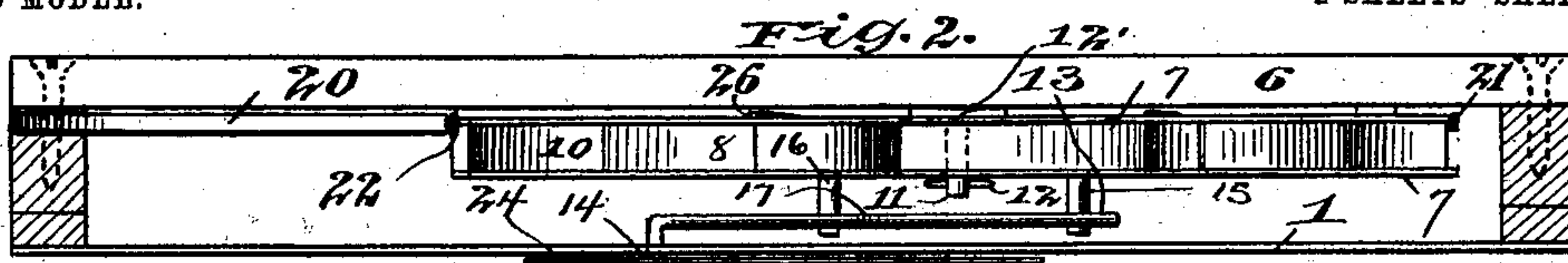
PATENTED FEB. 24, 1903.

J. H. GREEN.  
MOTOR.

APPLICATION FILED JULY 29, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



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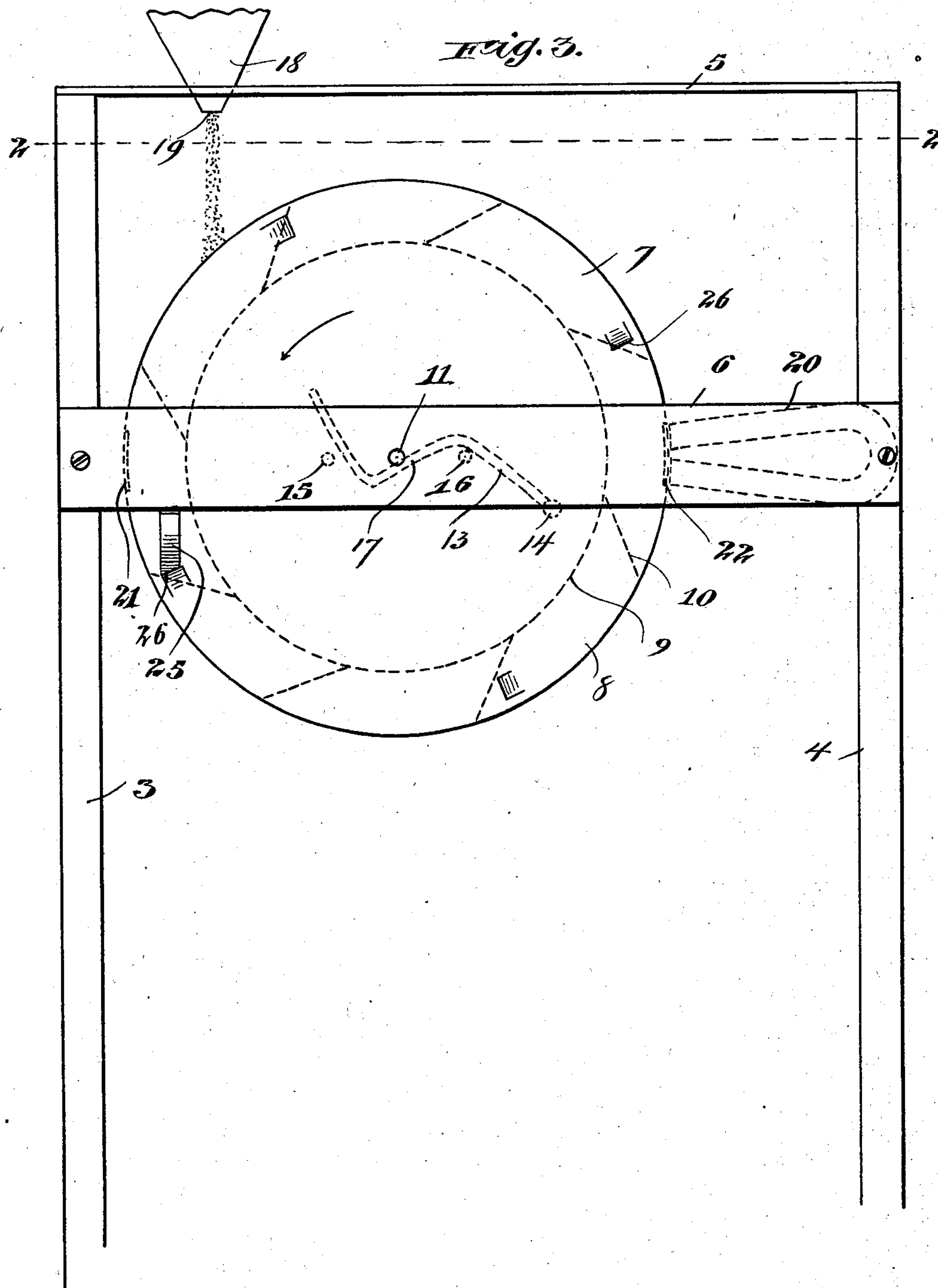
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# UNITED STATES PATENT OFFICE.

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## MOTOR.

SPECIFICATION forming part of Letters Patent No. 721,561, dated February 24, 1903.

Application filed July 29, 1901. Serial No. 70,049. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. GREEN, of Chicago, Illinois, have invented certain new and useful Improvements in Motors, of which the following is a specification.

This invention relates to improvements in motors, and refers more specifically to motors adapted for operating small mechanisms, such as advertising novelties and analogous easily-operated mechanisms.

Among the salient objects of the invention are to provide an extremely simple motor having a minimum number of moving parts and as nearly devoid of mechanism liable to get out of order through continued use as possible, to provide at the same time a motor which will require a minimum amount of power to operate it and so constructed and arranged that a suitable motive fluid or analogous means may be used over and over, to provide in a motor of the character referred to an extremely simple mechanism whereby a movement will be imparted to a figure closely imitating the movement of a living animal, and in general to provide a simple and durable and very cheap motor capable of application to a wide variety of uses.

Referring to the drawings, Figure 1 is a front elevation of an advertising novelty to which my improved motor is applied. Fig. 2 is a transverse horizontal sectional view taken on line 2 2 of Fig. 3 and looking downwardly. Fig. 3 is a rear elevation of the device, both the lower portions of Figs. 1 and 3 being broken away or shortened slightly to reduce the size of the figure.

Referring to the drawings, 1 designates a front plate, which constitutes one of the main frame members of the device and serves in the present instance as a background for a human figure, (designated as a whole 2,) which is in part supported from and in part pictured upon said plate. As a convenient construction said front plate is provided at its rear side with lateral marginal bars 3 4 and at its upper end with a cross-support 5, these members forming also a part of the main frame. Across the bars 3 and 4 is secured an intermediate stationary frame-bar 6, which, as shown clearly in Fig. 2, is spaced away from the front plate, in the present instance

a distance equal to the width of the side frame members 3 and 4. Upon said cross-bar 6 is journaled a bucket-wheel, (designated as a whole 7,) provided at its periphery with a plurality of pockets 8, which may be constructed in any suitable manner, the wheel being in the present instance formed of two sheets of cardboard, between which are interposed a continuous cylindric partition 9 and a plurality of approximately tangential partitions 10, together forming the series of pockets. The wheel 7 is conveniently journaled upon a stud 11, projecting rigidly from the cross-bar 6, the stud extending entirely through the wheel, and the latter being held conveniently thereon by means of a cotter or through pin 12. A suitable washer 12' is interposed between the cross-bar 6 and the proximate side of the wheel, so as to hold the latter free from the cross-bar and prevent undue friction.

13 designates a bent cam-arm pivotally secured to the front plate 1 at a point to one side of the axis of the wheel, as indicated at 14, and upon the proximate side of the wheel are mounted a pair of cam-studs 15 16, desirably and in the present instance located at points diametrically opposite the axis of the wheel and at equal distances from said axis. The distance between said cam-studs and the length and shape of the cam-arm 13 are such that when the wheel stands at its normal stationary position the cam-arm will rest upon one or both of said studs, its intervening portion 17 being in the form of a downwardly-projecting V-shaped cam, which during the rotation of the wheel is engaged by the studs 15 and 16 alternately and the arm thereby lifted gradually and allowed to descend somewhat more abruptly, although preferably without dropping. Obviously the precise relative speed of movement throughout the different parts of the throw of the arm may be varied by simply varying the shape of the latter, and it is to be noted that as one cam-stud passes out of engagement with the cam-arm the opposite will have reached a position to pass into operative engagement therewith.

18 designates any suitable hopper adapted to contain a suitable motive fluid, preferably sand, and provided at its lower end with a re-



stricted outlet 19, adapted to discharge the fluid gradually in a continuous stream. The hopper is so located as to discharge upon the periphery of the bucket-wheel at one side of its vertical center, so as to tend to rotate the wheel in the usual manner of an overshot wheel.

Means are provided for restraining the rotation of the wheel, so that it will be rotated intermittently at intervals apart instead of rotating continuously, as it would unless restrained under the action of the continuous flow of the motive fluid, and the means whereby this intermittent motion is produced forms a salient feature of invention. To this end a permanent magnet 20 is secured adjacent to the periphery of the wheel, said magnet being conveniently and in the present instance of the ordinary horseshoe type and being supported upon the main frame at a point opposite that side of the wheel which receives the discharge from the hopper and with its poles directed toward the periphery of the wheel and closely adjacent thereto.

21 22 respectively designate armature-plates mounted upon the periphery of the wheel at diametrically opposite points and in such position that when one or the other of said armatures is opposite the poles of the magnet and attracted and held thereby the cam-arm 13 will be in its normal lowermost position, or that indicated in Fig. 3 of the drawings. Preferably, and as shown herein, the armature will be so mounted relatively to the poles of the magnet as to pass quite close to the latter, but not to pass into actual engagement with said poles, thereby bringing the armature well within the field of attraction of the magnet, but at the same time avoiding the much more powerful attraction which would occur were the armature allowed to pass into actual contact with the poles of the magnet.

In the present instance the mechanism is caused to move the arm of the representation of a human figure in such manner as to simulate the lifting of a confection from a box to the mouth.

Referring to Fig. 1, 23 designates the main representation of the figure, which may well be lithographed or otherwise printed directly upon the face of the face-plate 1, and 24 designates the movable arm, which is, as shown clearly, mounted upon the stud or pivot 14, which carries the cam-arm 13. The representation of the figure and parts are so proportioned that during the oscillatory movement of the cam-arm the right hand of the figure will be lifted from its normal lowered position, in which it is represented as picking up a confection, to the mouth of the figure and returned, these movements being performed at intervals apart and at such speed as to most closely imitate the movements of a person.

In order to prevent a rebounding action of the cam-arm or any return of the bucket-

wheel at the time of the completion of each intermittent movement, I provide a simple ratchet mechanism arranged to act upon the wheel, said mechanism comprising in the present instance a plate-spring 25, secured to the cross-bar 6 in position to press yieldingly against the proximate face of the wheel, and upon the wheel I provide two bosses or ratchet projections 26 26, respectively located in such angular relation to the armature as to be engaged by the end of the pawl 25 when the armatures are respectively opposite the magnet and the wheel thereby positively held against return movement.

The operation of the mechanism is probably entirely obvious from the foregoing description, but may be briefly recapitulated. The hopper having been charged with a suitable supply of material capable of flowing out gradually, such as sand or water, the bucket-wheel, if not already in position with one of its armatures in register and attracted by the magnet, will at once turn to this position, since the several parts are substantially counterbalanced, and a slight quantity of the motive fluid will serve to rotate the wheel until one armature is brought opposite the magnet. As soon as the armature reaches the position of greatest attraction, or that directly opposite the magnet, it will be held in this position with considerable force, so that notwithstanding the motive material is being discharged into that pocket which happens to be then immediately beneath the hopper the wheel will remain stationary until a considerable charge has accumulated, sufficient to overcome the attraction of the magnet. When this occurs, however, and the armature is drawn away from the magnet, the wheel will turn promptly under the weight of the accumulated material until it reaches a position where the pocket will discharge by gravity, which will be somewhat less than one-half of a revolution from its starting-point, and from this point the wheel will be advanced more slowly by the flow of the motive material into the succeeding pockets until the opposite armature has been brought into the field of attraction of the magnet, whereupon it will be caught and again restrained until another charge has accumulated sufficient to overcome the restraining power of the magnet. During these successive intermittent movements of the wheel the cam-arm and connected arm of the figure will repeat the movements hereinbefore described.

It is to be understood that the application of the mechanism herein described is, in the broader sense, merely illustrative and that a motor embodying the principles of this invention is capable of application to a wide variety of uses, not only in producing various movements of mechanical novelties and the like, but also in various other connections. It is to be understood, therefore, that with the exception of the specific claims covering the particular mechanism shown herein,



which in itself is novel, the language and claims are to be construed as setting forth merely one useful application of the invention and that the invention is not limited to such application alone. For example, while I have herein described a rotary element carrying a plurality of armatures by very slightly modifying the construction and arrangement and omitting one of the armatures the device would become a reciprocatory or oscillatory mechanism which might be employed for accomplishing the same or other analogous purposes.

I claim as my invention—

1. In a motor, the combination of a rotary motor element provided with a pocket adapted to discharge automatically upon a rotating movement of the element, a magnet element operatively connected and moving with said motor element, a second magnet element located adjacent to the path of movement of said first-mentioned magnet element and means for gradually charging said pocket to overcome the mutual attraction of the magnet elements and rotate the motor element.

2. In a motor, the combination of a wheel element provided with a series of pockets adapted to discharge upon rotation of the wheel, a plurality of magnet-armatures mounted upon said wheel; a magnet having its pole located adjacent to the path of movement of said armatures and means for charging said pockets successively and gradually to overcome the restraining attraction of the magnet and rotate the wheel.

3. In a motor, the combination of a wheel provided upon its periphery with a substantially continuous series of pockets and mounted to rotate upon a horizontal axis, a plurality of magnet-armatures mounted upon the periphery of said wheel at intervals apart, a magnet mounted adjacent to the periphery of said wheel in position to forcibly attract said armatures as they are carried past the magnet, a motive-fluid receptacle supported above said wheel and provided with a restricted outlet adapted to feed gradually into the pockets of the wheel at one side of the center of gravitation of the latter and means for imparting movement from said rotating-wheel element to a mechanism to be actuated thereby.

4. In a motor, the combination of a wheel provided upon its periphery with a substantially continuous series of pockets and mounted to rotate upon a horizontal axis, a plurality of magnet-armatures mounted upon the periphery of said wheel at intervals apart, a magnet mounted adjacent to the periphery of said wheel in position to forcibly attract said armatures as they are carried past the magnet, a motive-fluid receptacle supported above said wheel and provided with a restricted outlet adapted to feed gradually into the pockets of the wheel at one side of the center of gravitation of the latter and means for imparting movement from said rotating-wheel element to a mechanism to be actuated thereby comprising a cam-arm pivotally mounted adjacent to said wheel and one or more studs mounted upon the wheel and adapted to successively engage and oscillate said cam-arm.

5. In combination, a motor comprising a wheel provided upon its periphery with a substantially continuous series of pockets and mounted to rotate upon a horizontal axis, a plurality of magnet-armatures mounted upon the periphery of said wheel at intervals apart, a magnet mounted adjacent to the periphery of said wheel in position to forcibly attract said armatures as they are carried past the magnet, a motive-fluid receptacle supported above said wheel and provided with a restricted outlet adapted to feed gradually into the pockets of the wheel at one side of the center of gravitation of the latter, means for imparting movement from said rotating-wheel element to a mechanism to be actuated thereby comprising a cam-arm pivotally mounted adjacent to said wheel and one or more studs mounted upon the wheel and adapted to successively engage and oscillate said cam-arm, a face-plate within which the pivot-stud of said cam-arm is mounted and through which it extends and a member made to resemble a part of a living animal operatively connected with said cam through said pivot-stud so as to move with the latter, substantially as described.

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Witnesses:

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