No. 693,317. Patented Feb. 11, 1902.

G. WELLS.

AUTOMATIC CHROMATROPE.

(Application filed Apr. 4, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

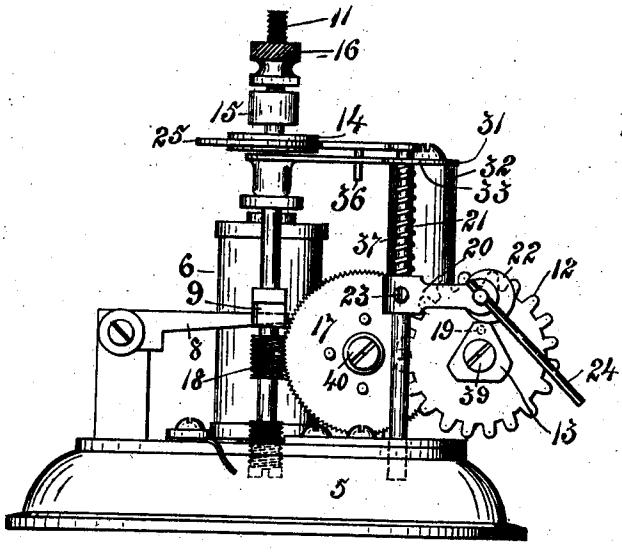


FIG. 4.

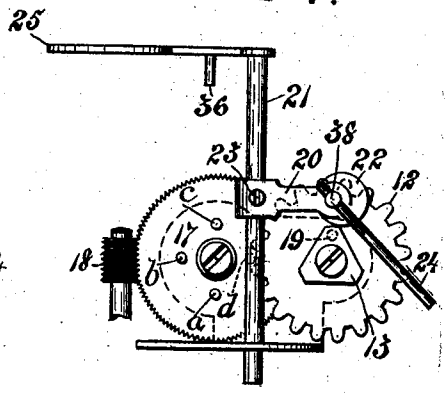


FIG. 2.

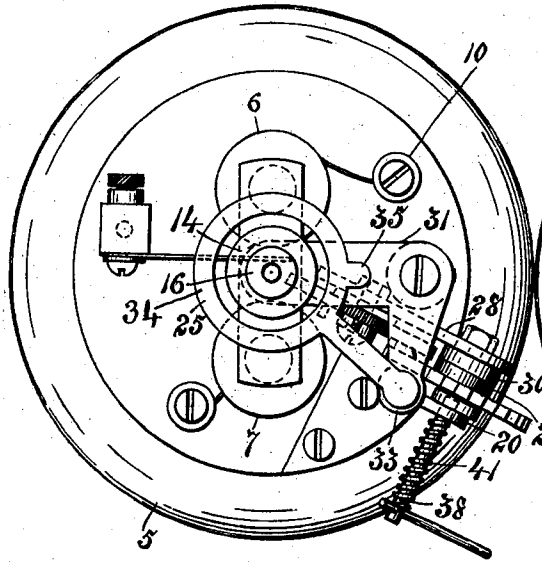
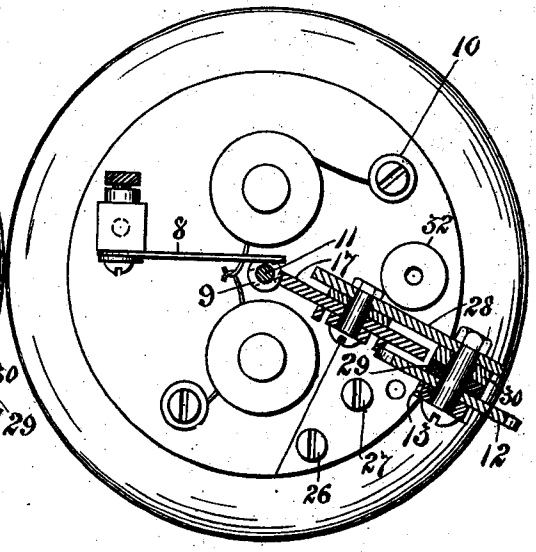


FIG. 3.



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FIG. 6.

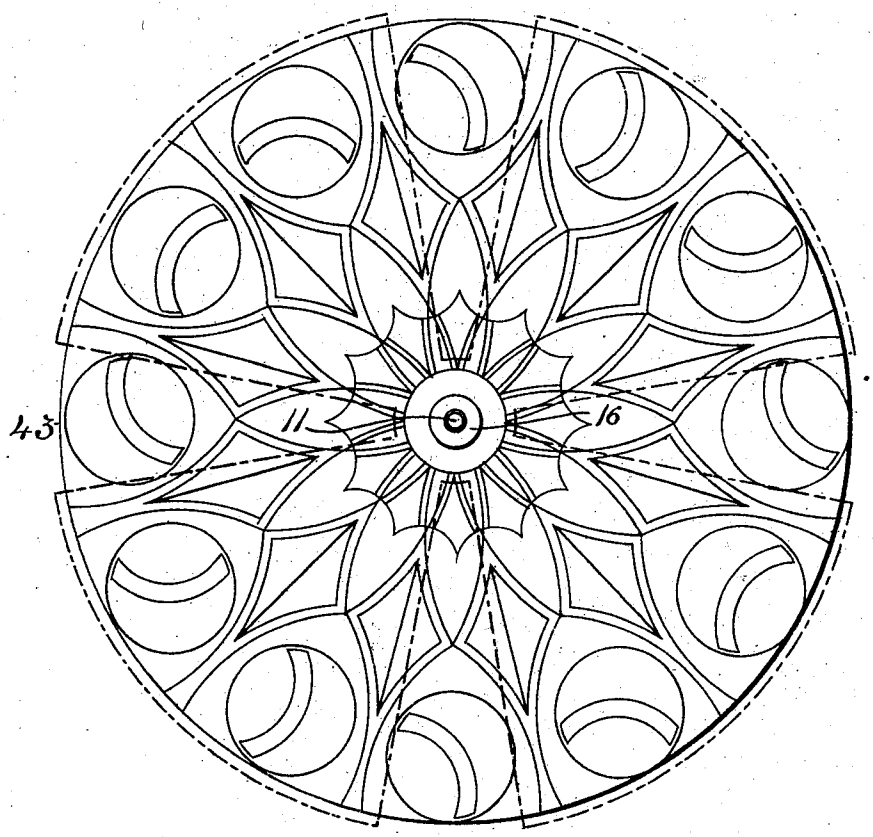
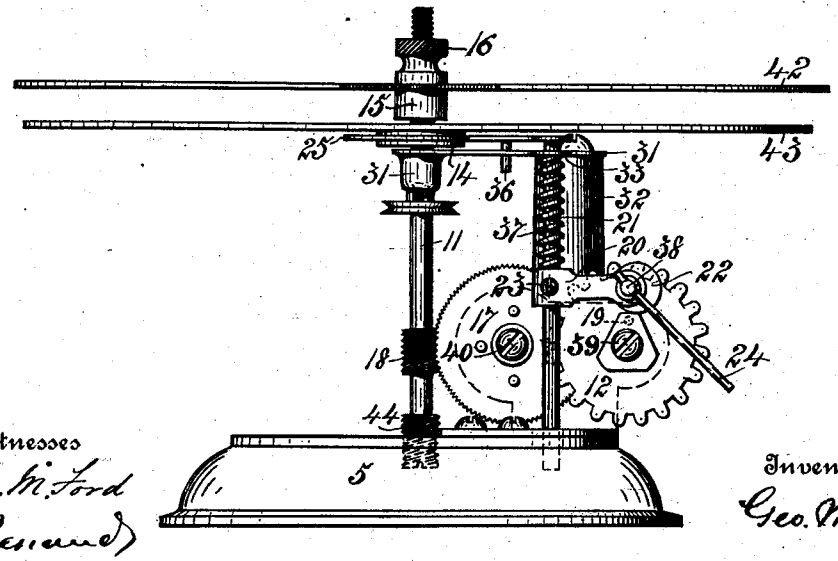


FIG. 5.



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AUTOMATIC CHROMATROPE.

SPECIFICATION forming part of Letters Patent No. 693,317, dated February 11, 1902.

Application filed April 4, 1901. Serial No. 54,382. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WELLS, a citizen of Canada, residing at 29ª Arcade street, in the city of Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Automatic Chromatropes, of which the following is a specification.

My invention relates to new and useful improvements in the method of producing designs from colored revolving cardboard disks. By automatically varying the velocity of the disks upon which the designs are shown a great diversity of beautiful effects are produced and reproduced with great regularity. By automatically stopping the design-disk at regular intervals enables advertisements to be seen and read. The device can also be used as a scientific toy and allows for endless changes, a few lines of colored printing matter producing beautiful effects, and as no two effects are the same when the disks are in motion and automatically retarded (except, as stated, the same effects are repeated automatically at regular intervals) instantaneous photographs can be taken, which will be found of great utility to artists, designers, students, &c., as an endless number of new, beautiful, and suggestive designs can be produced even from the same geometrical figure or design simply by changing the black or view disk for one differently pierced.

This invention can be used vertically, horizontally, or in any other position with equal effect.

The automatic device for changing the velocity of and stopping and starting the design-disk can be operated by the simple electric motor, as shown in the drawings; also, by the methods shown by which the device can be operated by any motive power.

The drawings shown are full-sized, and similar numerals and letters indicate like parts.

Figures 1, 2, and 3 show the automatic device attached to an electric motor of simple design. Fig. 3 also shows section of automatic device. Fig. 4 is a side elevation of automatic device. Fig. 5 shows the device attached to a base and arranged to be operated by any motive power. Fig. 5 also shows one of the black or view disks and a design-disk. Fig. 6 is a plan view of both disks, the black or view disk being shown in chain-lines No. 42.

The automatic device consists of a rectangular bracket 28, made of sheet-brass, into which are secured two studs 39 and 40, arranged to carry a worm-wheel 17 and a cog-wheel 12. The stud on which the cog-wheel 12 revolves carries a cam 13 of the shape shown in Figs. 1 and 4. The cam 13 is revolved on the stud by means of a pin 19, which projects from cam 13 into cog-wheel 12.

The cog-wheel 12 is operated by a worm-wheel 17 by means of four pins *a b c d*, projecting from the face of worm-wheel 17, which pins intermesh with the teeth of the cog-wheel 12. The worm-wheel 17 is operated by means of a screw or worm 18, which is fastened to spindle 11. The spindle 11 is revolved at a speed of about fifteen hundred revolutions per minute, and at this speed cog-wheel 12 will make three revolutions per minute. The spindle 11 continues to revolve at the same speed during all the changes in the speed of the design-disk.

29, Figs. 2 and 3, is a rubber washer for the purpose of securing the necessary friction to hold cog-wheel 12 in the same position in which the pins *a b c d* leave the teeth of the cog-wheel 12, so that the pins will always intermesh with the teeth of the cog-wheel while the same revolves.

30, Figs. 2 and 3, is a brass washer for the purpose of securing the necessary clearance between worm-wheel 17 and cog-wheel 12.

On the base 5, to which is attached the automatic device, is cast or fastened a post 32. To the top of post 32 is fastened a bearing 31 to carry the top end of spindle 11. This bearing is made in the shape shown in Fig. 2 and is made in one piece with a projecting arm 33.

25, Fig. 2, is an apparatus made of sheet-brass of the shape shown. It is attached at its end to a rod 21 and is for the purpose of lifting the design-disk from and lowering it to the top of the collar 14, Figs. 1 and 5, and will hereinafter be called the "retarding-ring" 25. It is provided with a guide-pin 36, which projects through the bearing 31, thus preventing the retarding-ring 25 from moving from the position shown in Fig. 2. The rod 21, Figs. 1 and 5, is carried down through a hole in base 5, which, together with the hole

in projecting arm 33, forms a guide for said rod. Connected to rod 21 by means of set-screw 23 is an arm 20, which arm carries at its end an eccentric 22 for the purpose of attaining the proper adjustment between the top of retarding-ring 25 and the design-disk.

24, Figs. 1, 2, 4, and 5, is a lever connected to the shaft, which carries the eccentric 22 and is used to move the eccentric to the position required.

41, Fig. 2, is a spring on shaft 38 for the purpose of preventing (by the friction between faces of arm and eccentric) the eccentric 22 from moving from any position in which it may be placed.

The springs 37, Figs. 1 and 5, (shown on rod 21,) is for the purpose of keeping the eccentric 22 against the cam 13 when the device is used with the spindle 11 in a horizontal position.

The collar 14, Figs. 1 and 5, is fastened to the spindle 11 and carries on its face the design-disk when the retarding-ring 25 is below the face of the collar.

A space sufficient to allow the design-disk to move freely is left between collars 14 and 15, as shown in Fig. 5. The design-disk is not fastened to the spindle 11 in any way.

The black or view disk is held between collar 15 and thumb-nut 16 and revolves at the same speed as the spindle 11.

The operation of the automatic device is as follows: When the design and view disks have been placed on spindle 11 in the position shown in Fig. 5 and the proper speed imparted to the spindle, the design-disk will eventually revolve at the same speed as the spindle, owing to the weight of disk on collar 14. When viewed at this velocity, certain effects are seen. On pressing down the lever 24, Figs. 1, 2, and 5, the eccentric 22 will move from the position shown in Figs. 1, 4, and 5 and will thus increase the distance between the cam 13 and the top of retarding-ring 25. The downward movement of lever 24 must be continued. The adjustment causes the top of retarding-ring 25 to rise above the collar 14. This adjustment will cause the retarding-ring 25 to lift the design-disk from the collar 14 and will gradually change its velocity and different effects are seen, and if the retarding-ring is adjusted to remain in this position a sufficient length of time it will entirely stop the movement of the disk. The greatest number of effects are produced when the adjustment is so arranged as to nearly stop the movement of the design-disk. This is accomplished by so adjusting the eccentric 22 that the retarding-ring 25 will lower the disk onto the collar 14 before the movement of the disk entirely ceases. If it is desired to show an advertisement printed or painted on the design-disk, the movement of the disk must stop. This is accomplished by adjusting the eccentric 22 so that the retarding-ring 25 will keep the design-disk from the collar 14 until sufficient time has been afforded to read the advertisement. When the cam 13 moves from the position shown in Figs. 1, 4, and 5, the retarding-ring 25 will lower and the design-disk will again rest on the collar 14 and revolve and again attain velocity before the retarding-ring 25 again lifts the disk from the collar, when the disk will reproduce the same effects.

The foregoing method of retarding the design-disk applies to the device when used with the spindle 11 in a vertical position.

When the device is used with the spindle in a horizontal position, the design-disk is revolved by the friction between the spindle and the hole in the disk and is retarded by adjusting the retarding-ring 25, so that it will press the disk against the removable collar 15 with the pressure required to secure the effects desired.

What I claim is as follows:

1. The combination with a base having suitable bearings in the center thereof for a pivotal point, and a standard to one side of the center, of a spindle turning on the pivotal point and journaled in a projecting arm from the standard, a pair of disks at its outer end, a worm-gear intermediate of the length of the spindle designed to operate a toothed wheel at intervals, and a cam fixedly attached to one face of the toothed wheel, designed to raise and lower a rod carrying at its top end a retarding-ring, as and for the purpose specified.

2. The combination with a base having a suitable bearing in the center thereof for a pivotal point and provided with a standard to one side of the center, of a spindle with its inner end forming the pivotal point, and journaled toward its outer end in a projecting arm from the standard, a pair of disks revolving with the spindle at its outer end, a toothed wheel, a worm-wheel, a worm on the spindle intermediate of its length meshing with a worm-wheel and designed to operate the toothed wheel at intervals, a cam fixedly attached to one face of the toothed wheel, a rod, a ring carried at the outer end and at right angles thereto, and a spiral spring encircling the said rod between the ring at its outer end and a projecting arm from the rod intermediate of its length, as and for the purpose specified.

3. The combination with a base provided with an adjustable bearing in the center thereof for a pivotal point, and a standard to one side of the center, of a disk with a plurality of perforations, revolving with a spindle journaled in a projecting arm from the standard and turning on a pivotal point in the adjustable bearing in the base, a second disk loosely journaled on the said spindle, immediately under the aforesaid disk, a toothed wheel, a worm-gear intermediate of the length of the spindle designed to operate the toothed wheel at intervals, a cam fixedly attached to one face of the toothed wheel, and a rod encircled toward its upper end by a spiral spring, and having its upward and downward move-

ment controlled by the cam, as and for the purpose specified.

4. The combination with a base provided with an adjustable pivotal point bearing in the center thereof, a standard to one side of the center, and a projecting arm from the top of the said standard, of a spindle turning on a pivotal point, a disk fixedly attached to its upper end, a second disk loosely journaled immediately beneath the outer disk, a retarding-ring surrounding a collar immediately inside the second disk attached to the outer end of a rod with an inner and outer movement, a worm-wheel provided with a plurality of projecting points set radially from the center in one of its faces, a worm on the spindle and intermediate of its length meshing therewith, a toothed wheel with a cam fixedly attached to its face, and an eccentric journaled at the outer end of an arm projecting from the aforesaid rod, and designed to abut the cam at all times, as and for the purpose specified.

5. The combination with a base having an adjustable bearing for a pivotal point in the center, a standard to one side of the center, and a projecting arm at the top end of the said standard, of a spindle journaled in the projecting arm, a pair of disks designed to revolve at the top thereof, the bearing in the center of the base, a rod placed parallel to the spindle, a ring carried at the upper end of the rod for raising and lowering one of the disks, and means for operating this rod at intervals from the spindle, as and for the purpose specified.

6. The combination with a base having suitable bearings in the center thereof for a pivotal point, and a standard to one side of the center, of a spindle turning on a pivotal point in the bearings in the base and journaled in a projecting arm from the standard, and provided with a disk toward its upper end loosely journaled thereon, a disk fixedly attached to the spindle and having a plurality of perforations immediately overtopping the aforesaid disk, a worm-wheel having points projecting radially from its center, a toothed wheel designed to be operated by the said projecting points, a rod, a ring carried at the top end of the rod and encircling a collar on the spindle, a projecting arm located intermediate of the length of the rod, and provided with an eccentric journaled at the outer end thereof, and a spiral spring around the upper end of the rod, and designed to hold the said eccentric wheel against the cam on the toothed wheel, as and for the purpose specified.

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

GEO. WELLS.

Witnesses:
GEO. R. W. KITTSON,
E. V. DEAN.