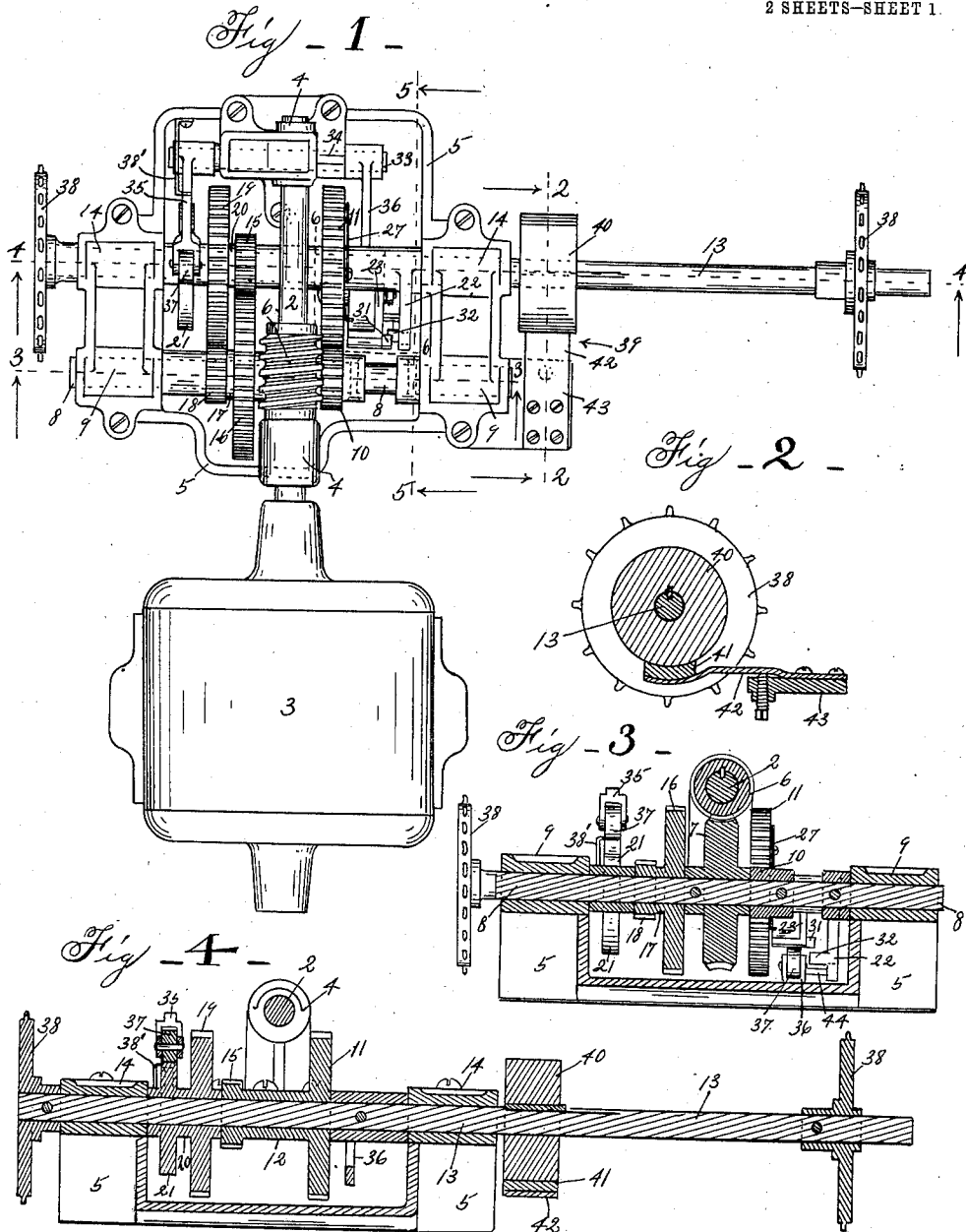


W. H. GAMBLE.
MECHANISM FOR GIVING INTERMITTENT ROTATION TO A SHAFT.
APPLICATION FILED FEB. 19, 1912.

1,042,905.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.



WITNESSES:
W. M. Gentle.

Fred Wells

INVENTOR
Walter H. Gamble

By *Alex. H. Liddons.*
ATTORNEY

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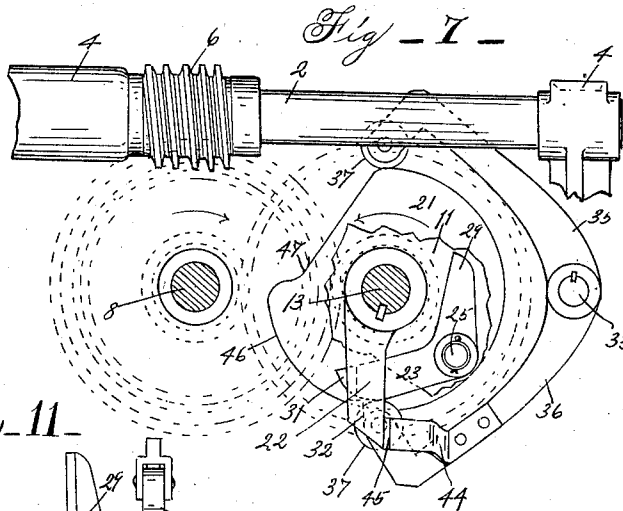
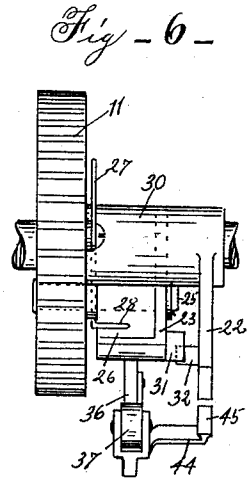
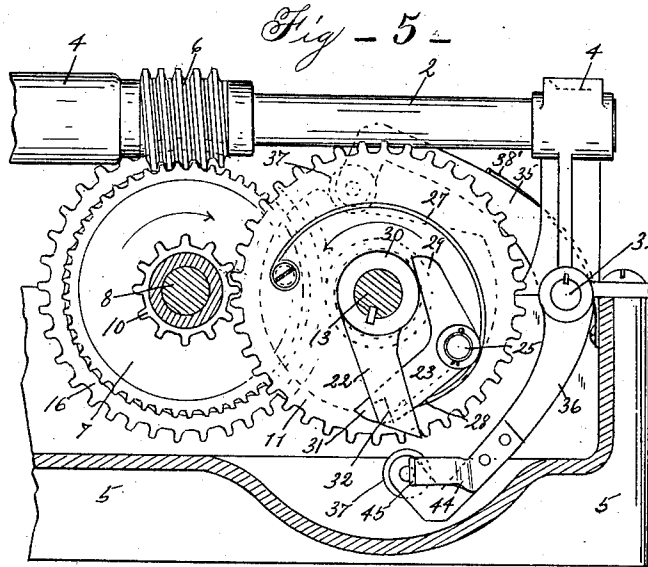


Fig. 8 -

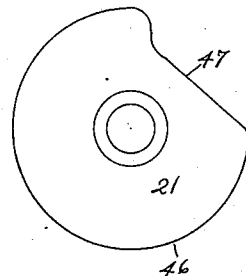


Fig. 11 -

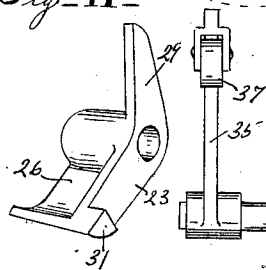


Fig. 9 -

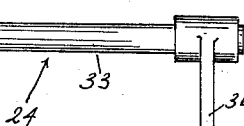
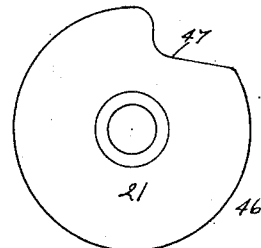


Fig. 10 -



WITNESSES:

W. M. Gentle

Fred Miller

INVENTOR

Walter H. Gamble

By

Robert N. Liddens

ATTORNEY.

UNITED STATES PATENT OFFICE.

WALTER H. GAMBLE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO EMMA LANG INVESTMENT COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

MECHANISM FOR GIVING INTERMITTENT ROTATION TO A SHAFT.

1,042,905.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed February 19, 1912. Serial No. 678,735.

To all whom it may concern:

Be it known that I, WALTER H. GAMBLE, a citizen of the United States of America, residing at Los Angeles, in the county of Los Angeles, State of California, have invented a certain new and useful Mechanism for Giving Intermittent Rotation to a Shaft; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mechanism for giving intermittent rotation to a shaft, and, though the mechanism is adapted to be used in many other relations, it is especially designed for use in connection with display apparatus.

One object of the invention is to provide novel and improved mechanism of the class specified in which the speed ratio gearing and the cam may be easily and quickly changed when desired.

Another object of the invention is to provide novel and improved mechanism of the class specified in which the arm connected with the shaft which is given intermittent rotation is automatically brought to a predetermined position when the arm has been moved from such predetermined position in consequence of rotation of the shaft.

Further objects of the invention are to provide novel and improved mechanism of the class specified which is simple and compact in construction, economical to install and maintain, effective in action, and in which the parts are easily accessible for renewal or repairs.

With the above and other apparent objects and advantages in view, the invention may be said to consist in the provision of the novel features and in the novel and improved construction, arrangement and combination of parts and devices as will appear from the description and claims which follow taken in connection with the accompanying drawings which illustrate the preferred form of construction in which the invention may be embodied.

Referring to the drawings, Figure 1 is a top plan view of mechanism embodying the invention; Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1; Fig. 5 is a partial enlarged view of the mechanism taken on the line 5—5 of Fig. 1; Fig. 6 is an enlarged view of parts of the mechanism taken on the line 6—6 of Fig. 1; Fig. 7 shows some of the parts of Fig. 5 in changed position; Fig. 8 is a detail of one form of cam; Fig. 9 is a view of the spaced cam arms which are arranged fast to a shaft; Fig. 10 is a detail of another form of cam, and Fig. 11 is a perspective detail of the dog.

The motor shaft 2, connected with any suitable or approved form of motor indicated at 3, may be suitably mounted in bearings 4 on the frame 5. Keyed to the motor shaft 2 is a worm 6 which is adapted to mesh with a worm wheel 7 fastened to the shaft 8 which latter is preferably arranged below and at right angles to the motor shaft 2 and is mounted in bearings 9 on the frame 5. Shaft 8 has fast thereon a spur pinion 10 which is adapted to mesh with a spur wheel 11 on a sleeve 12 loose on the shaft 13 which latter is mounted in bearings 14 on the frame 5 and is arranged in parallel with the shaft 8. The sleeve 12 has thereon a spur pinion 15 which is adapted to mesh with the spur wheel 16 on the sleeve 17 loose on the shaft 8 and the sleeve 17 has thereon a spur pinion 18 which is adapted to mesh with a spur wheel 19 on the sleeve 20 which latter is arranged loose on the shaft 13 and has thereon the cam 21.

From the foregoing it will be seen that the cam 21 is driven by the shaft 8 through speed reducing gearing which may be easily and quickly replaced by other sizes of spur pinions and spur wheels when it is desired to change the ratio of speed between the shaft 8 and the cam 21. The shaft 13 is intermittently operatively connected with the spur wheel 11 and given rotation by the means now to be described and which consists broadly of an arm 22 secured to the shaft 13 and adapted to be engaged by a dog 23 pivotally mounted on the spur wheel 11; the engagement of the dog 23 with the arm 22 being controlled by a device 24 operated by the cam 21.

As shown more clearly in Figs. 5, 6, and 7, the dog 23 may be mounted on a pivot 25 arranged near the circumferential portion of the spur wheel 11 and it may be formed

rounded at its lower end portion and provided, at its lower edge, with a flange 26 extending toward the spur wheel 11. A spring 27, suitably secured to the spur wheel 11, may be arranged to have its end portion 28 bear against the flange 26 to move and hold down the lower end portion of the dog 23, the upper portion 29 of the dog 23 being adapted to limit the downward movement of the lower portion of the dog 23 by engaging with a collar 30 which may extend between the arm 22 and the spur wheel 11. The dog 23 is provided with a projection 31 which, when the lower end portion of the dog is in the down position, is adapted to contact with a projection 32 on the arm 22. The device 24, as shown more clearly in Figs. 5, 7, and 9, may consist of a shaft 33 arranged in a bearing 34 and in parallel with the shaft 13, and arms 35 and 36 having one end thereof fast on the shaft 33 and each having suitably mounted at the other end thereof a roller 37. A spring 38' is suitably arranged to coact with the arm 35 so that the roller 37 on said arm is held in contact with the periphery of the cam 21 to have the latter operate the device 24 to control engagement of the dog 23 with the arm 22 by bringing the roller 37 on the arm 36 into or out of engagement with the flange 26 on the dog 23. The arm 36 may have thereon a projecting part 44, the end portion 45 of which the arm 22 engages with when the roller 37 of the arm 36 is in engagement with the flange 26 of the dog 23.

When the mechanism is used in connection with the display apparatus already mentioned, the shaft 13 may have fast thereon the sprocket wheels 38; also a brake 39 may be connected with the shaft 13 and consist of a drum 40 fast on the shaft 13 and a shoe 41 held in contact with the drum 40 by means of a spring plate 42 suitably secured to any stationary part 43.

As shown more clearly in Figs. 8 and 10 the cam 21 may be formed to provide a periphery with a circular portion 46 and with a depression 47; the length of the latter varying according to the reducing gearing which is operatively connected with the cam 21 and the amount of rotation it is desired to give the shaft 13 at any one interval.

From the foregoing the mode of operation will be readily apparent to those skilled in the art, it being understood that the spur wheel 11 is continuously driven by means of its operative connections with the motor shaft 2. By means of the gearing connected between the spur wheel 11 and the cam 21 the cam is driven at a lower speed than the spur wheel 11. While the roller of the arm 35 is in contact with the circular portion 46 of the periphery of the cam 21, see Fig. 7, the arm 36 is moved to have the end portion 45 of part 44 disposed to engage with

the arm 22 and its roller disposed in position to contact with the flange 26 of the dog 23, and lift the lower end portion of the dog as it passes the arm 22 during the rotation of the spur wheel 11, thus preventing the projection 31 on the dog coming into engagement with the projection 32 on the arm 22. During the time the roller on the arm 35 is disposed in the depression 47 in the periphery of the cam 21, see Fig. 5, the arm 36 is moved to have its roller held away from the dog 23 and the projection 31 on the dog is adapted to engage with the projection 32 on the arm 22 to move the latter to rotate the shaft 13 until the roller on the arm 35 leaves the depression 47.

While one form of construction in which the invention may be embodied has been particularly illustrated and described, there are many changes and modifications that will readily occur to those skilled in the art wherefore the right is reserved to all such changes and modifications as do not depart from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In mechanism of the class specified, the combination of a shaft, a spur wheel and a cam both loosely mounted on said shaft, means for continuously rotating said spur wheel and said cam, a dog pivotally mounted on said spur wheel, an arm fast on the said shaft, and a device adapted to coact with the cam and operated by the cam to control engagement of said dog with said arm.

2. In mechanism of the class specified, the combination of a shaft, a spur wheel and a cam both loosely mounted on said shaft, means for continuously rotating the spur wheel, speed reducing gearing connected between the spur wheel and the cam, a dog pivotally mounted on the spur wheel, an arm fast on the said shaft, and a device including an arm operated by said cam and connected with an arm adapted to coact with said dog to control engagement of said dog with said arm fast on the said shaft.

3. In mechanism of the class specified, the combination of a shaft, a spur wheel and a cam both loosely mounted on said shaft, means for continuously rotating said spur wheel and said cam, an arm fast on the said shaft, a dog mounted on said spur wheel and adapted to engage with said arm, and a device operatively connected with said cam and adapted to coact with the dog to control the engagement of said dog with said arm.

4. In mechanism of the class specified, the combination of a shaft, a wheel and a cam both loosely mounted on said shaft, means for continuously rotating the wheel, speed reducing gearing connected between the

wheel and the cam, an arm fast on the said shaft, a spring-pressed dog pivotally mounted on the wheel and adapted to engage with said arm, and a device operatively
5 connected with the cam and adapted to coact with the dog to control the engagement of said dog with the arm.

5. In mechanism of the class specified, the combination of a shaft, a wheel and a cam
10 both loosely mounted on said shaft, means for continuously rotating said wheel and said cam, an arm fast on the said shaft, a spring-pressed dog pivotally mounted on said
15 wheel and adapted to engage with said arm, and means to control the engagement of said dog with said arm, said means including a shaft, an arm fast on the last shaft and adapted to bear against said cam, and
20 an arm fast on the last shaft and adapted to engage with said dog.

6. In mechanism of the class specified, the combination of a shaft, a spur wheel and a cam both loosely mounted on said shaft, said cam provided with a periphery having

a circular portion and a depression, means 25 for continuously rotating said spur wheel, speed reducing gearing connected between said spur wheel and said cam, an arm fast on the said shaft, a spring-pressed dog pivotally mounted on said spur wheel and
30 adapted to engage with said arm, a second shaft, an arm fast on the second shaft and adapted to bear against the periphery of the cam, a second arm fast on the second shaft and adapted, when the first arm bears on
35 the circular portion of the periphery of the cam, to lift the dog to prevent the engagement of said dog with the arm fast on the first shaft.

In testimony whereof, I have signed my 40 name to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 10th day of February A. D. 1912.

WALTER H. GAMBLE.

Witnesses:

ALEX. H. LIDDERS,
T. H. GIBBS.

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