

(No Model.)

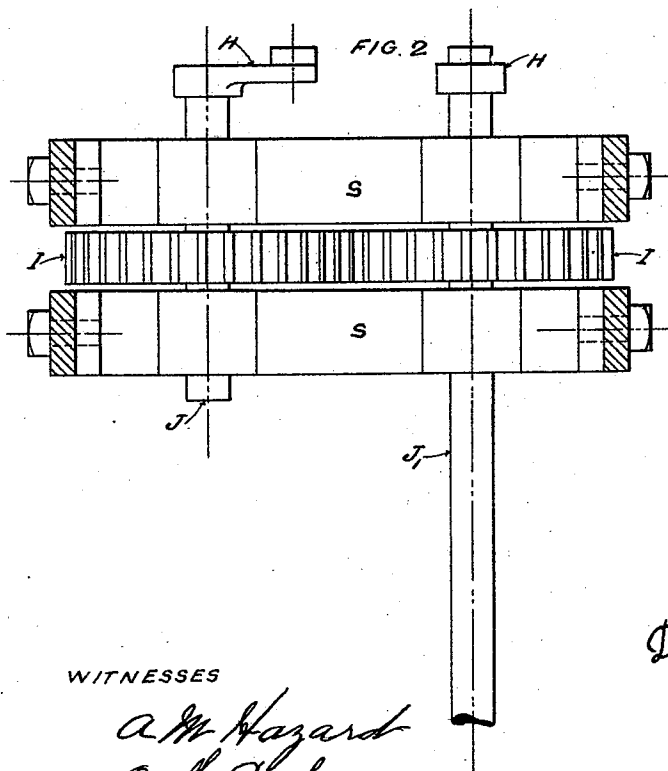
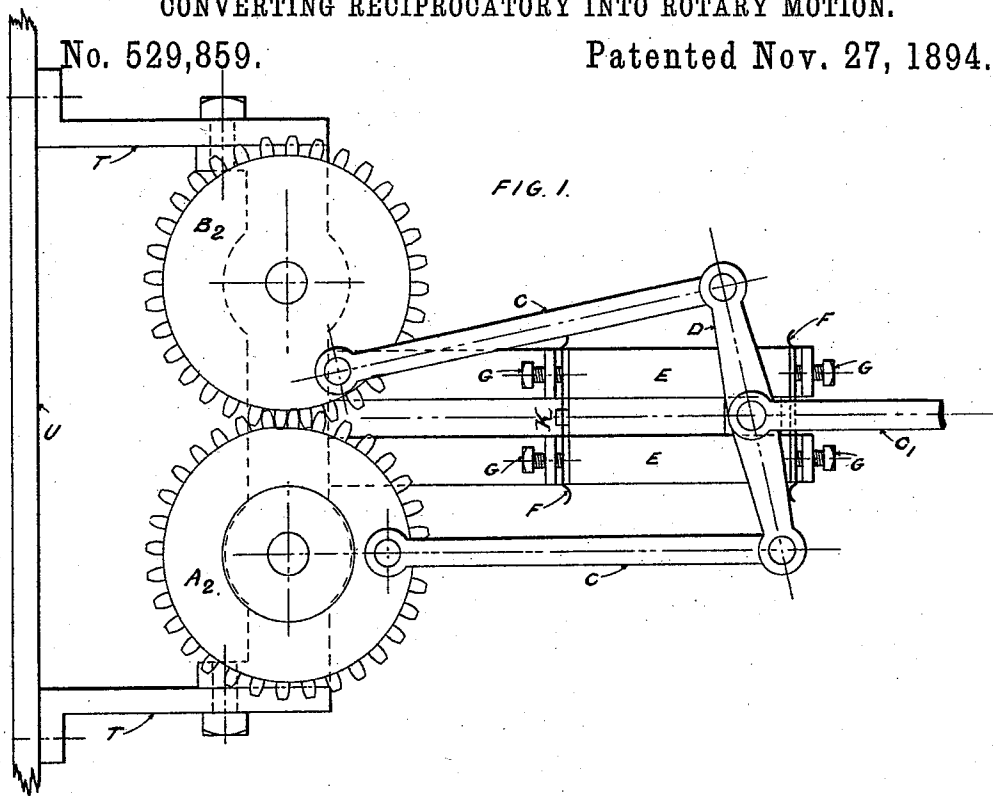
2 Sheets—Sheet 1.

D. HAZARD.

CONVERTING RECIPROCATORY INTO ROTARY MOTION.

No. 529,859.

Patented Nov. 27, 1894.



WITNESSES

A. M. Hazard
O. M. Parker

Dexter Hazard
INVENTOR

(No Model.)

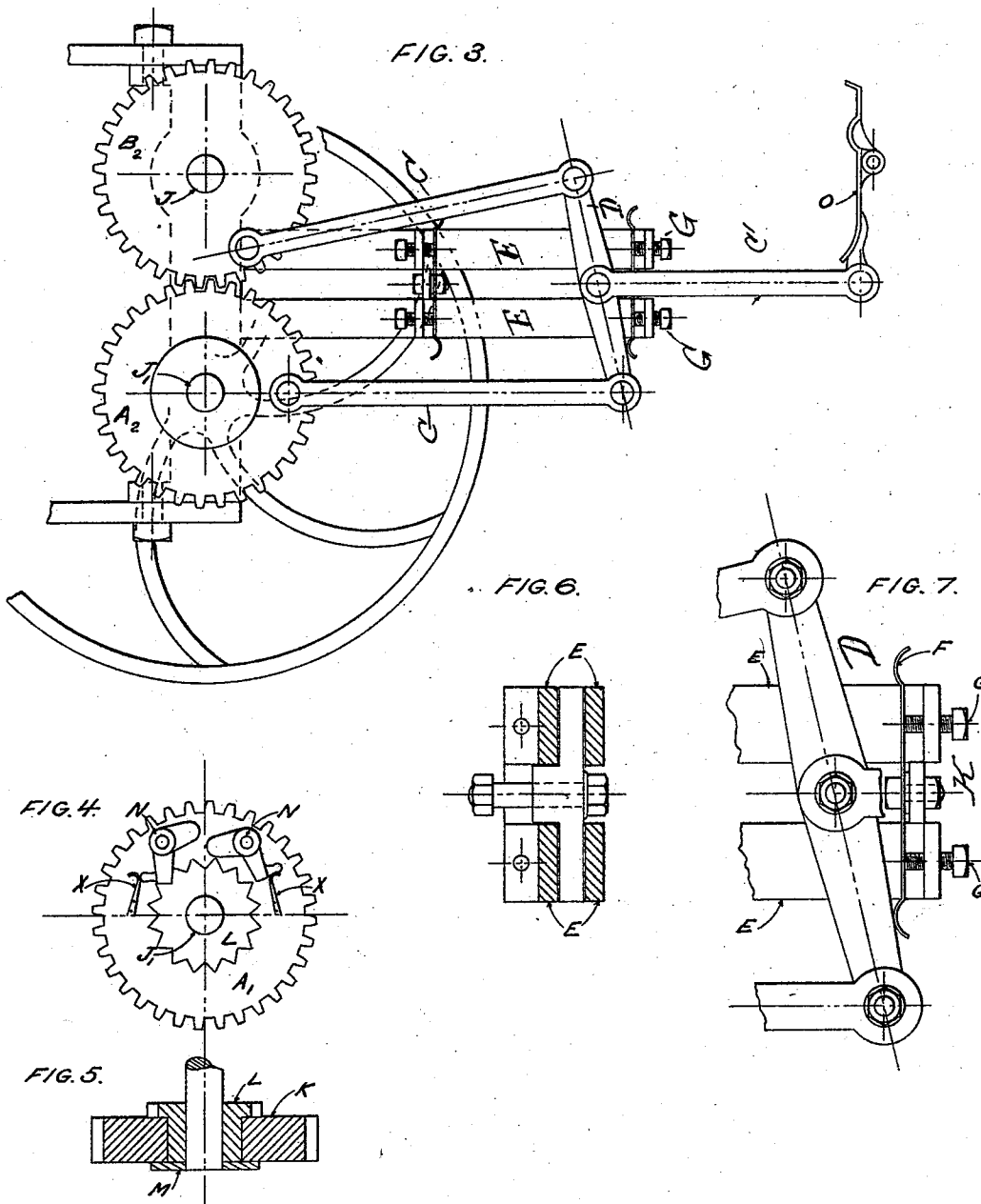
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WITNESSES

M. J. D'Meira
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UNITED STATES PATENT OFFICE.

DEXTER HAZARD, OF MARQUETTE, MICHIGAN, ASSIGNOR OF ONE-HALF TO
FREDERICK O. CLARK, OF SAME PLACE.

CONVERTING RECIPROCATORY INTO ROTARY MOTION.

SPECIFICATION forming part of Letters Patent No. 529,859, dated November 27, 1894.

Application filed January 22, 1894. Serial No. 497,726. (No model.)

To all whom it may concern:

Be it known that I, DEXTER HAZARD, of Marquette, county of Marquette, and State of Michigan, have invented a new and novel
5 Device for Converting Reciprocatory into Rotary Motion, which will prevent the difficulty of dead-centers and will provide the means whereby the operator can start a sewing-machine in either direction, as desired, of which
10 the following is a specification.

My invention has for its object, first, to prevent the crank pin used in producing rotary motion from stopping on the centers; second, the construction of a mechanism
15 which will enable the operator to start a sewing machine in the desired direction, when connected to the driving shaft and treadle by the use of the treadle only; and third, to keep said machine in continuous motion when it
20 is desirable to operate at a slow rate of speed.

In the drawings, Figure 1 is a face view of my invention, with a section of a reciprocating arm attached. Fig. 2 is a view of a pair
25 of gear wheels held in position by a long and short shaft, which are provided with ordinary cranks. Fig. 3 is a face view of my device connected to the treadle and driving shaft of a sewing machine; and showing a section of the large belt wheel, such as are used on said
30 machines. Figs. 4 and 5, show the construction of gear wheel A², by which the operator can determine in what direction the treadle will start the machine. Fig. 6 is a section of the guideways and cross-head which hold the
35 pivot and bar D in position. Fig. 7 is a detailed view of the spring F.

K is a half section of circular rim A', which is provided with cogs on its outside rim, and is the outside rim and the largest portion of
40 the body of gear wheel A².

L is a hub turned on the outside rim to fit the open space in rim A', and forms the rest of the body of gear wheel A². Hub L is provided with notches on one side.

45 N N are small dogs fastened to rim A' directly over the notches in hub L.

X X are springs fastened to rim A', and hold the dogs N above or bring the end of the dog in contact with the face of the notches in
50 hub L.

M is a collar fastened to hub L by small screws, which prevents rim A' coming off of hub L when in operation.

The combination of rim A', hub L, dogs N, springs X and collar M is gear wheel A², which
55 appears in the other views of my invention.

J' is the end of the driving shaft of a sewing machine, to which hub L is attached and by which wheel A² is held in position.

B² is an ordinary gear wheel of the same
60 diameter as A², and provided with the same number of teeth of corresponding size as those on A². B² is not provided with the dogs N N, springs X X and hub L, as appears in A'.

J is a short shaft which holds B² in position, so as to allow the teeth of B² to mesh
65 with those of A².

C C are connecting arms, which are held to wheels A² and B² and rocking bar D by ordinary pins.

E E are guideways, which hold a small cross-head in position.

C' is the pitman, which is connected to bar D, the cross-head and treadle O, by ordinary
70 turned pins.

G G are set-screws, held in position by projecting lugs, which are cast to the guideways E E. These set-screws G are for the purpose
75 of increasing or decreasing the tension of springs F.

F F are springs held in position, one at each end of the guideways E, by the lugs K, which are also cast solid to the guideways.

The function of springs F is to create a bearing between the end and center pins on
85 rocking bar D, which is necessary in order to throw that end of bar D (to which the connecting arm on A² is attached) up at the same time the pitman C' pulls the opposite end of bar D down; which will give momentum to
90 B², and cause B² to throw the crank pin on A² over the center, as the tension of the spring F will continue to press that end of bar D upward, to which the connecting arm of A² is attached until the pin on B² approaches its bottom center. Then, as the pitman moves bar D in the opposite direction,
95 the pin on A² will have passed its bottom center to a point where bar D will have sufficient purchase on the pin of A² to cause A²
100

to continue its motion, and throw the pin on B^2 over its bottom center, when both ends of bar D will have a purchase on both wheels, until the crank pins approach the top centers, where the top spring F will perform the same operation of assisting bar D in causing one pin to pass over the center in advance of the other. In applying this mechanism to a sewing machine, the advantage of having wheel A^2 constructed as described, lies in the fact, that no part of the mechanism is connected to the driving shaft, except the hub L, and as rim A' is loose on said hub, the rim A' and the rest of the mechanism cannot give momentum to the driving shaft until one of the dogs N on rim A' is adjusted, so that the end of the said dog will come in contact with the face of the notches in hub L.

If rim A' should move in the direction that would separate the end of the dog N adjusted from the face of the notch in L, the dog N would simply slip backward over the notches and L would remain unmoved.

By reference to Fig. 4, it will be apparent how the operator of a sewing machine can determine in which direction it is possible with this mechanism to give momentum to said machine, by the adjustment of either one of the dogs, as above described; and it is easy to determine which dog should be adjusted to come in contact with the notches on L, as described in order to start the machine in the desired direction.

A further advantage of my device over that of a crank in operating sewing machines lies in the fact, of the natural tendency of said cranks to stop near or directly on the centers, when it becomes necessary to start the belt wheel by hand, and as the location of the crank on sewing machines is such that its position is not apparent to the operator, it is now also necessary to start the machine by hand, in order to determine in which direction to move the treadle, in order to run the machine in the desired direction. With my device, it is not necessary to start the machine by hand, as it will always move in the desired direction, according to the adjustment of one of the dogs N, as above stated.

In applying this invention to a sewing machine, I prefer to have the guides and frame

cast solid together, but the style of frame used with this device will depend upon the purpose to which it is applied.

I I are gear-wheels of uniform diameter, and number and size of teeth. J represents the short shaft which holds one of said gear wheels in position. J' represents a driving shaft, which holds the other wheel I in position. H H are ordinary cranks attached to said shaft. This view is for the purpose of showing how the difficulty of dead centers could be overcome by connecting the arm C C to cranks H H. The same result of overcoming dead centers can be accomplished with the use of these gear wheels and cranks as is accomplished by connecting the arm C to the gear wheels themselves.

What I claim is—

1. In a machine for converting reciprocatory into rotary motion, the combination with the driving shaft and a short shaft, and the gear wheels A^2 and B^2 mounted on said shafts respectively; the wheel A^2 comprising the hub L, having notches at one side and the collar M at the other, and the rim A' ; dogs N N fastened to said rim, and the springs X X bearing on said dogs; of the guideways E E; the rocking bar D provided with a cross-head, moving in said guideways; the springs F F; the lugs K and set-screws G; arm C C, connecting the ends of the rocking bar to the wheels A^2 , B^2 ; the treadle O, and the pitman C' connecting said treadle to said rocking bar; substantially as shown and described.

2. In a machine for converting reciprocatory into rotary motion, the combination with the driving shaft and a short shaft, and the gear wheels A^2 and B^2 mounted on said shafts respectively; of the guideways E E; the rocking bar D provided with a cross-head, moving in said guideways; the springs F F; the lugs K and set-screws G; arm C C connecting the ends of the rocking bar D to the wheels A^2 , B^2 ; the treadle O and the pitman C' connecting said treadle to said rocking bar; substantially as shown and described.

Dated January 16, 1894.

DEXTER HAZARD.

In presence of—

A. M. HAZARD,
O. M. PARKER.