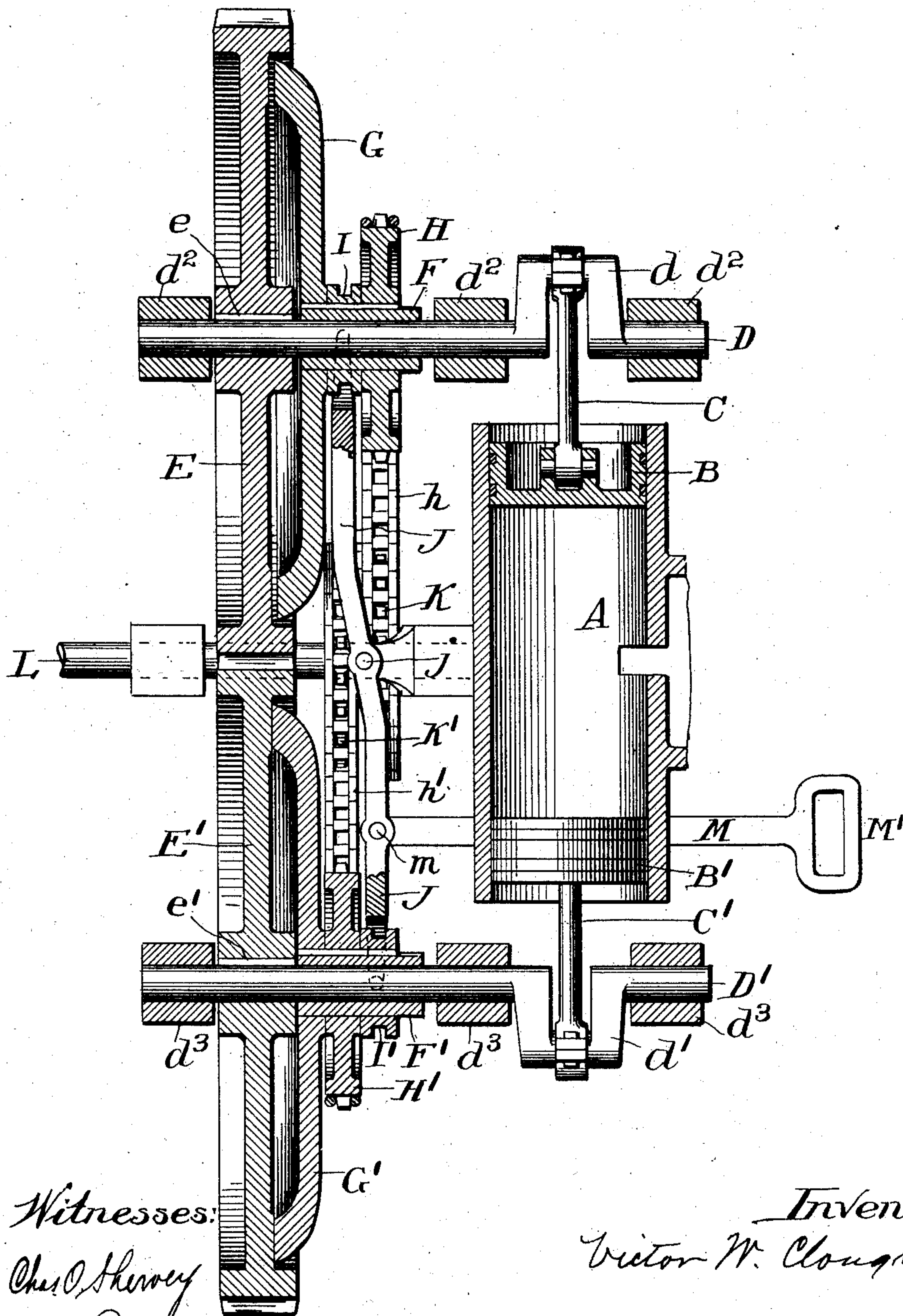


No. 706,637.

Patented Aug. 12, 1902.

V. W. CLOUGH.
REVERSING GEAR FOR ENGINES
(Application filed Mar. 3, 1902.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

VICTOR W. CLOUGH, OF GENESEO, ILLINOIS.

REVERSING-GEAR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 706,637, dated August 12, 1902.

Application filed March 3, 1902. Serial No. 96,517. (No model.)

To all whom it may concern:

Be it known that I, VICTOR W. CLOUGH, a citizen of the United States of America, residing at Geneseo, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Reversing-Gear for Engines, of which the following is a specification.

My invention relates to improvements in reversing-gear for engines, and its object is to produce a device preferably for use in connection with the style of engine herein shown, by which the direction of the driving force can be reversed instantly without jar to the driven parts without changing the direction of movement of the engine proper.

To this end my invention consists in certain novel features of construction which are shown in the accompanying drawing and fully set forth in the specification.

The drawing is a longitudinal section through the center line of the engine and reversing-gear, showing the shafts and pitmen in elevation.

Referring to the drawing, A is a cylinder in an engine having two pistons within it adapted to move in opposite directions at the same time, the ports of the cylinder not being shown. I am aware that this is not a particularly common form of engine, but many methods of constructing such an engine would at once occur to any person having any knowledge whatever of either steam or gas engines. It will be obvious that instead of this engine two engines, arranged back to back, may be used.

B B' are pistons which run in the cylinder A, and they are pivotally connected to pitmen C C', as shown. The pitmen C C' are connected to cranks $d d'$ of two shafts D D', these shafts being journaled in boxes $d^2 d^2$ $d^3 d^3$ $d^3 d^3$. It is obvious that motion of the pitmen C C' in opposite directions will rotate the shafts D D' also in opposite directions. Upon the shafts D D' are secured gears E E', keyed against rotation on the shaft by the keys $e e'$, these gears mutually engaging each other, as seen. This, it will be seen, secures synchronous motion of the two pistons in opposite directions and equalizes the force exerted by them.

Upon the shafts D D' are two loose collars F F', upon which are mounted friction-clutches G G', adapted to engage, respectively, the gears E E', sprocket-wheels H H', and grooved rings I I', adapted to receive the ends of a suitable shift-lever. This lever, which is designated by J, is pivoted at j upon any suitable support and is so arranged that motion of it in either direction about the pivot j will throw one of the friction-clutches into engagement with its gear, at the same time throwing the other clutch out of engagement with its gear. This will be readily understood by reference to the drawing. If, for instance, the lower end of the lever J is moved to the right, the clutch G' will be drawn away from the gear E', while the clutch G is thrown into engagement with the gear E. In other words, motion of the lever will release one of the rotatable collars F F' from engagement with the rotating gear, and thereby stop its rotation, and will at the same time throw the other rotating collar into engagement with its corresponding gear, and thereby start it in the opposite direction to that in which the first collar had been moving.

The sprocket-wheel H is connected by a suitable chain h to a sprocket-wheel K, mounted upon a shaft L, from which power may be taken. The sprocket-wheel H' is connected by a similar chain h' to a sprocket K' on the same shaft. The result of this is that whichever of the pulleys H H' is in engagement with its corresponding pinion at a given time will drive the shaft L in the same direction, which shaft will in turn drive the remaining sprocket, which at the time is loose, also in the same direction—that is, a shift of the connecting-lever J will reverse the motion of the driving-shaft L by releasing one of the sprockets H H' from its gear and at the same time setting up a driving force in the opposite direction upon the shaft from the other one of said sprockets.

The shifting of the position of the lever J is accomplished by the use of a push-lever M, pivoted to said lever at m and having a handle M'. It is obvious that pulling or pushing this lever will accomplish the reversing, as heretofore explained, of the shaft L.

The use of a friction-clutch in devices for

the reversing of driving-shafts is particularly advantageous, as it starts the reverse motion gradually and prevents jolting or jarring the driven machinery injuriously. The system
5 herein shown is an extremely efficacious and simple reversing-gear and accomplishes all the results which are desired in devices of this general sort.

I am aware that variations might be made
10 in the structure of this reversing-gear without in any way departing from the general principles involved, and I do not, therefore, intend to limit myself to the specific form herein set forth.

15 I claim as new and desire to secure by Letters Patent—

1. The combination with an engine having two pistons moving in opposite directions, two driven shafts suitably connected to said
20 pistons, gears on said shafts mutually engaging one another and a third suitably-journaled drive-shaft, of a sprocket mounted on each of said driven shafts, friction-clutches connected to said sprockets, suitable means
25 of connection between said sprockets and said driving-shaft and suitable means for throwing one of said friction-clutches into engagement with the gear upon its shaft and the other friction-clutch out of engagement
30 with the gear upon its shaft at the same time; substantially as described.

2. In a device of the class described, the combination with an engine having two gears
35 moving synchronously in opposite directions, two shafts suitably connected to said gears, means of engagement between said shafts, whereby they are made to move synchronously in opposite directions and a suitably-journaled driving-shaft, of suitable gears
40 loose upon said driven shafts, means of connection between said gears and said driving-shaft, and means for throwing either of said gears into engagement with its own shaft and at the same time releasing the other of them

from similar engagement, substantially as 45 described.

3. In a device of the class described, the combination with an engine having two pistons moving synchronously in opposite directions, two driven shafts suitably connected 50 to said pistons, gears upon said shafts mutually engaging each other, and adapted to cause them to move synchronously in opposite directions and a third suitably-journaled driving-shaft, of loose collars upon said 55 driven shafts, a friction-clutch adapted to engage its corresponding gear, a suitable sprocket-wheel and a grooved ring secured to each of said collars, a suitably-pivoted lever engaging both of said grooved rings and 60 adapted to move said collars at the same time in opposite directions, suitable sprockets rigidly secured to said driving-shaft, and suitable means of connection between the sprockets mounted upon the collars and the 65 sprockets mounted upon the driving-shaft; substantially as described.

4. In a device of the class described, the combination with two oppositely-driven shafts, gears thereon mutually engaging each 70 other, and a suitably-journaled driving-shaft, of sprockets loosely mounted on each of said driven shafts, means of connection between said sprockets and said driving-shaft, and means whereby either of said 75 sprockets may be thrown into engagement with the shaft on which it is mounted, the other sprocket being at the same time released from similar engagement with its shaft; substantially as described. 80

In witness whereof I have hereunto set my hand, at Geneseo, in the county of Henry and State of Illinois, this 17th day of February, A. D. 1902.

VICTOR W. CLOUGH.

Witnesses:

HARRY E. BROWN,
C. C. MARTIN.