

R. SCHEIDLER.

REVERSING MECHANISM FOR ENGINES.

No. 311,921.

Patented Feb. 10, 1885.

Fig 1

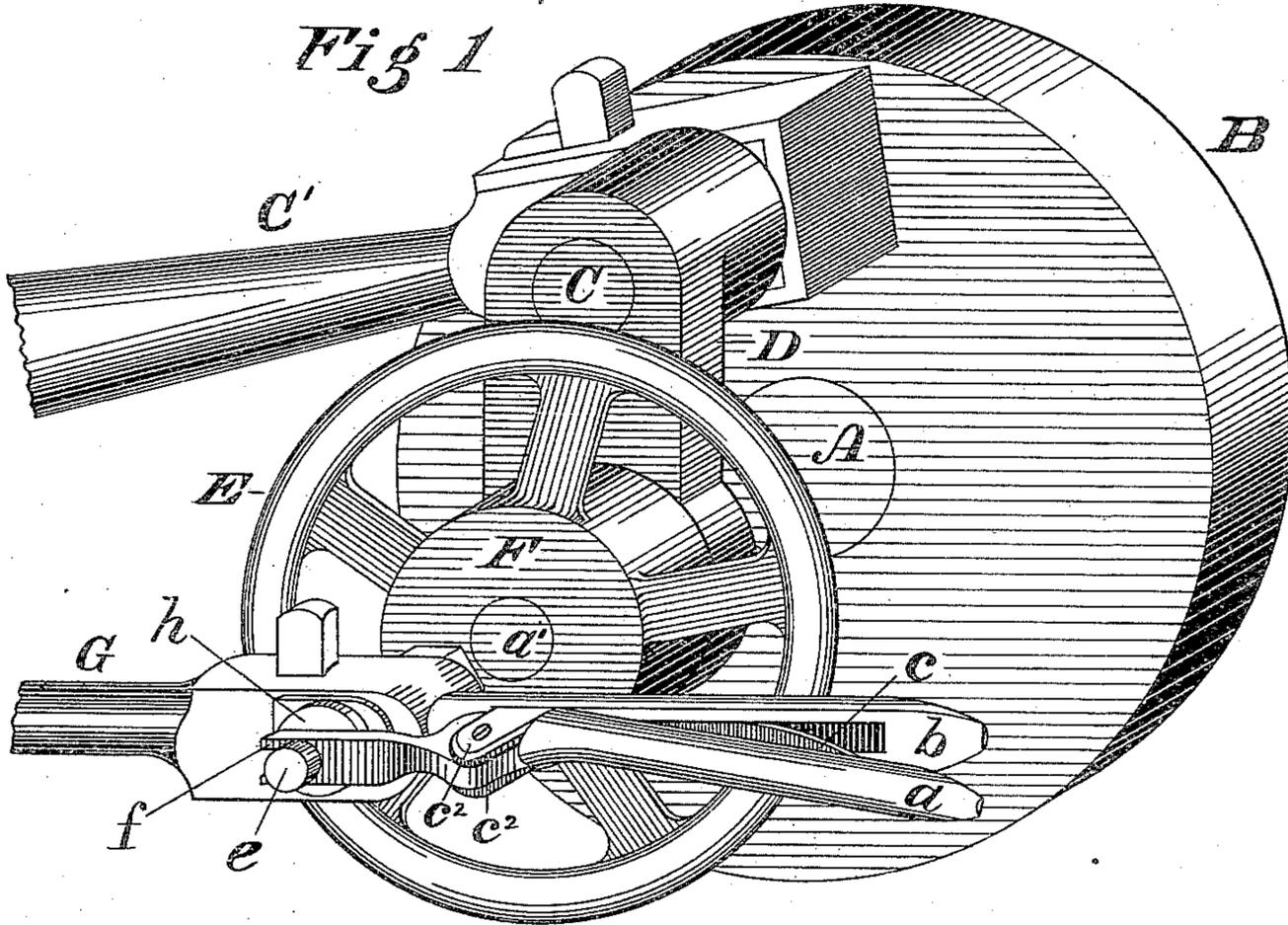
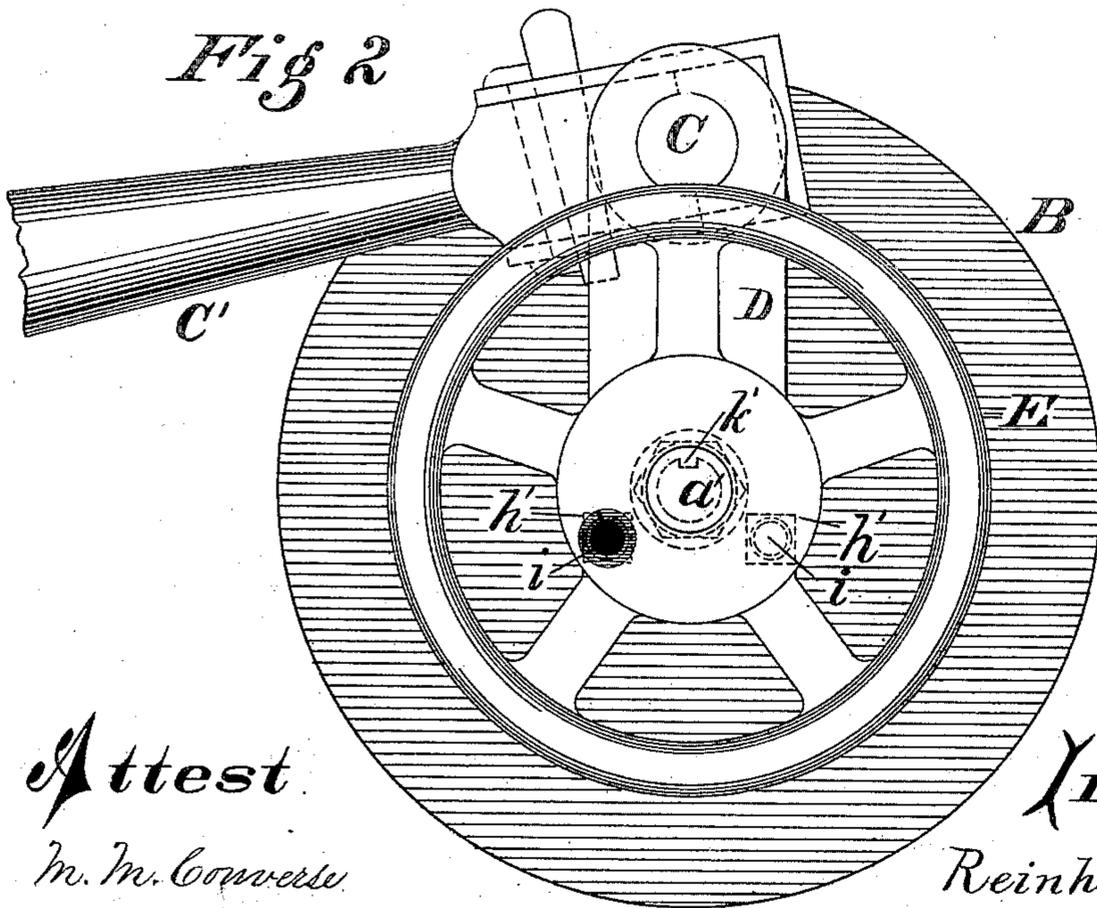


Fig 2



Attest

M. M. Converse  
Collin Ford, Jr.

Inventor

Reinhard Scheidler  
B. C. Converse, Atty

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Fig 3

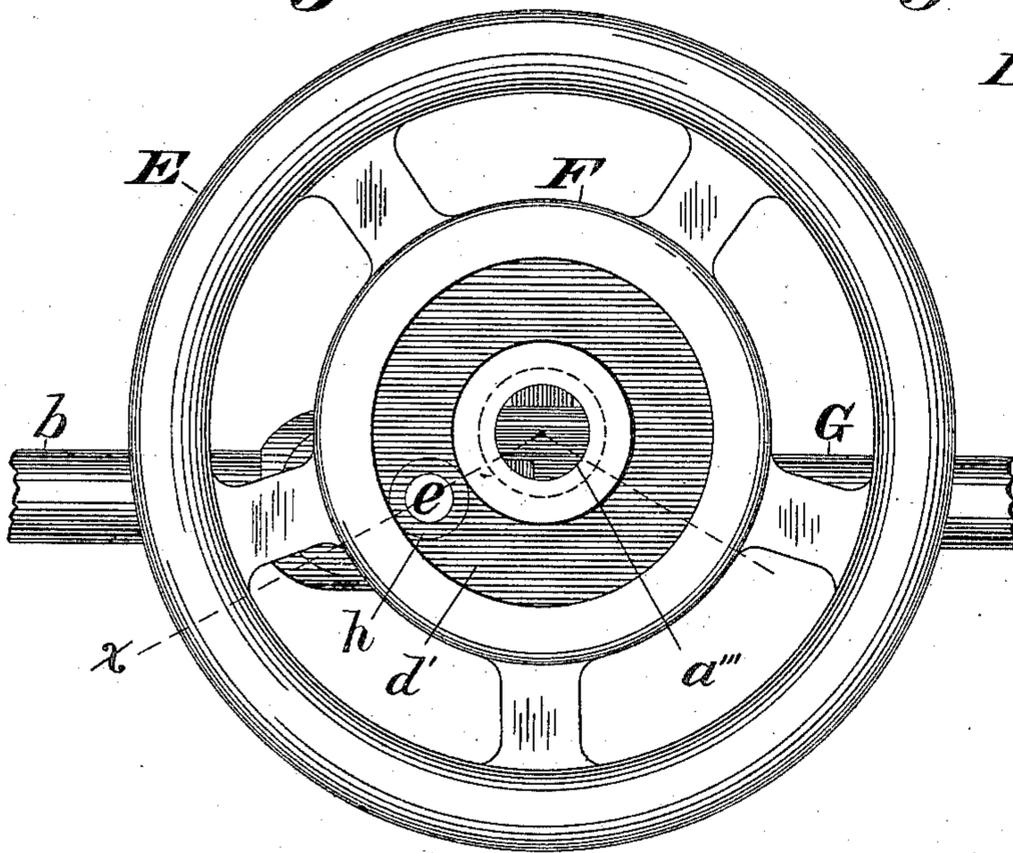


Fig 4

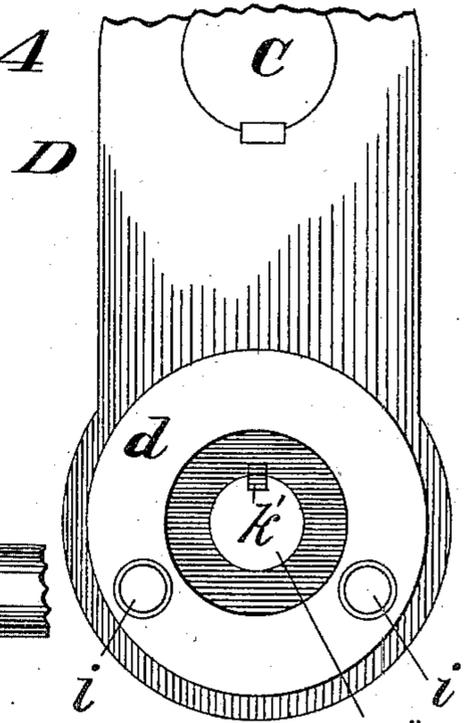


Fig 5

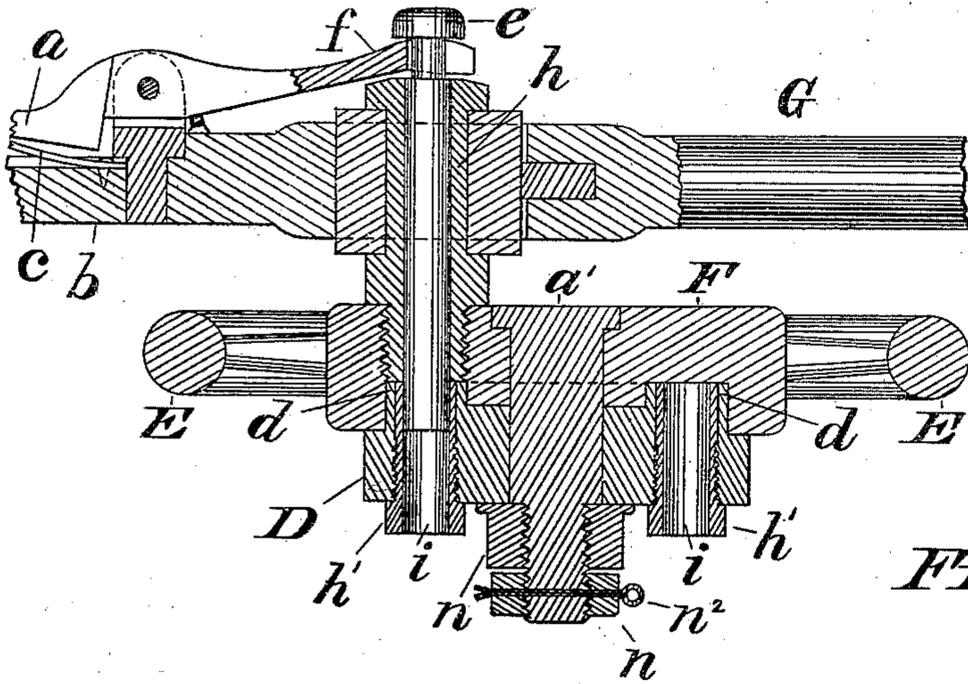


Fig 6

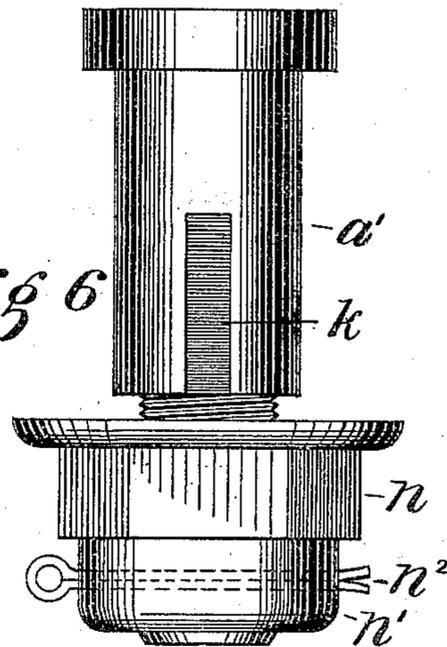
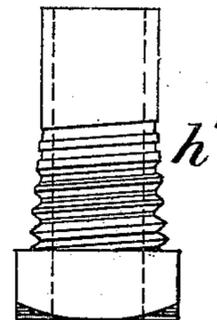


Fig 7



Attest

W. M. Converse  
Collin Ford Jr.

Inventor

Reinhard Scheidler  
B. Converse Atty.

# UNITED STATES PATENT OFFICE.

REINHARD SCHEIDLER, OF NEWARK, OHIO.

## REVERSING MECHANISM FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 311,921, dated February 10, 1885.

Application filed September 17, 1884. (Model.)

*To all whom it may concern:*

Be it known that I, REINHARD SCHEIDLER, a citizen of the United States, residing at Newark, in the county of Licking and State of Ohio, have invented certain new and useful Improvements in Reversing Mechanism for Engines; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in reversing devices for engines, the object being to dispense with the complicated and expensive link-motion, and the single and double eccentric gearings connected with the main shaft for this purpose. This device differs from those heretofore used as substitutes for the gearing before mentioned, in not being applied directly to the main shaft or to an eccentric on the latter, but is connected with and forms a part of the free end of the crank and its connection with the valve-rod. The free end of the crank, instead of the usual boss, has an elevated annulus encircling the center pin, with two holes therein equidistant from the center, and on the outside of this and engaging therewith is a hand-wheel with an annular recess in the hub of the same, which engages with the elevated annulus on the crank when the two parts are put together. The hand-wheel is used to throw the valve from one port over the other in reversing, the same as a hand-lever attached to the valve-rod in a locomotive-engine. The center pin is rigidly secured in the crank, and the hand-wheel is pivoted thereon, so as to turn freely in reversing the motion of the crank. The valve-rod is pivoted upon a hollow wrist-pin, which latter extends through the hub of the hand-wheel. A loosely-fitted pin extends through the wrist-pin of the valve-rod at a point over the recess and annulus, and engages alternately with holes in thimbles in the annulus when reversing the crank. These holes are at the proper relative distance from the center (on each side of the latter) to give the required throw to the valve. A spring-lever on the end of the valve-rod, operated by hand, is

used as means to raise the loose pin out of each hole to allow it to engage the other in reversing the motion.

Figure 1 is a perspective view of the crank-wheel end of the main shaft of an engine with valve-rod connection in which my improvement is embodied. Fig. 2 is a side elevation of the same with the valve-rod and its wrist-pin removed. Fig. 3 is a side elevation of the reverse side of the hand-wheel and valve-rod, and shows the annular recess in the hub of the same. Fig. 4 is an end elevation of the crank with the hand-wheel removed. The elevated annulus which engages with the recess in the latter is shown in this figure. Fig. 5 is a section of the valve-rod and hand-wheel with the crank cut through line  $x$ , Fig. 3, to show the holes in the latter and their relation to the engaging-pin. Fig. 6 is an elevation of the center pin and nuts enlarged. Fig. 7 is an elevation of one of the steel bushes which form the holes in the crank.

A is the main shaft; B, the crank-wheel on the end of the same. C is the crank pin or wrist connecting the end of the pitman-rod C' thereto. D is the crank, and on the outside of the free end of this, concentric with the hole  $a''$ , (for the center pin,) is turned an elevated annulus,  $d$ , as seen in Fig. 4. Over this part of the crank the hub F of the hand-wheel E is fitted, the latter having a circular recess,  $d'$ , therein with which the annulus  $d$  engages. These parts are held together by the center pin,  $a'$ , upon which the hand-wheel E is pivoted.

The hub F is counterbored for the head of the center pin, and the latter has a keyway,  $k$ , cut therein, which, when the pin is inserted in the hole  $a''$ , engages with a fixed key,  $k'$ , in the latter and prevents the pin from turning. The center pin is made long enough to project beyond the crank, the projecting part being reduced in diameter and threaded and provided with a movable and a stationary nut,  $n$  and  $n'$ . The latter is fastened diametrically on the end of the center pin by a split pin,  $n^2$ , as seen in Fig. 6. The shoulder on the center pin is intended not to be quite flush with the outside of the crank, so as to allow nut  $n$  to be used for adjustment to take up any wear and to clamp the hub F and the crank tightly together when the motion of the engine is

continuous in one direction for a length of time, thus preventing undue strain on the loose pin *e*. The wrist-pin *h*, on which the end of the valve-rod *G* is pivoted, has a hole 5 bored through it from end to end of even diameter throughout, and in this is fitted the long steel pin *e*. The inner end of *h* is threaded and screwed into the hub *F* down to the shoulder over the recess *d'*, its end being flush 10 with the bottom of the latter, so that when the hand-wheel is rotated on its center pin, *a'*, the inner end of the loose pin *e* slides around on the top of the annulus *d* on the crank *D*, and through the crank in the line of the annulus are bored two holes at the proper relative distance from the center of the pin *a'* (one 15 on each side of the latter) for the throw of the valve from port to port, which may be attached to rod *G*. These holes are bored tapering from the inner side of the crank outward, (in the direction of the hand-wheel hub,) their axial lines being parallel with that of the pin *a'*. Into each of these holes is fitted a long tapering threaded steel bush or thimble, 20 *h'*, having a straight hole, *i*, therein of corresponding size with the loose sliding pin *e*, which is seen engaged with the hole *i* in the bush *h'* on the left in Fig. 5. The pin *e* is grooved circumferentially below the head for the fork *f* on the end of the spring-lever *a*, which loosely straddles the pin *e* at this point. 30

Extending from the pivoted end of rod *G*, and in line therewith, is a fixed piece, *b*, which forms, in connection with the loosely-pivoted section *a*, a handle for operating the pin *e*. 35 Ears *c*<sup>2</sup> *c*<sup>2</sup> project laterally outward from the fixed part *b*, and between these is pivoted the spring-lever *a*, near the middle of the same. This lever is slightly bent near its pivotal 40 point to allow its handle part to remain elevated by means of the spring *c*, this latter being a flat steel spring bent in the form used in latch-levers. A groove in the fixed part *b* allows the spring to fall therein when the latch-lever is operated. 45

It will be noticed by reference to the figures that when the lever *a* is pressed toward *b* the pin *e* is elevated until it is clear of the top of the annulus *d*. This can easily be performed 50 by the hand while the engine is running. To reverse the motion of the crank *D*, the pin *e* is raised out of the hole *i* in the thimble *h'* on the left, Figs. 2 and 5, by the operator grasping spring-handles *a* *b* and pressing them together, and at the same time holding the wheel *E* from turning, until the crank travels far enough to allow the pin *e* to drop into the hole *i* in the thimble *h'* on the right, when the motion of the crank *D* is reversed, and it rotates in the opposite direction. The thimbles 60 or bushes *h'* *h'* are made tapering, and are threaded about one-half their length from the head, in order to secure them firmly in the crank. These bushes are made with either a square or hexagonal head to allow them to be 65 screwed to their places by means of a wrench. They are in this way made detachable, and

when worn can be readily replaced by others. They are of steel and thoroughly hardened. The end of pin *e* being in the same orbital line 70 with the holes *i* in the annulus, it engages quickly with the hole *i* in either bush when reversed. The pressure of spring *c* against the pivoted lever *a* causes the pin *e* to be held against the top surface of the annulus *d* until 75 the hole *i* registers with the pin, when the engagement is instantly and certainly made.

In this device the parts are few, simple, and inexpensive, and can be readily applied upon any engine in which a crank-motion is used. 80

I claim as my invention—

1. In a reversing device for engines, the combination of the crank provided with the steel-bushed holes, the center pin, an annulus 85 formed on said crank concentric with the latter, the pivoted hand-wheel provided with a channel in the hub of the same engaging said annulus, the hollow wrist-pin, the valve-rod connected therewith, the loosely-fitted pin extending through said wrist-pin adapted to engage 90 said steel-bushed holes in the crank, and the pivoted spring-lever on said valve-rod engaging said loosely-fitted pin, and adapted to operate the same, as set forth.

2. In a reversing device for engines of the class described, the combination of the main shaft, the crank-wheel, the crank, a center pin in the free end of the latter, a wheel pivoted thereon, with a tongue-and-groove connection between the hub of the latter and the 100 crank concentric with said center pin, the steel bushes in said crank, the valve-rod, the hollow wrist-pin on which the latter is pivoted, the loosely-fitted pin extending through said wrist-pin, and means for operating the 105 latter by which it is disengaged from one of said bushes and caused to engage with the hole in the other in reversing the motion of said crank and shaft, as set forth.

3. In a reversing device for engines of the class described, the combination, with the 110 crank-wheel, of a crank provided with the two holes in the free end of the same, a fixed center pin in the latter, an annulus concentric with said center pin formed on said crank, 115 the holes in the latter being in the line of said annulus, a hand-wheel pivoted on said center pin, having a channel concentric with the latter in the hub of the same engaging the annulus on the crank, a hollow wrist-pin, the 120 valve-rod pivoted upon the latter, the loosely-fitted pin extending through said hollow wrist-pin and operated therein, and the spring-lever pivotally attached to the extension of said valve-rod, having a fork end engaging a circumferential groove in said loosely-fitted pin 125 and adapted to operate the latter, substantially as set forth.

4. In a reversing device for engines, the combination, with the crank-wheel, of a crank 130 having a hand-wheel pivoted on the free end of the same, said crank being provided with two holes at the proper relative distance for the throw of the valve from the center pin of

the same, detachable steel bushes inserted in said holes, the hollow wrist-pin attached to said pivoted hand-wheel, the loosely-fitted pin therein circumferentially grooved below the head, the valve-rod pivotally connected with the latter and provided with an extended part in line therewith, and the pivoted spring-lever attached to said extended part, its fork end engaging the circumferential groove in said loosely-fitted pin, and adapted to disengage the latter from one of the bush-holes in the crank to allow it to engage the other as the latter is partially rotated, for the purpose set forth.

5. In combination, the crank provided with the annulus on the free end of the same concentric with its center, a hole in said annulus on either side of the latter, said holes being at points embracing about one-third the circumference of said annulus, and in a separate horizontal plane from the axial line of the center pin, the hand-wheel with a circular recess in the hub of the same engaging said annulus, the center pin connecting said hand-wheel and crank together and pivoting the former upon the latter, the hollow wrist-pin, the valve-rod, the loose-sliding pin within said wrist-pin, and means for operating the same, whereby it is disengaged from one hole in the annulus and engaged with the other to reverse the motion of the engine, substantially as set forth.

6. The combination of the crank provided with an annulus and holes therein at the proper relative distance from the center and from

each other, the hand-wheel having a circular recess engaging said annulus and pivoted to said crank, the hollow wrist-pin, the valve-rod pivoted thereto, the sliding pin within said wrist-pin, and means for operating the same, whereby it is engaged and disengaged alternately with the holes in said crank in reversing the motion of the engine, substantially as set forth.

7. The combination, with the valve-rod, the reversing devices, and the crank, of the hand-wheel pivoted on the latter and adapted to be used as means for operating said valve-rod to throw the valve from one port over the other in starting the engine, as set forth.

8. The combination, with the crank, the hand-wheel, and the engaging and disengaging devices for reversing the motion, of the center pin, and means for adjusting the same, substantially as and for the purpose hereinbefore set forth.

9. In a device for reversing motion, the combination, with the crank having threaded holes therein, and the sliding pin, of the detachable tapering threaded bush-pins of hardened steel inserted in said holes, as and for the purpose hereinbefore set forth.

In testimony whereof I affix my signature in presence of two witnesses.

REINHARD SCHEIDLER.

Witnesses:

B. C. CONVERSE,  
COLLIN FORD, Jr.