

(No Model.)

J. S. DAVIS.
DOUBLE CRANK.

No. 306,591.

Patented Oct. 14, 1884.

Fig. 1.

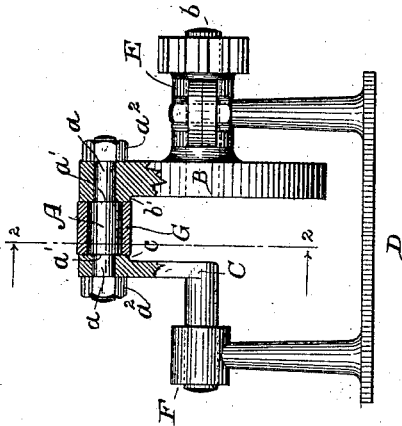


Fig. 2.

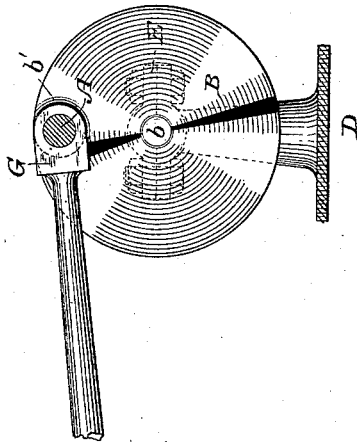
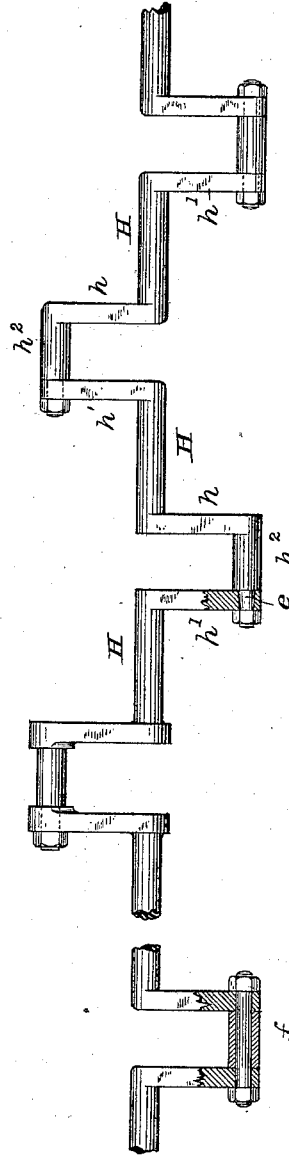


Fig. 3.



Witnesses

W. J. Bellamy
Henry A. Lamb

Inventor

John S. Davis

By his Attorneys

Jannus & Shunk

UNITED STATES PATENT OFFICE

JOHN S. DAVIS, OF TOLEDO, OHIO.

DOUBLE CRANK.

SPECIFICATION forming part of Letters Patent No. 306,591, dated October 14, 1884.

Application filed August 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. DAVIS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Double Cranks, of which the following is a specification, reference being had to the accompanying drawings.

In mechanism where a rotary is converted into a reciprocating motion, or vice versa, through the agency of a crank and pitman, the operation of the double crank possesses well-known advantages over the single. By the crank-shaft having a bearing on each side of the crank, greater smoothness and accuracy of motion are obtained and the tendency to twist or spring the wrist-pin with its resultant unequal strain and wear is obviated. In mechanism of this character where cheap and durable construction are desired, and especially where very high speed is used, a solid-head pitman is preferred—*i. e.*, one in which the aperture embracing the wrist or crank pin is bored through the solid material of the head, instead of having the head made up of several detachable parts, whereby it may be readily removed from the crank-pin. Pitmen of the latter class require to be nicely fitted, making them expensive, and in high-speed machines they are subjected to strains and shocks which soon loosen the parts, calling for constant attention and setting up. Double cranks as heretofore constructed have been solidly connected with the crank-pins, either by being forged integral therewith or by having the crank-pins riveted at each end into the crank-arms, either construction producing a solid crank, to which the pitman could only be applied by having the detachable head.

My invention has for its object the construction of a double crank by which the advantages of both the double crank and the solid-head pitman may be obtained; and to this end I secure the crank-pin in one or both the arms or disks of the crank in such a manner that it may readily be detached therefrom and the pitman slipped on or off, as desired.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a double crank embodying my improvements. Fig. 2 is an elevation of the same, partly in section,

on the line 2 2 of Fig. 1. Fig. 3 is a view, partly in elevation and partly in section, showing how my improvement may be employed in the production of a crank-shaft having a series of double cranks in its length.

In Figs. 1 and 2 I show my invention as applied to the crank-disk of a harvester cutting apparatus. The crank-pin A is turned down at each end, forming trunnions *a* (which are threaded at their ends for the reception of screw-nuts *a'*) and shoulders *a'*, against which the crank-arms are clamped. The crank plate, disk, or arm B, suitably mounted upon or formed with the shaft or journal *b*, has a boss, *b'*, which is faced off while the disk is centered in the lathe for turning up the shaft. The crank C, which may be of cast or forged metal, is similarly turned and faced upon its journal and boss *c*. Holes of such a diameter as to give a tight fit to the tenons *a* of the crank-pin are then drilled in each arm. The tenon ends of the pin are inserted therein and the nuts screwed up tightly, thus forming a cheap double crank, which is durable and strong, and at the same time easily separable, to admit of placing or removing a solid-head pitman, G.

The supporting-frame D, with its two boxes, E and F, is cast in one piece, the boxes being far enough apart to admit of the arm C being detached from the crank-pin by simply removing its clamping-nut and slipping it back in its box to move it off the tenon *a*. This obviates the necessity for removing the shaft from the journal-boxes when taking out the pitman G.

The tenons may be made slightly tapering where they pass through the crank-arms, as shown at *e*, Fig. 3, with very good effect.

Fig. 3 is an illustration of the manner in which I can produce a series or multiple crank-shaft of any length or number of double cranks, every one of which may be readily detached, as before described.

At *f*, Fig. 3, is shown another way of forming the crank-pin, which will be readily understood on inspection. According to this method the crank-shaft is built up of sections H, of any desired length, each of which is provided with a crank-arm, *h*, formed with a wrist-pin, *h'*, integral therewith, and a crank-

arm, *h'*, formed with an aperture, to receive the end of the wrist-pin of the adjoining section.

5 The blank H, as described, may be either cast or forged, and the arms placed at any required angle to each other, to produce a multiple crank with crank-pins at any desired radial angle at very much reduced expense.

What I claim is—

10 1. A crank-pin for a double crank, the wrist or pitman seat of which is its largest diameter, and is of equal diameter throughout its length, the ends being reduced to form tenons, upon which the crank-arms are placed, and shoulders
15 15 against which the arms are clamped by screw-nuts on the end of the tenons, substantially as hereinbefore described.

2. The combination of a pair of crank-arms with a removable wrist-pin, the pitman seat
20 20 or wrist of which is its largest diameter, said pin being formed with reduced tenon ends, upon which said crank-arms are placed, and shoulders against which they are clamped by screw-nuts on the ends of the tenons forming a separable double crank, substantially as hereinbefore set forth.

3. The combination of a pair of crank-arms with a removable crank-pin, the pitman seat
30 30 or wrist of which is its greatest diameter, and is of equal diameter throughout its length, its

ends being reduced to form tenons upon which said crank-arms are placed and clamped in position by screw-nuts on the ends of the tenons, forming a separable double crank, substantially as hereinbefore set forth. 35

4. The combination of a crank arm and pin, the pitman seat or wrist of which is its largest diameter, with a solid bearing-box or pitman-head mounted thereon, and a second crank-arm rigidly clamped by screw-nut upon the reduced tenon of said pin, and adapted to support its outer end but detachable therefrom to permit of the removal of the pitman-head, substantially as hereinbefore set forth. 40

5. The combination of a crank-arm and pin with a solid bearing-box or pitman-head mounted thereon, and a second crank-arm rigidly clamped by screw-nuts upon the reduced tenon of said pin, and adapted to support its outer end but detachable therefrom, the shaft end of the second crank being movable laterally in its bearings to disengage the crank from the pin to permit of the removal of the pitman-head, substantially as described. 45 50

In testimony whereof I affix my signature in presence of two witnesses. 55

JOHN S. DAVIS.

Witnesses:

J. H. SOUTHARD,
CARRIE T. WALES.