J. DRONSFIELD.

DETACHABLE JACK FOR ROTATING SHAFTS.

APPLICATION FILED MAY 26, 1915.

1,193,246.

Patented Aug. 1, 1916.

5 SHEETS—SHEET 1.

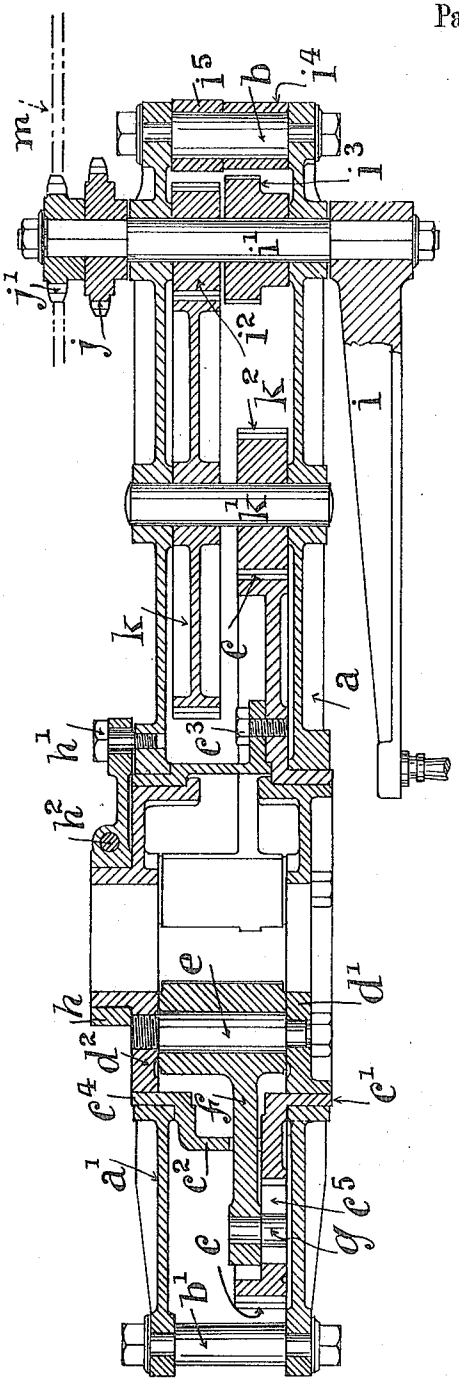


FIG. 1.

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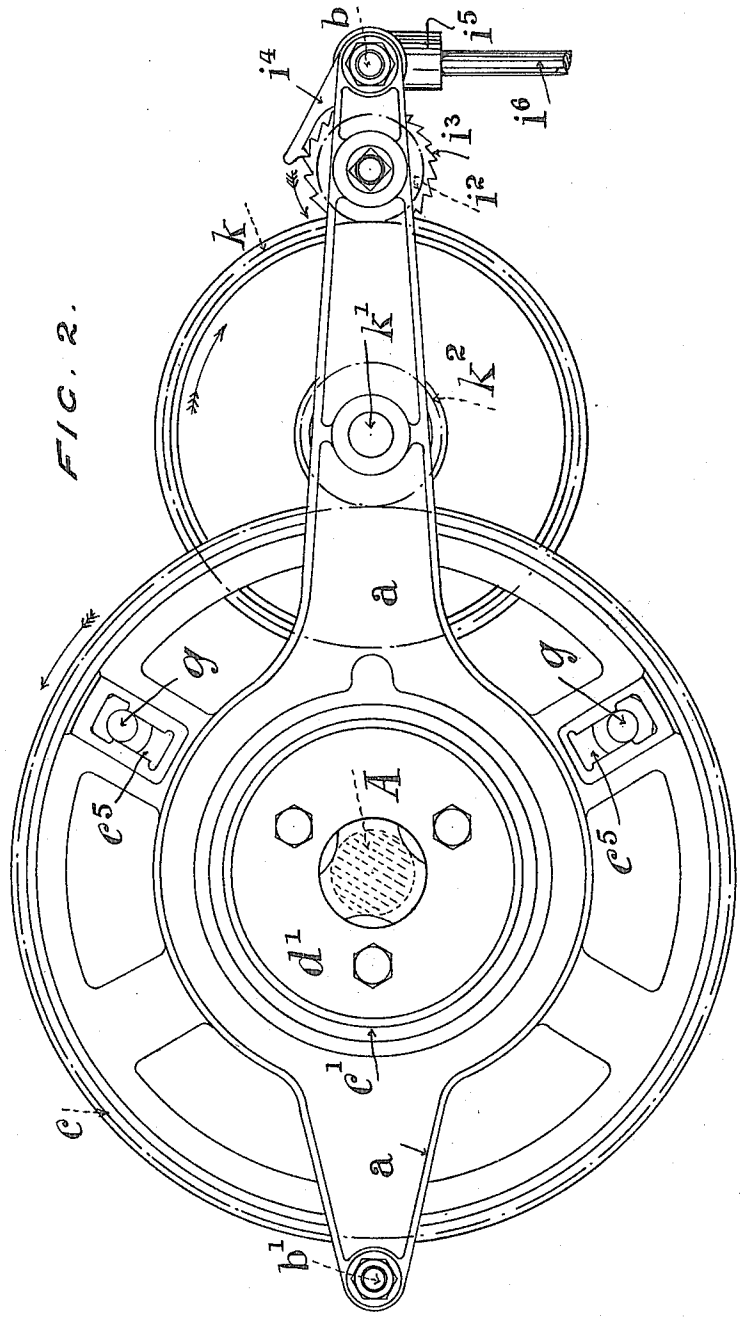
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5 SHEETS—SHEET 2.

FIG. 2.



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5 SHEETS—SHEET 3.

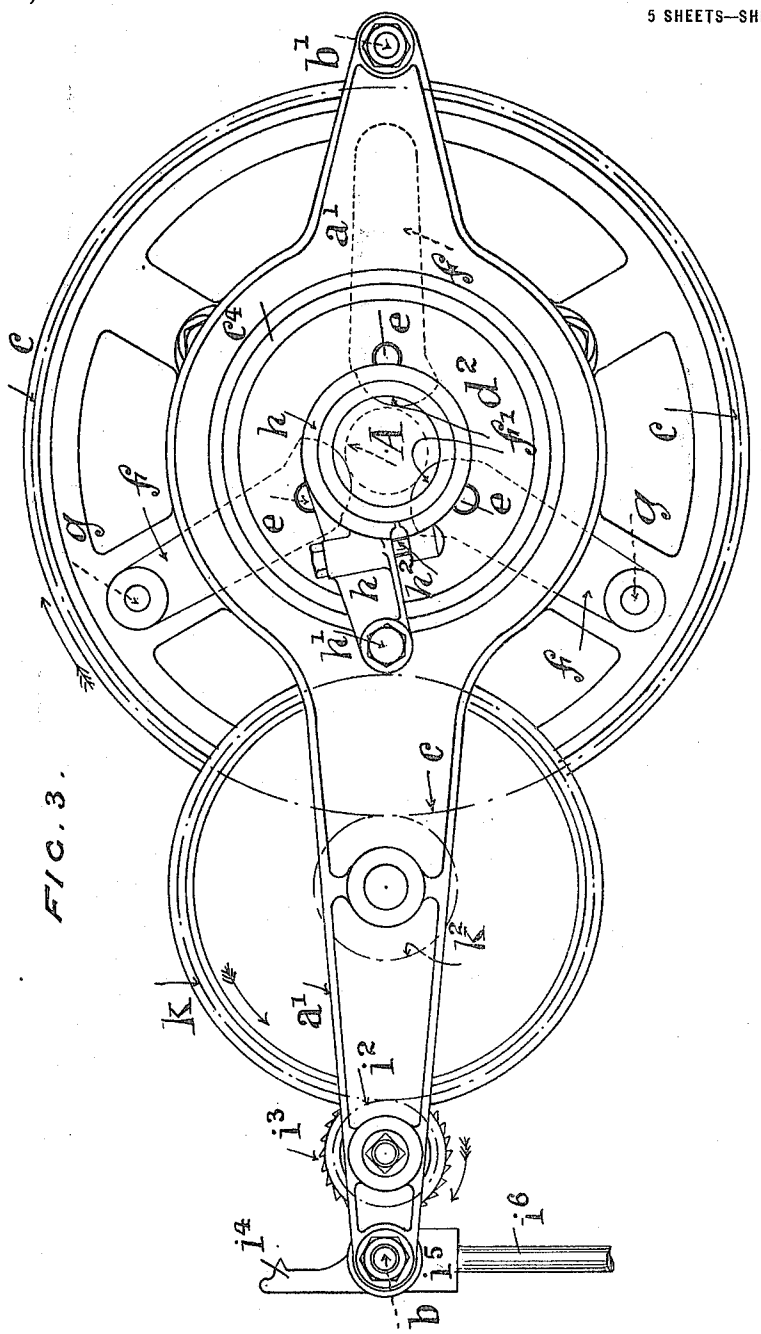


FIG. 3.

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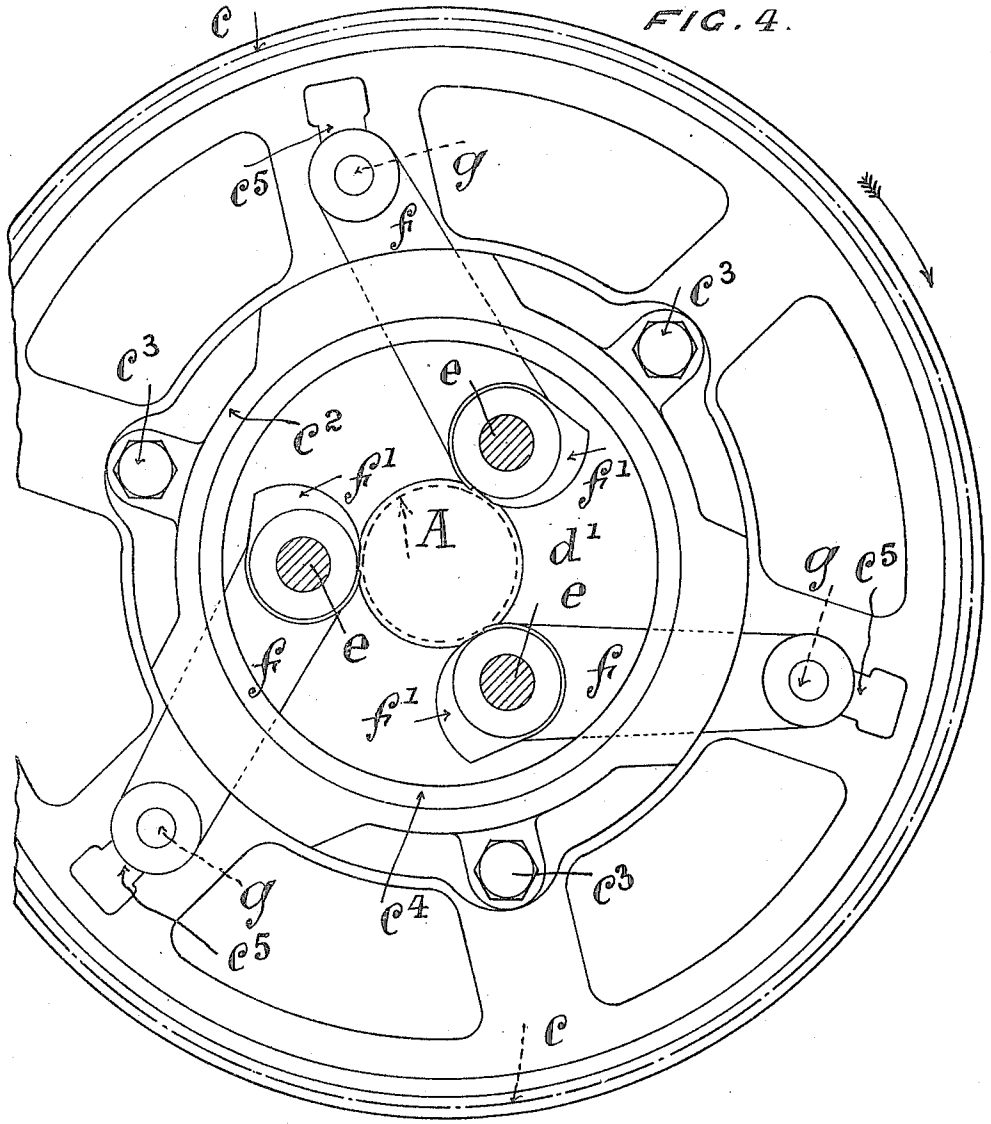
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5 SHEETS—SHEET 4.

FIG. 4.



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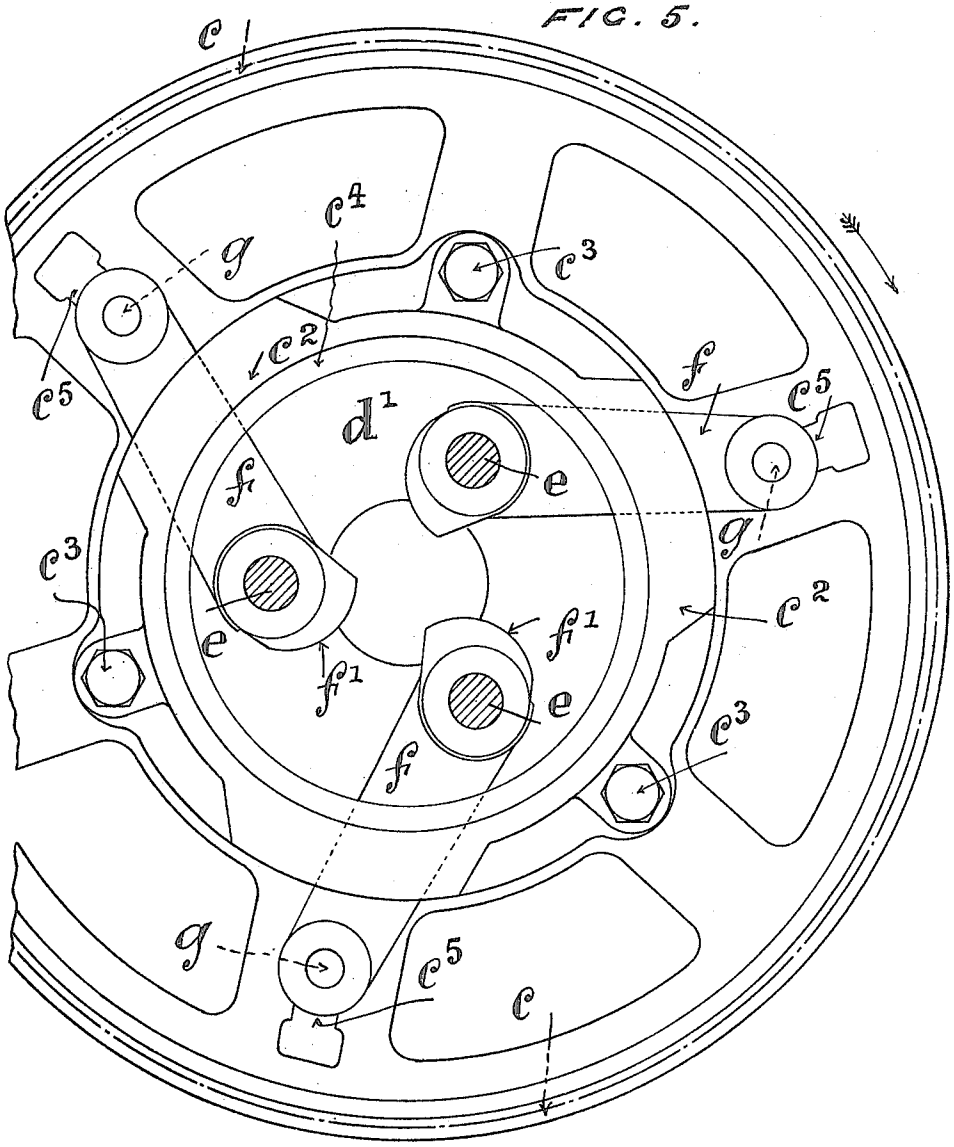
APPLICATION FILED MAY 26, 1915.

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Patented Aug. 1, 1916.

5 SHEETS—SHEET 5.

FIG. 5.



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UNITED STATES PATENT OFFICE.

JAMES DRONSFIELD, OF OLDHAM, ENGLAND.

DETACHABLE JACK FOR ROTATING SHAFTS.

1,193,246. Specification of Letters Patent. Patented Aug. 1, 1916.

Application filed May 26, 1915. Serial No. 30,561.

To all whom it may concern:

Be it known that I, JAMES DRONSFIELD, a subject of the King of Great Britain and Ireland, residing at Atlas Works, Oldham, in the county of Lancaster, England, have invented new and useful Improvements in Detachable Jacks for Rotating Shafts, of which the following is a specification.

This invention relates to an improved "jack" or readily attachable and detachable driving arrangement for use in connection with card-mounting or filleting wrapping or winding-on and such like machines, and, by which the doffer, cylinder, or such like and the tension mechanism can be readily driven by hand.

The combination is such that the complete "jack" will fit shafts of various diameters and will automatically adapt itself for fitting or release without the use of any loose parts or the making of any changes in the combination. When the "jack" is applied and the actuating handle turned in one direction, the "jack" is, by the mere turning, automatically clamped or clutched upon the shaft and with continued actuation the shaft, &c., will be driven. By turning the handle in the opposite direction, the clamping or clutching effect ceases and the "jack" is released and ready for lifting away.

The attached drawings clearly illustrate the preferred construction of my improved "jack" or readily attachable and detachable driving arrangement for the indicated purpose.

In the said drawings:—Figure 1 shows a sectional plan view of the complete contrivance ready for application. Fig. 2 is a front elevation of the contrivance, but with the actuating handle omitted. Fig. 3 is a back view, the small chain wheels seen in Fig. 1 not being shown. Fig. 4 shows an enlarged detail rear view of the main spur wheel, with the back fulcrum plate omitted, and the cam levers in such position as to give the maximum amount of jaw opening. Fig. 5 also shows a further detail rear view of the main spur wheel with the back fulcrum plate omitted, but with the cam levers contracted in the shaft opening or in such a position as represents the minimum amount of jaw opening obtainable.

Referring to the construction illustrated, I utilize two stout elongated brackets a a', which are suitably bored and fashioned as shown and are connected together by studs or distance pieces b b', so shaped as to rigidly connect or tie said elongated brackets a a' a suitable distance apart. Such elongated brackets a, a' are adapted to support between their inner walls the necessary spur wheels. There is a main or large spur wheel c having a turned front boss c' and a rear sleeve like extension c^2 fixed by studs c^3, the said sleeve like extension having a turned portion c^4. The turned portions c' and c^4 find each a bearing between the bored portions of the brackets a, a', and the turned front and back fulcrum plates d', d^2, which fulcrum plates are bored to fit or pass over the largest diameter of shaft to which the "jack" is applicable. Between such fulcrum plates d', d^2, fulcrum studs e are introduced which separate and stay the fulcrum plates and serve each as a fulcrum to a cam lever f. I show in the drawings three such cam levers f each having a long arm and a cam shaped short arm f'. Each long arm of the three cam levers f carries a pin or bowl g, each pin fitting an elongated slot c^5 most conveniently formed in each of the three main arms of the large spur wheel c. To the rear fulcrum plate d^2 is fitted a clamp or clip h, one extremity or arm of which is attached at h' to the main rear bracket a', and whereby the two fulcrum plates are frictionally anchored. Such clamp or clip h is tightened upon the turned extension of the rear fulcrum plate by a bolt and nut such as h^2.

The main spur wheel c is driven through suitable gear from a hand-lever or turning device. I show a hand-lever i mounted on a short shaft i' finding bearings in the two main brackets a, a', and this shaft carries the chain wheels for driving the tension motion. Two such chain wheels j j' are shown, it being understood that a suitable pitch chain is engaged with one or the other chain wheel j, j', in usual manner, in order to traverse the tension motion and according to the width of the filleting being dealt with as is well understood.

Likewise upon the shaft i' I apply a spur wheel i^2 which gears with a larger spur wheel k. This larger spur wheel k is mounted on a shaft k' finding bearings in the main brackets a and a', and, said shaft k' also carries a small spur wheel k^2 gearing with the main spur wheel c revoluble about the fulcrum plates. In this manner, the main spur wheel c is driven from the hand-lever i. On

the hand-lever shaft i' I fit a ratchet wheel i^3 and I provide a disengageable pawl i^4 to work with such ratchet wheel i^3 to normally check backward rotation. This pawl i^4 can be neatly carried on the stud b which also supports a socket i^5 for an upright or clutch i^6 the latter being adjusted in length to engage the floor to support the complete contrivance in an approximately horizontal position when the contrivance is applied to a doffer or cylinder shaft.

It is seen that a slight left hand rotation of the main spur wheel c Figs. 3, 4 and 5 (with the pawl i^4 disengaged) will retract the curved or clutching portions f' of the cam levers f, and, in applying the "jack," the same is lifted or pushed into place with such curved portions retracted (see Fig. 4). The vertical upright i^6 is then adjusted, and the hand lever i turned in the same direction as the cylinder is to rotate or an anti-clockwise direction, the movement of the hand-lever at once acting (through the gear wheels i^2, k, k^2, c) on the cam levers f and causing the curved portions f' to bind on and clutch the shaft of the doffer or cylinder (indicated by the dotted lines A Fig. 2) thus locking the "jack" in place. The ratchet pawl i^4 is engaged with the ratchet wheel i^3 and the chain m for the tension motion is engaged with one or other of the chain wheels j, j'. Thereafter, continued actuation of the hand-lever i in an anti-clockwise direction or the same direction as the cylinder is to rotate, effects rotation of the shaft of the doffer or cylinder; also the tension motion is driven as is obvious.

When winding or mounting is completed, the pawl i^4 is disengaged, and thereupon by turning the hand-lever i in the reverse direction or to the right, the "jack" is at once unlocked from the shaft and is ready for lifting away on disengagement of the tension motion driving chain.

The merit of my invention lies in the production of an entirely automatic self-contained geared "jack" without loose parts, and which, by actuation of the handle in one direction or the other is automatically locked upon or released from the shaft as is requisite.

I declare that what I claim is:

1. A detachable "jack" for rotating a shaft, comprising a frame, a spur gear train mounted thereon, a handle whereby to drive said train, and a friction clutch adapted to automatically grip said shaft when the said gear train is set in motion.

2. A detachable "jack" for driving a shaft, comprising a frame, a spur gear train mounted thereon, a handle to operate said train, a collar having an internal diameter greater than the diameter of the driven shaft within and concentric with the last spur wheel of the train, arms pivoted on said collar, the outer ends of said arms provided with studs adapted to engage radial slots in the said last spur wheel of the train, whereby rotation of the spur wheel with respect to the collar rotates said arms about said pivots, causing their inner ends to engage the driven shaft.

3. An attachable and detachable "jack" for temporary driving of a shaft on card mounting machines and the like comprising front and rear supports, means to interconnect said front and rear supports, a spur gear train mounted upon and between said supports, a hand actuated handle to operate said train, and pivoted clamping devices carried by said supports and actuated by said gear train to grip the shaft when revolved in one direction and to release the shaft when the motion of the gear train is reversed.

4. An attachable and detachable "jack" comprising a rear support and a front support, a driving shaft mounted on said supports, means for manually operating said shaft, a driven gear, a train of gearing connecting the driving shaft with the driven gear, a driven shaft, pivoted clamping devices operated by the driven gear to grip the driven shaft in one direction of rotation of said driven gear, and other driving means operatively connected to the driving shaft.

5. An attachable and detachable driving "jack" adapted to fit and drive shafts of various diameters and to automatically adapt itself thereto comprising front and rear supports, a driven gear wheel between said supports, a hand driven shaft journaled in said supports, a train of gear wheels connecting said hand driven shaft with said driven gear wheel, clamping arms actuated by the driven gear wheel to grip the shaft to be driven, fulcrum plates upon which said clamping arms are pivoted, a ratchet wheel on the hand driven shaft, a pawl therefor, and other driving means operatively connected with the hand driven shaft, as described.

6. An attachable and detachable driving "jack" comprising front and rear supports, means connecting such supports, fulcrum plates revolubly carried by said supports, clamping arms fulcrumed to said plates, a main gear wheel mounted on said supports, means on said main wear wheel for actuating the clamping arms, a driving shaft mounted on the supports, a train of gear wheels mounted upon said supports connecting the driving shaft and said main gear wheel, a hand lever on said shaft to operate said gear train, a ratchet wheel on said driving shaft, a pawl therefor, and other driving means on said shaft as set forth.

7. An attachable and detachable jack comprising front and rear supports, inter-

connecting devices, central fulcrum plates mounted on said supports, fulcrum studs in said plates, a main gear wheel mounted on said frame concentric to said fulcrum plates, clamping levers pivotally mounted on said studs and actuated by the main gear wheel, a train of gear wheels carried by the supports and driving the main gear wheel, a hand actuated first motion shaft to drive said train, a ratchet wheel on said shaft, a pawl therefor, other driving means on the first motion shaft, and a supporting crutch attached to the supports, all as described.

8. An attachable and detachable jack comprising front and rear supports, interconnecting devices for said supports, front and rear fulcrum plates revolubly carried by said supports, fulcrum pins carried by said plates, clamping levers movable on said pins, a main gear wheel mounted on said supports and adapted to operate said clamping levers, a spur gear train carried by the front and rear supports and connected with the said main gear wheel, a hand actuated shaft with operating lever to drive said train, a ratchet wheel on the hand actuated shaft, a pawl therefor, chain wheels on said shaft for other driving purposes, and a crutch to support one end of the complete jack, all, for the purposes as described.

9. An attachable and detachable "jack" for driving a shaft comprising inner and outer concentric annular members adapted to have relative rotatory displacement, clamping arms mounted on one of said members, part of said arms engaging the other member, and means to drive one of said members, whereby motion of the latter member in one direction causes the clamping arms to grip the shaft and the whole to revolve therewith.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES DRONSFIELD.

Witnesses:

WILLIAM BRIDEOAKE DRONSFIELD,
RICHARD WEBSTER IBBERSON.

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