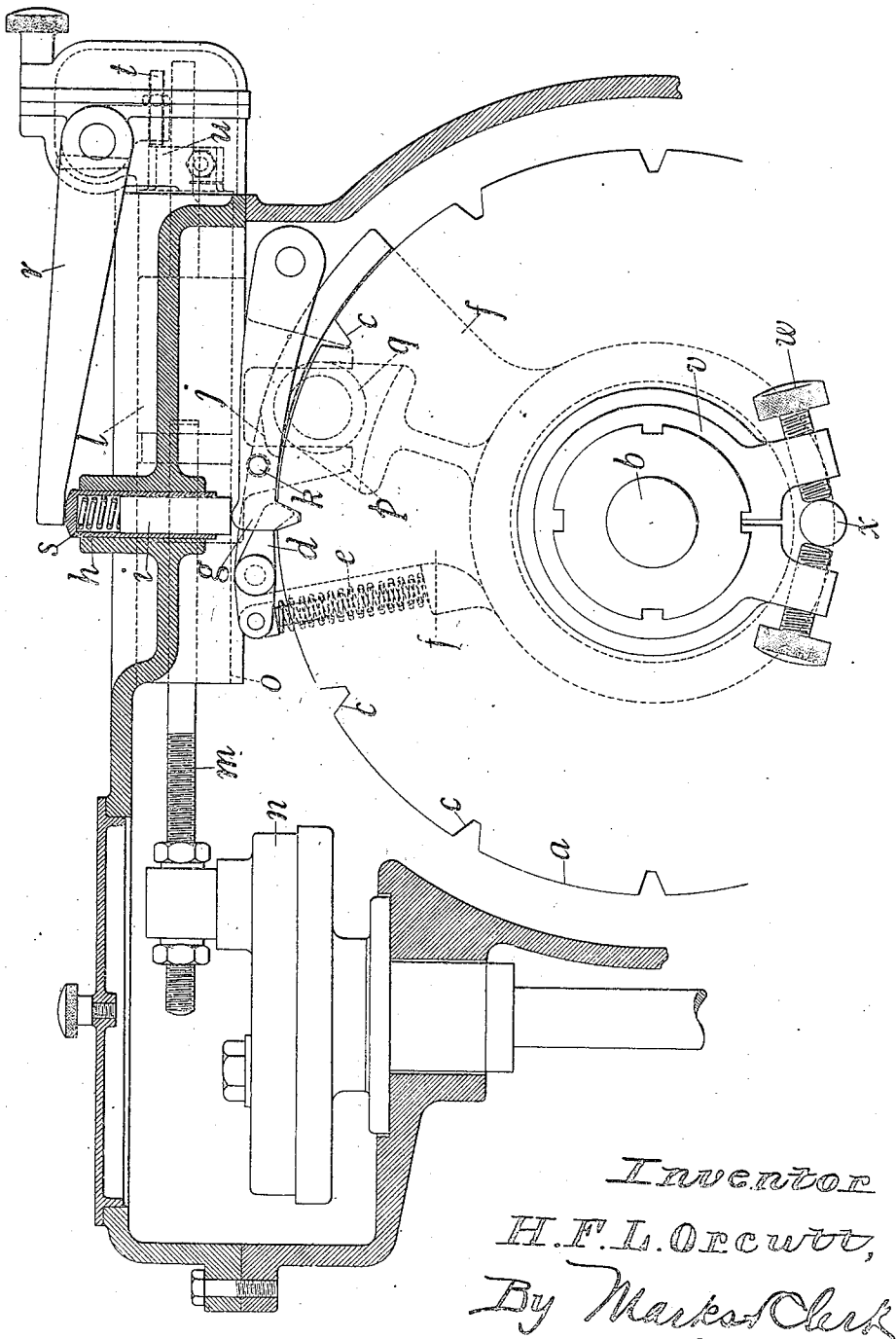
Jan. 16, 1923. 1,442,537

H. F. L. ORCUTT.

DIVIDING HEAD FOR GRINDING AND OTHER MACHINES.

FILED JULY 25, 1921.



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UNITED STATES PATENT OFFICE.

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DIVIDING HEAD FOR GRINDING AND OTHER MACHINES.

Application filed July 25, 1921. Serial No. 487,473.

To all whom it may concern:

Be it known that I, HARRY FRED LEE ORCUTT, a subject of the King of Great Britain and Ireland, residing at Anne Road, Handsworth, in the city of Birmingham, England, have invented certain new and useful Improvements Relating to Dividing Heads for Grinding and Other Machines, of which the following is a specification.

This invention relates to machines for grinding gear wheel teeth or shaft splines, and for like work involving the use of a grinding wheel whose periphery is accurately shaped to a definite form. In such machines it is usual to hold the work stationary during the grinding operations, and to impart an angular movement to the work intermittently for the purpose of subjecting different parts to the action of a grinding wheel, which is reciprocated relatively to the work.

Whilst primarily intended for grinding machines, the invention is also applicable to other machines, such as gear cutting machines in which intermittent angular movements of the work are required.

The object of the present invention is to provide an improved dividing head whereby the necessary high order of accuracy in the said intermittent angular movements of the work can be obtained in a convenent manner.

The invention comprises the combination with the work spindle, of a disc having peripheral notches corresponding to the required angular movements of the work, a spring controlled locking pawl for engaging the said notches in turn and locking the disc, an arm receiving motion from a crank and provided with a pawl for actuating the disc, and a cam on the arm for disengaging the locking pawl prior to each movement of the disc.

The accompanying drawing illustrates dividing head mechanism constructed in accordance with this invention.

In carrying the invention into effect as shown, a relatively large disc *a* is secured to one end of the work spindle *b*. This disc is formed with notches *c* around its periphery at intervals corresponding to the number of wheel teeth, shaft splines, or the like on the work piece or pieces to be ground or otherwise treated. Each of these notches is engaged in turn by a pawl *d* controlled by a spring *e* and carried on an arm *f* which is freely mounted coaxially with and alongside of the disc. On an adjacent portion of the fixed frame or case is pivoted a locking pawl *g* adapted to accurately fit the disc notches and to engage each in turn for the purpose of rigidly locking the disc, this pawl being held in its operative position by a spring *h* acting through a pressure piece *i* on the outer end of the pawl *g*. To lift the pawl out of action the arm above mentioned is utilized, its outer end being shaped as shown at *j* to serve as a cam for engaging the pawl through the medium of a projection *k* on the pawl.

Motion is given to the arm by a slide *l* which is actuated through a connecting rod *m* from an adjustable-throw crank *n*, the latter receiving its motion at proper intervals from some other suitable part of the grinding or cutting machine. Preferably the slide is of cylindrical form and arranged to reciprocate in a cylindrical guide *o* the underside of the latter being slotted to permit the passage through it from the slide of a fork piece *p* which engages a projecting roller *q* or the like secured to one side of the arm *f*.

Adjacent to the slide is arranged a bell crank lever *r* pivoted on the case or frame of the machine. One end of this lever acts on the outer end of a cup *s* containing the spring *h* and slidable over the pressure piece *i*. The other end of the lever is fitted with an adjustable screw stop *t* which can coact with an abutment *u* on the slide. During a small portion of the movement of the slide when it is completing its traverse from left to right, the abutment strikes against the stop and causes the opposite end of the lever to press on the cup *s*, the pressure being transmitted through the spring and pressure piece to the pawl *g* and serving to force the tapered end of the pawl firmly into the adjacent notch in the disc. This insures accurate positioning of the disc. Preferably the movement given to the disc by the other pawl *d* is slightly short of that required to bring the disc at each operation into the proper position, the final positioning being effected by the action of the lever *r* on the pawl *g*. During the movement of the slide from right to left, the lever *r* is left free

so that it offers no hindrance to the raising of the pawl *g* out of engagement with the disc by the arm *f*.

In operation the arm *f* moves under the action of the crank first in one direction and then in the other. During the movement from right to left, the cam on the arm lifts the pawl *g* out of action, and the arm traverses the pawl *d* to the next notch over the periphery of the disc. In the return of the arm from left to right the pawl *d* moves the disc through an angular distance equal to the pitch of the notches, or nearly so, and the slide *l* by operating on the lever *r*, causes the final positioning and securing of the disc through the pawl *g*, the latter having immediately prior to the action of this lever been allowed by the arm to drop into the adjacent notch in the disc under its own weight.

By this invention I am able to provide a robust and rigid dividing head which permits of the desired accuracy of operation to be obtained in a very simple manner. When it is desired to provide an adjustable connection between the disc and its spindle, a collar *v* is secured to the spindle and connection with the disc is effected by adjustable screws *w* acting on a projection *x* secured to the disc.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In dividing heads for imparting angular movements to a work piece, the combination of a work spindle, a disc having peripheral notches corresponding to the required angular movements of the work spindle, a locking pawl for engaging the said notches in turn and locking the disc, a rocking arm, a pawl on the arm for actuating the disc, a cam on the arm for disengaging the locking pawl prior to each movement of the disc, a slide for actuating the arm, a crank for reciprocating the slide, a lever adjacent to the locking pawl, and a spring and thrust piece between the said lever and locking pawl, the lever being actuated by the slide for pressing the locking pawl into its operative position, substantially as described.

2. In dividing heads for imparting angular movements to a work piece, the combination of a work spindle, a disc having peripheral notches on said spindle, a locking pawl engageable with the disc notches, a rocking arm, a pivoted pawl on the arm and also engageable with the disc notches for actuating the disc, a spring operating on the disc actuating pawl, an arm actuating slide, a crank for reciprocating the slide, a cam on the arm for disengaging the locking pawl, a lever adjacent to the locking pawl, and a spring and thrust piece between the said lever and locking pawl, the lever being actuated by the slide for pressing the locking pawl into its operative position, substantially as described.

In testimony whereof I have signed my name to this specification.

HARRY FRED LEE ORCUTT.