No. 736,799. PATENTED AUG. 18, 1903.

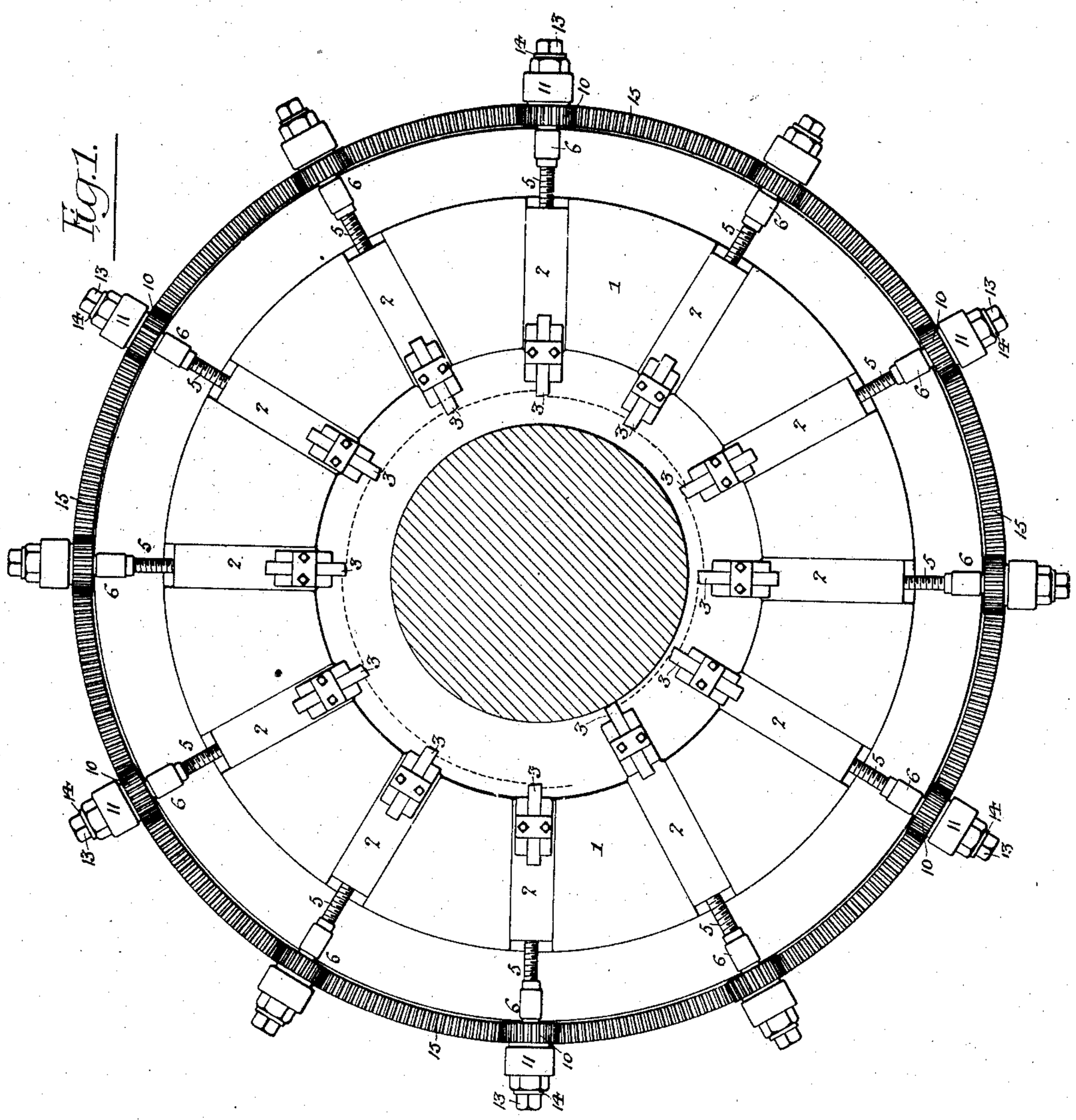
A. TINDEL.

METAL WORKING TOOL.

APPLICATION FILED APR. 26, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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# A. TINDEL.

## METAL WORKING TOOL.

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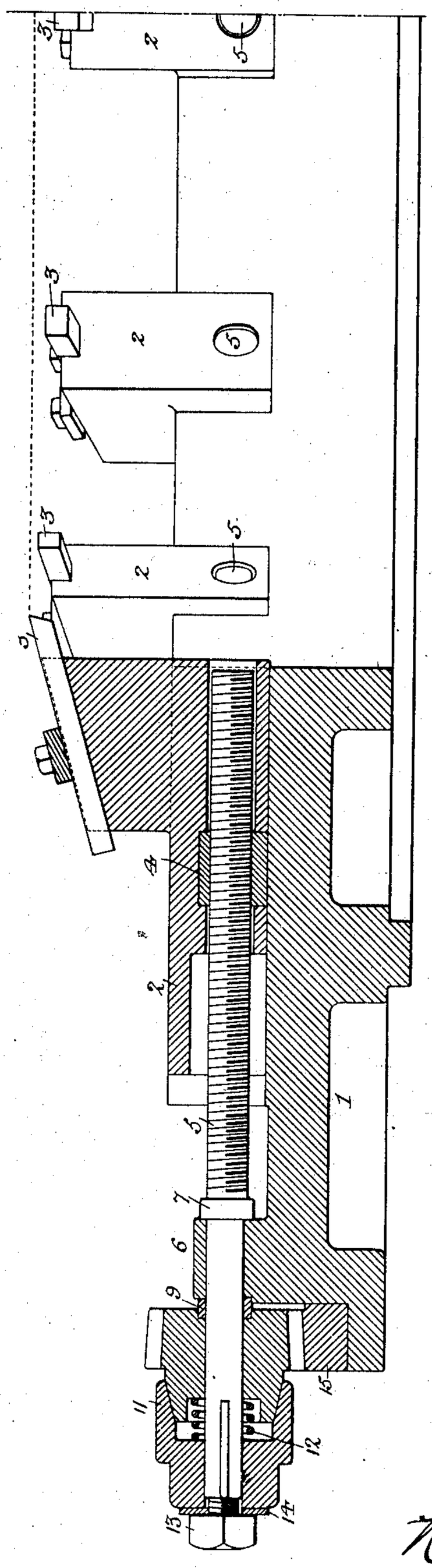
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

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No. 736,799. Patented August 18, 1903.

# UNITED STATES PATENT OFFICE.

ADAM TINDEL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO TINDEL-MORRIS COMPANY, OF EDDYSTONE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## METAL-WORKING TOOL.

SPECIFICATION forming part of Letters Patent No. 736,799, dated August 18, 1903.

Application filed April 26, 1902. Serial No. 104,778. (No model.)

*To all whom it may concern:*

Be it known that I, ADAM TINDEL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Metal-Working Tools, of which the following is a specification.

My invention consists of certain improvements in metal-working tools intended for turning, the purpose of the invention being to so construct such a tool as to provide for a heavy cut, while at the same time both the tool and the work are relieved from the strain which would ordinarily accompany the making of such heavy cut. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a face view of a cutting-tool constructed in accordance with my invention. Fig. 2 is an enlarged transverse section of a portion of the same.

In the above drawings, 1 represents an annular face-plate, which may be so mounted in the lathe as to have rotating movement only, the work having longitudinal movement, or it may be mounted so as to have longitudinal movement while the work rotates, or it may have both longitudinal and rotating movement, the work being stationary, or the face-plate may be stationary and the work may have both longitudinal and rotating movement, the particular method of operation being immaterial to my invention, which relates to the means whereby a series of cutting-tools are mounted upon the face-plate so as to operate successively upon the work, whereby heavy cuts can be made without imparting injurious strain to either the individual cutting-tools and without undue strain upon the work.

The face-plate 1 has formed in it a series of radial guides for a number of slides 2, there being as many of these slides as there are tools to be employed, each slide 2 having one of the cutting-tools 3 securely fastened to its inner end. The slides 2, however, differ from each other as to those portions upon which the tools are mounted in the respect that the tools are not all supported in the same transverse plane, the inner or cutting ends of the tools being in different but overlapping planes transverse to the axis of the face-plate. Hence the width of the cut made by the tools is equal to the aggregate amount of overlap of these planes, the cut made by each tool being only equal to the extent to which the successive tools overlap each other. The inner or cutting ends of the series of tools also occupy different circumferential planes, these planes overlapping each other progressively throughout the series of tools, as shown in Fig. 1, this overlapping being effected by varying the position of the tools upon the slides 2 or by varying the radial adjustment of said slides 2 in their guides upon the face-plate and having the same effect as the overlapping transverse planes of the tools—that is to say, the depth of cut is equal to the aggregate amount of the overlap, while the cut made by each individual tool is only equal to the extent to which one tool overlaps another.

Each of the tool-carrying slides 2 has an internal nut 4, engaging with a screw-stem 5, disposed radially upon the face-plate and longitudinally confined to a lug 6 upon said face-plate by means of internal and external collars 7 and 9, as shown in Fig. 2. Upon the outer portion of each screw-spindle 5 is mounted, so as to be free to turn, a spur-wheel 10, which has an external tapering hub adapted to the internally-tapering cup of a clutch-hub 11, splined upon the outer end of the spindle 5, so that it is compelled to turn therewith, but can have movement longitudinally thereon. A coiled spring 12, interposed between the hub of the spur-wheel 10 and the clutch 11, tends to separate the two; but a frictional contact of the engaging surfaces of the two hubs is insured by inward pressure upon the outer end of the clutch-hub, such pressure being exerted by means of a nut 13, adapted to the threaded outer end of the spindle 5 and acting upon the outer end of the clutch-hub 11 through the medium of an interposed washer 14, as shown in Fig. 2.

To a suitable bearing upon the outer portion of the face-plate 1 is adapted an annular rack 15, which meshes with all of the spur-

wheels 10, so that by turning or partially turning this annular rack upon the face-plate all of the screw-spindles 5 may be simultaneously rotated in one direction or the other and all of the tool-slides 2 therefor caused to move from or toward the axis of the face-plate, thereby effecting simultaneous adjustment in the same direction of all of the tools carried by said slides, the movement being transmitted from each spur-wheel 10 to its corresponding screw-spindle 5 through the medium of the frictional connection between said spur-wheel and the clutch-hub 11. Hence if the movement of any one of the tools or tool-slides is obstructed the frictional driving connection thus provided between the screw-spindle and its driving-pinion will permit of an arrest of movement of said obstructed tool or tool-slide without interfering with the movement of the others. The frictional connection between each screw-spindle and its driving-pinion also provides for the adjustment of any one of the tool-slides independently of the others by the turning of the clutch-hub 11, the latter being provided for this purpose with a polygonally-shaped portion for the reception of a wrench or other implement, whereby its rotation or partial rotation can be readily effected.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of an annular tool-carrier, a series of tool-slides radially adjustable thereon, a screw-spindle for each of said tool-slides, a spur-pinion on each of said tool-spindles, an annular rack mounted on the tool-carrier and engaging said spur-pinions, and a frictional connection between each spur-pinion and its spindle, substantially as specified.

2. The combination of an annular tool-carrier, a series of tool-slides radially adjustable thereon, an adjusting screw-spindle for each of said tool-slides, a spur-pinion on each of said tool-spindles, an annular rack engaging the series of pinions, and a clutch-hub secured to each spindle and having frictional connection with the spur-pinion of said spindle, substantially as specified.

3. The combination of an annular tool-carrier, a series of tool-slides radially adjustable thereon, an adjusting screw-spindle for each of said slides, mechanism for simultaneously rotating said spindles at will, said mechanism including friction-clutches designed to permit relative movement between the mechanism and the spindle when the resistance of the turning of the spindle exceeds a predetermined amount, substantially as described.

4. The combination of an annular tool-carrier, a series of tool-slides radially adjustable thereon, an adjustable screw-spindle for each of said slides, mechanism for simultaneously turning said spindle, each spindle being provided with a clutch having a tapered hub and an internally-tapered sleeve engaging said hub, one of said members being connected to said mechanism and the other to its respective spindle, with means for varying the frictional contact between the engaging surface of the hub and the sleeve, substantially as described.

5. The combination of an annular tool-carrier, a series of tool-slides radially adjustable thereon, a screw-spindle for each of said slides, a spur-pinion on each of the spindles, an annular rack engaging the spur-pinions, with a clutch operatively connecting each of said spindles with the spur-pinion, said clutch including a hub, a sleeve constructed to frictionally engage said hub, means for varying the amount of said friction between said two members and a spring tending to force said members apart, substantially as described.

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

ADAM TINDEL.

Witnesses:
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