No. 668,086. Patented Feb. 12, 1901.

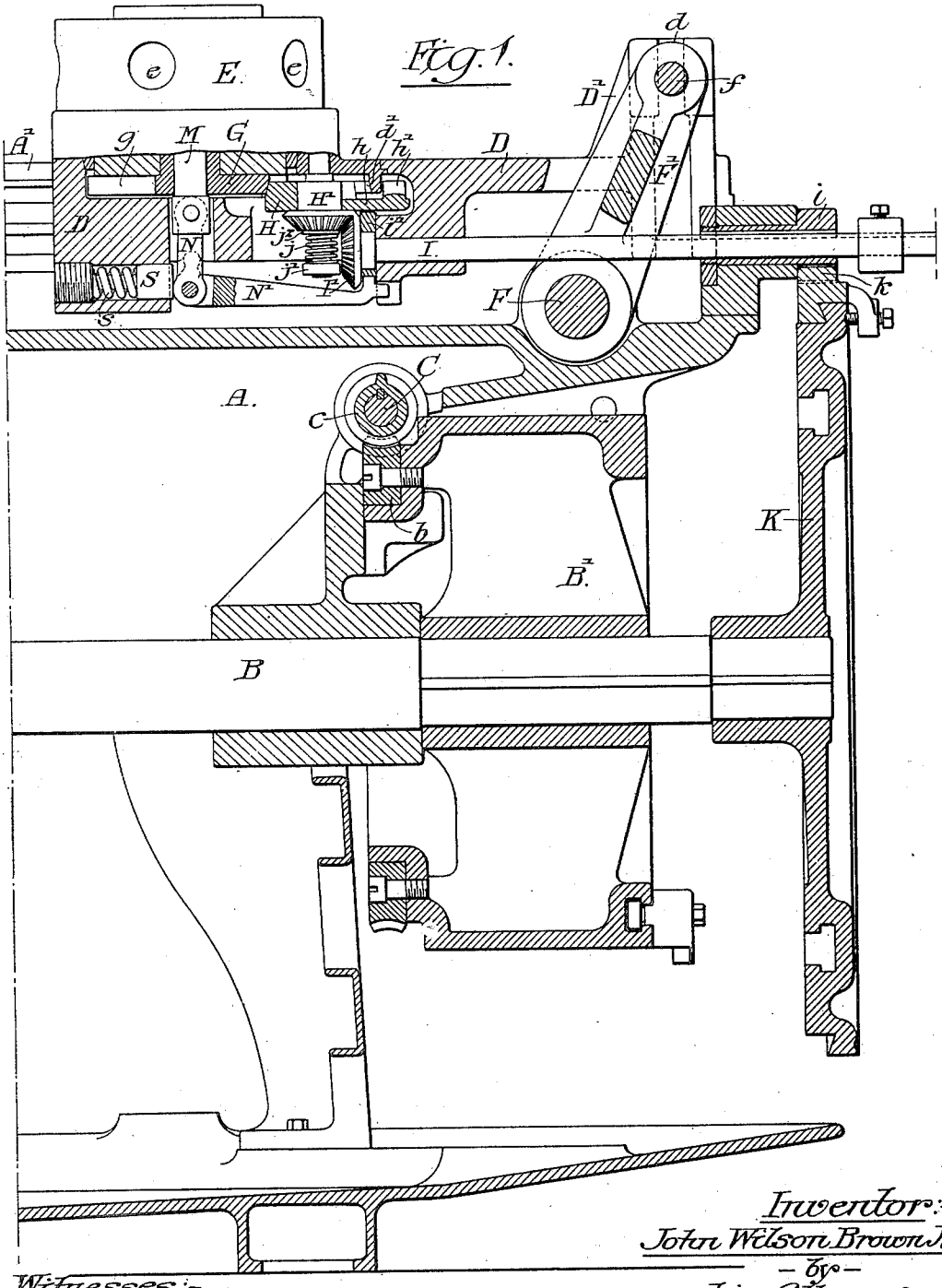
J. W. BROWN, JR.

OPERATING DEVICE FOR TURRET LATHES.

(Application filed July 17, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



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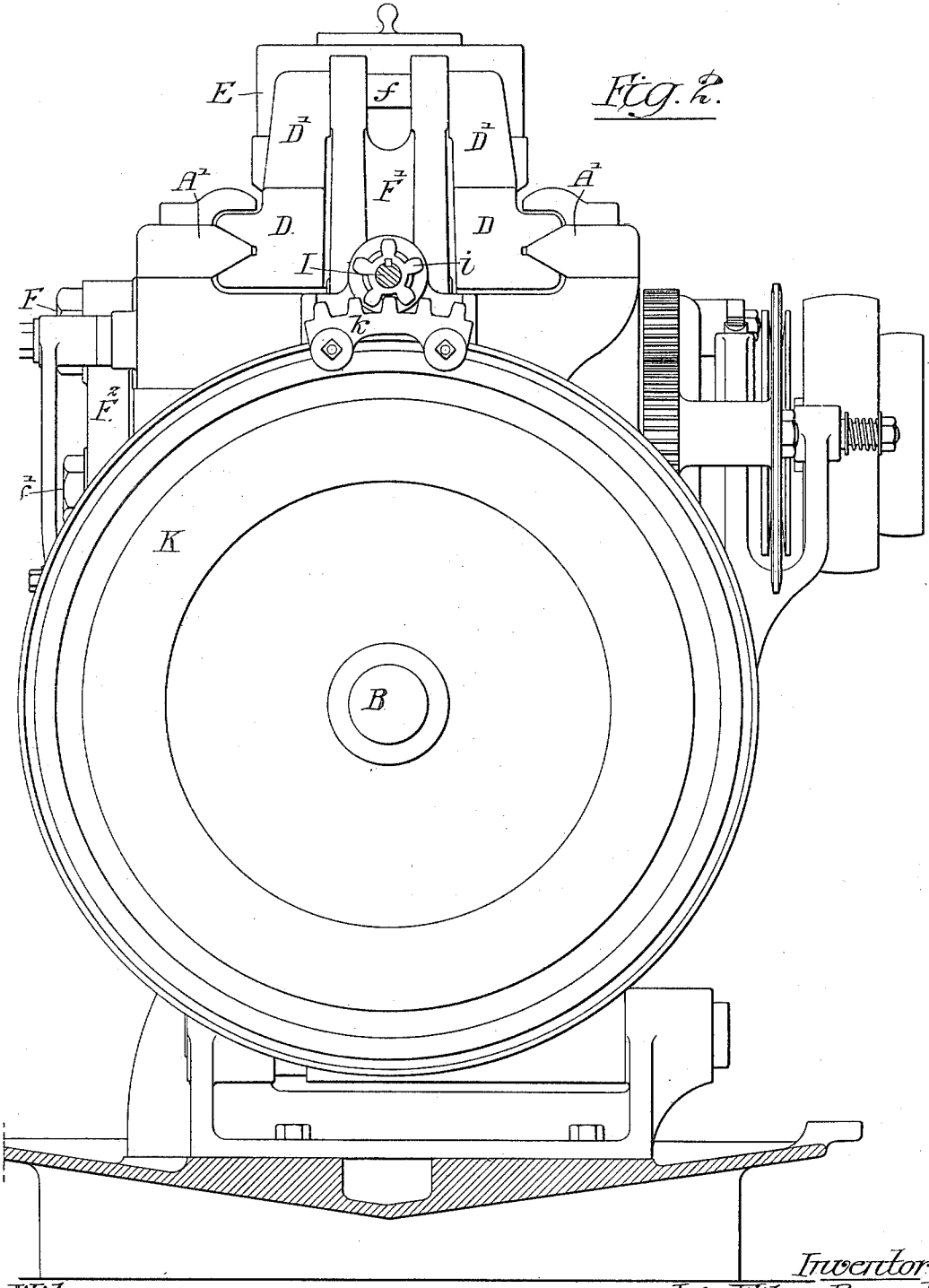


Fig. 2.

Witnesses:-
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Inventor:
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by his Attorneys:-
Howson & Howson

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(No Model.) 4 Sheets—Sheet 3.

Fig. 3.

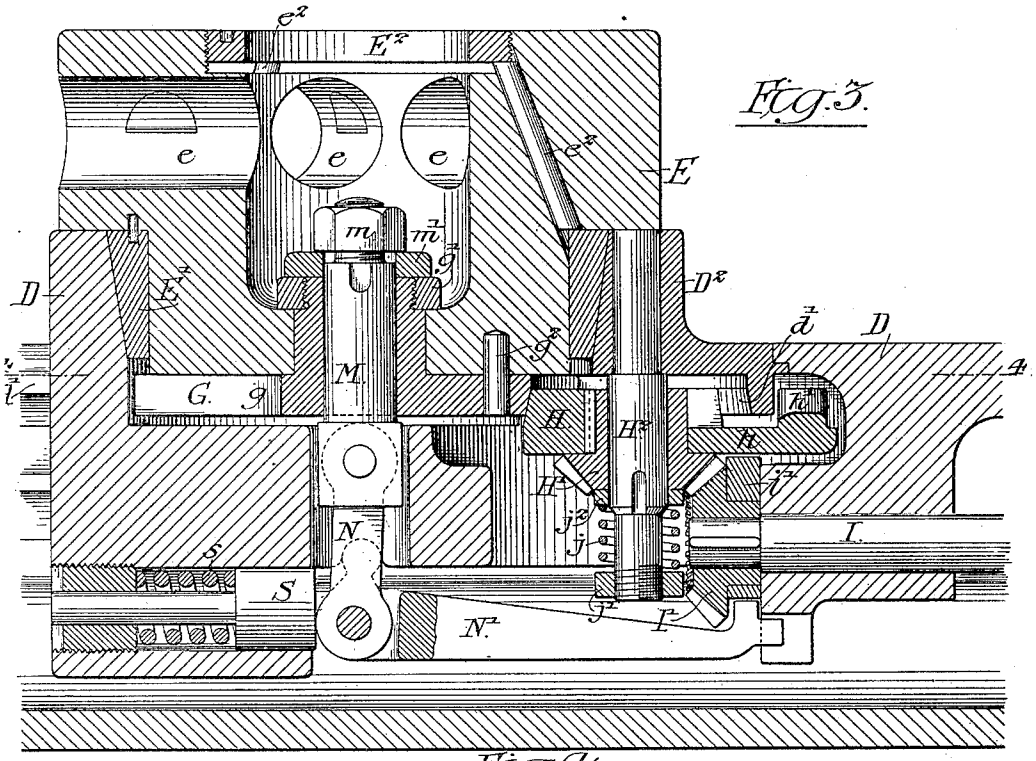
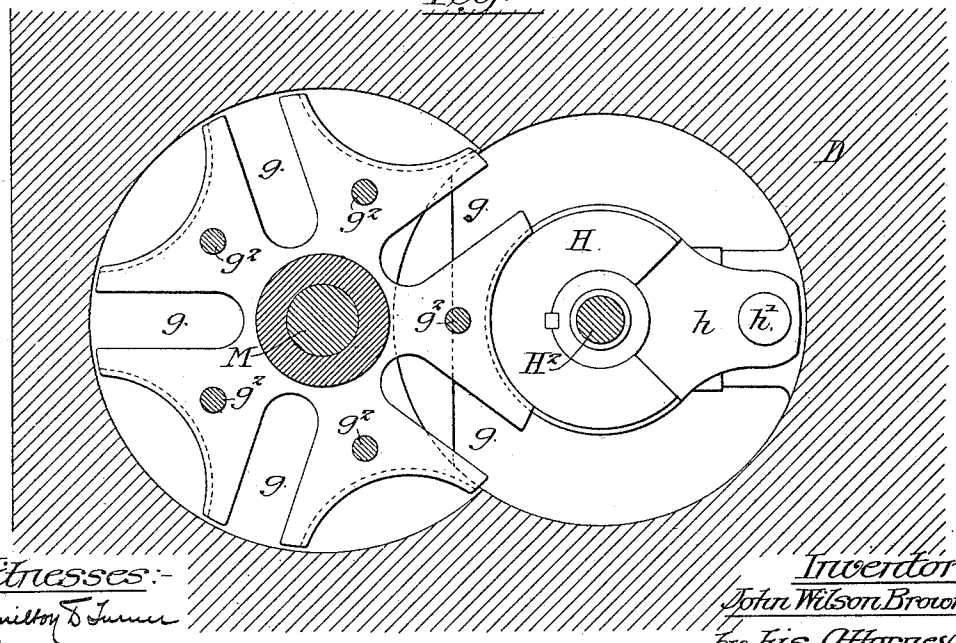


Fig. 4.



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

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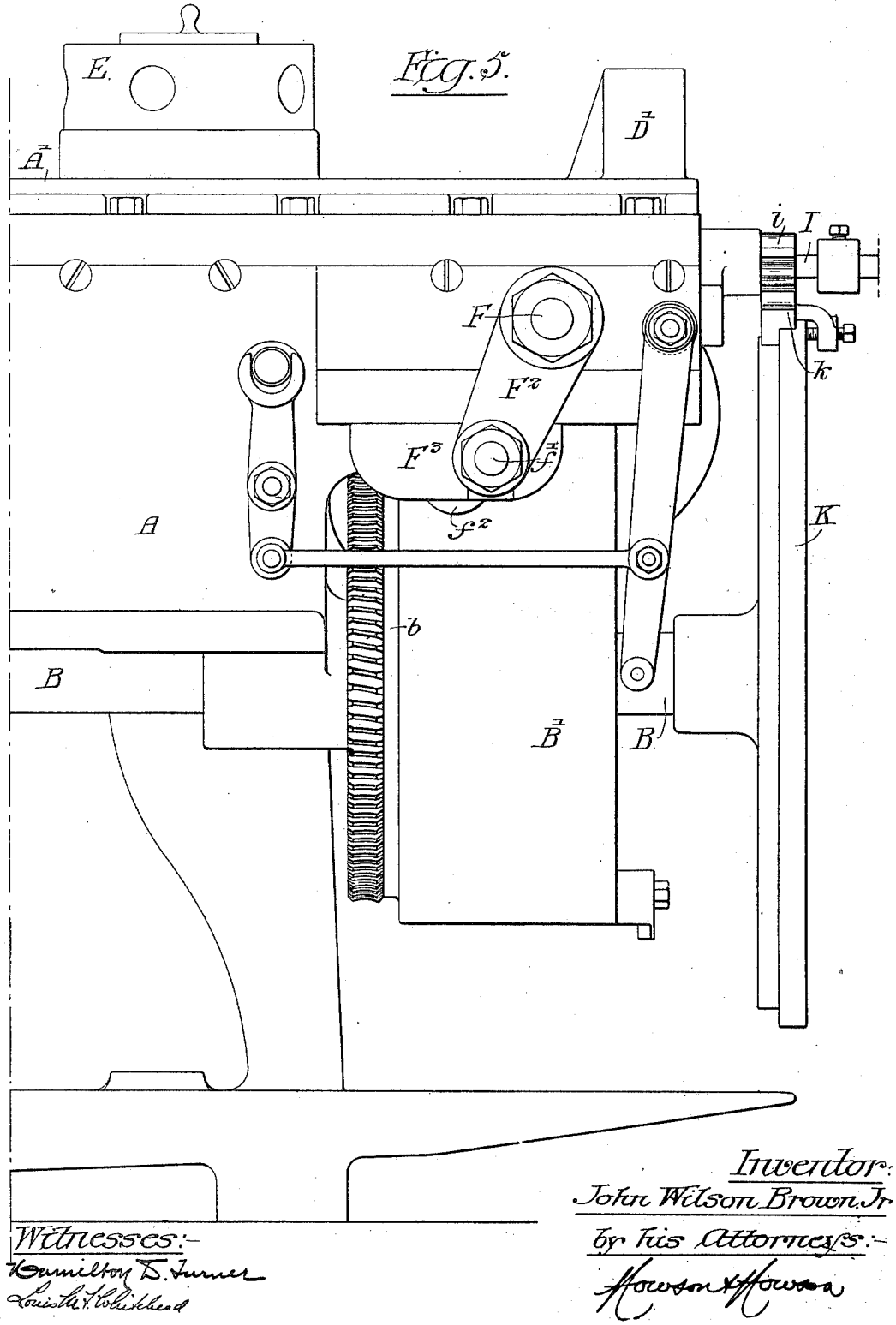
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(Application filed July 17, 1900.)

(No Model.) 4 Sheets—Sheet 4.

FIG. 5.



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UNITED STATES PATENT OFFICE.

JOHN WILSON BROWN, JR., OF PHILADELPHIA, PENNSYLVANIA.

OPERATING DEVICE FOR TURRET-LATHES.

SPECIFICATION forming part of Letters Patent No. 668,086, dated February 12, 1901.

Application filed July 17, 1900. Serial No. 23,911. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILSON BROWN, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Operating Devices for Turret-Lathes, of which the following is a specification.

My improved turret-operating device is designed to be used in connection with a turret-lathe for which application for Letters Patent was filed on the 2d day of August, 1900, Serial No. 25,674, although it will be understood that it can be used in connection with any turret-lathe without departing from my invention.

The object of my invention is to so construct the operating mechanism that the turret will be positively rotated intermittently and when at rest will be locked rigidly to the slide.

In the accompanying drawings, Figure 1 is a vertical sectional view of the turret end of a turret-lathe to illustrate my invention. Fig. 2 is an end view of Fig. 1. Fig. 3 is a vertical sectional view of the turret. Fig. 4 is a sectional plan view on the line 4 4, Fig. 3, and Fig. 5 is a side view of the turret end of a turret-lathe.

A is the frame of the machine.

B is the main shaft, having a drum B', on which is a worm-wheel *b*, with which engages a worm *c* on a driving-shaft C.

D is the turret-carriage. This carriage is grooved at each side, and extending into the grooves are the V-shaped guide-plates A', secured to the frame of the machine in any suitable manner. The guide-plates A' are of such a length that the slide does not overhang in either the forward or backward position. Thus the slide is fully supported, so as to give the maximum stiffness to the tool-support.

The turret E is mounted on the slide D, as clearly shown in Fig. 3, and has a series of sockets *e* for the different tools. Fitting on the reduced portion of the turret E is a ring E', having a tapered periphery fitting a tapered socket in the slide D. The ring is held from turning on the turret by pins or other devices, but can be moved vertically to take up wear, when desired. In the drawings I have shown one means for adjusting the ring E' on the turret. I provide three rods e^2, mounted in the turret and controlled by an adjusting-ring E^2, so that on turning this ring E^2 the pins e^2 will be forced down, and they will in turn force the ring E' down to its seat, thus taking up the wear.

F is a rock-shaft mounted in bearings in the frame of the machine, and on this shaft is a lever F', having a pin *f*, extending into vertical slots *d d* in a projection D' of the slide D. The rock-shaft F moves the slide toward and from the chuck. It will be noted that the pin *f*, when the lever is in the central position, is in line with the tool-socket *e* of the turret E. Thus the tilting strain is avoided, as the point of pressure is in line with the tool and not below it, as is the common practice.

The rock-shaft F has an arm F^2, which has a pin *f'* engaging a sliding block F^3, mounted in ways on the frame A, and this block F^3 has a projection f^2, which is acted upon by one or more cam-segments on the drum B', so that as the shaft B revolves the turret-slide D will be moved toward and from the work.

Secured to the under side of the turret E is a star-wheel G, having five radial slots *g* in the present instance and five curved locking-recesses between the slots, as there are five tool-sockets *e* in the turret-head shown. Engaging the star-wheel G is a wiper H, having a single arm *h*, carrying a pin or lug *h'*, which enters each one of the slots *g* of the star-wheel G. The curved portion of the wiper fits the curved locking-recesses and holds the star-wheel and turret during the time the lug *h'* moves out of one slot *g* and enters another. The wiper H is keyed to the hub of a bevel gear-wheel H', free to turn on a stud H^2, projecting from a bearing-piece D^2, secured to the slide D. The curved portion of the wiper is beveled, as shown in Fig. 3, and the curved locking-surfaces of the star-wheel G are also beveled to correspond with the bevel of the wiper, and in order to relieve the stud H^2 from strain I flange the bearing-piece D^2 at *d'* and bevel the curved flange, so that when the wiper is forced upward by a spring *j*, confined between a nut *j'* on the stud H^2 and a washer j^2, it will find its bearing upon both the flange *d'* and the star-wheel, so that a neat fit is always assured.

From the construction and principle of the

star-wheel and wiper described above it will be seen that their operation in connection with the turret E is not merely that of locking, but rather that of registering. Forming particularly, as it does, a part of the turret, the star-wheel is turned by the wiper, being stopped exactly and holding the said turret registered without lost motion, with its tool in precisely the position desired.

I is the shaft which turns the turret, and on the inner end of this shaft is a bevel-wheel I′, which meshes with the bevel-wheel H′. On the end of the shaft I is a pinion *i*, with which engages a gear-section *k* on the disk K, secured to the end of the main shaft B. The pinion and gear-section are so proportioned in the present instance that during the engagement of the gear-section the pinion and its shaft will turn one revolution, and thus turning the turret one-fifth of a revolution. The gear-section *k* is adjustable on the disk K and can be secured in any position desired. The gear-section can be of a length sufficient to turn the shaft I two or more revolutions, if the work requires it.

In order to hold the turret rigidly to its seat on the slide D, I provide means for drawing the turret down as soon as the wiper turns it to the point where it is at rest.

The star-wheel G has a hub that extends through the base of the turret E and is confined thereto by a nut *g′*. Pins g^2 extend through the star-wheel and into the turret, so that the turret must turn with the wheel.

Extending through the hub of the star-wheel G is a stud M, having a nut *m* at its upper end resting on a washer *m′*. Pivoted to the lower end of the stud M is a link N, and pivoted to the link is a two-armed lever N′, forked at the link. The short arm of the lever is forked, and its rounded ends rest in sockets in the under portion of the slide. The long arm of the lever extends under the bevel gear-wheel I′, and on the hub of this wheel is a cam *i′*, which actuates the lever.

S is a plunger mounted in a cylindrical socket in the slide, and back of this plunger is a spring *s*. The plunger bears against the lever and tends to straighten the link N and draw the turret to its seat.

The cam *i′* mentioned above is so set as to release the turret when it is to be turned. It presses the lever N′ down, forcing the spring-plunger S back, at the same time relieving the turret, so that it can be turned.

I claim as my invention—

1. The combination of a carrier, means for reciprocating the same, a turret mounted on the carrier, means independent of the reciprocating means for positively turning the turret a given distance and registering the same, with means for forcing the turret tightly to its seat after it is registered, substantially as described.

2. The combination of a carrier, a turret mounted thereon, means for intermittently rotating said turret and registering the turret after it is rotated, and means for forcing the turret down to its seat after each movement of the said turret and when it is at rest, substantially as described.

3. The combination of a carrier, a turret mounted thereon, a star-wheel secured to the turret, a shaft, means for turning the shaft, a wiper secured to the shaft and engaging the star-wheel so that the turret will be intermittently rotated and locked when at rest, substantially as described.

4. The combination of a carrier having a tapered recess, a turret having a tapered bearing within the recess, means for intermittently rotating the turret, and means for drawing the turret to its seat after each movement of said turret and when it is at rest, substantially as described.

5. The combination of a carrier, a turret seated in the carrier, a central stud passing through the turret, a lever pivoted to the carrier, a link connecting the lever to the stud, a spring-plunger for operating the lever to force the turret to its seat, and a cam for releasing the turret, substantially as described.

6. The combination of a carrier, a turret seated in the carrier, a central stud passing through the turret, a lever pivoted to the carrier, a link connecting the lever to the stud, means for operating the lever, and means for vertically adjusting the stud, substantially as described.

7. The combination in a turret-lathe, of a frame, a carrying-slide mounted on the frame, a turret on said slide, a driving-shaft extending rearwardly from the slide, means for intermittently rotating said shaft, a wiper geared to said shaft, and a star-wheel on the turret with which the wiper engages, substantially as described.

8. The combination in a turret-lathe, of a frame, a driving-shaft, a disk on the driving-shaft, a toothed segment on the disk, a slide, a turret carried by said slide, a gear-wheel with which the toothed segment of the disk engages, a shaft turned by said gear-wheel, a wiper geared to said shaft, and a star-wheel on the turret with which the wiper engages, substantially as described.

9. The combination of the slide, a shaft mounted thereon, means for intermittently rotating said shaft, a turret carried by the slide, a vertical stud, a gear-wheel on the shaft and a gear-wheel on the stud, star-gearing for operating the turret whereby the turret is intermittently rotated, a cam on the driving-shaft of the slide, a lever pivoted to the slide and connected to the turret, a plunger and a cam for operating the lever, substantially as described.

10. The combination of a carrier, a turret, a tapered ring adjustable on said turret, said ring having its bearing on the carrier, substantially as described.

11. The combination of a carrier having a

cavity with tapered walls, a turret, a ring on the turret tapered to correspond to the walls of the carrier, an adjusting-ring mounted in the turret and rods extending from the said ring to the tapered bearing-ring, so that when the adjusting-ring is moved the tapered bearing-ring will be adjusted, substantially as described.

12. The combination in a turret-lathe, of the frame, V-shaped guides mounted on the frame, a carrier having V-shaped grooves at each side into which the guides extend, a turret mounted on the carrier, and means for rotating the turret, substantially as described.

13. The combination of a carrier, a turret mounted thereon, a star-wheel on the turret, the locking-cavities of the star-wheel being beveled, a portion of the carrier beveled to correspond to the bevel of the star-wheel, a wiper for turning the turret, the grooved portion of the wiper being beveled to correspond to the bevel of the turret and the carrier, and a spring for forcing the conical portion of the wiper into contact with the conical portion of the star-wheel and carrier, substantially as described.

14. The combination of a carrier, a turret mounted on the carrier, a star-wheel secured to the turret, a bearing-piece mounted on the carrier and having a flange, the grooved locking portions of the star-wheel and the flange forming, when the locking-surface of the star-wheel is in position, portions of the same conical surface, a stud on the bearing-piece, a wiper, the grooved portion of the wiper being beveled to conform to the bevel of the star-wheel, and a spring tending to force the conical surface of the wiper into contact with the conical surface of the star-wheel, substantially as described.

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

JOHN WILSON BROWN, JR.

Witnesses:
WILL. A. BARR,
JOS. H. KLEIN.