Dec. 30, 1924. 1,520,871

V. R. KOONTZ

DIE HEAD

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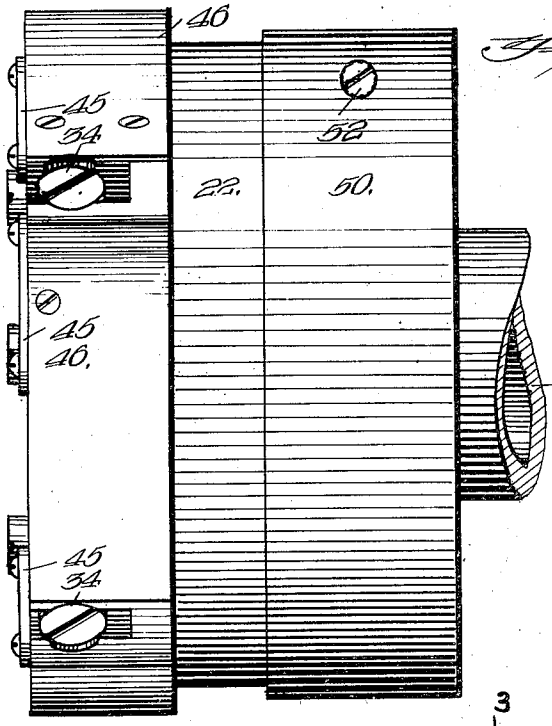


Fig. 1.

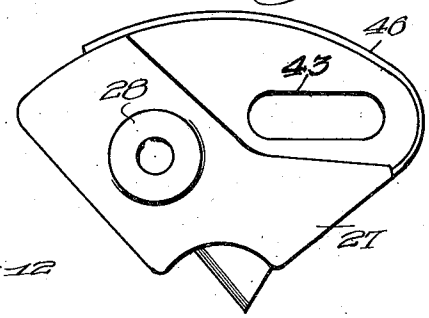


Fig. 7.

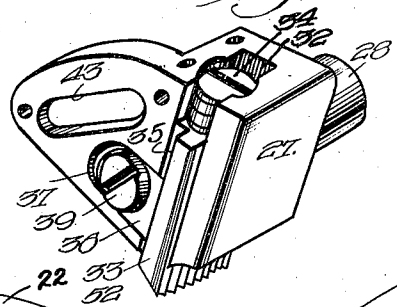


Fig. 6.

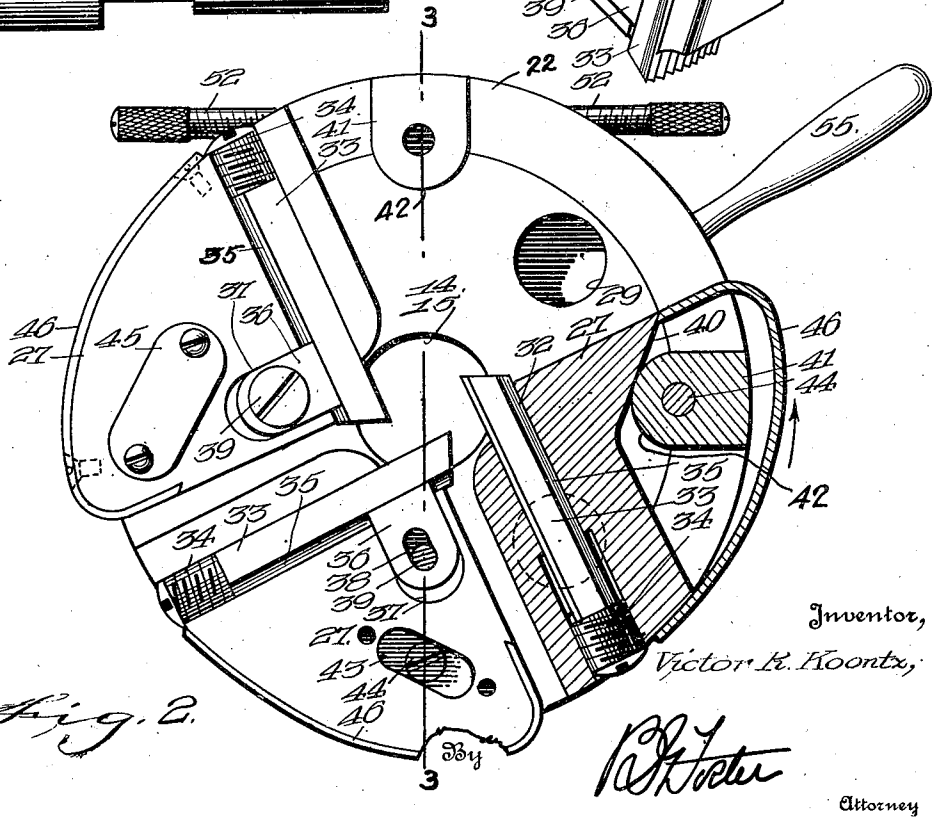


Fig. 2.

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Fig. 3.

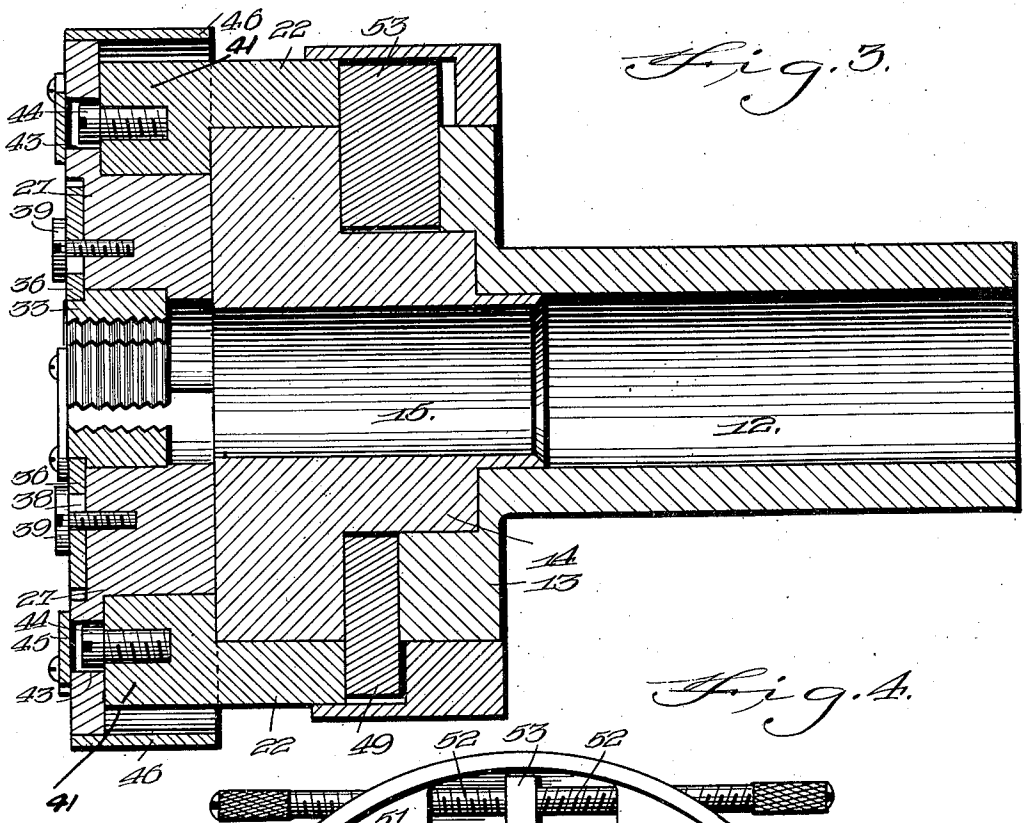
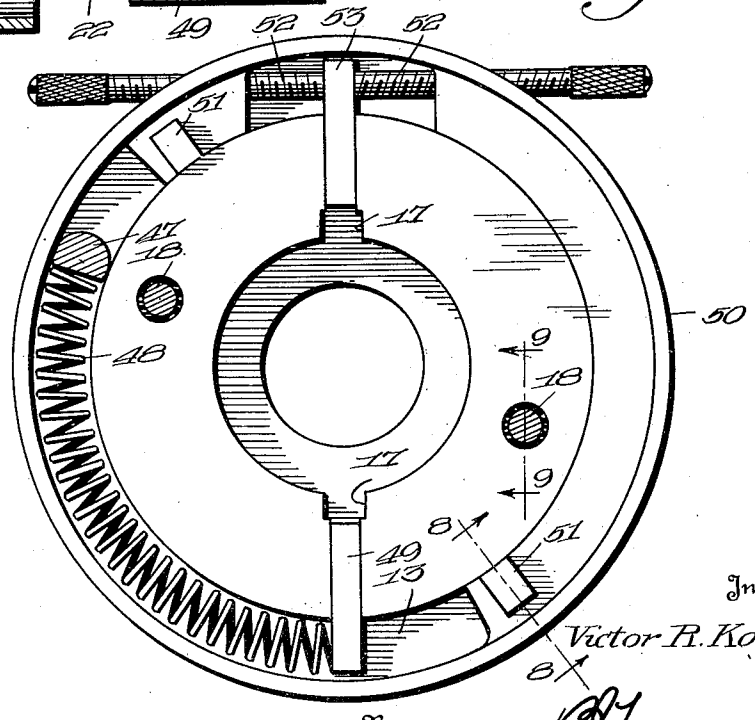


Fig. 4.



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Fig. 5.

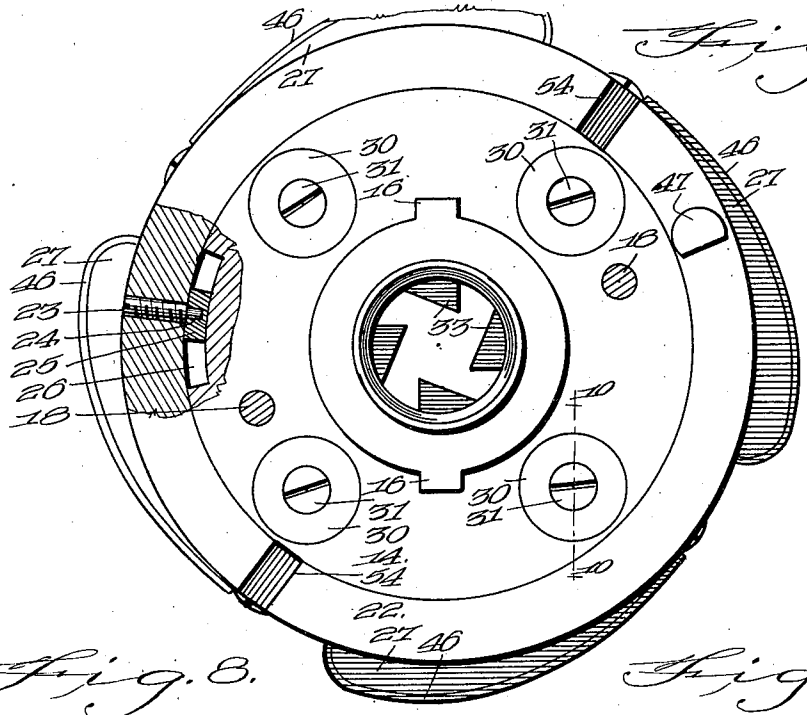


Fig. 8.

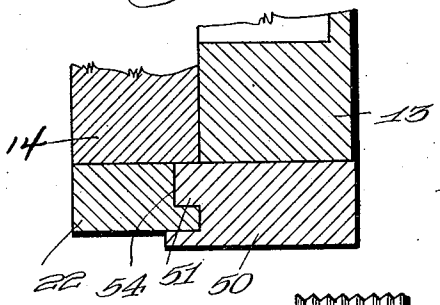


Fig. 9.

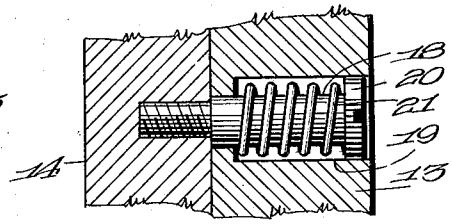


Fig. 10.

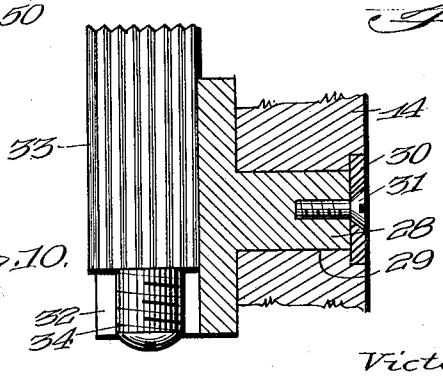
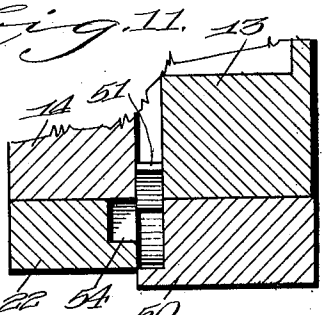


Fig. 11.



Inventor,
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By

Attorney

Patented Dec. 30, 1924. 1,520,871

UNITED STATES PATENT OFFICE.

VICTOR R. KOONTZ, OF WAYNESBORO, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO LANDIS MACHINE COMPANY, OF WAYNESBORO, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DIE HEAD.

Application filed July 26, 1921. Serial No. 487,652.

To all whom it may concern:

Be it known that I, VICTOR R. KOONTZ, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Die Heads, of which the following is a specification.

The present invention relates to threading die heads of the expansible type, and one of the principal objects is to provide a combination of elements that will effectively hold the cutters against "creeping" or in other words against any outward movement due to the strain or pressure of the work and the cutting action. With many structures of this type it has been found that under the strain there is apt to be a slight "give" between the various elements, resulting in the production of a tapered thread, and this is entirely overcome in the present device.

A further and important object is the provision of simple but very effective means for securing the chasers on the holders, yet permitting their ready detachment.

In the accompanying drawings:—

Figure 1 is a side elevation of a head constructed in accordance with the present invention,

Figure 2 is a front elevation of the same, with one of the cutter holders complete, a second with part of the elements removed, a third cutter holder being shown in section, and with the fourth cutter holder entirely removed,

Figure 3 is a longitudinal sectional view through the structure, taken on the line 3—3 of Figure 2, but showing all the parts in place,

Figure 4 is a front elevation of the stock and casing, the body and ring being detached therefrom,

Figure 5 is a rear elevation of the body and actuating ring,

Figure 6 is a perspective view of one of the cutter holders,

Figure 7 is a rear elevation of the same,

Figure 8 is a detail sectional view substantially on the line 8—8 of Figure 4, but with the body and actuating ring assembled,

Figure 9 is a cross sectional view on the line 9—9 of Figure 4,

Figure 10 is a sectional view on the line 10—10 of Figure 5,

Figure 11 is a view similar to Figure 8, but showing the actuating ring in unlocked position.

In the embodiment disclosed, a tubular stock 12 is employed, having a flanged portion 13 at its front end, in which is slidably mounted a body 14, having a bore 15 therethrough. The body 14 is provided with keys 16 that slidably engage in keyways 17 formed in the flanged portion of the stock 12. The body and stock are thus held against relative rotation, but the body is obviously movable longitudinally with respect to said stock. This movement is, however, restricted by stop screws 18 located in sockets 19 in the flange portion 13, and threaded into the body 14, as shown in Figure 9. These screws have heads 20 forming bearings for coiled springs 21 surrounding the screws within the sockets 19 and bearing against the bottoms of said sockets. The screws limit the outward movement of the body 14, and the springs 21 serve to return the body after its forward movement.

Rotatably mounted on the body 14 is an actuating ring 22 which may be held thereon by screws 23, one of which is shown in Figure 5, said screws being threaded through the ring and having terminal pins 24 at their inner ends that engage blocks 25 slidably mounted in grooves 26 formed in the periphery of the body 14. The front faces of the body 14 and actuating ring 22 are flush, and located over said front faces are cutter or chaser carriers comprising bodies 27, preferably having integral pintles 28 that are journaled in openings 29 formed in the body 14. As illustrated more particularly in Figure 10 the openings 29 extend entirely through the body 14 and the pintles 28 have retaining disks 30 secured on their rear ends by screws 31. The cutter holders are provided with longitudinally disposed slots 32 in line with the pintles 28, as indicated in Fig. 2 and shown in Fig. 10. In these slots 32 the chasers 33 are slidably mounted, these chasers being borne against at their rear ends by adjustable abutment screws 34. The chasers are provided on their outer portions with shoulders 35, upon which are adapted to rest retaining plates

36. These retaining plates are slidably mounted in recessed seats 37 formed in the outer faces of the cutter holders, and said plates have longitudinal slots 38. Through the slots are passed headed clamping screws 39 threaded into the cutter holders. As will be clear particularly by reference to Figure 2 the holding plates are adapted to be moved to a position where they will overhang the slots and rest on the shoulders 35 of the chasers, being held therein by the clamping screws 39. By loosening said screws 39, the plates can be moved backwardly, so as to be entirely at one side of the slots, thus permitting the free removal of the chasers.

The rear sides of the cutter holders are generally in concave form, providing cam surfaces 40 and the actuating ring 22 is provided with outstanding lugs 41 that overhang the margins of the body 14 and are provided with inner curved abutment faces 42 that bear against said cam surfaces 40. It will be noted in Figure 2 that the bearing points of the abutments 41 are directly behind and in line with the cutting ends of the chasers 33, transversely of the inner ends of said chasers forming a solid rigid backing for the active ends of said chasers. It will be clear that if the ring 22 is rotated in the direction indicated by the arrow in Figure 2, the abutments will cause the cutter holders 27 and the chasers carried thereby, to swing inwardly to their operative positions. In order to move the cutter holders and chasers outwardly, upon the retrograde movement of the ring 22, said holders 27 are provided with slots 43, in which are engaged the outer ends of screws 44 threaded into the abutments 41, as illustrated in Figure 3. The slots 43 are covered by cap plates 45 and the abutments 41 and cam surfaces 40 are enclosed by covering strips 46.

The mechanism for effecting the rotation of the actuating ring 22 is preferably as follows. The actuating ring 22 is provided with an inwardly extending abutment lug 47 borne against by a coiled spring 48 that also bears against an abutment 49 fixed to the flanged portion 13 of the stock 12, the spring 48 thereby acting to turn the actuating ring in one direction. Mounted on the flanged portion 13 is a housing ring 50 that encloses the spring 48 and carries a pair of locking lugs 51. This housing ring 50 is normally fixed with respect to the stock but can be adjusted by means of a pair of oppositely disposed screws 52 that bear against opposite sides of a lug 53 fixed in the flange 13 of the stock 12. The lugs 51 thus constitute in effect a part of the stock. The actuating ring 22 is provided in its rear edge with oppositely arranged sockets 54, and these sockets are adapted to receive the lugs 51 when the actuating ring 22 has been turned in a direction to compress the spring 48. When the lugs 51 aline with these sockets 54 the springs 21 act to move the actuating ring and body rearwardly, so that the lugs will enter said sockets. Furthermore when so turned and the lugs 51 are in the sockets 54 the cutter holders 27 are swung inwardly to their active positions by the abutments 41 operating against the cam faces 40.

Assuming the parts in the above described relation and as shown in the drawings, with the exception of Figure 11, the tool is in condition to thread and therefore if the work is introduced into the threading die the threads will be cut thereon. During this threading action the work is held against longitudinal movement and consequently the body 14 and actuating ring 22 will be drawn forwardly with respect to the stock. This in time will cause the locking lugs 51 to be disengaged from the sockets 54 and immediately on such disengagement the spring 48 will act to turn the locking ring in a direction to swing the cutter holders 27 and the chasers carried thereby outwardly, and thus release the work. The actuating ring 22 is preferably provided with a handle 55 by which the ring can be again turned in the opposite direction to aline the sockets 54 with the lugs 51, whereupon the springs 21 which have been compressed, will react and return the parts to their operative positions.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a die head, the combination with relatively rotatable members, of means for effecting their relative rotation, a cutter holder pivotally mounted on one of the members and having a cutter-receiving socket, and an abutment on the other member having a slidable bearing against the cutter holder behind and in a line with the cutting end of a cutter held in the socket of the holder and in the same plane with such socket and holder, said line being transverse to the cutter receiving socket and said abutment acting to effect the movement of the cutter holder and hold it in a predetermined position.

2. In a die head, the combination with a body, of an actuating ring member rotatably mounted thereon, a cutter holder member pivotally mounted on the body, a cam surface on one of said members, an abutment

on the other member slidably engaging the cam surface, said surface and abutment being in the plane of a cutter held by the holder member and on the same side of the pivot axis of the holder as the cutting end of a cutter carried by the holder, and means for rotating the ring.

3. In a die head, the combination with a body, of an actuating ring rotatably mounted thereon, a cutter holder pivotally mounted on the body and having means for holding a cutter with its cutting end projecting from one end of the holder, a cam surface on the cutter holder, an abutment on the ring that slidably engages the cam surface behind the cutter holder and exerting a pressure against the cutter holder in a direction transverse to the longitudinal line of a tool held by the holder, and means for rotating the ring.

4. In a die head, the combination with a body, of a cutter holder pivotally mounted thereon and having a recessed rear portion at the rear side of its inner end provided with a cam surface, an actuating ring rotatably mounted on the body and having an abutment block slidably engaging the cam surface, and means for rotating the ring.

5. In a die head, the combination with a body, of a cutter holder pivotally mounted thereon and having the rear side of its inner end recessed and provided with a cam surface, an actuating ring rotatably mounted on the body and having an abutment block slidably engaging the cam surface for moving the cutter holder inwardly, and a connection between the ring and cutter holder to move the latter outwardly, and means for rotating the ring.

6. In a die head, the combination with a body, of a cutter holder pivotally mounted thereon and having a recessed rear portion provided with a cam surface, an actuating ring rotatably mounted on the body and having an abutment block slidably engaging the cam surface for moving the cutter holder inwardly, said holder having a slot, and a pin carried by the abutment and engaged in the slot to move the cutter holder outwardly, and means for rotating the ring.

7. In a die head, the combination with a stock, of a body slidably mounted thereon, a plurality of cutter holders pivoted on the body and having rear cam surfaces, a ring rotatable on the body and having abutments slidably bearing against the respective cutter holders, a lock between the ring and stock for holding the ring against rotation on the body when the cutter holders are in their active positions and so held by the abutments, said lock releasing the ring on a predetermined relative movement between the stock and body, and a spring for rotating the ring when released to thereby move the abutment to an inactive relation with respect to the cutter holders.

8. In a die head, the combination with a body, of a cutter holder pivoted on the body, said holder having a rear side and an inner end and an outer end and having means for mounting a cutter thereon and the pivot axis of the holder intersecting a cutter so mounted, and means operating against the rear side of the cutter holder and effecting a pressure against the same in a line transverse to the inner end of the holder and the cutting end of a cutter mounted thereon for moving said cutter holder.

9. In a die head, the combination with a body, of a cutter holder an inner end portion provided with a rear side and also having a longitudinal cutter receiving recess in its outer end and a transverse pivot in line with the recess and engaged with the body, and a cam operating against the rear side of the inner end portion of the holder to swing the same inwardly.

10. In a die head, the combination with a body having a central work-receiving opening, of a plurality of cutter holders having inner and outer ends and pivoted between said ends to the body on different sides of the opening, said holders having longitudinal recesses for the reception of cutters that project from their inner ends, means operable at the outer ends of the holders for adjusting the cutters, a rotatable ring on the body, and cams carried by the ring and operating transversely against the inner end portions of the holders on the inner sides of their pivot axes for swinging said holders.

11. In a die head, the combination with a body and an actuating ring rotatably mounted thereon, of a cutter holder movably mounted on the body and movable by the ring, said body having a groove, a bearing block in the groove, and a screw threaded through the ring and having a terminal pin engaged in an opening in the block.

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

VICTOR R. KOONTZ.

Witnesses:
M. F. STULL,
JOHN H. ELLIOTT.