No. 801,786. PATENTED OCT. 10, 1905.

B. M. W. HANSON.

TAPER TURNING ATTACHMENT FOR TURRET LATHES.

APPLICATION FILED MAY 31, 1904.

3 SHEETS—SHEET 1.

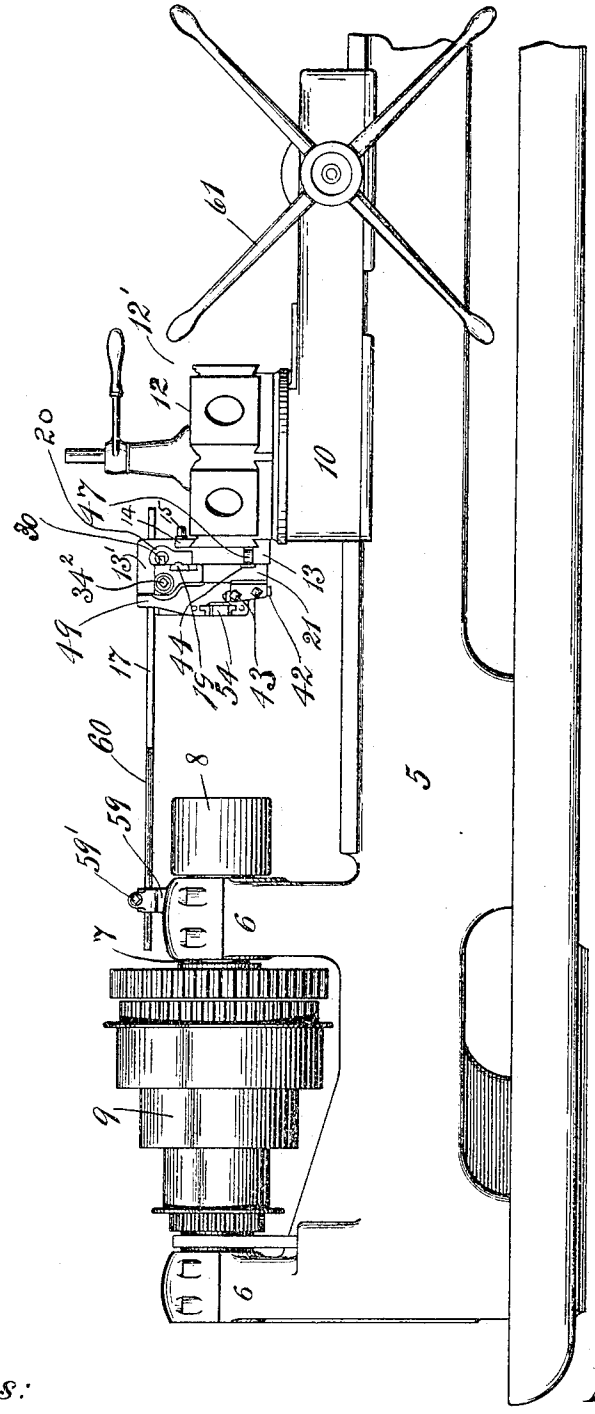


Fig. 1.

Witnesses:

F. E. Anderson.

Frances E. Blodgett.

Inventor:

B. M. W. Hanson

By his Attorney,

Wm. F. Blodgett

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

Fig. 3.

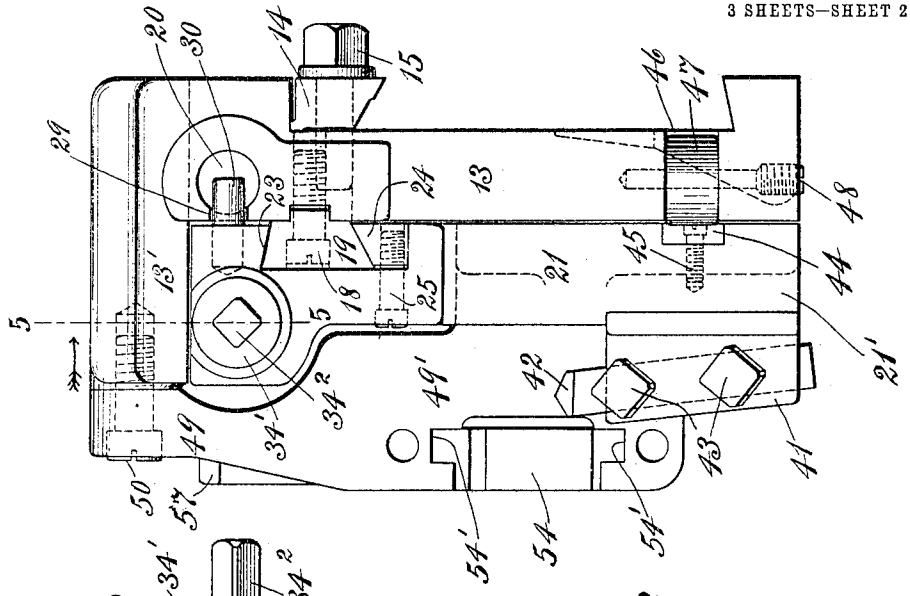
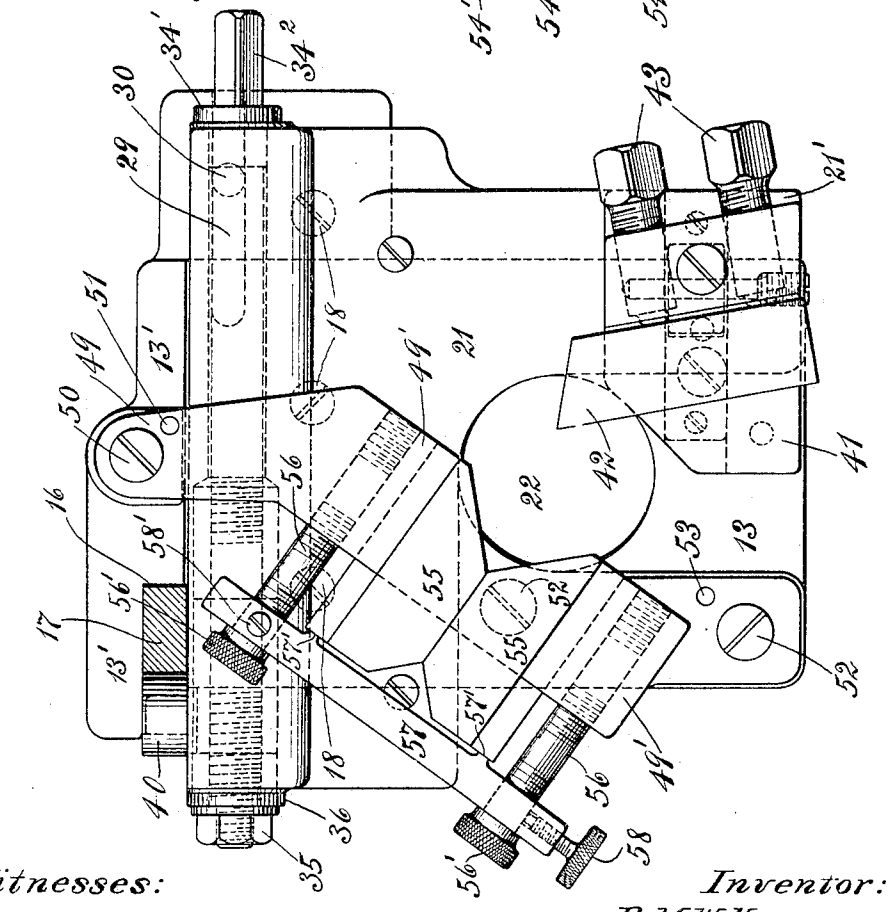


Fig. 2.



Witnesses:

F. E. Anderson.

Frances E. Blodgett.

Inventor:

B. M. W. Hanson

By his Attorney,

Wm. H. T. Thatcher

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3 SHEETS—SHEET 3.

Fig. 4.

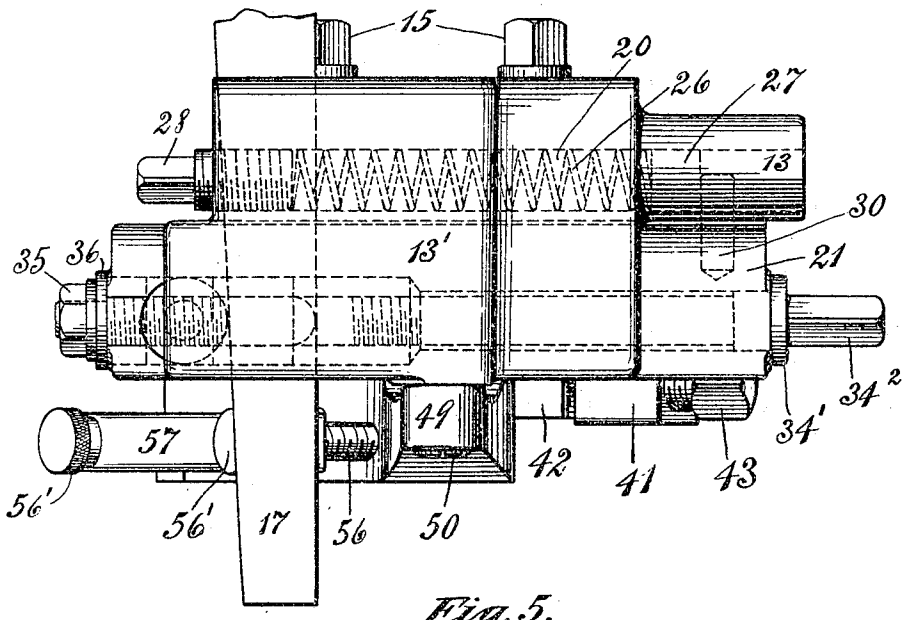
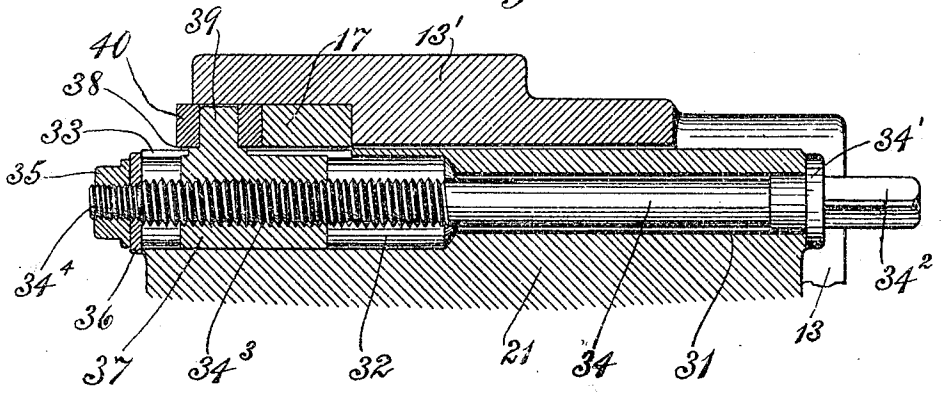


Fig. 5.



Witnesses:

F. E. Anderson.

Frances E. Blodgett.

Inventor:

B. M. W. Hanson.

By his Attorney,

Wm. H. Blodgett

UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

TAPER-TURNING ATTACHMENT FOR TURRET-LATHES.

No. 801,786. Specification of Letters Patent. Patented Oct. 10, 1905.

Application filed May 31, 1904. Serial No. 210,474.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of the Kingdom of Sweden, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Taper-Turning Attachments for Turret-Lathes, of which the following is a specification.

My invention relates to taper-turning attachments for turning-lathes; and it is shown applied to that type of such machines known as "turret-lathes," although it is not restricted to any specific use.

Heretofore taper-turning attachments have been employed in which the tool is mounted to swing in a circular path, the result being that owing to the movement of said tool in an arc struck from the pivot of its carrier it does not engage the work in a radial plane and cannot form a true taper.

Primarily the object of this invention is the provision of a slide for the tool and in connection therewith improved means for causing a part (for instance, a stud and roller) of said slide to remain constantly in contact with the taper bar, so that the tool will engage the stock on a true radial line, and consequently will produce thereon a perfect taper conforming exactly to the inclined surface of the taper bar or pattern in use.

A further object of the invention is the provision in an attachment of the character set forth of a support adapted to be connected to a turret or other part of a lathe and a movable member fitted for sliding action upon the said support, said movable member carrying the tool and also carrying a roller in engagement with the taper bar.

Other objects of the invention will be hereinafter set forth.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a turret-lathe with my improved taper-turning attachment applied to the turret thereof. Fig. 2 is a front view of the attachment. Fig. 3 is an end view, and Fig. 4 is a plan view, of said attachment. Fig. 5 is a vertical section taken on line 5 5 of Fig. 3 looking in the direction of the arrow.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 5 designates the bed of a turret-lathe, from which rise the pillow-blocks 6 6, having bearings for the spindle 7, the latter carrying a stock-chuck 8 of any suitable kind and a cone-pulley 9.

Designated by 10 is the usual longitudinally-movable slide of the lathe, carrying a turret 12, having dovetailed projections 12′, upon which the tools are placed.

In the improved taper-turning attachment one member thereof is in the form of a broad flat plate 13, recessed at its rear side to conform to the shape of the projections 12′ and provided with the usual gib 14 and screws 15 for clamping said gib. At its top the plate 13 is provided with a lateral extension or overhang 13′, which reinforces said plate, and to said overhang a back-rest support, hereinafter described, is secured, and said extension is slotted at 16 to receive a taper bar or pattern 17, as illustrated in Figs. 2 and 5. Secured to the side of the member 13 by screws 18 is a guide-bar 19 of dovetail shape, and in the upper part of said member is formed a bore 20, all for purposes hereinafter described.

Designated by 21 is the movable member of the attachment, and it consists of an L-shaped plate having a depending tool-carrying extension 21′. Member 13 is perforated at 22 to receive the stock, and the top of the movable member fits under the overhang of said member 13, as shown in Fig. 3, thereby affording a compact construction. In the upper part of its rear face the movable member 21 is provided with a recess to fit the dovetailed guide-bar 19, and a gib 24 and screws 25 serve to secure the parts with a capability of sliding movement one upon the other in the usual way.

As will be observed by referring to Figs. 1, 2, and 3, the movable member 21 is sustained at all points against lateral displacement by the base-plate 13.

Located in the bore 20 of the member 13 is a coiled spring 26, which bears at one end against a plug 27 in said bore (see dotted lines, Fig. 4) and at its opposite extremity against a screw 28, threaded into said member, and by which the tension of the spring may be regulated.

Projecting from the movable member through a slot 29, leading to the chamber 20 thereof, is a pin 30, and against said pin the

outer end of the plug 27 bears, as shown in Fig. 4.

In the top portion of the movable member 21 is formed a bore 31, enlarged to form a chamber 32 at its left-hand end, the upper wall of said chamber being cut through to form a slot 33. In the bore 31 and its chamber 32 is fitted a rod 34, having a collar 34′ bearing against the end of the movable member and closing the bore therein, said rod being provided with an angular head 34^2 for the reception of a wrench. For a portion of its length this rod is threaded at 34^3, and at its left-hand extremity it is reduced and provided with a thread 34^4 of different pitch for the reception of a nut 35, a washer 36 being placed between said nut and the open end of chamber 32, as shown more clearly in Fig. 5.

In the chamber 32 is mounted a nut 37 for the screw 34^3, and this nut is provided with an angular shoulder 38, fitting in the slot 33, and thus preventing rotation of the nut, and with a stud 39, upon which is mounted a roller 40, said roller bearing against one side of the taper bar 17, as shown in Figs. 2, 4, and 5.

Secured to the lower part of the movable member 21 is a carrier 41, having a seat for the reception of a turning-tool 42, held in place in said seat by screws 43. To afford greater strength against breakage at the point most needed, this carrier is preferably formed of steel and is detachably secured to the depending extension 21′ of the movable member 21.

At its rear side the movable member is rabbeted to receive a steel wear-plate 44, secured in place by screws 45, and the member 13 is slotted at 46 to receive an antifriction-roller 47, journaled on a pintle 48, said roller and plate serving to reduce friction at the point where the greatest strain is applied to the movable support by the action of the tool upon the stock.

Designated by 49 is a back-rest support shown as of angular form and as secured to the overhanging portion 13′ of the member 13 by a screw 50 and pin 51 and to the plate portion of said member by screws 52 and a pin 53, although other means of attachment may be employed. This support overlaps the upper portion of the movable member and has a thick or reinforced intermediate part 49′, provided with a recess 54, having side guides 54′ for the reception of the back-rest proper, consisting of the blocks 55. This reinforced part is tapped to receive screws 56, having knurled heads 56′, said screws passing through perforations in a cross-bar 57, having lugs 57′ bearing against the back-rest blocks 55, as shown in Fig. 2. These back-rest blocks have inclined or flaring ends to form seats of different sizes, and they are reversible end for end in the chamber 54 and guide-grooves 54′ of the support 49. By turning the screws 56 the blocks may be adjusted to fit different diameters of stock, and to lock said screws against movement binding-screws 58 58′ are inserted in the cross-bar, as shown in Fig. 2.

Projecting from the forward pillow-block 6 is a short standard 59, having a split eye 59′ for the reception of a stop-rod 60, the purpose of which will be hereinafter explained.

For actuating the turret-slide any desired mechanism may be employed—for instance, the usual pinion and rack devices (not shown) operated by a spoke-wheel 61.

From what has been stated it will be seen that the spring 26 always presses the plate or slide 21, carrying the turning-tool, toward the right, thereby keeping the roller 40 in constant engagement with the side of the taper bar 17, and consequently causing said tool accurately to copy the incline of said bar upon the stock. A set of interchangeable taper bars or patterns, each with a different degree of taper, is employed with the machine, so that any desired degree of taper to the inch may be formed upon the stock, and the taper formed on the stock will be of correct form and not longitudinally curved, as in old constructions.

By supporting the tool in a depending part of plate or slide 21 the thrust of the work thereon tends to push said slide downward, and thus to hold the guideway thereof firmly upon the dovetailed block 19, thereby avoiding chattering or lost motion.

To adjust the tool to stock of different diameters, the screw 34 is turned by a wrench applied to its head 34^2, and as said screw is so held in slide 21 that it has no independent longitudinal movement it follows that as the screw is rotated in the nut 37 the slide will be adjusted, its pin 30 acting against plug 27, and thereby compressing spring 26 until the turning-tool is brought to the desired position.

In the operation of my invention the attachment is first secured to the desired movable part of a lathe, and the tool having been adjusted properly to engage the stock said part is advanced. During this advancing movement the forward end of the taper bar is in engagement with the rod 60, and consequently said taper bar is gradually pushed to the rear, the spring 26 acting on plug 27 and through the pin 30 causing the slide 21 to recede in accordance with the degree of taper of the bar and the roller 40 being held in firm engagement with the side of said taper bar throughout the entire operation.

By substituting one interchangeable taper bar for another any desired degree of taper to the inch may be formed.

My invention is not limited to use with a machine of the character set forth, for it may be employed in other relations, if desired; nor is it limited to the precise details of construction illustrated and described, for various modifications may be made that will be within the purview thereof.

Having thus described my invention, what I claim is—

1. A taper-turning attachment comprising a support having an opening for the passage of stock; a movable member guided upon said support, and sustained by the same; a tool-holder on said movable member; a taper bar; means on the movable member for engaging said taper bar; and a back-rest carrier secured to the support, and overlapping a part of said movable member.

2. A taper-turning attachment comprising a base-plate having a passage for stock and a guideway; a movable member fitted to the guideway, and sustained against lateral pressure by the base-plate; a back-rest support secured at different points to the base-plate, and a part of which overlaps the movable member; a tool-holder carried by the movable member; a taper bar; and means on the movable member engaging said taper bar.

3. The combination, with a plate having an overhang at its top, and also having a guideway, of a plate fitted to said guideway beneath the overhang, and having a depending extension, and sustained laterally by the base-plate and against vertical displacement by said overhang; a tool-holder rigid with said depending extension; a taper bar; and means for holding a part of the movable member against said taper bar.

4. In a taper-turning attachment for lathes, the combination, with a support having an overhang, of a back-rest carrier carried by said overhang; a slidable member connected to the support beneath the overhang; a taper bar in engagement with a part of the slidable member; and means for adjusting said slidable member.

5. The combination, with a support having a chamber with a slot in its wall and a guideway, of a movable member fitted upon said guideway; a tool-holder carried by said movable member; a projection from said movable member passing through the slot in the support and entering the chamber thereof; a spring mounted in said chamber, and serving normally to force said movable member in one direction; a taper bar; and a roller carried by the movable member and in contact with said taper bar.

6. The combination, with a support, of a movable member mounted for sliding movement upon said support; a tool-carrier secured to said movable member; a back-rest for sustaining the stock; a screw carried by the movable member; a nut coöperating with said screw, said nut being mounted in a chamber of the movable member and having a projection; a roller on said projection; a taper bar; and means for normally holding the movable member in such position that said roller will be in engagement with said taper bar.

7. The combination, with a support having a bore provided with a slotted wall, of a spring in said bore; means for regulating the tension of said spring; a slidable plug against which one end of the spring bears; a movable member; a pin projecting from said movable member through the slot of, and entering the bore in the support; a taper bar; a tool-holder carried by the movable member; and means also carried by the movable member and in contact with said taper bar.

8. The combination, with a support having a bore provided with a slot in one of its walls, of a spring located in said bore; a slidable plug with which one end of the spring is in engagement; a movable member fitted for sliding movement upon the support; a pin carried by said movable member and entering the bore of the support; a taper bar; a roller carried by the movable member and in contact with said taper bar; and a tool-holder also carried by the movable member.

9. The combination, with a support having a lateral extension and a guideway; of a movable member fitted beneath said lateral extension and upon said guideway; a back-rest support secured to said lateral extension; a tool-holder carried by the movable member; means for adjusting the movable member to engage the tool with different diameters of stock; a taper bar; a roller carried by the movable member and in contact with said taper bar; and yielding means for normally so actuating said movable member that the roller will be held in constant engagement with the taper bar.

10. The combination, with a support having a bore provided with a slotted wall, of a spring in said bore; a movable member connected for sliding movement upon the support; a pin projecting from the movable member and entering the bore of the support; a slidable plug between said pin and the spring; a tool-holder carried by the movable member; a taper bar; a screw mounted in the movable member; a nut actuated by said screw and carrying a roller in contact with the taper bar.

11. The combination, with a support having a bore provided with a slotted wall, of a spring located in said bore; a screw for regulating the tension of said spring; a guide-bar carried by the support; a chambered movable member fitted upon said guide-bar; a pin projecting from said movable member and entering the bore of the support; a tool-holder carried by the movable member; a screw mounted in the movable member; a nut in the chamber of said movable member, and with which the screw is in engagement, said nut having a projection; a roller carried by the projection; and a taper bar mounted between said roller and a part of the support.

12. The combination, with a support having a guide-bar, of a roller journaled in a slot of said support; a movable member fitted upon said guide-bar; a tool-holder carried by said movable member; and a plate located in a re-

cess of the movable member and bearing against the roller.

13. The combination, with a support having an overhanging extension, and also having a bore provided with a slotted wall; of a spring in said bore; a guide-bar carried by the support; a movable member fitted upon said guide-bar; a pin projecting from the upper part of the movable member over the slot of the support and through the bore thereof; a tool-carrier secured to the movable member; a screw carried by the movable member; a nut actuated by said screw and provided with a projection; a roller upon said nut; a sliding taper bar located between the roller and a part of the support; and a back-rest support attached to the overhanging extension.

14. The combination, with a support having a bore with a slotted wall, and also having a recess, of a spring in the bore; a taper bar in the recess; a movable member having a bore and a chamber; a screw; a nut actuated by the screw and mounted in the chamber, said nut having a projection; a roller on said projection and in contact with the taper bar; a pin on the movable member, said pin passing through the slot of the support, and entering the bore thereof; a block between the pin and spring; and a tool-holder carried by the movable member.

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

BENGT M. W. HANSON.

Witnesses:

WILLIAM H. BLODGETT, Jr.,

FRANCES E. BLODGETT.