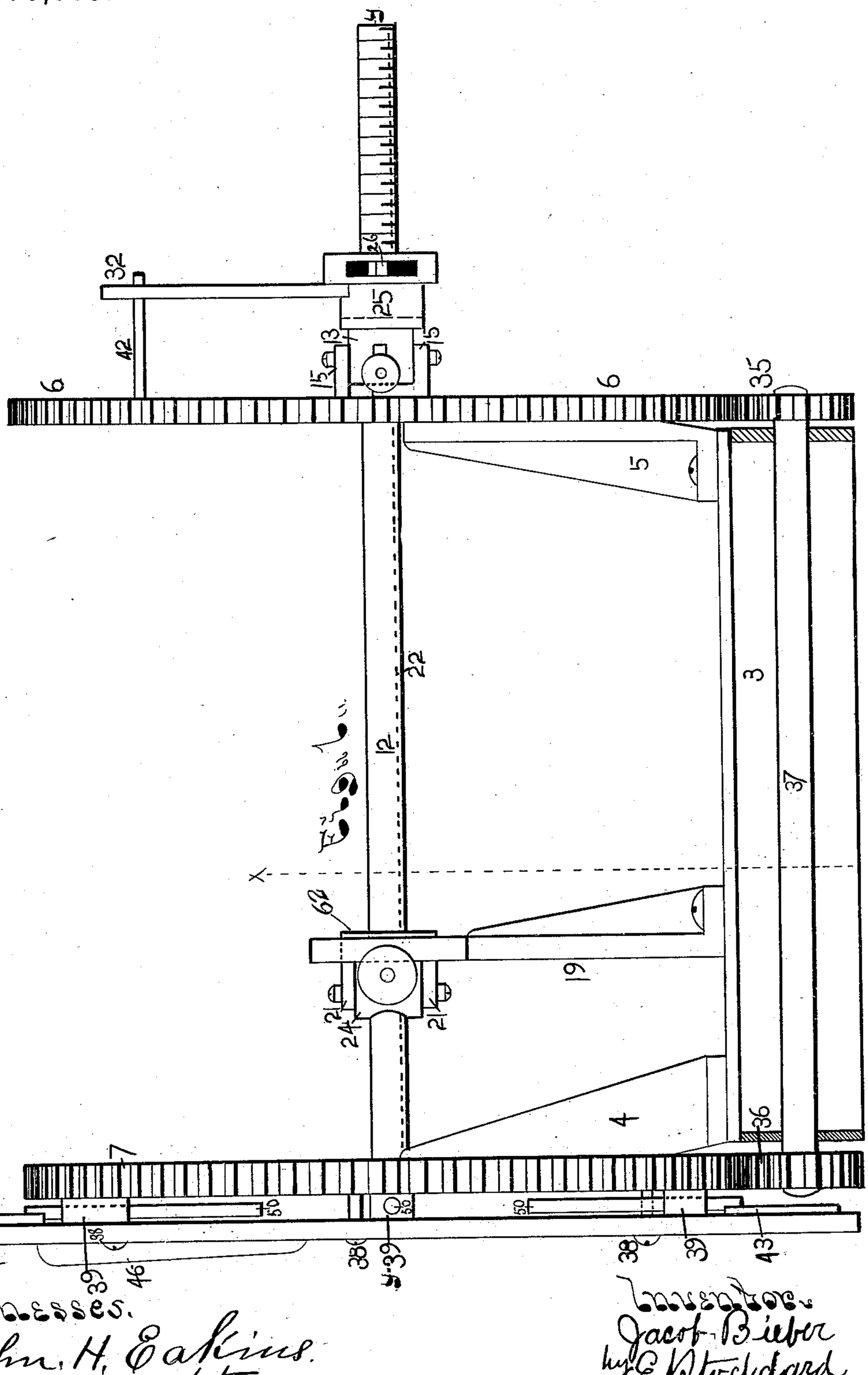
(No Model.) 5 Sheets—Sheet 1.

J. BIEBER.

HUB BORING MACHINE.

No. 376,063. Patented Jan. 10, 1888.



Witnesses.
John. H. Eakins.
Lyman E. Stowe.

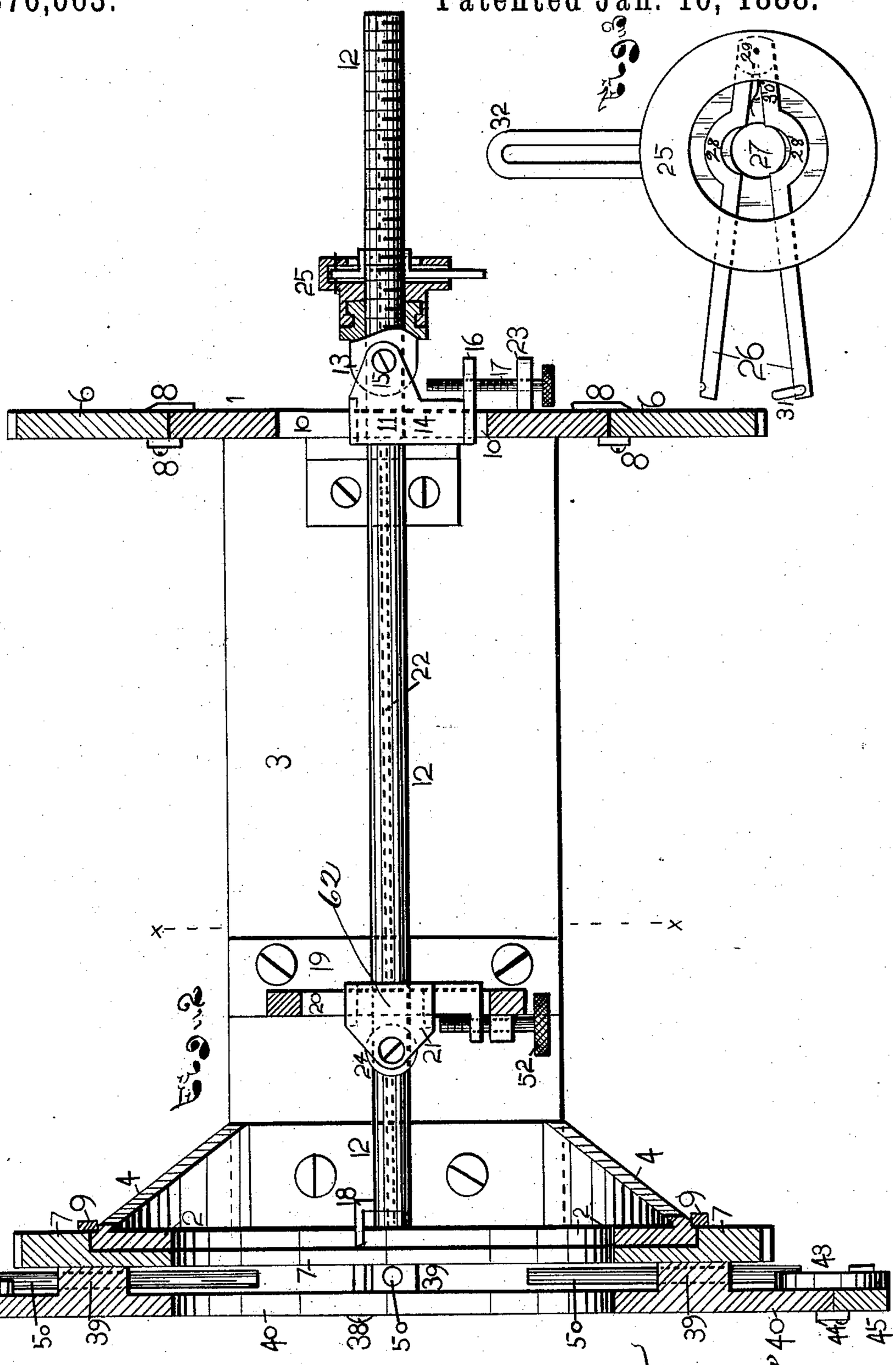
Inventor.
Jacob Bieber
by E. P. Stoddard
Att'y

(No Model.) 5 Sheets—Sheet 2.

J. BIEBER.

HUB BORING MACHINE.

No. 376,063. Patented Jan. 10, 1888.



Witnesses.
John. H. Collins.
Lyman E. Stowe

Inventor
Jacob Bieber
by E. P. Stoddard
Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

5 Sheets—Sheet 3.

J. BIEBER.

HUB BORING MACHINE.

No. 376,063. Patented Jan. 10, 1888.

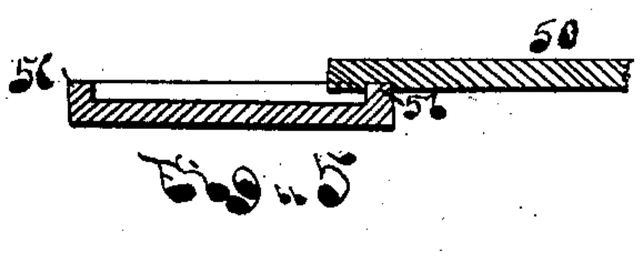
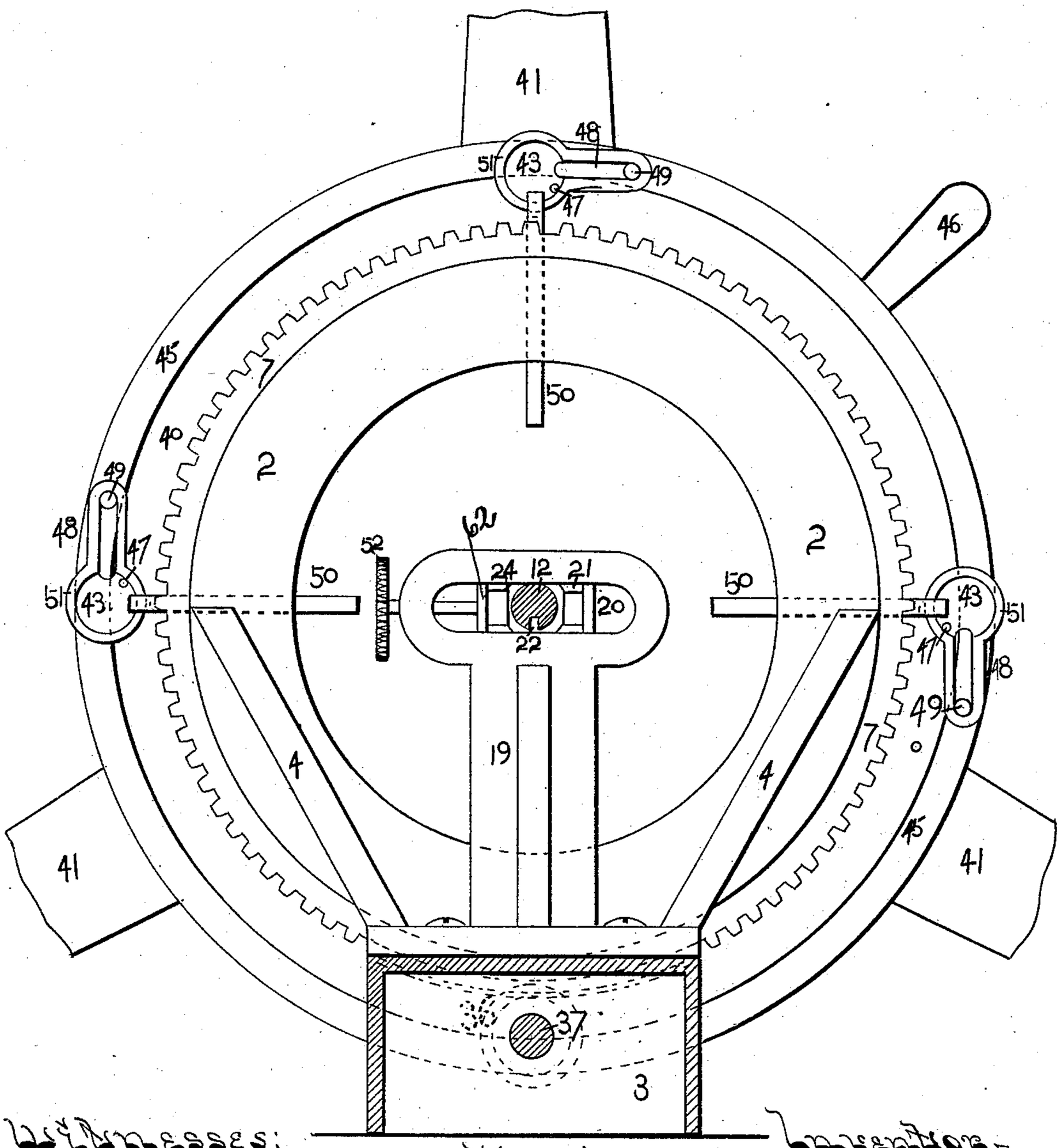


Fig. 5.



Witnesses:
John. A. Eakins
Lyman E. Stowe

Inventor:
Jacob Bieber
by E. P. Stoddard.
Att-y

(No Model.) 5 Sheets—Sheet 4.

J. BIEBER.

HUB BORING MACHINE.

No. 376,063. Patented Jan. 10, 1888.

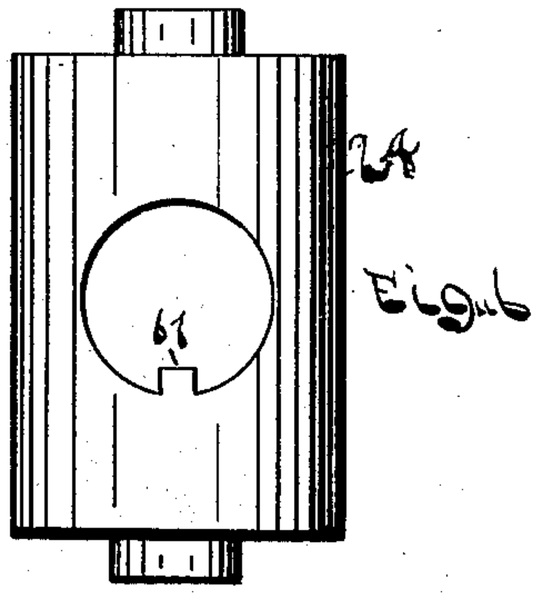


Fig. 6.

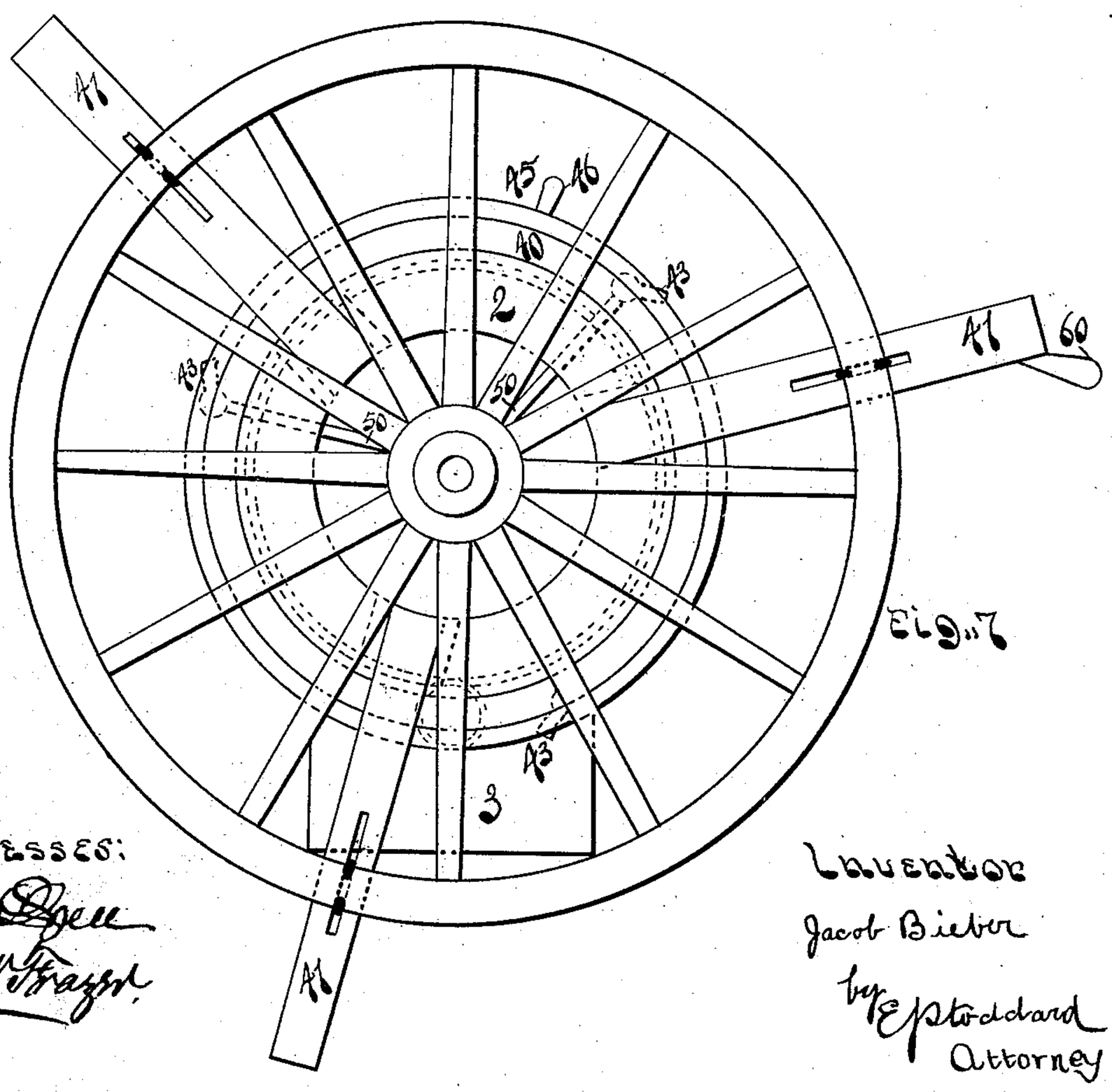


Fig. 7.

Witnesses:
Edwin Gee
Lucius W. Frazer

Inventor
Jacob Bieber
by Epstaddard
Attorney

(No Model.) 5 Sheets—Sheet 5.

J. BIEBER.

HUB BORING MACHINE.

No. 376,063. Patented Jan. 10, 1888.

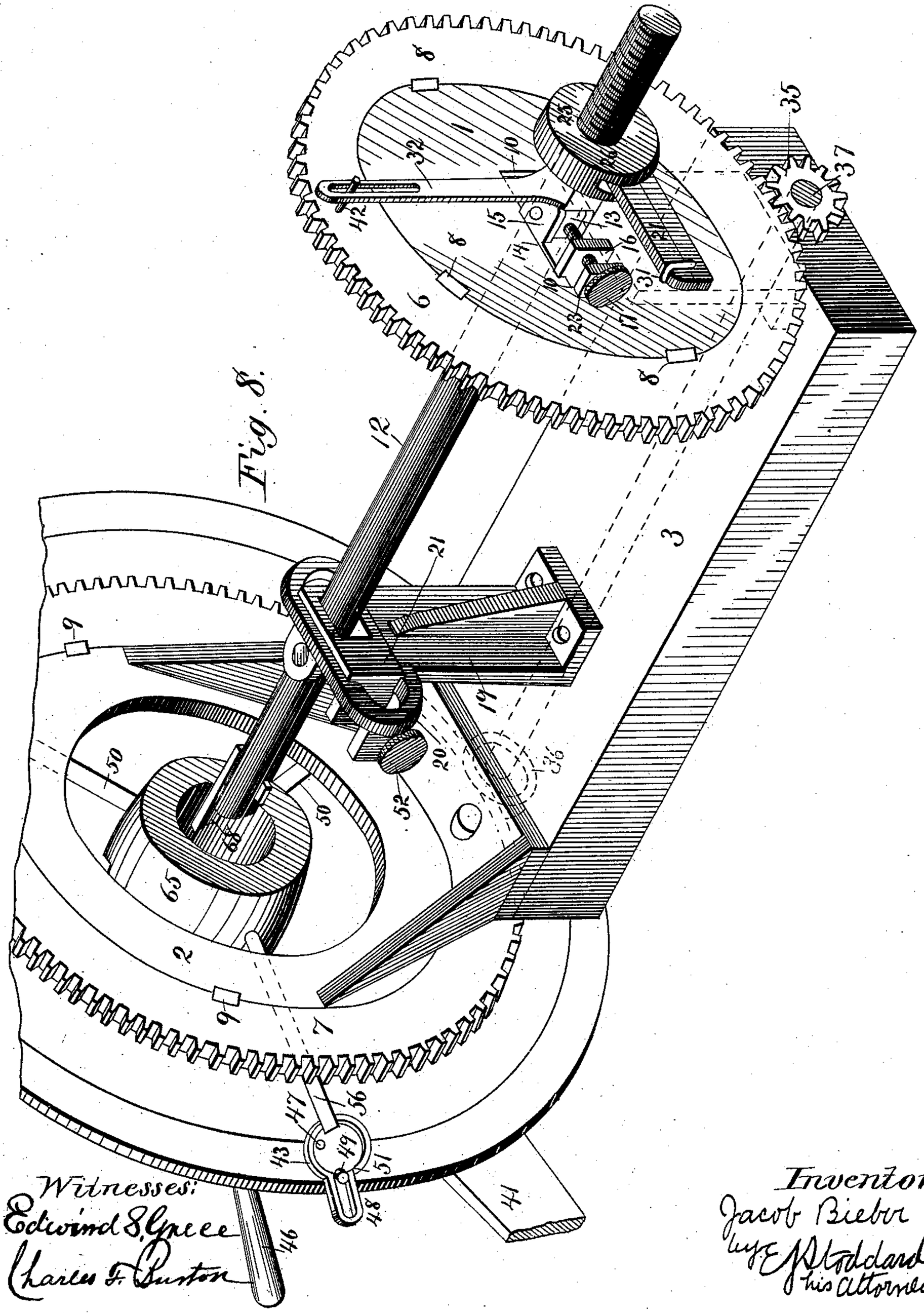


Fig. 8.

Witnesses:
Edwind S. Greee
Charles F. Burton

Inventor
Jacob Bieber
by E. J. Stoddard
his Attorney

UNITED STATES PATENT OFFICE.

JACOB BIEBER, OF JACKSON, MICHIGAN, ASSIGNOR OF TWO-THIRDS TO ALFRED B. BOLTON AND CHRISTIAN WILLIAM KAST, BOTH OF SAME PLACE.

HUB-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 376,063, dated January 10, 1888.

Application filed November 11, 1886. Serial No. 218,568. (No model.)

To all whom it may concern:

Be it known that I, JACOB BIEBER, of Jackson, in the county of Jackson and State of Michigan, have invented a new and useful Improvement in Hub-Boring Machines, of which the following is a specification.

My invention relates to hub-boring machines.

The object of my invention is to provide an improved machine for boring or reaming out the hubs of wheels to receive the axle-box. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the entire machine with the side of the hollow base which is toward the observer broken away. Fig. 2 is a section on the line *y y*, Fig. 1, showing the tool-holding bar and a portion of its bearings in full. Fig. 3 is a detail view of the screw-clamp and box in which it is held. Fig. 4 is a section on the line *x x*, Figs. 1 and 2. Fig. 5 is a detail view in section of a cam and centering-rod. Fig. 6 is a detail view of the bar 24. Fig. 7 is an elevation of the machine with a wheel whose hub is to be bored attached. The front or end at which is the chuck-head is shown. Fig. 8 is an isometric view of my hub-boring machine, showing the hub in position to be operated upon by the boring-tool 18. For the sake of clearness and to economize room, a portion of the chuck-head is broken away and the spokes and rim of the wheel are not shown.

Similar reference-figures refer to similar parts throughout the several views.

1 is a circular disk-bearing secured transversely across one end of the base 3, and 2 is an annular bearing rigidly secured transversely across the other end of said base. Through the bearing 1 at its center is the horizontal slot 10 10, adapted to receive the adjustable bearing 11 of the tool-bearing rod 12. The opening in the annular bearing 2 should be of a sufficient size to receive the largest hubs that may be bored on the machine with room to spare.

19 is a standard or pedestal having the horizontal slot 20 20 at its upper part, which slot is adapted to receive the adjustable bearing 21 of the tool-bearing rod 12. The pedestal 19 is of such a height as to bring the slot 21 on a level with the slot 10 10.

18 is the boring or reaming tool.

The bar 12 is adapted for receiving the tool 18 at one end, has a screw-thread at the other for a considerable distance—say one-half its length—and is provided with a slot, 22, extending along its entire length. (Shown in section in Fig. 4 and in dotted lines in Figs. 1 and 2.) The bearing 11 of the rod 12 consists of the frame 14, fitted to slide in the slot 10, and the bar or piece of metal 13, pivoted between the lugs 15, which lugs project from the top and bottom of the frame 14. From one end of the frame 14 extends the lug 16, near to and on a level with which is the stationary lug 23, extending from the disk-bearing.

In the lug 23 is fitted the shank of the screw in such a way as to allow it to turn, but not to move in the direction of its length. The threaded portion of the shank of the screw 17 passes through a hole in the lug 16, said hole being provided with screw-threads to correspond with the thread on the shank of the screw 17. By turning the screw 17 the bearing 11 may be adjusted laterally to any desired position. The bearing 21 is similar to the bearing 11, and therefore requires no separate description.

The tool-bearing rod 12 is fitted snugly in holes through the bars or pieces of metal 13 and 24 in such a way as to permit it to slide through either way in the direction of its length, but is prevented from turning by a fin or spline, 61, which rises from the bottom of the wall surrounding the holes in the bars 13 and 24 and projects into the slot 22.

The circular box 25 is secured to the bearing 11 in such a manner as to allow it to revolve in a perpendicular plane, but not to move toward or away from the bearing 1. The rod 12 passes through the hole 27 in the box 25, Fig. 3. In the box 25 are pivoted the levers 26. Said levers have formed in them the semicircular faces 28, provided with screw-threads adapted to engage with the screw-threads on the bar 12. The levers 26 turn about the point 29, and are held apart by the spring 30 when not required to engage with the thread on the rod 12.

31 is a metal loop secured to one of the levers 26, and adapted to pass over the other lever to hold the levers together when the machine is in operation.

32 is a slotted rod rigidly secured to the box 25, the use of which will be pointed out in a different connection.

On the disk-bearing 1 is secured, by plates 8 8, the gear-wheel 6. On the annular bearing 2 is secured, by the formation of the wheel and plates 9 9, the gear-wheel 7. These two wheels 6 and 7 are geared together by the gear-wheels 35 and 36 on the shaft 37. Secured by screws 38 to the face of the gear-wheel 7, and held a short distance therefrom by projections 39, is the ring 40, to which are attached the arms 41 41 41, to which arms is secured by clamps the rim of the wheel the hub of which is to be bored. The wheel 7 and rings 40 and 45 constitute a chuck-head for holding the wheel the hub of which is to be bored. From the wheel 6 extends the rod 42, which passes through a slot in the rod 32. Upon the ring 40 as a bearing is the ring 45, which is held in position by the cams 43 43 43 and plates 44. The ring 45 can be turned around its bearing 40 by the handle 46.

43 43 43 are cams which turn about the pivots 47. Said pivots 47 extend from the ring 40 and are rigidly fastened thereto.

48 48 48 are slots in the cams 43, through which extend from the surface of the ring 45, to which they are fixed, the short rods 49. The cams 43 are so pivoted to the ring 40 that the slot 48 shall always be at an angle with the motion of the rods 49 when the ring 45 is rotated about the ring 40.

50 50 are rods sliding radially to the chuck-head 40 45 7 in holes through the projections 39 39.

51 51 51 are annular projections from the periphery of the circular part of the cam 43 43 43, which projections extend into and slide in slots in the outer ends of the rods 50.

The method of using my improved hub-boring machine is as follows: One end of the hub to be bored is inserted through or into the opening in the annular bearing 2. The operator takes hold of the handle 46 and turns the ring 45, moving the rods 49 along the slots 48, and thus turning the cams 43 about the pivots 47, forcing the rods 50 simultaneously in toward the center of the chuck-head till the inner ends of all said rods come in contact with the hub, thus forcing said hub into the center of the chuck-head. The levers 26 are closed, bringing the threads on the faces 28 into engagement with the threads on the rod 12. The rod 12 is adjusted to an angle to correspond to the taper it is required to give the hole in the hub by moving forward or back the bearings 11 and 21 by the screws 17 and 52. The wheel and chuck-head to which it is attached are revolved either by means of a handle, 60, on the arms 41 or in any other convenient manner. The revolution of the wheel 7, acting through the gear-wheels 35 and 36 and shaft 37, revolves the wheel 6. The rod 42, carried by the wheel 6, acting on the slotted rod 32, revolves the box 25 and levers 26, causing the rod 12 to move longitudinally and carry the cutting-tool 18 through the hub while the hub is being revolved around the cutting-tool.

Having fully described my invention, what I wish to claim and secure by Letters Patent is—

1. The combination of a revolving chuck-head to which the wheel the hub of which is to be bored is attached, a standard, 19, provided with a horizontal slot, 20, a bearing for the tool-bearing rod adjustable in the slot 20, a circular bearing, 1, provided with a horizontal slot, 10, in which is the adjustable bearing 11, a feed-actuating wheel, 6, turning upon a circular bearing, 1, and a device for feeding the tool-bearing rod up to its work, substantially as shown and described.

2. The combination of a revolving chuck-head provided with a toothed wheel, 7, the standard 19, provided with a horizontal slot, 20, a bearing for the tool-bearing rod adjustable in the slot 20, a circular bearing, 1, gear-wheels and shaft 36, 37, and 35, connecting wheels 7 and 6, and a means of feeding the tool-bearing rod up to its work, substantially as shown and described.

3. The combination of a ring, 45, the bearing 40 for said ring, slotted cams 43, rods 49, extending from the ring 45 through the slots in the cams 43, and the centering-rods 50, substantially as shown and described.

JACOB BIEBER.

Witnesses:
JOSIAH B. FROST,
JACOB H. SLATER.