

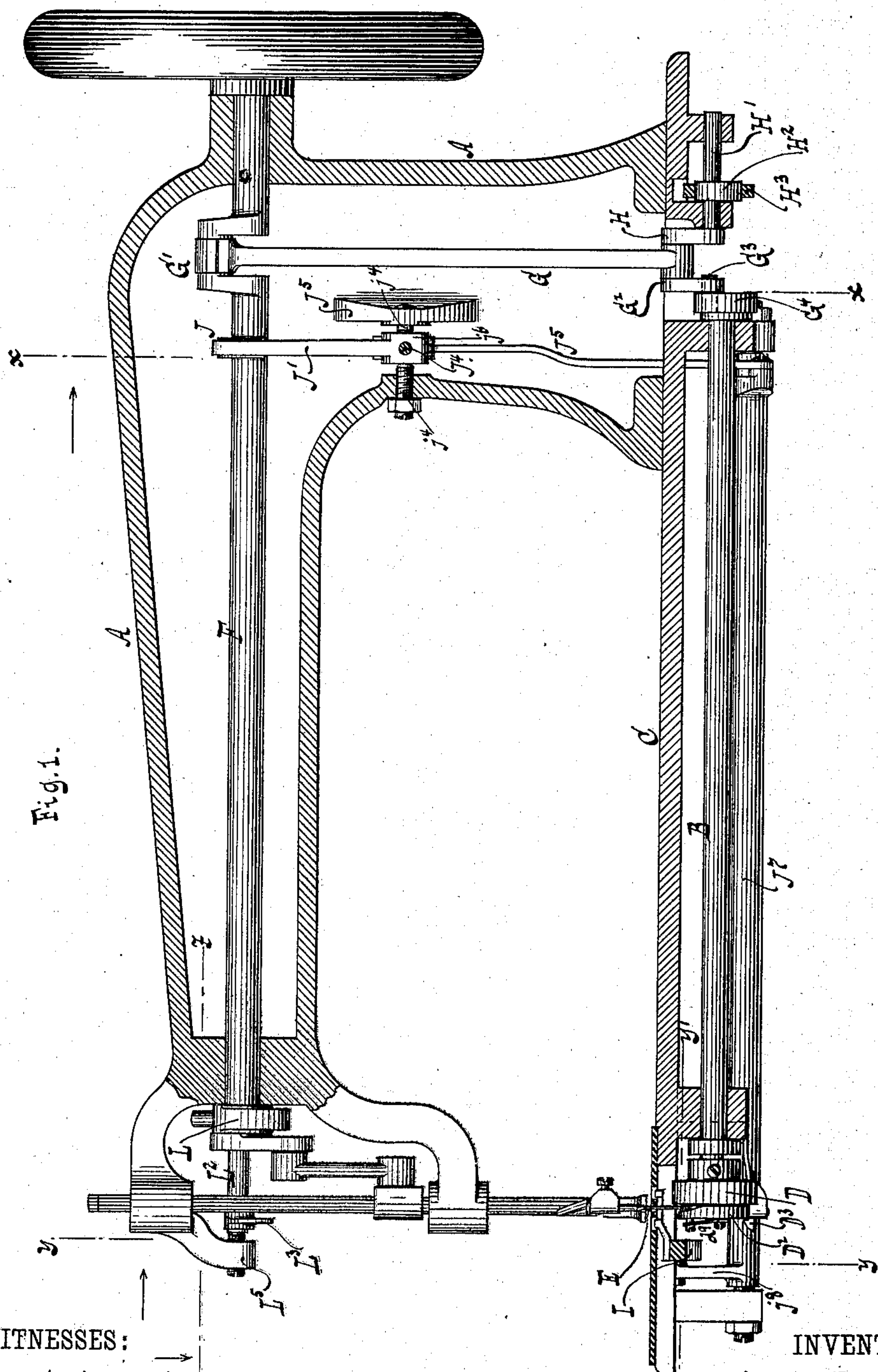
(No Model.)

4 Sheets—Sheet 1.

A. BOECHER.
SEWING MACHINE.

No. 322,245.

Patented July 14, 1885.



WITNESSES:

Otto Aufeland
Käfer der Tierf.

INVENTOR

Adam Boecher

BY

^I Van Gaatvoord & Hauff,

ATTORNEYS

(No Model.)

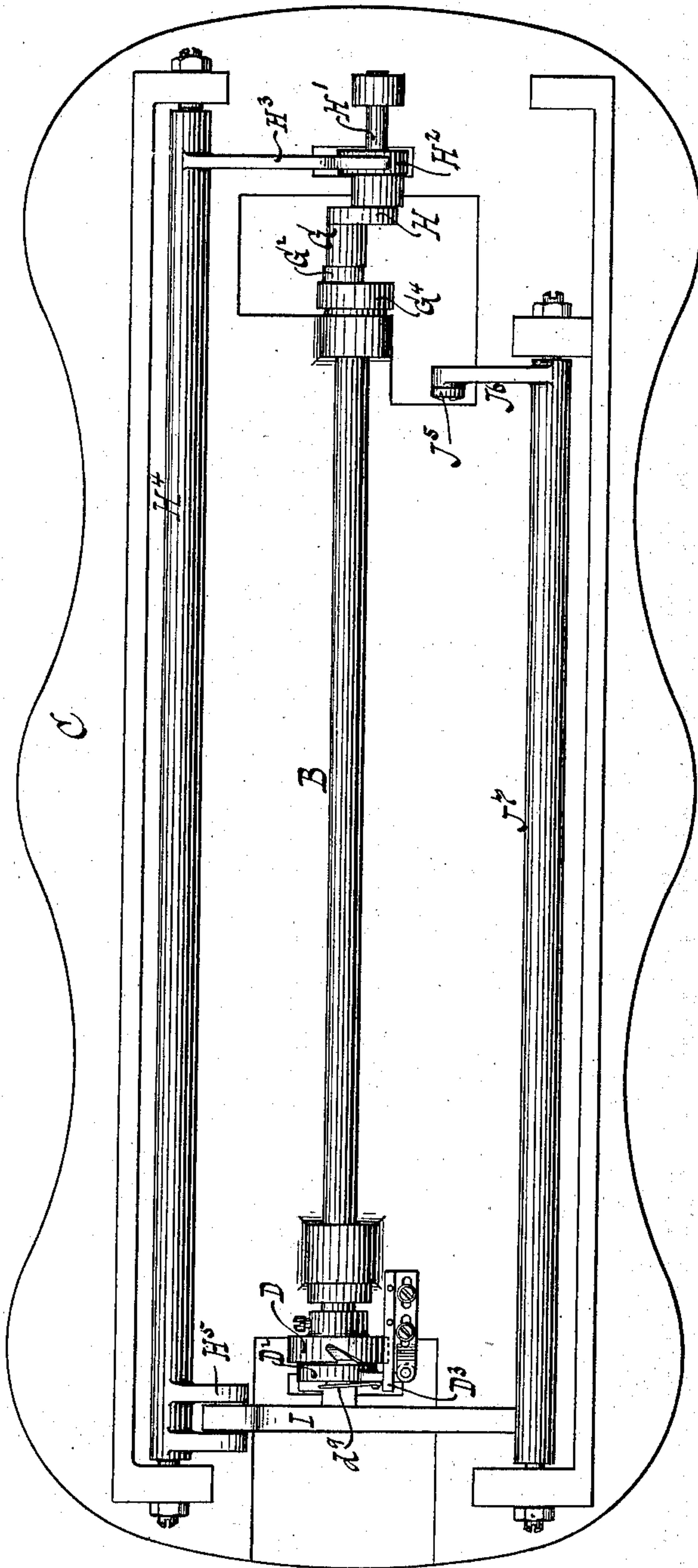
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Fig. 2.



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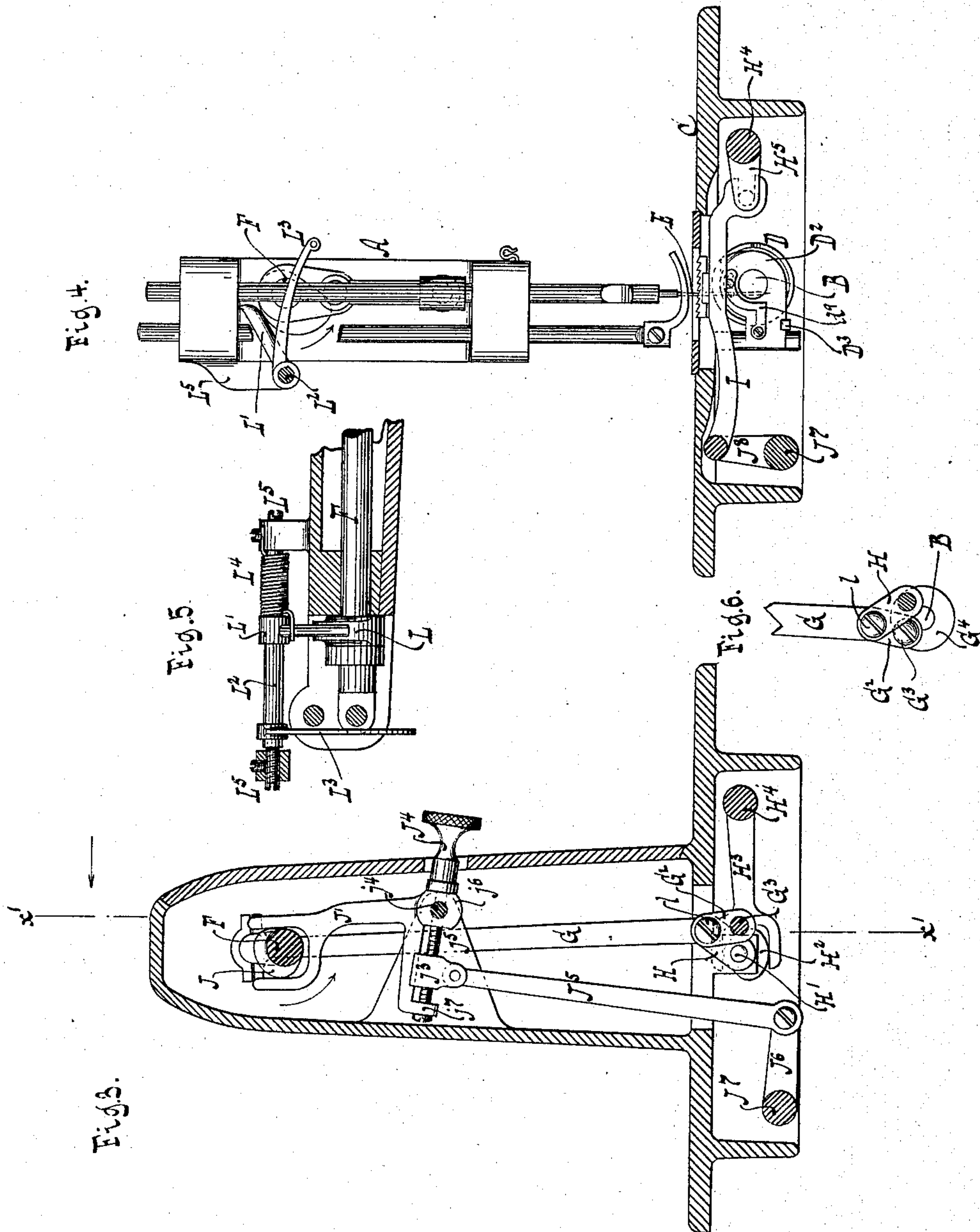
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A. BOECHER.
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4 Sheets—Sheet 4.

No. 322,245.

Patented July 14, 1885.

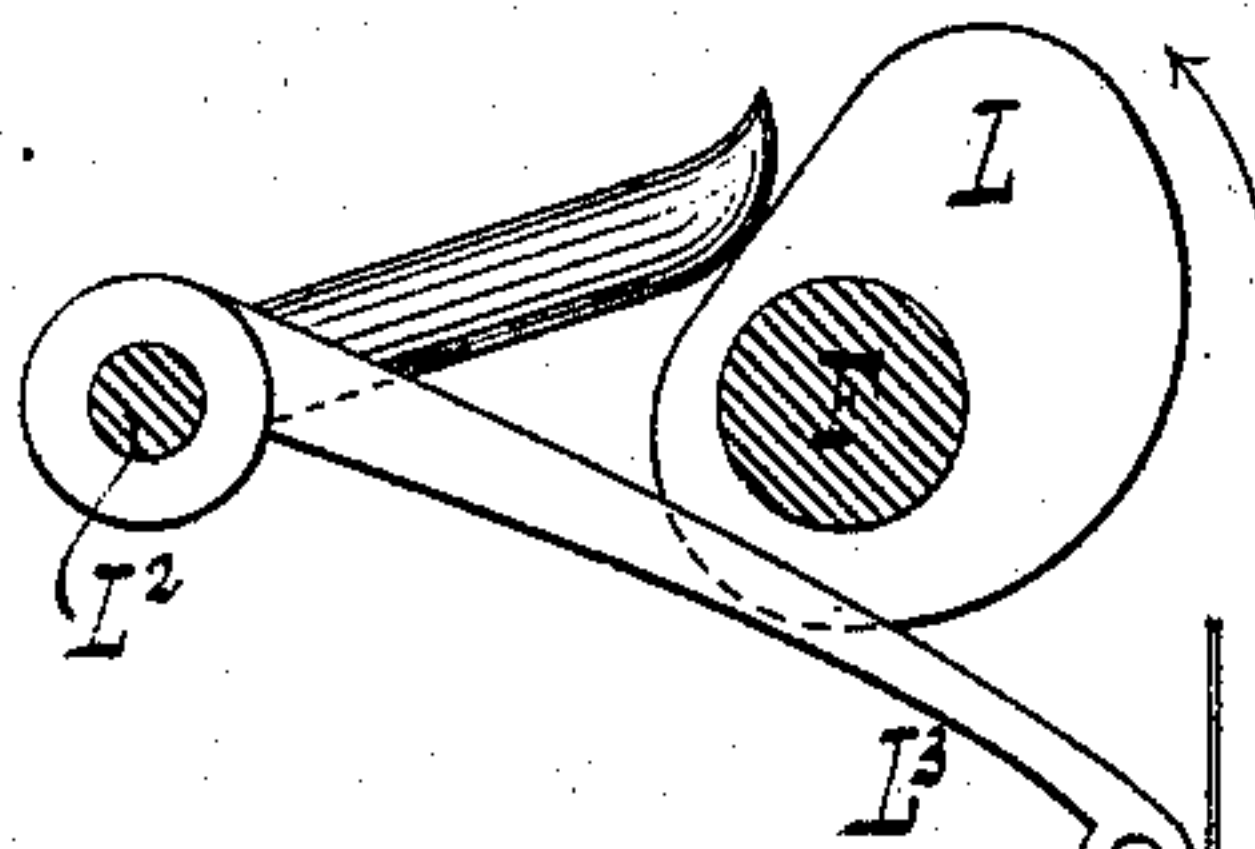
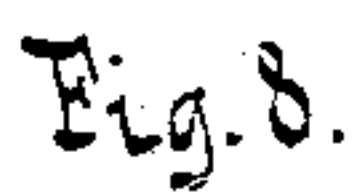


Fig. 7.

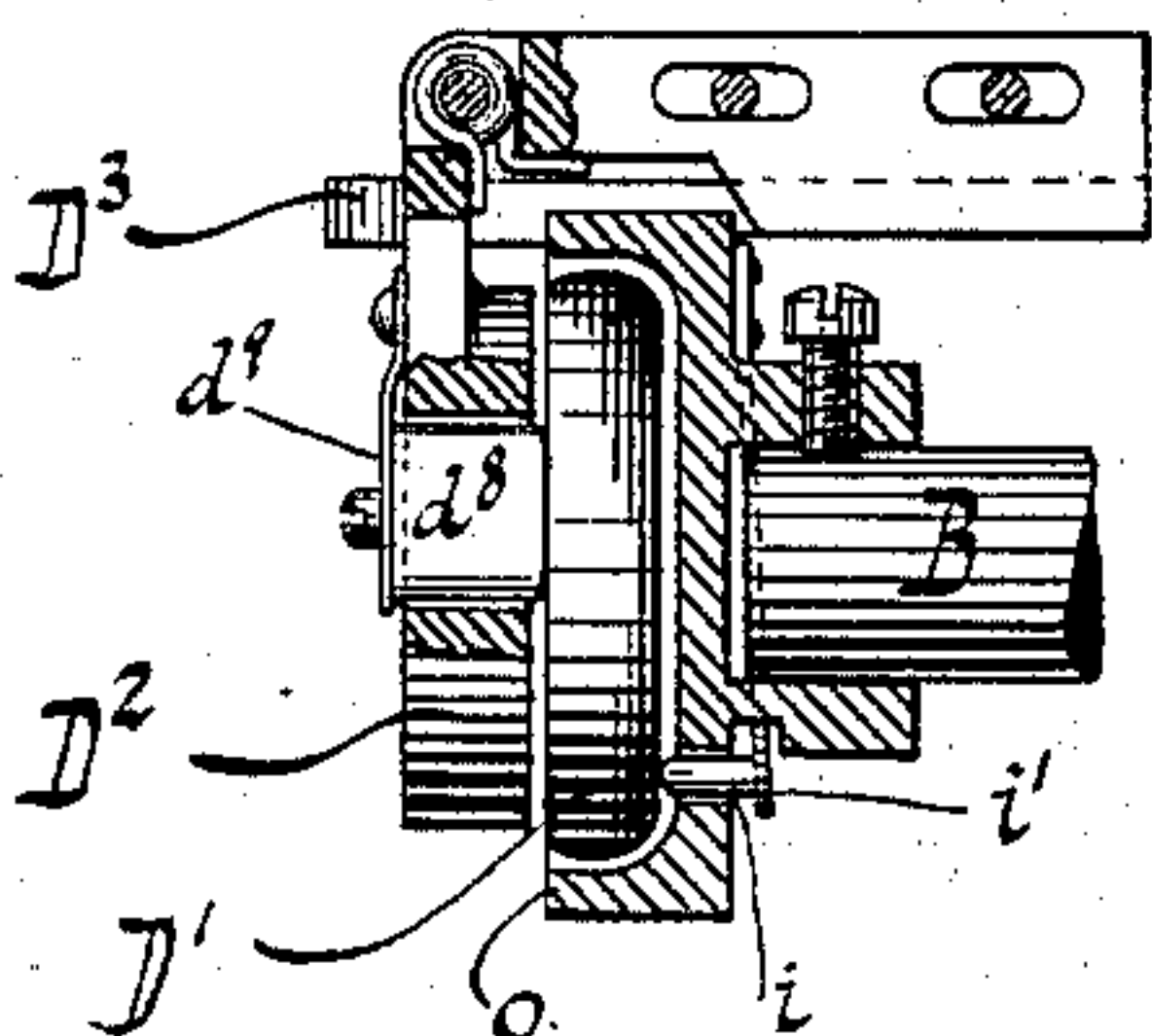


Fig. 9.

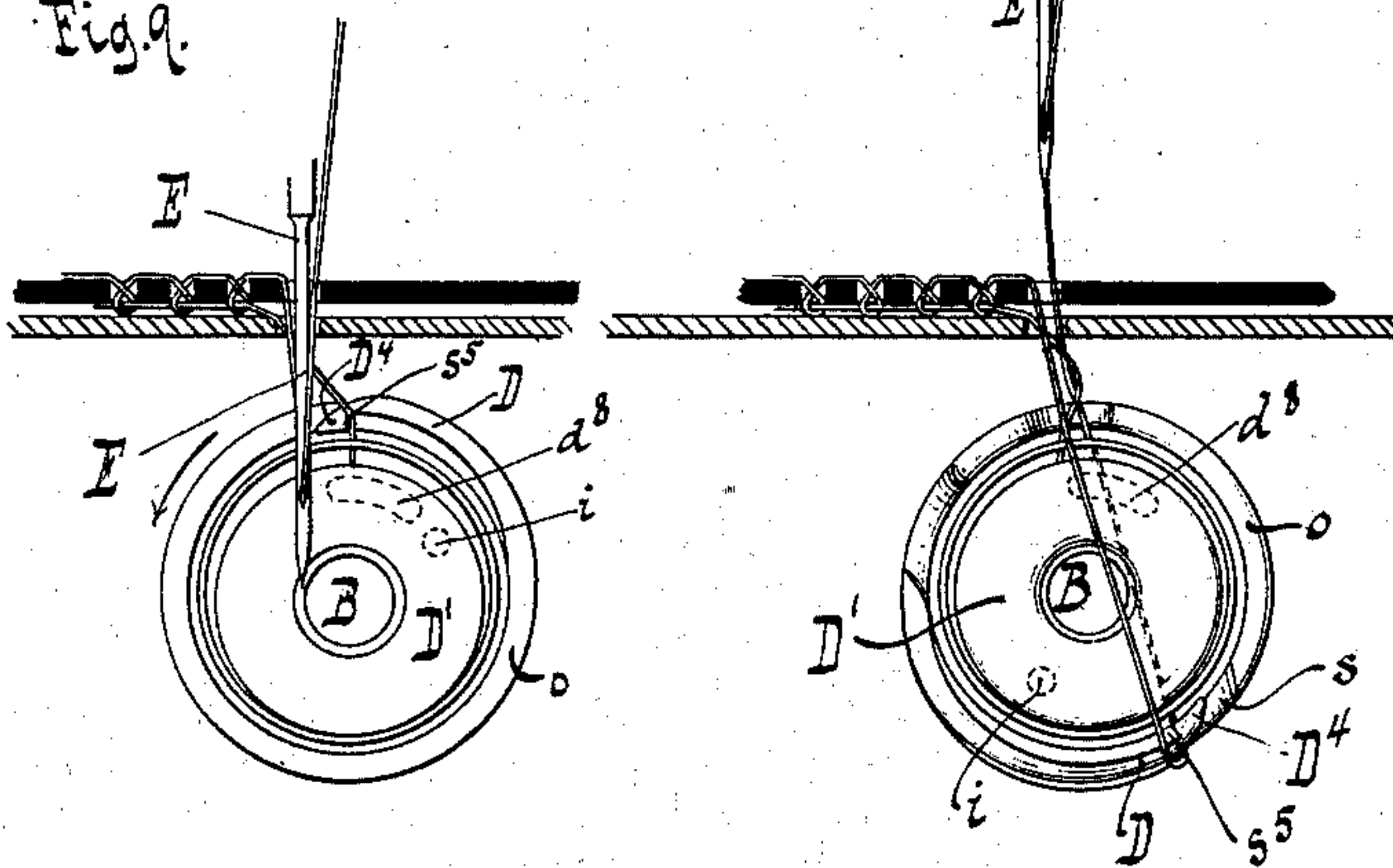


Fig. 7a

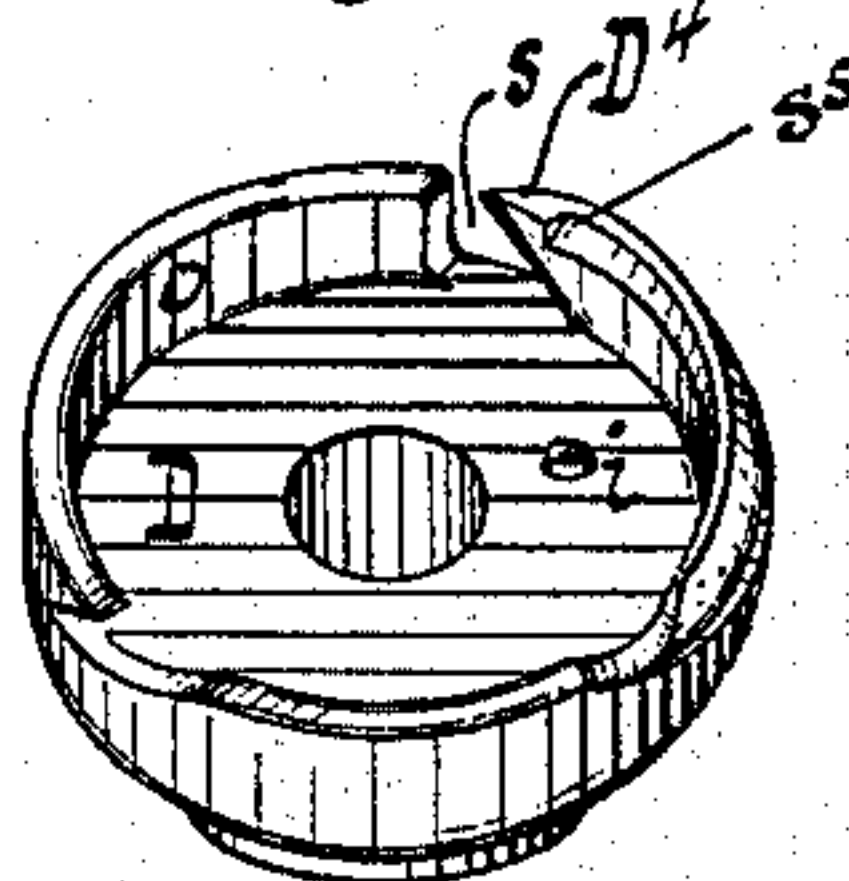
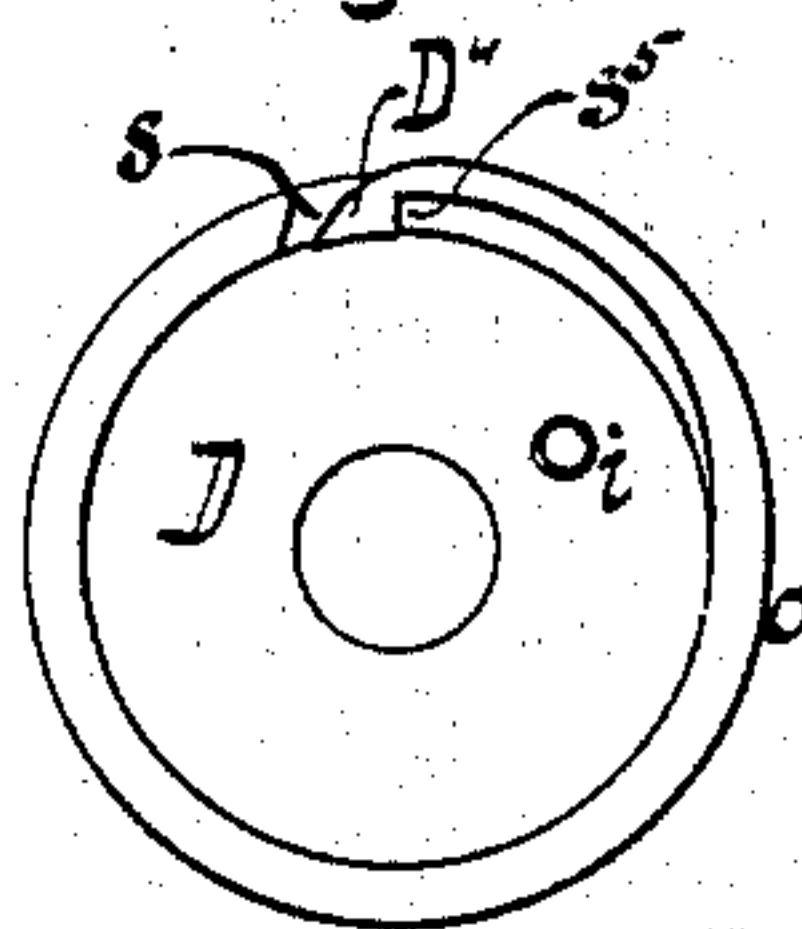


Fig. 8a



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UNITED STATES PATENT OFFICE.

ADAM BOECHER, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 322,245, dated July 14, 1885.

Application filed August 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, ADAM BOECHER, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to a sewing-machine which comprises the following elements: a reciprocating needle, a bobbin, a hook, mechanism for imparting to the hook an oscillating motion, and a shoulder on the hook-point for retaining the bobbin-thread out of the path of the needle.

The invention is illustrated by the accompanying drawings, in which—

Figure 1 represents a vertical longitudinal section in the plane $x'x'$, Fig. 3. Fig. 2 is an inverted plan view. Fig. 3 is a vertical cross-section in the plane xx , Fig. 1. Fig. 4 is a similar section in the plane yy , Fig. 1. Fig. 5 is a partial horizontal section in the plane zz , Fig. 1. Fig. 6 is a detail view of the devices for rotating the hook-shaft. Fig. 7 is a horizontal section in the plane $y'y'$, Fig. 1, on a larger scale than the previous figures. Fig. 7^a is a perspective view of the hook detached. Fig. 8 is a diagram showing the position of the threads in relation to the needle, the take-up lever, the bobbin, and the hook just before the take-up lever begins to rise. Fig. 8^a is an elevation of the hook shown in Fig. 7^a detached. Fig. 9 is a similar view showing the relative position of the needle, the hook, and the bobbin just before the hook enters the loop of the needle-thread.

Similar letters indicate corresponding parts.

The letter A designates the arm of the sewing-machine, rising from the bed-plate C in the usual manner, and B indicates the shaft carrying the hook D. In the example shown in the drawings this hook forms an integral portion of the bobbin-holder; but, if desired, the hook may be made detached from the bobbin-holder which contains the bobbin D', about which is cast the loop of the needle-thread in the operation of the hook, as presently explained. The bobbin D' is held in place by a hinged cover, D², which is retained in its closed position by a latch, D³, (see Figs. 1, 2, and 7,) and which, when closed, leaves sufficient space for the passage of the needle-thread, as shown

in Fig. 7. With the cover D² is combined a toe, d^8 , which is secured to a spring, d^9 , and which presses upon the bobbin at a point indicated in Fig. 7, so as to prevent the same from turning round too freely, and which also serves to facilitate the passage of the loop of the needle-thread over the bobbin, as will be hereinafter more fully explained. The hook-point D⁴ is formed on one edge of a break or division, s , in the rim o of the body, and it projects laterally in a curved line toward and slightly beyond the plane of the open face of the body which constitutes the bobbin-holder, while it is rounded in cross-section from the extremity to the junction thereof with the body. At a point inward from its extremity the hook-point D⁴ is provided on its inside with a shoulder, s^5 , the object of which is to prevent the bobbin-thread from slipping over the end of the hook-point when the hook makes its return-stroke, Fig. 9. If no precaution is taken in this direction, the bobbin-thread is liable to slip over the end of the hook-point and to interfere with the formation of a correct stitch, as will be hereinafter explained.

Through the flat base of the bobbin-holder projects inwardly a bit, i , with a rounded tip. It is attached to a supporting-spring, i' , whereby it is held slightly within or beyond the inner surface of the bobbin-holder, so as to retain the bobbin at a slight distance from said inner surface under normal conditions. When the cover D² is opened, the bobbin can be thrown out of the bobbin-holder by pressing upon the spring i' .

The hook D is arranged vertically next to the vertical plane of the needle E in an inward direction on the machine, as shown in Fig. 1, and in its operation the hook-point advances in the direction of the arrow marked near it in Fig. 9, so as to catch the loop of the needle-thread and to carry the same to the position shown in Fig. 8. During this movement the bobbin-thread is twisted round that portion of the loop which extends from the needle, and when the hook-point has reached the position shown in this last-named figure the needle has ascended, and then the take-up lever L³ begins to rise, so as to draw the loop of the needle-thread over the bobbin, the strand of said loop which extends from the fabric being situ-

ated in front and being retained by the toe d^8 , while the other strand of the loop is behind the bobbin, so that said loop on being drawn up tight, encompasses the bobbin-thread and forms a twisted stitch, as indicated in Fig. 8. Immediately after the take-up lever has commenced its upward movement, thereby drawing the loop off over the hook-point, the hook begins to recede, and it continues to do so until the hook-point reaches the position shown in Fig. 9. By comparing Figs. 8 and 9, it will be seen that the hook-point in its forward stroke, as well as in its backward stroke, passes through an arc of about two hundred degrees, or considerably more than one-half of a revolution, so that when it reaches the position shown in Fig. 8 the loop of the needle-thread is situated beyond the center of the bobbin; and when it is drawn off it is sure to pass over that portion of the bobbin which is situated in front of the hook-point, Fig. 8. If the hook-point in its forward motion does not pass beyond the center of the bobbin, the loop when drawn off is liable to slip over that portion of the bobbin which is situated behind the hook-point, and no proper stitch is formed. Before the needle has descended to the position shown in Fig. 9 the bobbin-thread is caught by the shoulder s^5 of the hook and held out of the way of the descending needle, so that the needle is not liable to catch in the bobbin-thread or to pass down on the wrong side thereof, and to produce a wrong or defective stitch.

The hook-shaft B receives a rotary reciprocating motion for operating the hook from the needle-bar-operating shaft F by means of a pitman, G, one end of which connects with a crank, G, on such operating-shaft, Fig. 1, while its other or lower end connects by a link, G^2 , with the pin G^3 of a crank, G^4 , on the hook-shaft, Figs. 2 and 6. The function of the link G^2 is to increase the motion of the crank G^4 and of the hook-shaft relatively to the motion of the pitman, and for this purpose the pitman is guided at the lower end by a swinging arm, H, to which it is connected by a pivot, l , serving also to connect the pitman to the link. The guide-arm H is fixed to a cam-shaft, H^1 , which thus shares the motion of the arm, and the cam H^2 of this shaft acts on an arm, H^3 , of a rock-shaft, H^4 , which carries, also, a second arm, H^5 , engaging with the feed-bar I in such a manner that a rising and falling motion is imparted to the feed-dog from the guide-arm H through the cam-shaft and rock-shaft, causing such arm to perform two functions.

A forward and backward motion is imparted to the feed-bar I to complete its action from the needle-bar-operating shaft F in the following manner: To the shaft F is fixed the usual cam, J, (best seen in Fig. 3,) which acts on one arm of an elbow-lever, J^1 . This elbow lever swings in center points, $j^4 j^4$, one of which extends through the inside of the arm A, while the other passes through a lug, j^5 , in the interior of said arm, Fig. 1. Through the boss j^6 of the elbow-lever extends a thumb-screw, J^4 , the tip of which has its bearing in a lug, j^7 , which projects from the second arm of the elbow-lever J^1 , Fig. 3, said thumb-screw being mounted in its bearings in such a manner that it can be turned freely in either direction, but is not permitted to move endwise. On the thumb-screw is fitted a traveling nut, J^3 , which connects by a rod, J^5 , with an arm, J^6 , of a rock-shaft, J^7 . This shaft carries a second arm, J^8 , Fig. 4, which connects with the feed-bar, so as to impart to the same the desired feed motion during each revolution of the needle bar-operating shaft F. By turning the thumb-screw J^4 the traveling nut J^3 is moved closer to or farther from the fulcrum of the elbow-lever J^1 , and the feed motion can be decreased or increased as may be desired.

To the needle-operating shaft F is fixed near its forward end, which is exterior of the machine-arm, a cam, L, acting on an arm, L^1 , of a shaft, L^2 , which engages the cam and carries also the take-up lever L^3 , and on which is coiled a return-spring, L^4 , so that in the motion of said operating-shaft the cam acts on the shaft-arm to move the take-up shaft and lever in one direction, while the spring moves said parts in the opposite direction. The take-up shaft L^2 is arranged on one side of the machine-arm parallel to the needle-bar-operating shaft F in lugs L^5 of the arm.

What I claim as new, and desire to secure by Letters Patent, is—

The combination, substantially as hereinbefore described, of the reciprocating needle, the bobbin, the hook, mechanism, substantially as herein described, for imparting to the hook an oscillating motion, and the shoulder s^5 , for retaining the bobbin-thread out of the path of the needle.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

ADAM BOECHER. [L. S.]

Witnesses:

W. HAUFF,
E. F. KASTENHUBER.