No. 644,322. Patented Feb. 27, 1900.

P. GOLDSCHMIDT.

LEASE MECHANISM.

(Application filed June 22, 1897.)

(No Model.) 3 Sheets—Sheet 1.

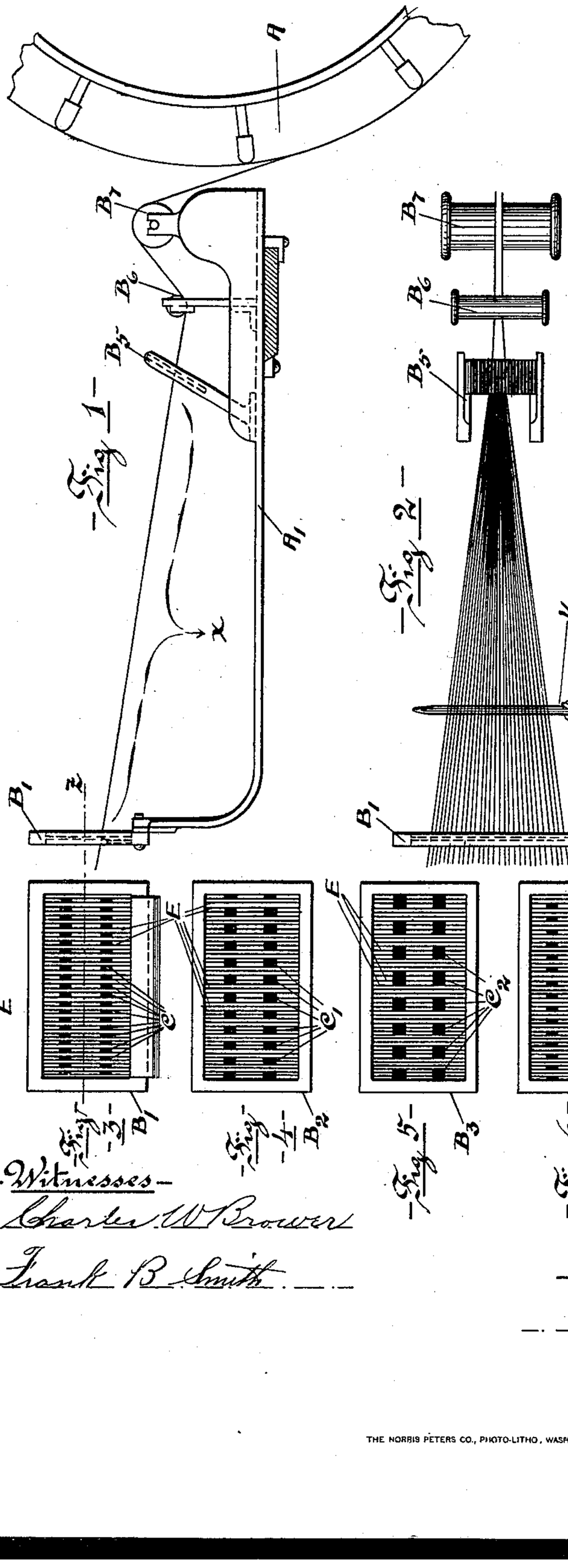

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses—
Charles W. Brower
Frank B. Smith

Inventor—
Philipp Goldschmidt
By his Attorney—
August M. Fleischmann

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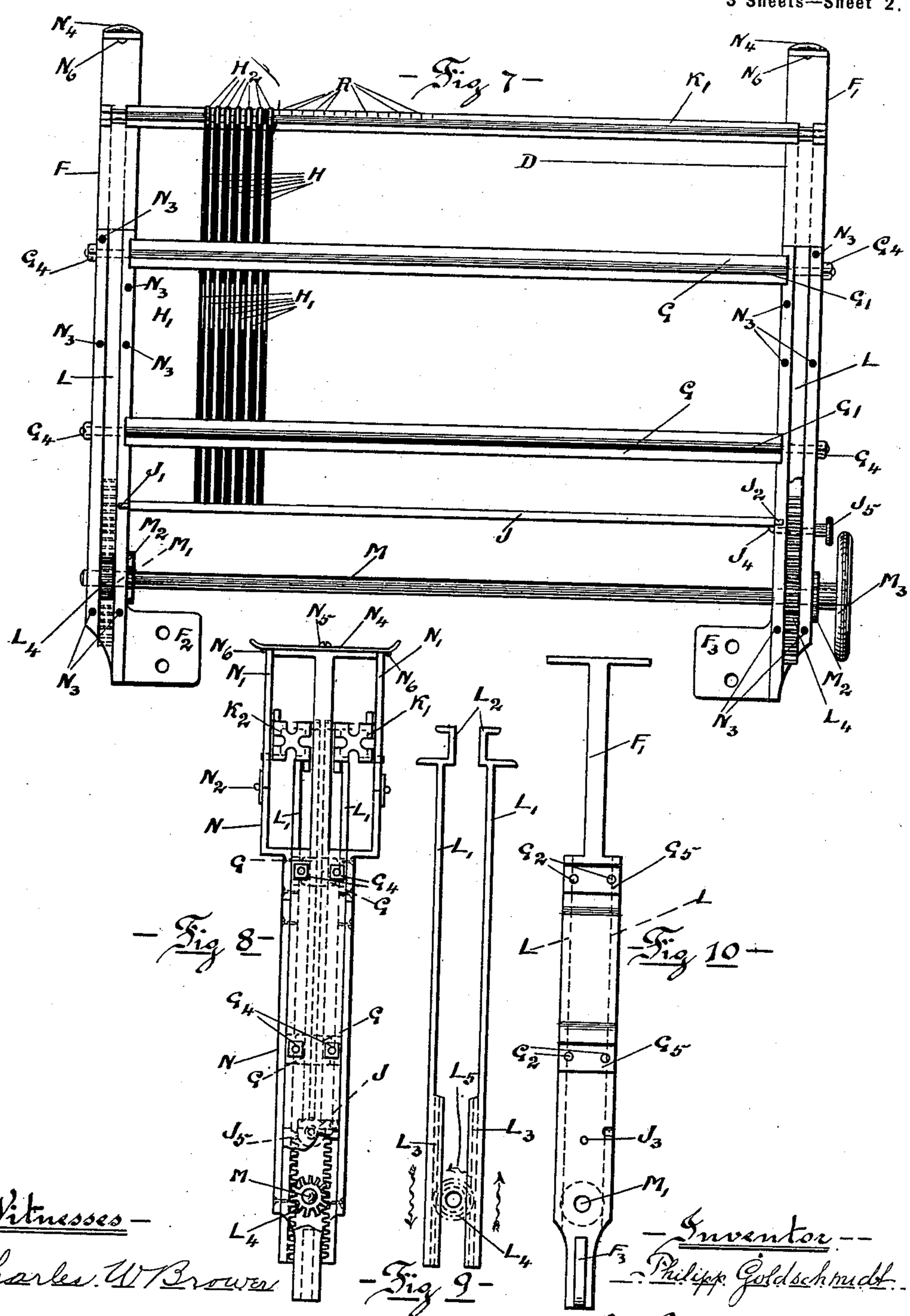
P. GOLDSCHMIDT.

LEASE MECHANISM.

(Application filed June 22, 1897.)

(No Model.)

3 Sheets—Sheet 2.



— Fig 7 —

— Fig 8 —

— Fig 9 —

— Fig 10 —

— Witnesses —

Charles. W Brower

Frank. B. Smith

— Inventor —

— Philipp Goldschmidt —

— by his Attorney —

August N. Fleschow

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P. GOLDSCHMIDT.

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(Application filed June 22, 1897.)

(No Model.) 3 Sheets—Sheet 3.

Fig 11

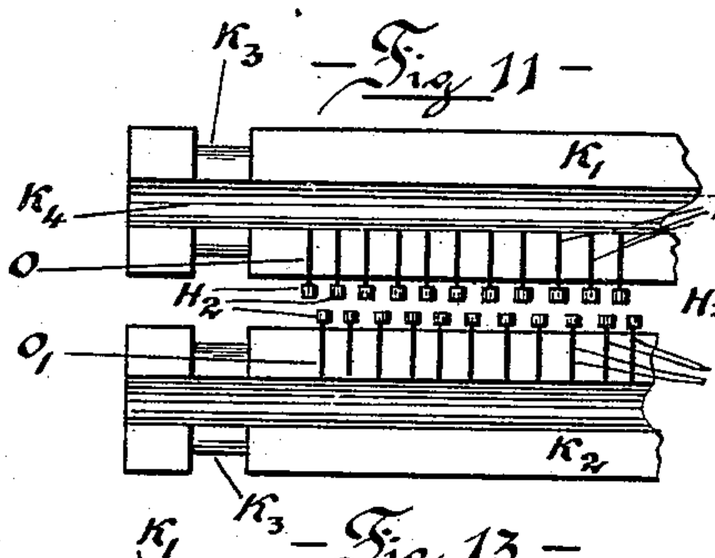


Fig 12

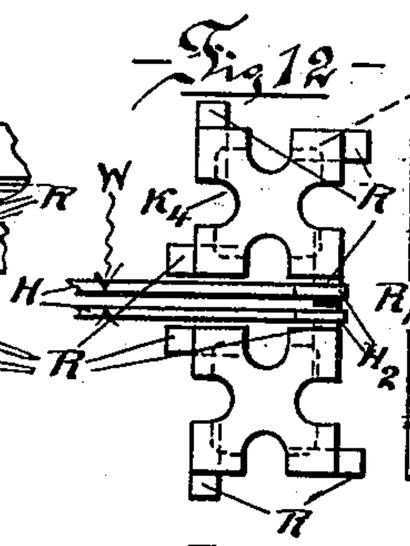


Fig 15

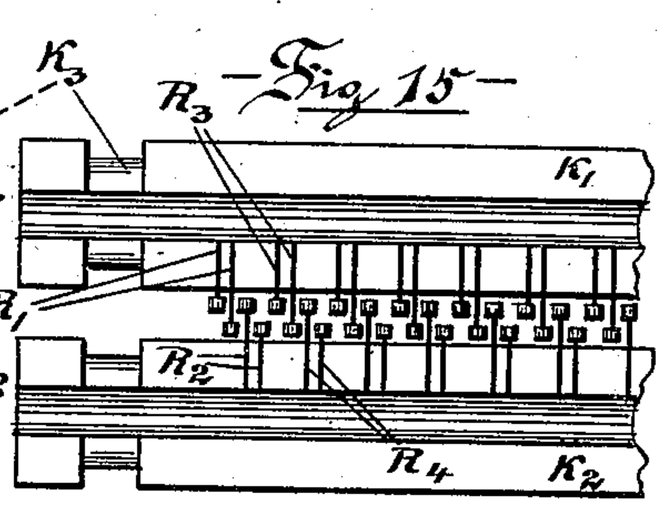


Fig 13

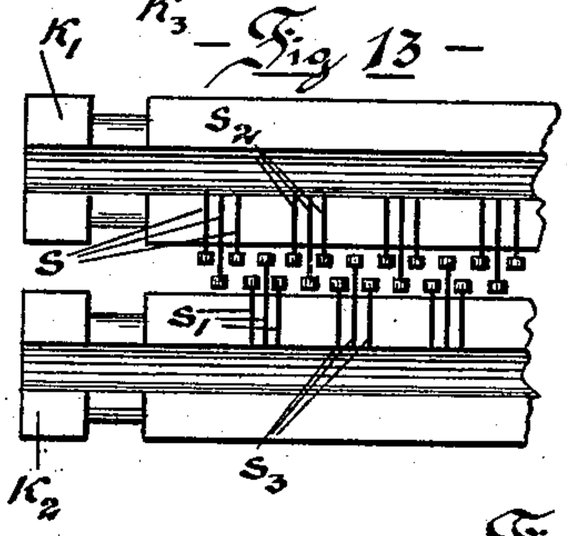


Fig 14

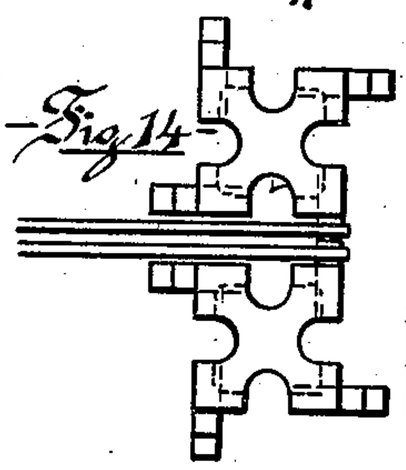


Fig 16

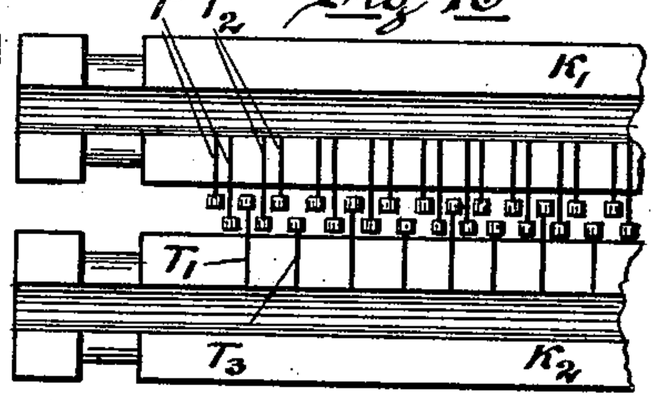


Fig 17

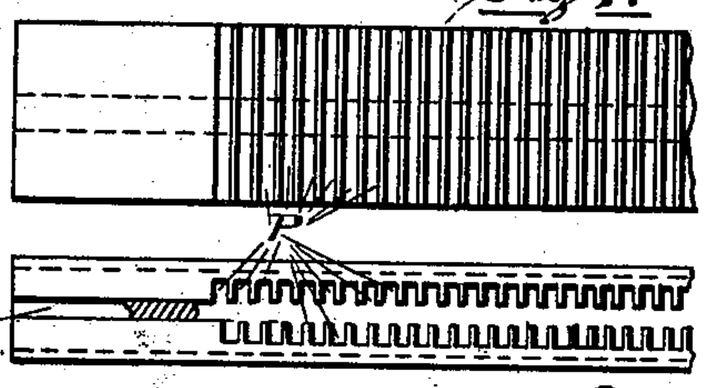


Fig 18

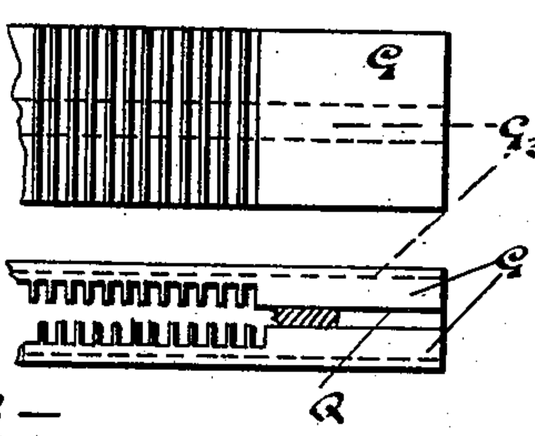


Fig 19

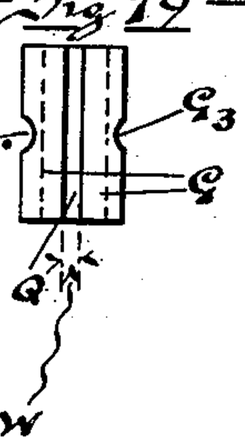
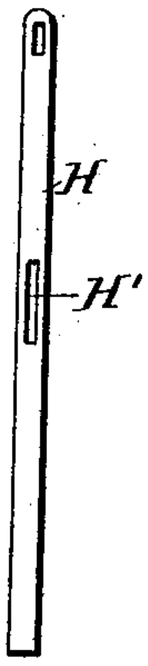


Fig. 20.



Witnesses —

Charles W Brower

Frank B Smith

Inventor —

Philipp Goldschmidt

by his Attorney —

August M. Pleschow

UNITED STATES PATENT OFFICE.

PHILIPP GOLDSCHMIDT, OF PATERSON, NEW JERSEY.

LEASE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 644,322, dated February 27, 1900.

Application filed June 22, 1897. Serial No. 641,774. (No model.)

To all whom it may concern:

Be it known that I, PHILIPP GOLDSCHMIDT, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Lease Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in the construction of the "warp-reed" as it is known and used up to the present date, and as my invention has for its object to provide a novel construction as a substitute for any of the warp-reeds now used a description of the old reeds will be in place and a necessity in order to properly understand wherein my inventive idea lies.

As the object of my invention will appear most clearly defined in a comparison of the old system with my improvement, I will first enumerate and explain the different figures and then proceed with the description of the old system of reeds, accompanied by a parallel statement of the object of my invention.

Figure 1 is a side view of the warp-reed bracket attached to any ordinary warping-mill. Fig. 2 is a top view of parts shown in Fig. 1; Figs. 3, 4, 5, and 6, the different kinds of reeds that can be used in forming the crosses in the warp; Fig. 7, a front view of my improved combination warp-reed; Fig. 8, a side view of Fig. 7; Fig. 9, a detailed side view of parts of Fig. 8; Fig. 10, a side view of one of the side frames of my improved reed; Figs. 11, 13, 15, and 16, broken views of the bars, each figure showing one of the four faces of the two bars with the different systems of teeth; Fig. 12, an end view of the bar pair illustrated in Fig. 11; Fig. 14, an end view of the bar pair shown in Fig. 13; Fig. 17, a front view of one of the dent-guides; Fig. 19, an end view of both dent-guides; Fig. 18, a top view of Fig. 19, and Fig. 20 shows my improved dent.

In Fig. 1, A indicates the warping-mill on which the warps are wound after having the cross inserted which separates the threads into single, double, three-ply, or double-and-single warp.

A′ represents a bracket which at one end has attached to it any one of the four reeds illustrated, of which B′ produces a single-threaded warp; B^2, double warp; B^3, three-ply warp, and B^4, single-and-double warp. Through one of these warp-reeds—B′, for instance—the threads are guided, each coming from its spool on the creel. From there it passes through what is called the "section-reed" B^5, from whence it passes under a roll B^6 and over a roll B^7 and on to the warping-mill A. It is during the passage (indicated by letter *x* in Fig. 1) from the warp-reed B′ to the section-reed B^5 that the cross is secured, binding the threads into the necessary divisions which form the warp, and this operation is accomplished in the following manner:

Supposing that the reed B′ (shown in Figs. 1, 2, and 3) be taken as an example, it will be seen when looking at Figs. 3 and 2 that if a thread be inserted between each of the vertical dents they will appear as illustrated in the top view Fig. 2 and that if the operator's arm or a stick be laid across the entire span of threads—at, for instance, the place marked Y—and a downward pressure be exerted on the stick the threads, which are all inserted at the line Z, Fig. 3, will divide themselves into two distinct and separate parts—in fact, form a shed—for the reason that every other thread will be stopped at the parts marked C in the reed B′, said part C being the piece of soldering that joins two dents together, thus forming a rest or stop for a thread, while the other half of the threads will be carried down to the bottom of the frame. The operator then inserts between the shed thus formed a thread, technically known as the "cross-thread," forming the cross, and this ties together in the warp proper the threads thus divided, ready then to be wound on the warping-mill. It will then be apparent that if another division of the threads is required or any other cross is desired in the warp—for instance, the double warp, as in the shed formed by the reed Fig. 4—and the same process be followed by the operator then in the division of the threads in the case of Fig. 4 two threads will be stopped

at the soldered parts C′, while the next two will be carried down to the bottom of the frame, and so on, and consequently when the cross-thread is inserted in the shed thus formed a double warp will be formed, and such will also be the case in the use of the reed Fig. 5, when three threads will be stopped by the soldered parts C^2 and the next three threads be carried to the bottom of the frame, and in the use of the reed Fig. 6 one thread will be stopped by the soldered part C^3, while the next two will be pressed downward. In the combination of these four operations into one, or, in still plainer terms, in reconstructing these four reeds B′, B^2, B^3, and B^4 into one single frame D, as illustrated in Fig. 7, having the necessary mechanical means to change the four different combinations of threads—single, double, three-ply, and single-and-double warp—by one easy adjustable operation lies the object of my invention. The great advantage derived from this improved reed will be found to reside not only in the saving of the silk which has to be cut off and wasted at the change from one of the old-style reeds to another, but over and above all in the time saved by the operator, inasmuch as each individual thread has to be led between the dents and adjusted properly, a piece of work that generally occupies from one to two hours, whereas in my improvement, as will appear presently, this whole transaction of changing from one reed to another only occupies at most five minutes. Of other benefits derived may be mentioned two of no small importance, the first being this, that as all the dents E in the old style of reeds are in one body on account of being soldered together, the said soldering C, C′, C^2, and C^3 forming the rest for half of the threads that remain suspended, if one happens to break or any other accident happens to the reed the whole reed is for the time being useless, whereas in my improved reed each individual dent is separate and independent of the others. That means that each single dent is loosely supported and can be disconnected and removed by itself without removing any other or all of the entire series of dents, and can consequently, if damaged, be replaced by another. The second and to every operator very material benefit is this, that where one thread lying beside another should have been unwound looser from the spool than its neighbor the probabilities are that it would become entangled with it, and in time one or both threads would snap. This is easily overcome in my invention, as will be apparent as the description proceeds later on by setting one of my reed-bars a trifle apart from the other, thus separating the individual threads and preventing their becoming entangled.

From the above explanation of the dents, describing their loose and independent attachment to each other, it will be readily seen that the mechanical means embodying the principle of changing the different sheds resides, broadly, in a connection between the dents and the bars, enabling the latter by appropriate means to be connected and disconnected from the dents at any desired moment—that is, when a change of shed is demanded.

I shall now proceed to the description of my improved warp-reed as illustrated in a front view in Fig. 7, where F and F′ constitute the two side frames in my reed and are attached by lugs F^2 and F^3 to the bracket A′, taking the place of reed B′, as shown in Fig. 1. Securing these two frames together are the dent guide-rods G′, which pass through the holes G^2 and are secured on the outside by nuts G^4. The dent-guides G themselves act as bracing-rods between the two side frames, being secured in notches G^5, cut out in each frame to that effect.

H indicates my improved dents, having slits H′, through which the threads pass, and loops H^2, into which fit the teeth R, secured to the four surfaces of the square bars K′ and K^2. This connection between the loop in the dent and the pin or tooth on the bar-face is, as can be readily understood from the drawings and the description, entirely loose and must of a necessity be so in order that the pins or teeth R on the bar may be capable of elevating all the dents simultaneously and immediately when a new pair of contiguous oppositely-lying bar-faces are presented, and equally so at the same time the pins must be capable of instantaneous disconnection from the loops when another pair of bar-faces are desired. The dents are further supported on the dent-rest J, which itself is pivoted on pivots J′ and J^2, said pivots fitting into holes J^3 in each side frame.

As seen in Fig. 8, the dent-rest will swing around the pivots if unsupported, and to keep it in a horizontal position, so as to make it a rest for the dents, a pin J^4, with a tapered surface on its under side, is secured in the frame F′, said pin J^4 manipulated by a knob J^5. Sliding in guiding-grooves L, cut out longitudinally in each of the side frames F and F′, are two rods L′, being placed with regard to each other individually and with regard to the side frames F as shown in the illustration in Fig. 9. Each one of these rods L′ is at the top furnished with a fork L^2, which forms one of the bearings or supports for the bar, while each rod L′ is furnished with teeth at the bottom, forming a gear-rack L^3, with which gear-racks a pinion L^4 meshes, giving, consequently, when pinion L^4 is turned in the direction of arrow-head L^5, an up-and-down motion in the direction of vertical arrow-heads simultaneously to each of the rods L′. A rod M has these two pinions L^4 fittingly secured to it and is itself supported in the side frames F in holes M′ and secured to the frames F and F′, respectively, by bearings M^2. A hand-wheel M^3 is attached to the end of the rod M and operates the same. In order to secure the rods L′ in the grooves L, a plate N,

having the upper part N′ hinged to it by a hinge N^2, is furnished for the front and rear side of each of the frames F and F′, and said plate N is, by means of screws, secured to the frame in holes N^3, drilled and screw-cut for that purpose in said frames. The upper part N′ is hinged in order to permit of the bars K′ and K^2 being taken out and turned when a change of reed is wanted, and these hinged parts are locked to the side frames F by a spring N^4, attached by a screw N^5 to the top of the frames, said springs each having knob N^6, which permits the hinged part N′ to pass it, and then by the action of spring N^4 holds it in against the frame. In Fig. 7 for the sake of clearness in illustration the two rods L′, lying in front, are omitted, showing thus the grooves L in full view, while on the right side frame F′ part is broken away to show the gear-rack L^3 on the rear rod L′ in full. The guides G are four in number—two front and two rear. Their construction and function are best understood from Figs. 17, 18, and 19. Each one is furnished with a square groove P for every dent, and as there are two sets of dents lying opposite to each other—a front and rear set—there is a front and rear guide corresponding to each set, as seen in the top view in Fig. 18. To keep these separated from each other, and thus maintain the proper distance, and to keep the dent in the groove, a bar Q of the same length and height dimensions as the guide and a breadth or thickness equal to the distance between the front and rear rows of dents, (indicated by the letter W in Figs. 12 and 19,) is provided, and these guides, by having the longitudinal semicircular groove G^3, alluded to formerly, furnish a rest for the rods G′, that secure the side frames F and F′ to each other. Each of the bars K′ and K^2 is placed with one of its ends in the bearings L^2, furnished at the top of rods L′, and each front and rear bar is consequently supported, respectively, in two front and two rear supporting-rods. The part of the end of bar fitting in said bearings L^2 is a groove K^3, cut at a right angle with the axis of the bar. Each bar is a square in cross-section, and each of the four surfaces has a channel K^4 running lengthwise with the axis of the bar. On each of the four surfaces of the bar (and as they both are constructed alike one description will suffice for both) there is in a suitable mechanical manner affixed a row of "pins" or "teeth," as they appropriately might be termed, (called R in Fig. 7,) and to each of these rows of teeth when the two bars are in their proper places secured in their bearings, and consequently the teeth from each upturned surface act in unison, as in the position shown in Fig. 8, corresponds a reed of the old style, as seen in either Figs. 3, 4, 5, or 6. The comparison is as follows: To the single-warp reed B′ correspond in function the two rows of teeth shown on the first surfaces of each of the bars in Fig. 11. To the double-warp reed B^2 correspond the two rows of teeth shown in the second pair of surfaces shown in Fig. 15. To the three-ply-warp reed B^3 correspond the two rows of teeth shown on the third pair of surfaces in Fig. 13, and, finally, to the double and single warp reed B^4 correspond the two rows of teeth shown on the fourth pair of surfaces shown in Fig. 16.

I have said in the foregoing that the bars are constructed alike, but with this one difference, that, as will be observed in all the Figs. 11, 13, 15, and 16, the teeth R, that catch in the loops H^2 of the dents H, and consequently the dents themselves, are placed crosswise toward each other, so that the space between two dents in row O in Fig. 11 has a dent in row O′ lying opposite to it, and so throughout both of the rows, and as this applies to the dents that are laterally fixed by the guides the front and rear rows of dents are thus placed crosswise toward each other—viz., a dent on one side and a space on the other, and so on—and in order to facilitate a better understanding of the mechanical principle of my invention it may be said that this crosswise position of the dents makes this invention a possibility.

It will now be seen that as the main principle lies in the application of the cross-thread in the formation of a shed which will permit one half of the alternate threads to be separated from the other half, so that a cross-thread can be inserted through the shed thus formed, tying the two separate positions of threads together, if such a shed could be formed for the operator, leaving his hands free, a great advantage would be gained. This I accomplish in the instance just described, in the case of a single-thread warp, by having the pins R attached to each bar in rows O and O′, each pin accurately fitting into its loop H^2 of the nearby-lying dent H, so that when the bar is pushed into its two supports L^2 all the pins enter their respective opposite-lying loops at the same time, ready for the manipulation of the hand-wheel. If then hand-wheel M^5 be revolved, causing the rack-pinion L^4 and the respective racks L^3, gearing thereinto, to move, respectively, up and down, as indicated by the arrow-heads, the two bars will be carried apart, and the pins attached to the bars each fitting into a dent-loop the front row of dents will be elevated while the rear row is being depressed, or vice versa, and as the dents have the threads passing through the slits H′ it is easily seen by looking at Fig. 11 that every other thread in the dents having pins in row O in their loops will be elevated, while the threads in the dents having the pins in row O′ in their loops will be correspondingly depressed, and thus a shed will be formed which when the cross-thread is inserted will form a single-thread warp. When a double warp is required, the warp-reed B′ had to be replaced by the warp-reed B^2, the threads had to be

cut away, and a new thread from each spool on the creel had to be led between the dents in B^2.

In my improved device the threads remain in the dents, and the operator simply unlocks the hinged part N′ of the protection-plate N, (see Fig. 8,) takes out each of the bars, and inserts them again with the surfaces shown in Fig. 15 uppermost, the teeth turning toward each other. As the object in a double-thread warp, as apparent from Fig. 4, is to divide the two halves of threads up so that two threads are up while two are pressed down, two up and two down alternating all along in the warp, the pins must elevate or depress their respective dents to that effect, so that every other two threads will be depressed and every other two threads will be elevated. This takes place by R′, for instance, elevating two pins, dents, and threads; R^2 depressing two pins, dents, and threads; R^3 elevating two pins, dents, and threads; R^4 depressing two pins, dents, and threads, and so on. If a three-ply warp was desired, the threads had to be cut and again inserted through the frame B^3, taking the place of B^2 in the bracket, whereas the operator, as in the case of the double-thread warp, only need open the hinged plate N′, take out both the bars, and turn them until the surface shown in Fig. 13 comes uppermost, when it will be seen that the pins are so arranged as to fulfil the requirements demanded by the frame B^3—viz., to elevate every other three threads while every other three are depressed—as, for instance, pins S will catch up three successive threads and elevate them, while pins S′ will depress three, S^2 elevate three, S^3 depress three, and so on. Finally, in the case of a single-and-double warp being required the same operation of changing the bars will have to be gone through, and in comparing the reed B^4, which would have to be inserted in the bracket A′ in order to provide a double-and-single warp, with the pins on the surfaces of the two bars illustrated in Fig. 16 it will be seen that while pins T elevate two threads pin T′ depresses one, T^2 elevates two, T^3 depresses one, and so on.

An explanation of the mode of operation would plainly be a repetition of the foregoing, inasmuch as the coöperative elements have had to be so clearly defined and the functions of these are so closely connected with the very simple operation of my device that in brief it is only necessary to state that in having a framework, as illustrated in Fig. 7, if two bars K′ and K^2, furnished with pins on their four surfaces, each surface representing a different kind of warp, are by means of a hand-wheel M^3 attached to a rod M, having rack-pinions L^4 keyed to it, and each pinion gearing into a front and rear rack carrying said bars, moved to and from each other, a shed will be formed which, according to whatever bar-surfaces may be uppermost, and thus acting by the pins attached to them on the two rows of dents, will furnish a shed to the operator, out of which shed crosses can be formed for the function of either a single, double, three-ply, or single-and-double warp or any other warp that may be desired, which was the object of my invention.

From the foregoing it will now be easily seen how the operator can avoid two parallel-running threads from becoming entangled, as frequently is the case in the old style of warp-reeds, where of a necessity the threads always must run parallel, by simply turning the hand-wheel M^3 slightly, which then, no matter what warp is being formed, will separate the threads into two half parts—an upper and a lower—consequently lessening the chances of entanglement between the individual threads.

That I do not limit myself to a bar with either more or less than four sides will be apparent, inasmuch as if any one should elect to use only one or two or three surfaces with any assortment of either of the four mentioned warps or any other formation of warps that might be invented from time to time it would in no wise be an innovation on my inventive idea, nor would the change in the cross-section of the bar from a polygonal to a circle, in fact making the bar a cylinder fitted with means for operating the dents and having all the functions appertaining to a cylinder, alter the character of the conceptive idea in my invention, for

What I claim as new, useful, and not hitherto known, and desire to secure protection for by Letters Patent of the United States, is—

1. The combination in a lease mechanism of two rotatable bars, each provided with a series of dent-supporting means, of a series of dents loosely suspended on each bar.

2. The combination in a lease mechanism of two mutually-coöperating rotatable bars with two sets of singly-detachable loosely-suspended dents, means supporting said bars adapted to move said dents in opposite directions at the same time substantially as and for the purposes described.

3. The combination in a lease mechanism of two rotatable bars having faces furnished with dent-supporting means, a row of dents loosely suspended on the dent-supporting means of each bar substantially as described.

4. In a lease mechanism two rotatable bars, each having a series of dent-supporting means, a series of dents loosely suspended on each bar, each dent having a slot furnished therein and means at the top forming said loose suspension on the bar substantially as and for the purposes described.

5. In a lease mechanism two rotatable bars, each having a series of dent-supporting means, a series of dents loosely suspended on each bar, means furnished at the top for attaching the dent to the bar substantially as and for the purposes described.

6. The combination in a lease mechanism

of two bars capable of rotation on their axes so as to bring corresponding faces on said bars into alinement, means for supporting said bars and operating them in a vertical direction to and from each other with dents attached to the opposite-lying faces of each bar substantially as and for the purposes described.

7. The combination in a lease mechanism of two bars capable of rotation on their axes so as to bring corresponding faces on said bars contiguous to each other, dents, having thread-guiding means formed on them, means furnished on the faces of the said bars adapted to support the dents substantially as set forth and described.

8. The combination in a lease mechanism of two bars, each having faces furnished with dent-supporting means, a row of dents attached to the dent-supporting means on the contiguous faces of the bars, means, for supporting said bars adapted to make them capable of rotation on their axes so as to bring corresponding faces into alinement with each other and for moving said bars vertically to and from each other as and for the purposes described.

9. The combination in a lease mechanism of two bars, each having faces furnished with pins, a row of individually-detachable dents elevated by the said pins attached to the alined faces on each bar, means for supporting said bars and adapted to make them capable of rotation on their axes so as to bring their faces into alinement with each other substantially as described.

10. The combination in a lease mechanism of two bars, each having faces furnished with pins, a row of dents detachably secured on the pins of two contiguous opposite-lying bar-faces, two vertical rods having means at the top for supporting the bar, and bringing the faces of the bars into alinement with each other and having gearing means attached for operating the bars to and from each other substantially as described.

11. A frame consisting of two end pieces, each end piece having a front and rear guideway, a vertical rod secured in each guideway, gearing means for moving the said rods up and down, two horizontal-lying bars each of which is supported by a pair of the stated front and rear vertical rods respectively, and each of which has faces that can be brought into alinement with each other, means furnished on said faces that will operate shed-forming means, braces securing said end pieces together substantially as described.

12. In a lease mechanism two vertically-movable bars and means to support and operate them, each bar furnished with pins, dents having loops adapted to engage with the said bar-pins, slits provided in the dents to receive the warp-threads, guides for the dents having grooves placed crosswise of their length and attached to the frame, a dent-rest pivoted in the frame substantially as described.

13. In a lease mechanism a front and rear bar having four faces each, a row of pins suitably secured to each surface of said bars, two front and two rear vertical rods having bearings at the top supporting respectively each front and rear bar, each rod furnished with a tooth-rack at the bottom, a rod supported between the side frames having two pinions and a hand-wheel attached, each pinion gearing into the tooth-rack of a front and rear bar-supporting rod, two front and two rear dent-guides having grooves placed crosswise of their length with spacing means interposed between each front and rear guide, said guide supported appropriately in the frame substantially as illustrated and described.

14. In a lease mechanism composed of two side frames, each side frame having a front and rear longitudinal groove, a front and rear vertical bar-supporting rod moving respectively in the said front and rear groove, each rod furnished at the top with a forked bearing and at the bottom with a tooth-rack, two pinions each of which gears into the rack of a front and rear bar-supporting rod, a rod having said pinions and a hand-wheel mounted thereon, a front and rear bar having surfaces furnished with pins mounted in the said forked bearings, a front and rear row of dents, each dent having a loop coöperating with a pin from the bar and a slit furnished for the thread substantially as illustrated and described.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of June, 1897.

PHILIPP GOLDSCHMIDT.

Witnesses:
WILLIAM WEBER,
AUGUST M. TRESCHOW.