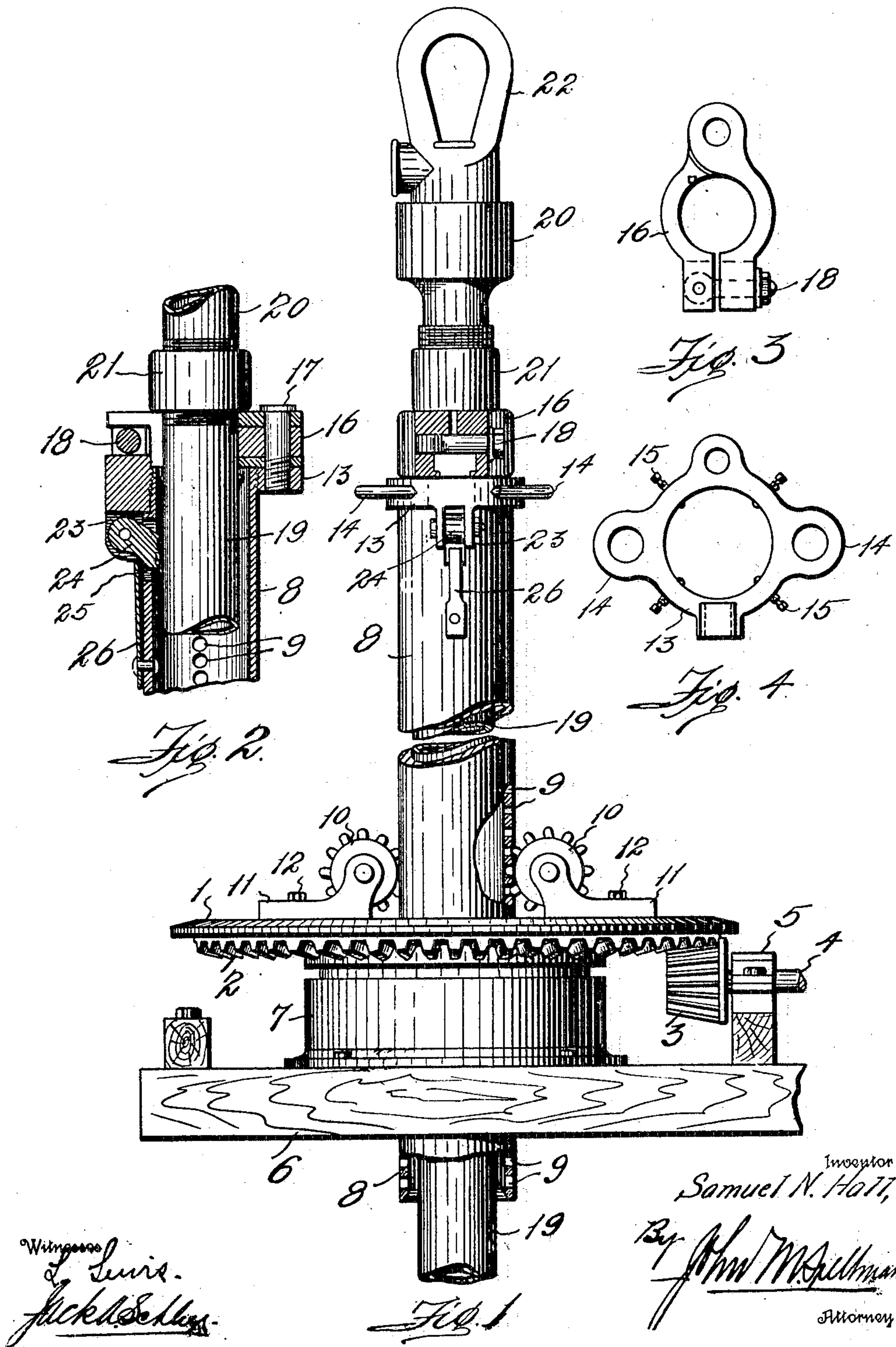


S. N. HALL.
 ROTARY FOR WELL TUBING.
 APPLICATION FILED JULY 6, 1908.

956,081.

Patented Apr. 26, 1910.

3 SHEETS—SHEET 1.



Witness
 L. Lewis.
 J. K. Schless.

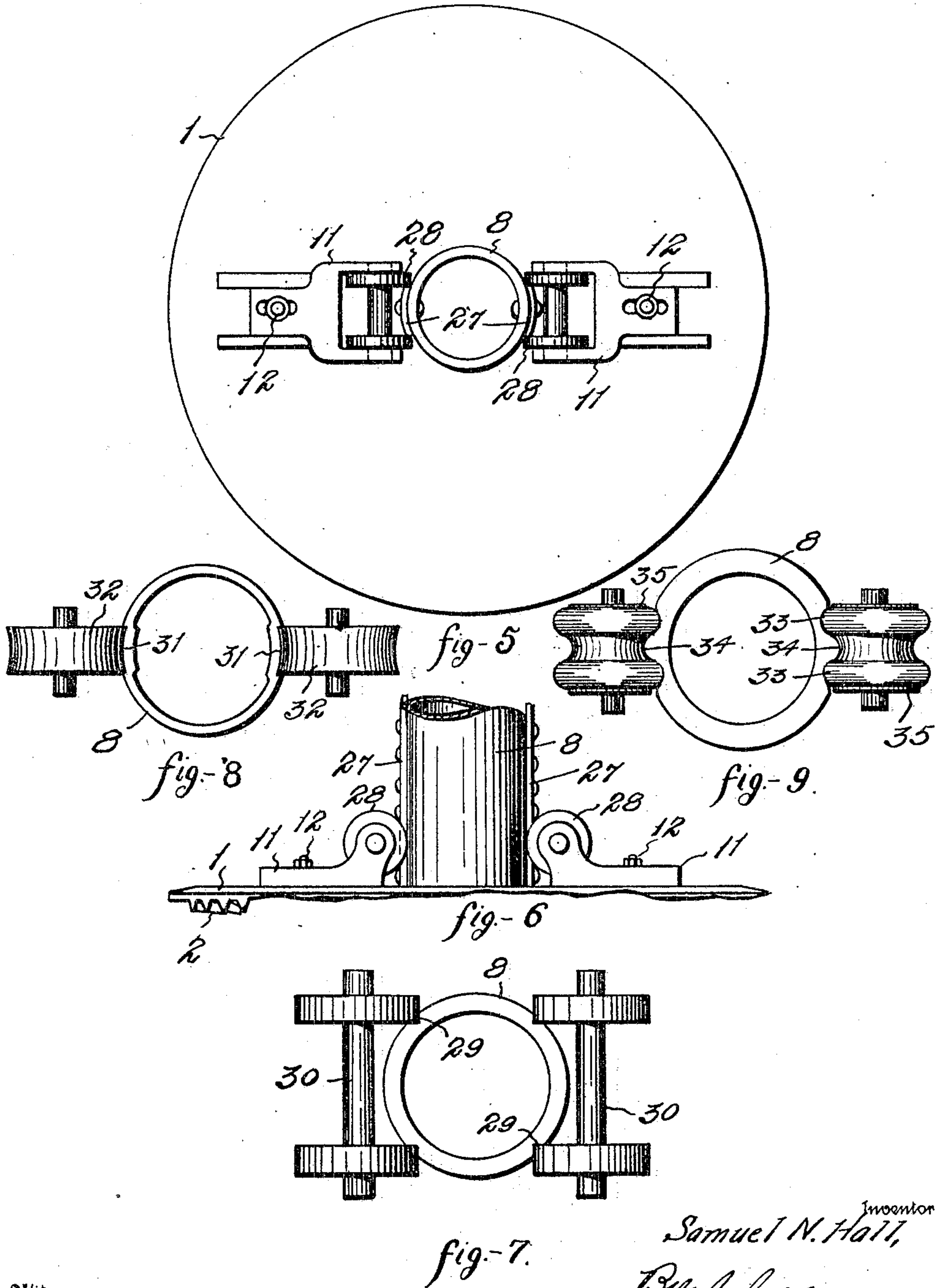
Inventor
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3 SHF TS-SHEET 2.



Witness
 Luis
 Jack Schuler.

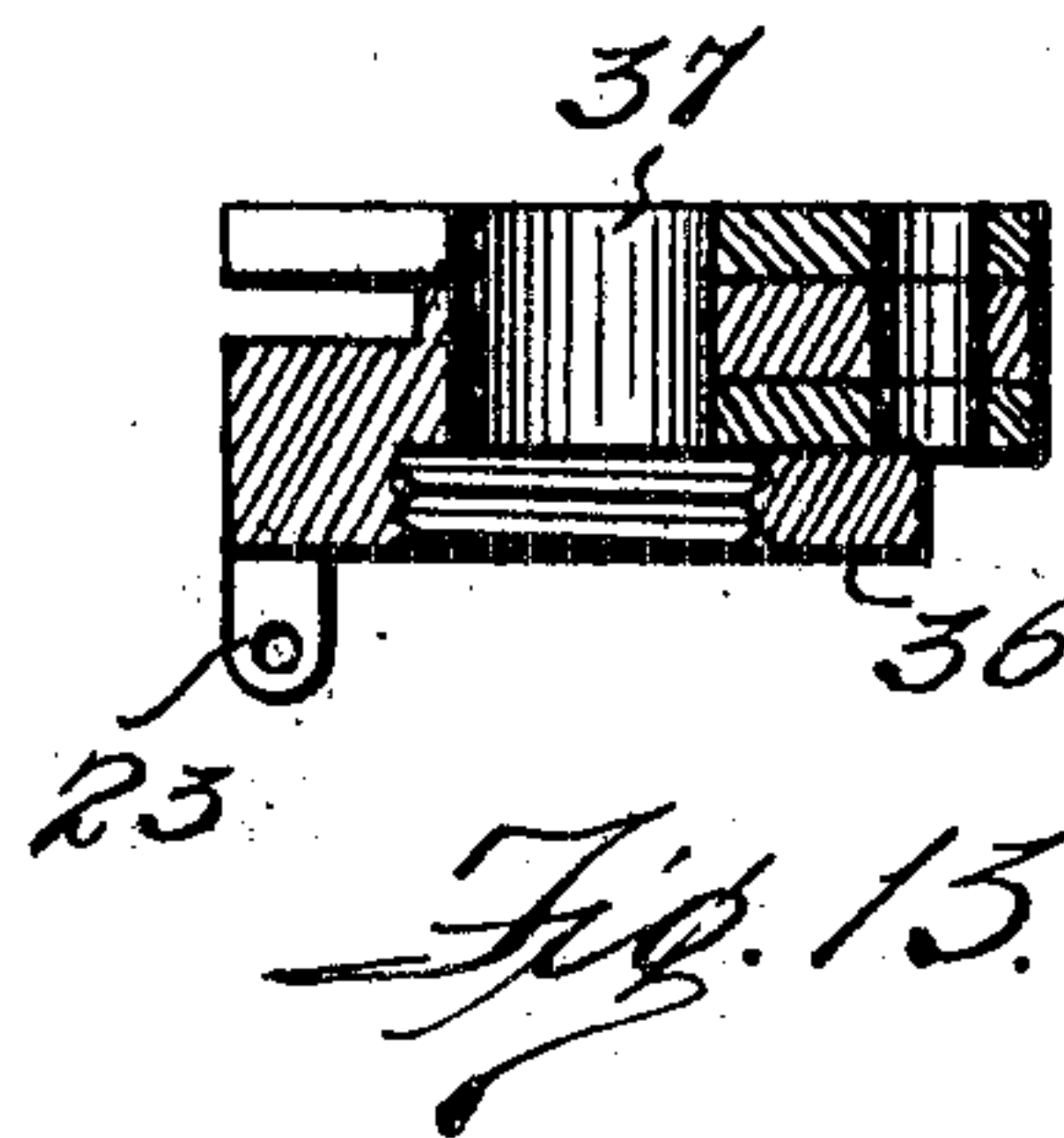
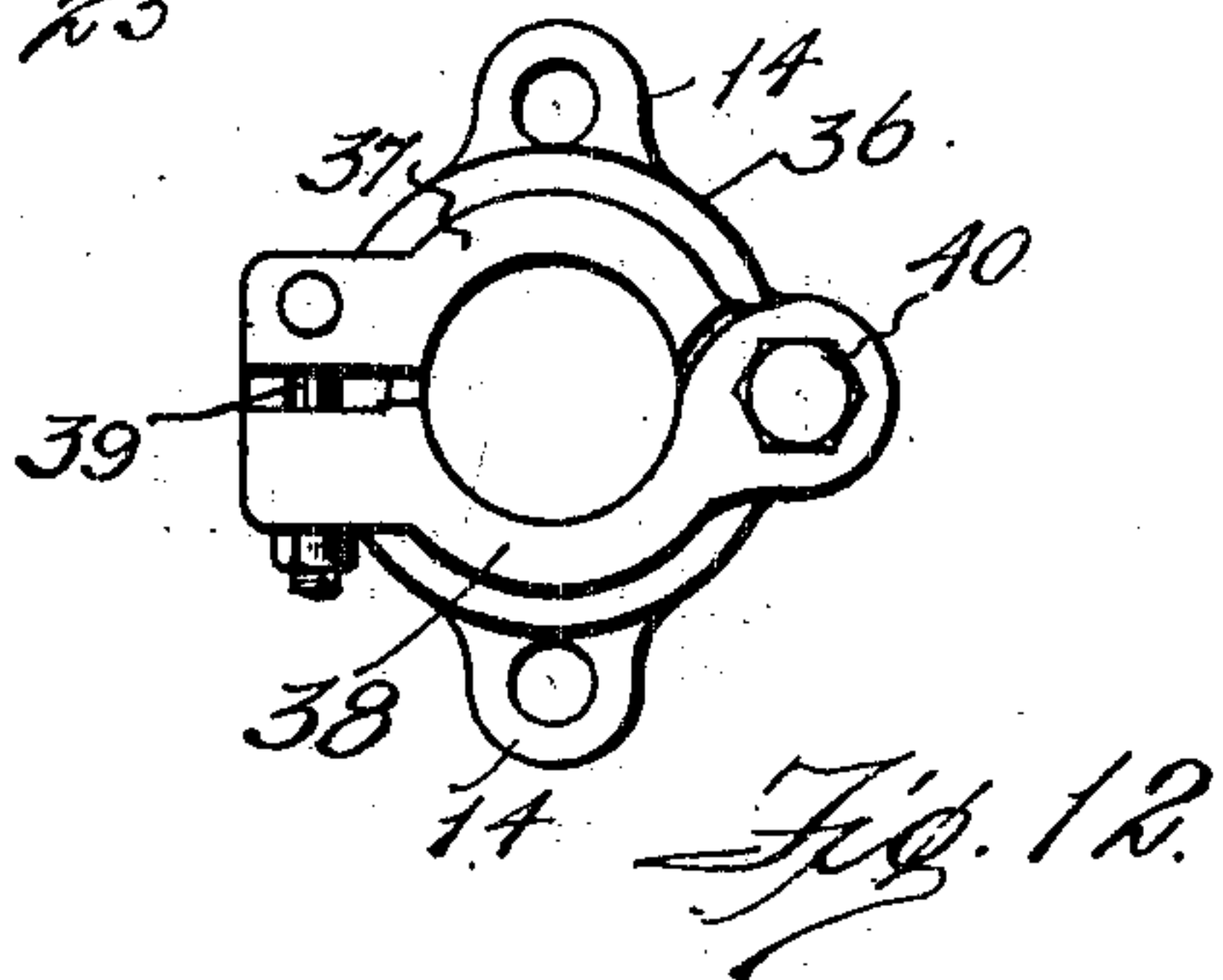
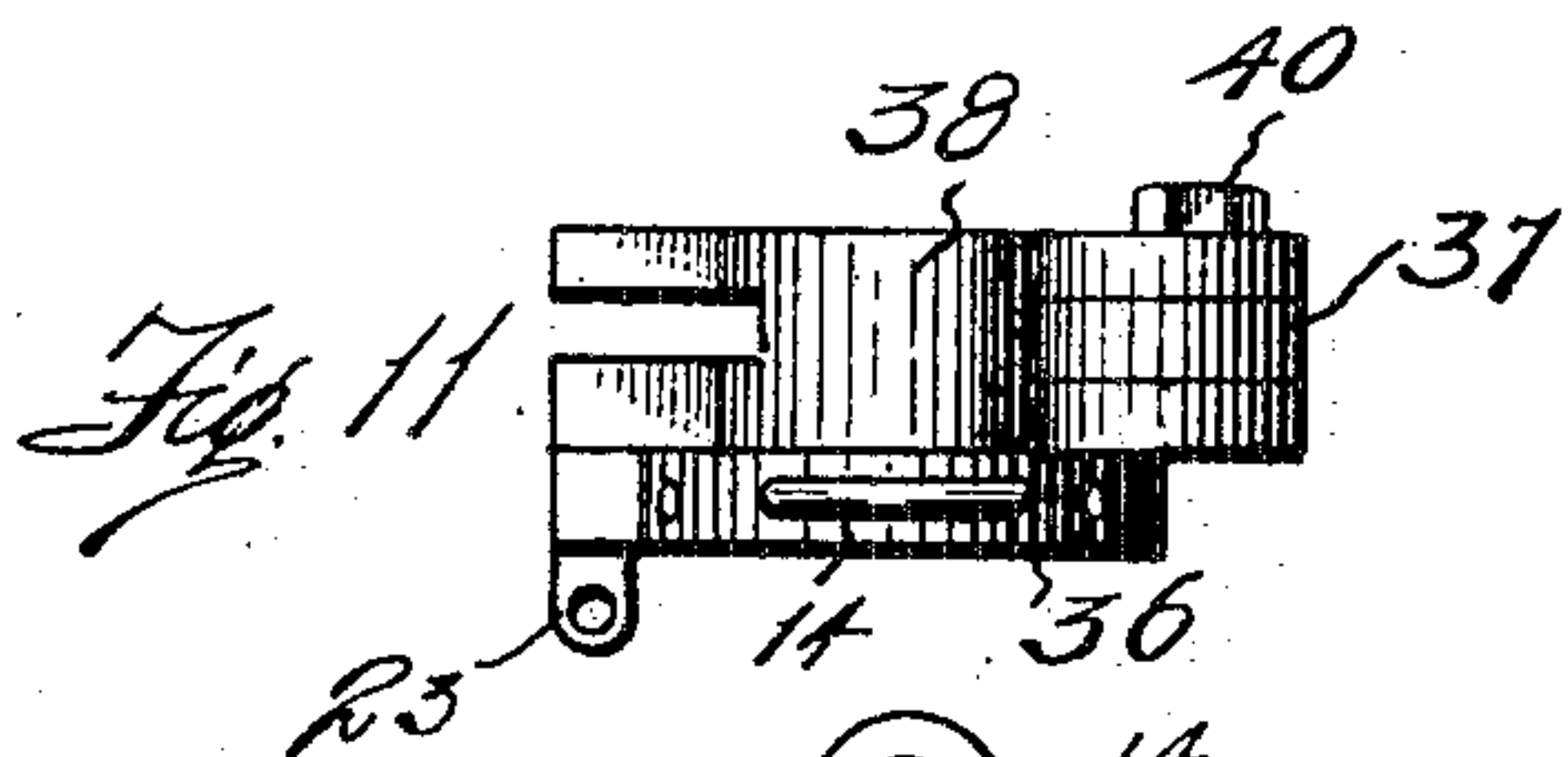
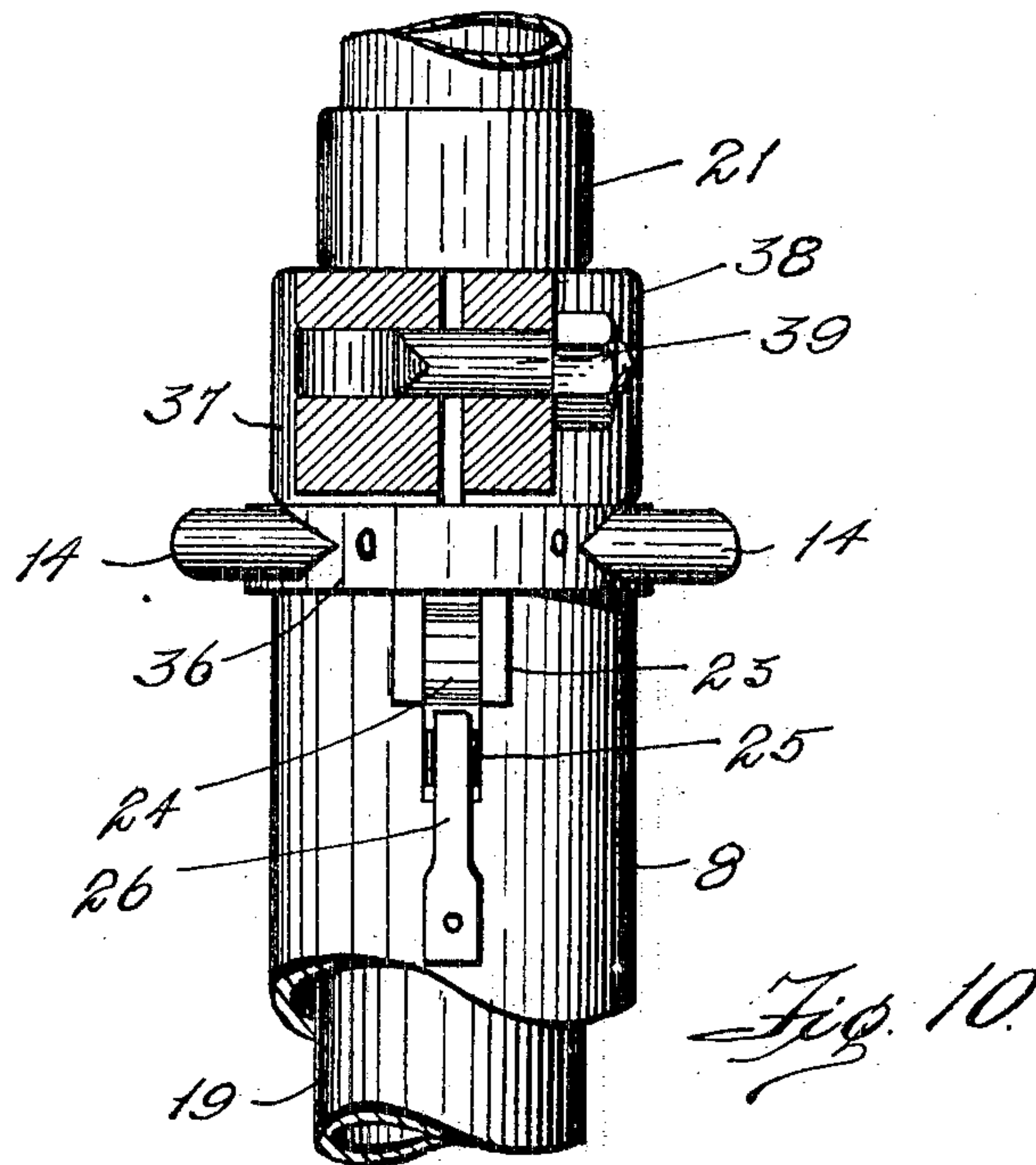
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL N. HALL, OF HOUSTON, TEXAS.

ROTARY FOR WELL-TUBING.

956,081.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed July 6, 1908. Serial No. 442,157.

To all whom it may concern:

Be it known that I, SAMUEL N. HALL, citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Rotaries for Well-Tubing, of which the following is a specification.

My invention relates to new and useful improvements in rotaries for well tubing.

10 The object of the invention is to provide means for holding the pipe or sleeve against rotation independent of the table and to accomplish this without marring or cutting the sleeve up.

15 Rollers now used with rotaries either do not hold the sleeve against rotation independently of the table or cut grooves in the sleeve each time the rollers are adjusted thereto.

20 Therefore one object of my invention is to provide the sleeve with roller receiving projections or grooves, before the sleeve is inserted in the rotary and to cut the grooves to such a depth that the rollers will enter the same grooves each time, thus preventing
25 "cutting up" of the sleeve surface and the forming of fresh grooves and defacing cuts each time the rollers are adjusted to the sleeve; thus prolonging the life of the sleeve.

30 Another feature resides in the provision whereby a water head swivel may be used and also the means by which the sleeve and the drilling member may be simultaneously or independently raised or lowered.

35 Finally the object of the invention is to provide a device of the character described that will be strong, durable, efficient and simple and comparatively inexpensive to construct and also one in which the several
40 parts will not be liable to get out of working order.

With the above and other objects in view, my invention has particular relation to certain novel features of construction and operation, an example of which is described in the following specification and illustrated in the accompanying drawings, wherein:

Figure 1 is an elevation of the rotary with parts broken away to show underlying construction, Fig. 2 is a vertical section of the upper portion of the sleeve and clamp, a portion of the drilling member being shown in elevation, Fig. 3 is a plan view of the clamp, Fig. 4 is a plan view of the collar,
55 Fig. 5 is a plan view showing a modified form of sleeve, Fig. 6 is a partial elevation

of the same, Figs. 7, 8 and 9 are details of modified forms of sleeves and rollers, Fig. 10 is a partial elevation showing a modified form of clamp and collar, Fig. 11 is a detailed elevation of the clamp and collar, Fig. 12 is a plan view of the same, and Fig. 13 is a vertical section of the same.

In the drawings, the numeral 1 designates the usual rotary table having the ring bevel gear 2 on its under side. This gear ring meshes with a bevel pinion 3 keyed on a power shaft 4 mounted in a bearing 5 supported on the frame 6. This frame is suitably constructed to support the bearing socket or cup 7 in which the table is rotatably supported.

In practice in the field it has been customary to use a device very similar to that shown in Fig. 7, but the pipe being comparatively soft and the wheels of hard steel, irregular channels or grooves are cut in each length of pipe. If the section has to be removed for any cause, the wheels are moved laterally and when the section is replaced, if the driller is not careful in adjusting the parts, other channels or grooves will be cut.

In order to obviate marring each length or section of pipe, I provide a protecting sleeve or pipe 8. In Figs. 1 to 4 the sleeve is formed with opposed vertical rows of perforations or openings 9 adapted to receive spur or stud wheels 10 mounted in bearing brackets 11 on opposite sides of the sleeve. The brackets are secured to the table by bolts 12 as shown in Fig. 5 and may be adjusted laterally to move the wheels into and out of engagement with the sleeve.

It is obvious that the sleeve may freely move vertically, but cannot rotate within the table through which it passes. This sleeve protects the pipe or drilling member as will hereinafter be described.

At its upper end, the sleeve is threaded to receive a collar 13 provided with oppositely extending eyes 14 and held against movement by set screws 15 adapted to impinge the sleeve. This collar receives a split clamp 16 having its pivot bolt 17 screwed into the collar. The clamp is held by an eye bolt 18, in close engagement around the pipe or drilling member 19. In this way the sleeve and drilling pipe 19 are clamped together so that by the engagement of the proper tackle with the eyes 14, the sleeve and pipe may be raised and lowered.

On the upper end of the pipe 19 a water

head swivel 20 is connected by a union 21 resting on the clamp 16 which latter prevents the pipe from slipping down into the sleeve and causes the pipe and sleeve to move downward together should the clamp become loose. This water head swivel is provided with an elongated eye 22 at its upper end.

It is obvious that by disengaging the screw 17 from the collar 13 and attaching the cable connections (not shown) to the eye 22, the drilling member or pipe 19 may be raised independently of the sleeve. For preventing the sleeve from dropping suddenly when the clamp and collar are disconnected, the collar is formed with ears 23 between which a dog 24 is pivoted. This dog projects through an opening 25 in the sleeve into close proximity to the pipe 19, while a flat spring 26 secured to the outer side of the sleeve bears against the dog and holds it in position as is shown in Figs. 1 and 2.

In Figs. 5 and 6 the sleeve 8 has strips 27 secured on its opposite sides to be engaged by wheels 28 in the form of spools, the construction being otherwise the same. Fig. 7 shows the sleeve first formed with V-shaped vertical channels 29 adapted to be engaged by disk wheels 30. This differs from the usual construction in which the channels are formed after the sleeve is set in position.

In Fig. 8 the sleeve 8 is pressed inward to form opposite vertical channels 31 shaped to receive concaved wheels 32; while Fig. 9 shows the sleeve 8 provided with opposed vertical grooves 33 divided each by a central rib 34 and adapted to be engaged by ribbed wheels 35.

All of the forms act to permit a free vertical movement of the sleeve but hold it against rotation independent of the table.

It is to be understood that the sleeve may be used as the upper section of the drilling member and lifted out and screwed to the new section each time a section of pipe is added.

In Figs. 10 to 13 inclusive, a modification of the clamp and collar is set forth. This contemplates the formation of the collar 36, which is substantially the same as the collar 13, integral with one side of the clamp 37. The other part or half 38 of the clamp is pivoted to the part 37 by a bolt 40 and connected thereto by an eye bolt 39.

The sleeve is provided with means for receiving the wheels to prevent rotation independent of the table, the clamp and collar connections and the water head swivel appliance, are invaluable to the driller and the advantages of such constructions are many.

It is to be understood that in drilling wells the outer casings or sleeves are removed after the well is drilled. If the casing or sleeves are badly cut or recessed they cannot be used again and last only a comparatively short time. At present the

rotaries used have rollers which cut into the casing or pipes, cutting into each outer section as it is worked down into the well. This is very expensive.

With my invention as above described a single section or casing length is provided with recesses, grooves, or projections receiving the guide wheels and is raised and lengths of plain pipe screwed on the lower end as the well is drilled. These lengths of plain pipe never come into contact with the wheels or rollers and their surfaces remain unscratched.

The working section of my invention may be used many times where not one but all the outer sections, which are cut by the present method, last for the drilling of only two or three wells. With my rotary the same groove or recess is used each time. I have seen sections with eight and ten longitudinal cuts as well as spiral cuts in their surfaces.

What I claim, is:

1. In a rotary for well tubing, a rotary table, a sleeve mounted in the table, a drilling member operating in the sleeve, a collar mounted on the sleeve, means for holding the collar on the sleeve, a dog mounted on the sleeve and adapted to engage the drilling member, and means for holding the dog in position.

2. In a rotary for well tubing, a frame, a rotary table mounted on the frame, a plurality of adjustable bearings mounted on the table, wheels mounted in the bearings, a sleeve mounted in the table, a drilling member mounted within the sleeve, a water head swivel mounted on the member, a collar clamped about the drilling member and having connection with the sleeve, means for adjusting the collar, a dog mounted on the collar adapted to engage with the drilling member, and means for holding the dog in position.

3. In a rotary for well tubing, a rotary table, a sleeve mounted in the table, wheels arranged to guide the sleeve vertically, a drilling member operating in the sleeve, and a spring dog supported by the sleeve adapted to engage the drilling member.

4. In a machine of the character described, a rotary table, non-cutting rollers mounted on said table, and a sleeve arranged to operate through said table and to be rotated therewith, said sleeve being provided with means freely engaging the rollers to offer substantially no resistance to the endwise movement of the sleeve but preventing independent rotary movement thereof.

5. In a machine of the character described, a rotary table, non-cutting rollers mounted on said table, and a sleeve arranged to operate through said table and to be rotated therewith, said sleeve being provided with projecting portions adapted to freely

engage the rollers to offer substantially no resistance to the endwise movement of the sleeve but preventing independent rotary movement thereof.

5 6. In a machine of the character described, a rotary table, a sleeve adapted to work through said table and be rotated therewith, a drill member adapted to pass
10 freely through the sleeve in one direction, and means on the sleeve arranged to automatically bind upon the drill member to prevent movement thereof through the sleeve in the opposite direction.

15 7. In a machine of the character described, the sleeve, the drill member therein, and a coupling between said sleeve and drill member threaded to the sleeve and clamped to the drill member, in combination with a pivoted dog carried by said coupling

adapted to automatically impinge upon the drill member to prevent movement thereof in the sleeve in one direction.

8. In a machine of the character described, the sleeve, the drill member therein, and a coupling between said sleeve and drill member, in combination with a pivoted dog carried by said coupling adapted to automatically impinge upon the drill member to prevent movement thereof in the sleeve in one direction.

30 In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL N. HALL.

Witnesses:

A. SCHLAFTL,
WM. A. CATHEY,