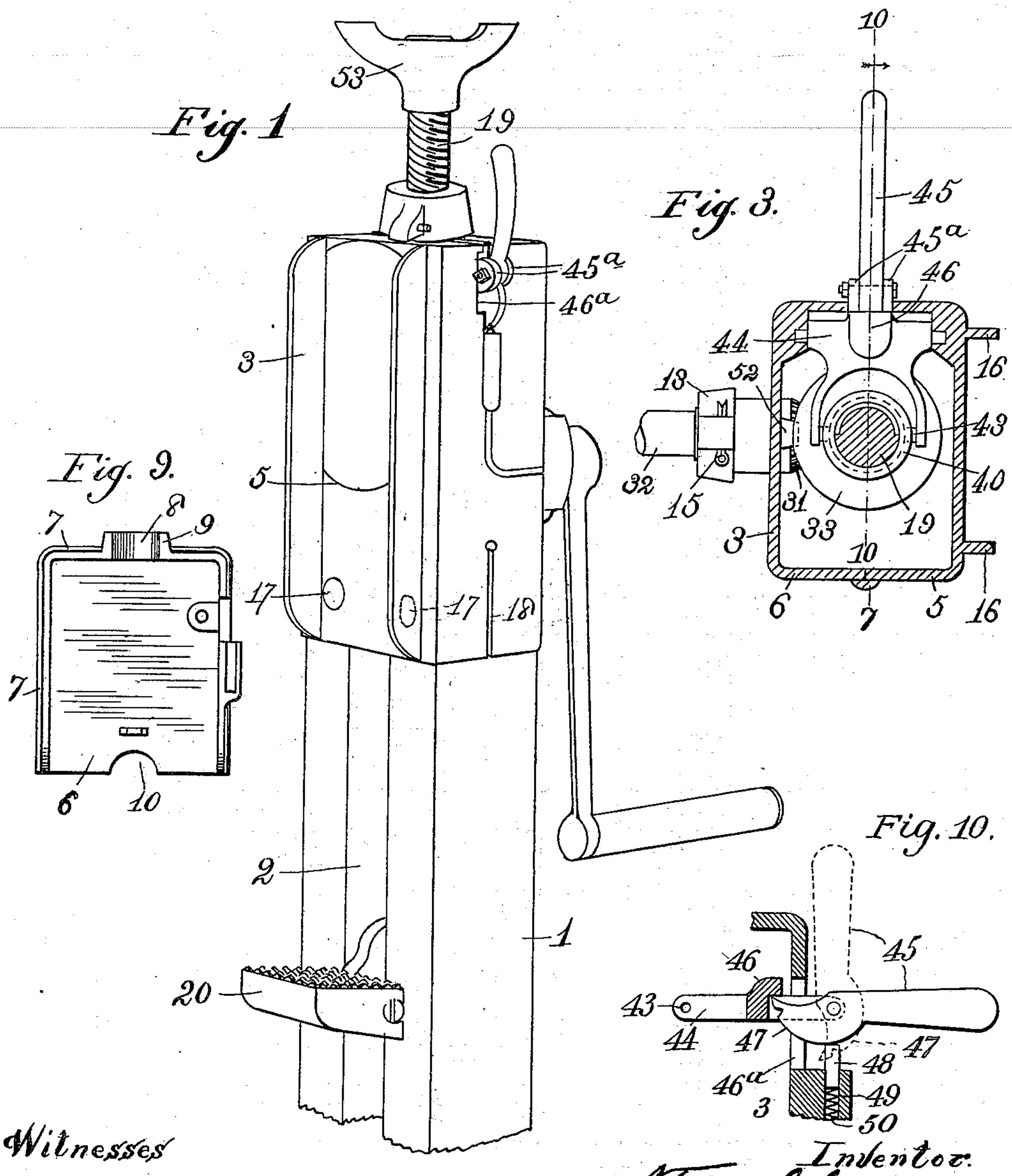
No. 647,765. Patented Apr. 17, 1900.

F. SCHULZ.

SCREW JACK.

(Application filed Nov. 6, 1899.)

(No Model.) 2 Sheets—Sheet 1.



Witnesses
E. F. Wilson.
J. D. Williamson.

Inventor.
Fritz Schulz
By Rudolph [illegible]
Attorney.

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2 Sheets—Sheet 2.

Fig. 2.

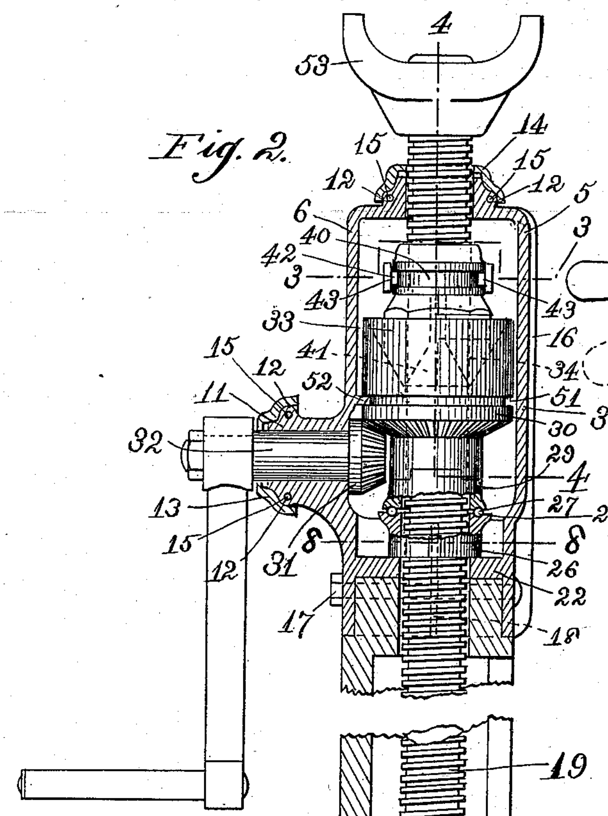
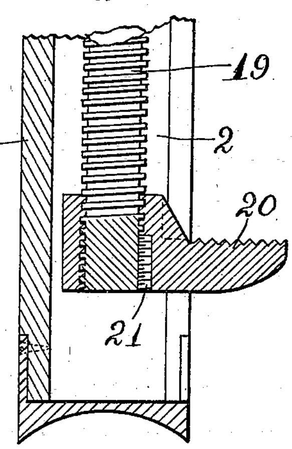



Fig. 4.

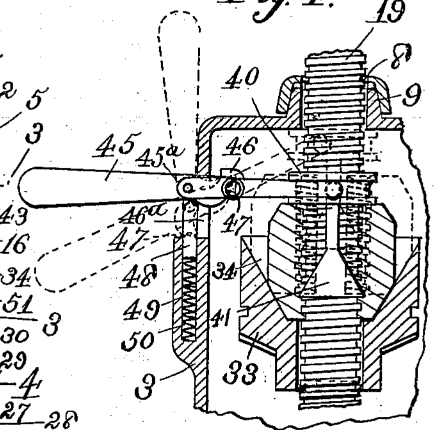


Fig. 5.

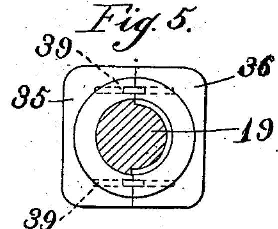


Fig. 6.

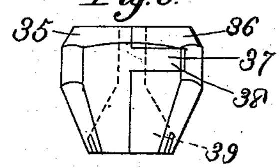


Fig. 8.

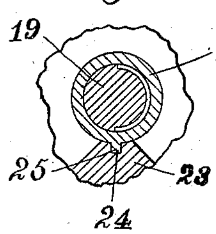
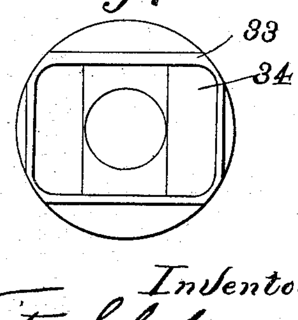


Fig. 7.



Witnesses
E. F. Wilson.
J. D. Williamson

Inventor:
Fritz Schulz
By Rudolph Wm Lotz
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRITZ SCHULZ, OF CHICAGO, ILLINOIS.

SCREW-JACK.

SPECIFICATION forming part of Letters Patent No. 647,765, dated April 17, 1900.

Application filed November 6, 1899. Serial No. 735,953. (No model.)

To all whom it may concern.

Be it known that I, FRITZ SCHULZ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Screw-Jacks; 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.

My invention relates to a novel construction in a screw-jack, the object being to provide a device of simple and efficient construction and great power, which can be readily adjusted to the height of the body to be raised without the loss of time generally incurred in devices of this kind, and which can also be readily taken apart to be repaired and oiled; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a perspective view of a screw-jack constructed in accordance with my invention. Fig. 2 is a vertical sectional view of same, showing the inner mechanism in elevation. Fig. 3 is a horizontal section on the line 3 3 of Fig. 2. Fig. 4 is a central longitudinal section on the line 4 4 of Fig. 2, showing the split nut turned ninety degrees from the position shown in Fig. 2. Fig. 5 is a top plan view of the split nut. Fig. 6 is a side elevation of same. Fig. 7 is a top plan view of the gear-wheel receiving the split nut. Fig. 8 is a sectional view on the line 8 8 of Fig. 2. Fig. 9 is an inside elevation of one member of the casing. Fig. 10 is a detail sectional view, on an enlarged scale, on the line 10 10 of Fig. 3.

My device consists, preferably, of a wood standard 1, provided with a recess 2 and carrying a metal casing 3 at its upper end and a metal footpiece 4 at its lower end. The said metal casing 3 consists of two parts 5 and 6, the part 5 being a square box adapted to receive the standard 1 in its lower end and which is cut away on one side of its upper end on a line extending diametrically across the middle of the top and down the middle of the side walls to a point midway between the top and bottom and thence horizontally through the front wall, while the part 6 fits said cut-away portion and is provided with a bead 7 along its straight edges to overlap the joint. In the center of the top of said casing 3 is an opening 8, surrounded by an annular flange 9, which is tapered off toward its outer end, one-half of said opening and flange being in each of said parts 5 and 6 of said casing 3. A similar opening 10, surrounded by a flange 11 similarly tapered, appears about the middle of the front wall and is likewise formed by semicircular recesses and flanges in each of the parts 5 and 6. Each of said flanges carries a radial lug or rib 12 at its base, and when said parts 5 and 6 are fitted together they are secured by means of internally-tapered caps 13 and 14, each of which is enlarged at diametrically-opposite points to receive said lugs or ribs 12 and are securely held in place by means of pins 15, passing through said enlarged portions of said caps and through said lugs or ribs 12. In this manner I form a casing which can be easily taken apart and put together without the use of screws or bolts. Said casing 3 is provided on its rear face with parallel ribs 16 to strengthen same and is secured to said standard 1 by means of bolts 17 passing through the front and rear walls of said casing and through the solid part of the standard on each side of said recess 2 therein. The side walls of said recess are provided with longitudinal slots or recesses 18 at their lower ends, thereby bifurcating them and permitting the casing to be slightly contracted at this portion to allow for shrinkage of the wood. A screw 19 enters said casing through said opening 8, passes centrally through said casing and into said recess 2 in said standard 1, and carries a shoe 20 at its lower end, with which it is rigid, being held by a pin 21. Said shoe 20 bears against the sides of said recess and is thereby held against turning. Said casing is provided adjacent its lower end with an inwardly-extending annular flange 22, against which the upper end of said standard 1 bears, and extending upwardly from said flange and inwardly from one of the side walls of said casing is a lug or rib 23, provided with a recess 24, in which a lug 25 on a bearing member 26 is adapted to fit to hold said bearing member against rotation. Said member 26 is provided with a central opening through which said screw 19 passes and

is provided in its upper face with an annular groove 27, in which balls 28 rest. The other bearing member 29 is provided with a similar groove in its lower face, while its upper face is recessed to form a clutch-face to engage a similar face on the lower end of the hub of bevel-gear 30, mounted thereon. Said bevel-gear 30 intermeshes with a bevel-pinion 31, carried by a crank-shaft 32, journaled in said opening 10 in the front wall of said casing 3. Said bevel-gear 30 is provided with a large head 33, in the upper end of which is a wedge-shaped recess 34, having two parallel sides and two inclined sides. A split nut comprising two members 35 and 36, which together are adapted to form a complete nut having a central screw-threaded opening to engage the screw 19, is mounted in said recess in said head 33. Each of said members 35 and 36 is provided with an inclined lower rear face coinciding with the inclined faces of said recess 34 and resting thereon, so that normally said members are held in close contact with each other and in engagement with said screw 19. Said member 35 carries two parallel arms or projections 37, adapted to enter guide-recesses 38 in the member 36, whereby said members are held in horizontal alinement with each other and are relatively movable only horizontally. In the meeting faces of said members 35 and 36 recesses 39 are cut, each of which is deeper at the lower end of the member than at the upper end thereof, so that when said members come together they form inverted-**V**-shaped recesses, the inclined innermost sides of which extend almost transversely to the inclined sides of the recess 34, the latter and said innermost sides of said recesses extending at the same angle to the axial plane intersecting said nut between the two parts thereof. A collar 40 is loosely mounted on said screw 19 above said split nut and carries two depending inverted-**V**-shaped ears 41, which are adapted to enter said recesses 39 and engage the inclined sides of the latter, so that when said collar 40 is raised said ears 41 will rise and at the same time separate said members 35 and 36, thereby releasing said screw 19 and permitting the latter free vertical movement. Said collar 40 is provided with an annular groove 42, adapted to receive lugs 43, carried by the bifurcated end of an arm or lever 44, pivotally mounted in said part 5 of said casing 3. The said arm or lever 44 is actuated by means of a lever 45, pivotally mounted between its ends between ears 45^a on the outer end of said lever 44, which project through a slot 46^a in said casing, said lever 45 being adapted at its inner end to engage said lever 44 at the part 46 thereof when said lever 45 is depressed to raise the inner end of said lever 44 and said collar 40. The inner end of said lever 45 is curved on its lower face and in its extreme end is provided with a recess 47. Said curved face of said lever is adapted to engage and depress a vertically-movable pin 48, moving in a socket 49 on said part 5 of said casing 3, which is normally held at the upper limit of its movement by means of a spring 50, said pin being adapted to enter said recess 47 when said lever 45 is vertical, as indicated in dotted lines in Fig. 4, thereby holding said lever in said position. By depressing said lever 45 to the lowermost position (shown in dotted lines in Fig. 4) the split nut is raised and separated to release the screw 19, which can then be freely raised and lowered and adjusted very quickly to the desired position and there held by releasing said lever 45 and permitting said split nut to drop and reëngage said screw 19. Said head 33 is provided with a circumferential groove 51, adapted to receive a lug 52 on the inner wall of the part 5 of the casing, which is adapted to hold said bevel-gear 30 against vertical movement, thereby preventing any interference with the operation of the split nut. By turning said crank-shaft 32 said bevel-gear 30 is revolved, and said split nut revolves therewith, thereby raising or lowering said screw 19. The latter carries a revoluble head 53.

My invention as herein described and claimed is obviously applicable to numerous other devices besides screw-jacks, such as testing-machines, and, in fact, to all kinds of machinery requiring great power, and I hereby retain the right to so apply my invention.

I claim as my invention—

1. In a screw-jack, the combination with a screw and a split nut consisting of a plurality of relatively-movable members engaging same, said screw and split nut being relatively revoluble to impart longitudinal motion to said screw, of devices engaging said split nut for normally holding same in engagement with said screw, and devices for separating said split nut to release said screw comprising wedge-shaped slots in the meeting faces of said members thereof, wedge-shaped ears fitting within said slots and each engaging two adjacent members, devices carrying said ears, and means for moving said last-named devices longitudinally with relation to said split nut whereby said ears are partially withdrawn and said members wedged apart.

2. In a screw-jack, the combination with a screw, of a separable split nut engaging same, said split nut comprising a plurality of members relatively movable and provided with inclined outer faces and with wedge-shaped slots on their meeting faces, a member having a recess adapted to contain said split nut and provided with inclined walls coacting with said inclined faces of said members to force said members together, and devices for separating said members to release said screw, comprising a member carrying wedge-shaped ears adapted to fit said wedge-shaped slots in the meeting faces of said members when said members are in position to engage said screw, and devices for moving said mem-

bers carrying said ears relatively to said split nut, whereby said ears are partially withdrawn from said slots and said members wedged apart to release said screw.

3. In a power-gearing, the combination with a screw movable longitudinally only, of a revoluble member in which said screw is loosely mounted, said member having a recess provided with two inclined sides, a separable split nut mounted in said recess and provided with two inclined faces adapted to coact with said inclined faces of said recess to close said nut, there being vertical recesses in the meeting faces of the members of said split nut each having an inclined wall extending practically transversely to the inclined faces of said split nut, and a collar mounted above said split nut and carrying inverted-wedge-shaped ears adapted to enter said recesses in said members of said split nut and engage said inclined faces thereof, whereby when said collar is raised said ears will force the members of said split nut apart.

4. In a power-gearing, the combination with a screw movable longitudinally only, of a revoluble member in which said screw is loosely mounted, said member having a recess provided with two inclined sides, a separable split nut mounted in said recess and provided with two inclined faces adapted to coact with said inclined faces of said recess to close said nut, there being vertical recesses in the meeting faces of the members of said split nut each having an inclined wall extending practically transversely to the inclined face of said split nut, and horizontal recesses in one of said members of said split nut and arms on the other member adapted to enter same to cause said members to move simultaneously, and a collar mounted above said split nut and carrying inverted-wedge-shaped ears adapted to enter said vertical recesses in said members of said split nut and engage the inclined faces thereof, whereby when said collar is raised, said ears will force said members of said split nut apart.

5. In a power-gearing, the combination with a screw movable longitudinally only, of a revoluble member in which said screw is loosely mounted, said member having a recess provided with two inclined sides, a separable split nut mounted in said recess and provided with two inclined faces adapted to coact with said inclined sides of said recess to close said nut, there being vertical recesses in the meeting faces of the members of said split nut each having an inclined wall extending practically transversely to the inclined faces of said split nut, and horizontal recesses in one of said members of said split nut and arms on the other member adapted to enter same to cause said members to move simultaneously, and a collar mounted above said split nut and carrying inverted-wedge-shaped ears adapted to enter said vertical recesses in said members of said split nut and engage the inclined faces thereof, whereby when said collar is raised, said ears will force said members of said split nut apart, and a lever pivotally mounted in the casing of said jack and adapted to engage said collar to raise same to separate said split nut.

6. In a power-gearing, the combination with a screw movable longitudinally only, of a revoluble member in which said screw is loosely mounted, said member having a recess provided with inclined sides, a separable split nut mounted in said recess and provided with inclined faces adapted to coact with said inclined sides of said recess to force said members of said split nut together, there being vertical recesses in said members of said nut provided each with an inclined face extending practically transversely to the inclined face of said member, a collar loosely mounted above said split nut and provided with downwardly-extending ears adapted to enter said vertical recesses and having inclined faces adapted to coact with said inclined faces of said recesses to force said members outwardly when said collar is raised, a lever for raising said collar pivotally mounted upon a rigid part of the jack, an arm pivotally secured to said lever and adapted to engage and actuate the same when moved in one direction, a spring-actuated pin mounted in said casing and bearing against said arm and adapted to engage same to hold it normally out of engagement with said lever, and devices carried by said split nut for causing the members thereof to move simultaneously into and out of engagement with said screw.

7. In a screw-jack, the combination with a longitudinally-movable screw and an actuating-shaft extending transversely to same, of a standard adapted to receive said screw, and a casing forming a head on said standard, said casing comprising two parts separated on planes intersecting the axes of said screw and said actuating-shaft, and provided on their meeting edges with semicircular recesses surrounded by flanges adapted to form bearings for said screw and said shaft, said flanges being tapered on their outer faces, and internally-tapered caps adapted to be forced over said flanges to hold said parts of said casing rigid with each other, substantially as described.

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

FRITZ SCHULZ.

Witnesses:
RUDOLPH WM. LOTZ,
ARTHUR C. LOTZ.