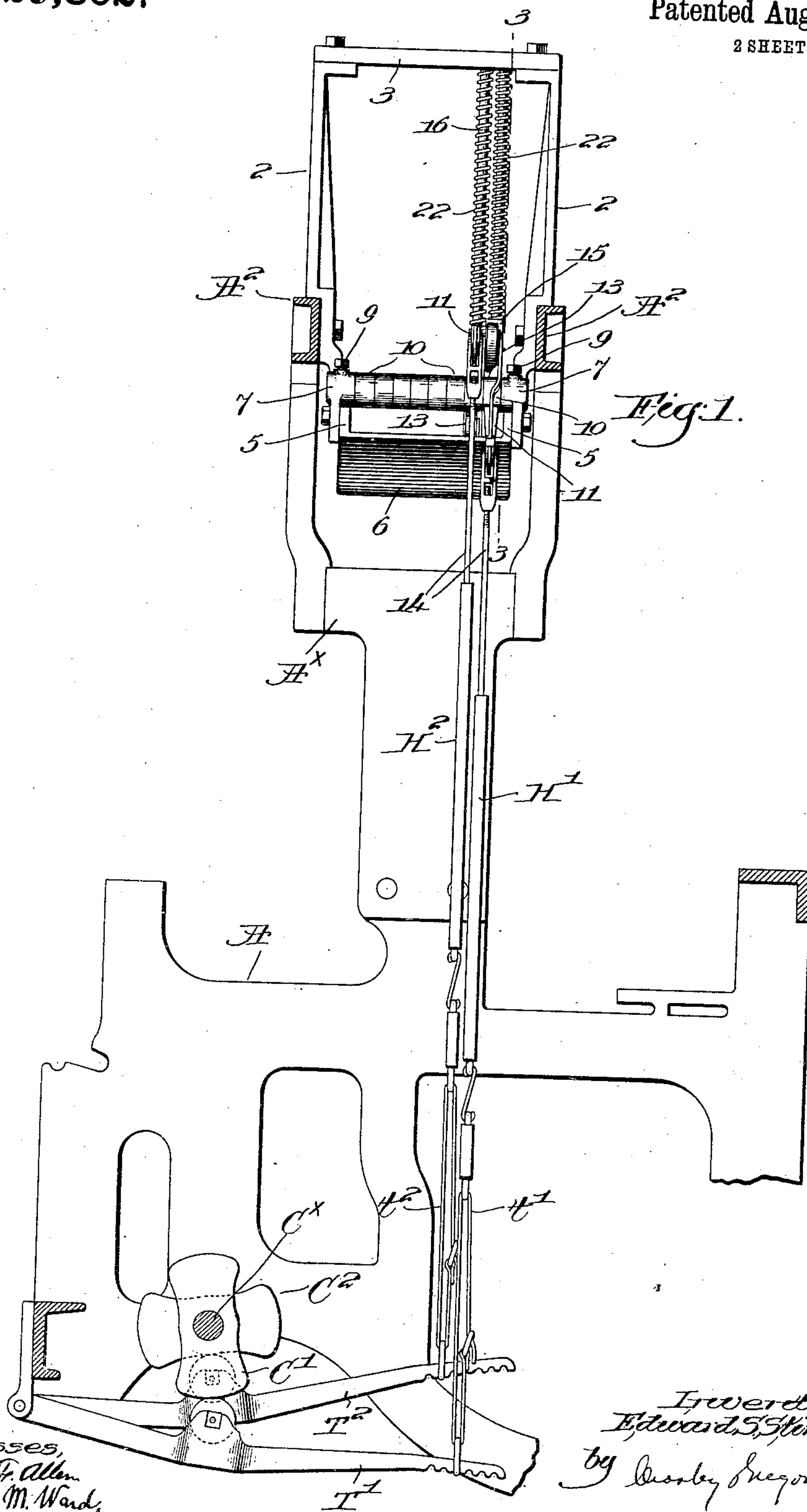


929,802.

2 SHEETS—SHEET 1.



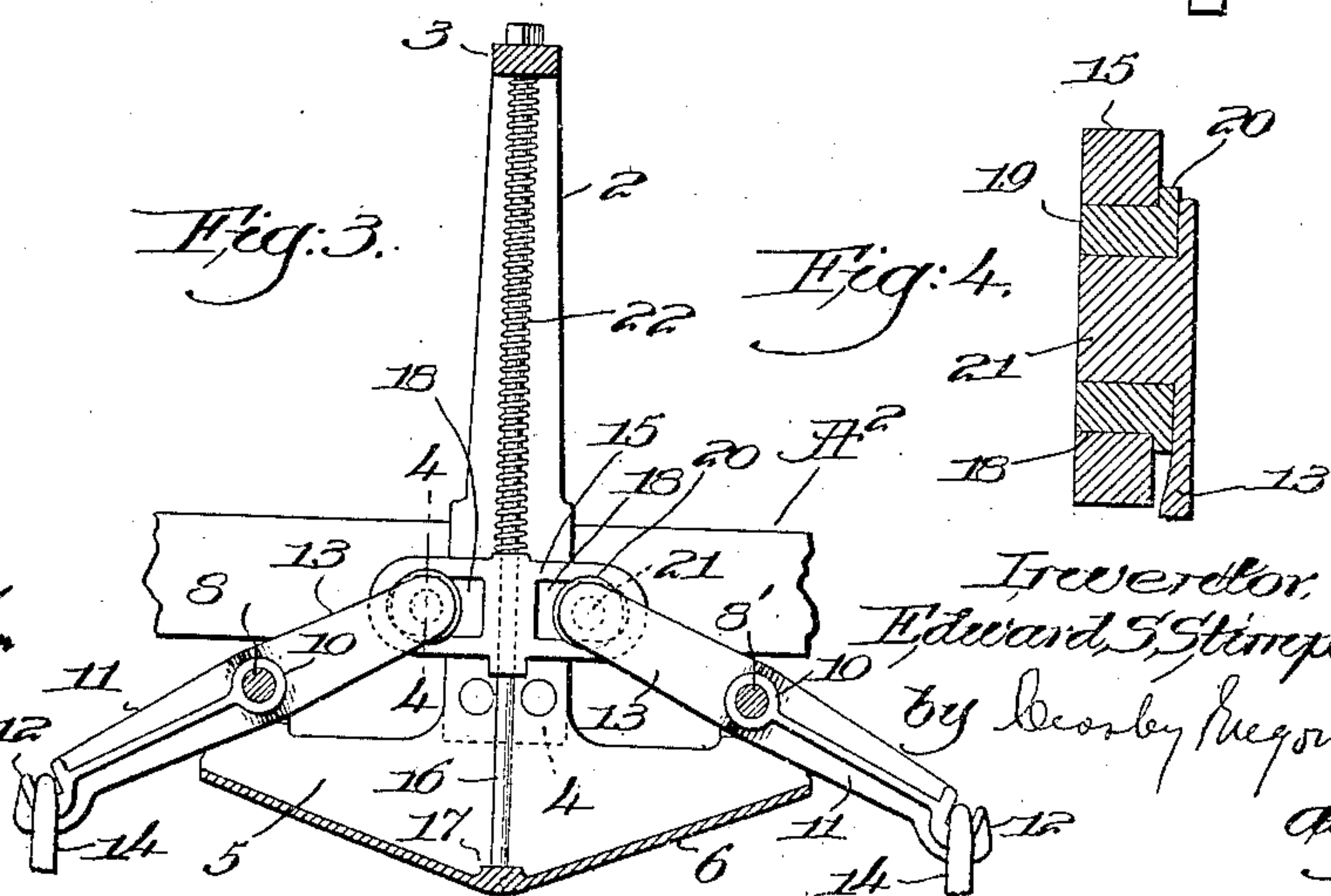
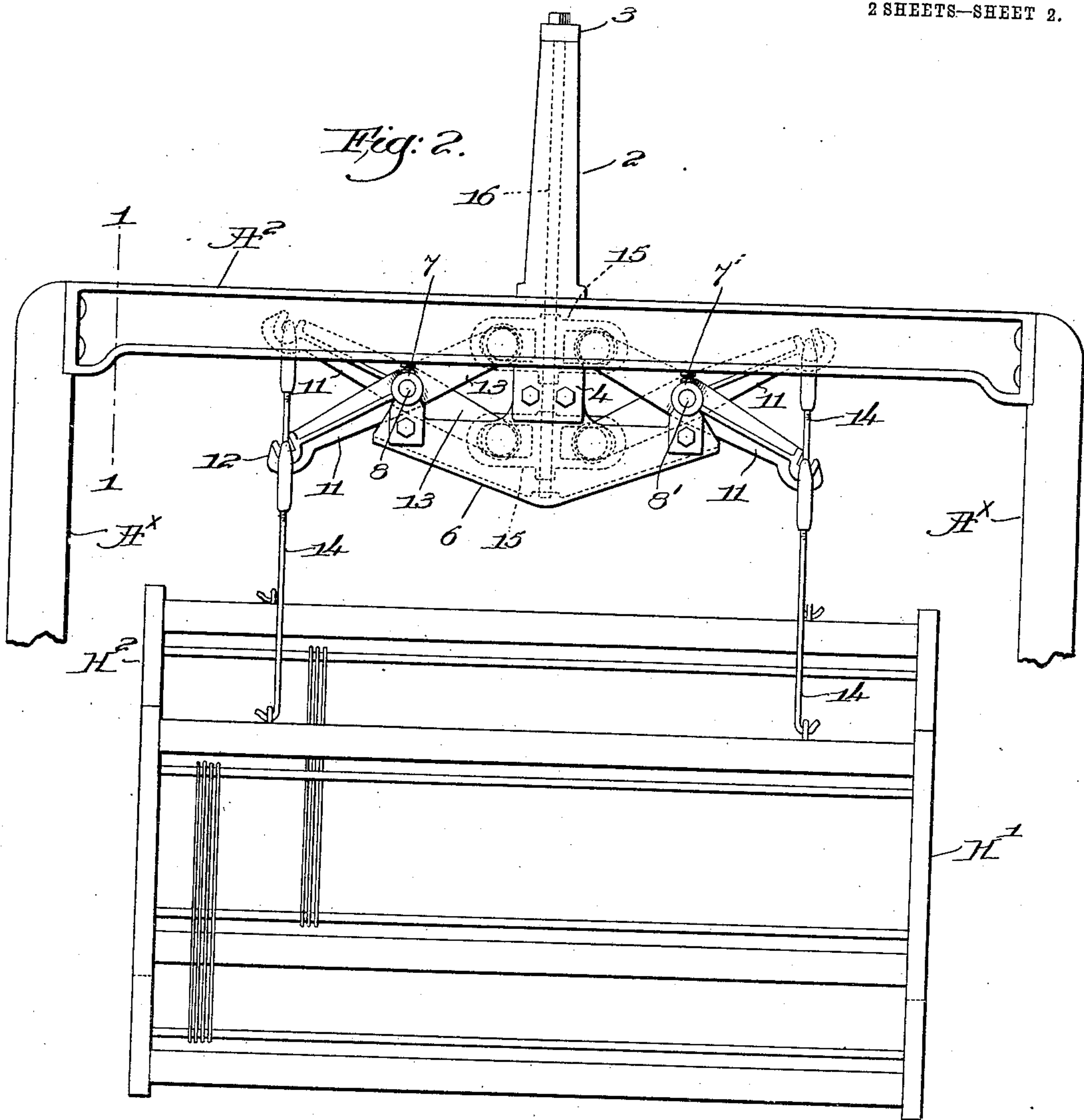
Witnesses,
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E. S. STIMPSON.
 LOOM HARNESS MECHANISM.
 APPLICATION FILED MAR. 10, 1909.

929,802.

Patented Aug. 3, 1909.
 2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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LOOM HARNESS MECHANISM.

No. 929,802.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed March 10, 1909. Serial No. 482,478.

To all whom it may concern:

Be it known that I, EDWARD S. STIMPSON, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Loom Harness Mechanism, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention has for its object the production of novel and effective mechanism for controlling the movement of loom harnesses, and it is particularly adapted for use in connection with multiple-harness mechanism, wherein three or more harness members are employed, my invention being capable of operating a set of harnesses with as much diversity of combination as can be attained by the use of a dobby, but with much simplified mechanism.

In accordance with my present invention each harness is reciprocated individually and independently of other harnesses of the set, and I have arranged for a positive actuation in one direction, and for movement in the opposite direction by a spring-actuated device.

Each harness is operatively connected with two rocking members, and is moved in one direction by cam-actuated means, said rocking members being positively connected by an equalizing device movable in a fixed path and causing said members to rock oppositely and equally, and a spring coöperating directly with the equalizer effects therethrough movement of the harness in the direction opposite that due to the cam-actuated means.

Simplicity, strength, ease of operation, and versatility as to the order of operation of the various harnesses of a set are distinguishing characteristics of my invention, the various novel features thereof being fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a transverse section on the line 1—1, Fig. 2, of a portion of a loom, equipped with harness mechanism embodying one form of my invention, but with only two harness members and their operating mechanism shown, to avoid confusion and unnecessary illustration; Fig. 2 is a front elevation of the upper portion of the mechanism shown in Fig. 1, omitting the treadles and their controlling cams; Fig. 3 is a vertical section on line 3—3, Fig. 1, looking toward the left;

Fig. 4 is an enlarged sectional detail of the connection between an equalizer and one of its pair of rocking members, taken on line 4—4, Fig. 3.

Referring to Fig. 1 A is the loom-frame, C^x the cam-shaft provided with suitable harness-controlling cams C', C², and T' T² are the treadles connected by suitable members t', t² with the bottom bars of the harness members H', H², it being understood that herein while I have shown only two harness members and their bottom attachments the structure is shown in Fig. 1 as designed for eight harness members.

The harness members may be of any suitable construction and are reciprocated in vertical paths, and they are positively depressed through the action of the cams upon the treadles, as will be apparent. The lifting devices for the several harnesses are mounted on the front and rear top-bars A² of the arch A^x erected upon the loom-sides, the top-bars being sufficiently separated to receive between them the lifting devices. Opposed, upright brackets 2 are rigidly attached to the top-bars at the center thereof and connected at their upper ends by a cross-bar 3, the foot 4 of each bracket depending below its adjacent top-bar, the feet having securely bolted to them the substantially triangular front and back portions 5 of a casting having a V-shaped bottom 6, Figs. 1, 2 and 3. Bosses 7, 7' are bolted to the front and back of the casting near its ends, to sustain parallel, horizontal rods or shafts 8, 8' which serve as fulcrum for a plurality of pairs of rocking members operatively connected with the harnesses, the rods being fixedly held in the bosses by set screws 9, Fig. 1.

As herein shown each rocking member is made as a lever having a bearing hub 10, the outer arm 11 of the lever being longitudinally ribbed, see Fig. 3 and hooked at its extremity, at 12, while the flat inner arm 13 is laterally offset from the center of the hub, lying in a plane parallel to the plane of the outer arm 11, see Fig. 1, and two of such members, mounted respectively on the fixed fulcrum 8, 8', constitute a pair and are attached to a harness by draft-connectors 14 provided with turn-buckles or open upper ends to engage the hooks 12.

The front harness H' is shown as depressed, and the next harness H² behind it is lifted, to more clearly illustrate the structure. The

hubs 10 of all the rocking members on the fulcrum 8 are mounted side by side, see Fig. 1, between the bosses 7, and in Fig. 1, I have omitted all of the levers except the first two, to avoid confusion. When the outer arms of a pair of rocking members are depressed the attached harness is down, as H^1 , while the elevation of the said outer arms lifts the attached harness, as H^2 , so that the levers of a pair must rock oppositely in unison and through equal angles; in order to effect movement of the attached harness smoothly and without twisting or tilting. This I effect by equalizing means positively connecting the inner arms of each pair of rocking members or levers, said equalizing means being herein shown as a species of cross-head 15, vertically sliding on an upright guide-rod 16 fixed at its upper end in the cross-bar 3 and at its lower end seated in the thickened part 17 of the V-shaped bottom 6 of the casting before referred to. There are as many equalizers 15 and their fixed guides 16 as there are harnesses in the set, the equalizers reciprocating in fixed paths midway between the fulcra 8, 8', Figs. 2 and 3. Each equalizer is laterally slotted at 18, Fig. 3, and in each slot is inserted with an easy sliding fit a tubular bushing 19, Fig. 4, flanged at its front end at 20, the bushing receiving loosely a stud 21 extended at right angles from the inner face of a lever arm 13.

Referring to Fig. 3 it will be seen that the inner arms 13 of the cooperating pair of rocking levers are thus positively connected with the equalizer 15, but in a slidable and pivotal manner, so that as the equalizer moves up and down the connected levers will swing on their fulcra 8, 8' oppositely but in unison and through equal angles. The levers cannot move longitudinally on their fulcra, so that their arms 13 must move in fixed vertical planes, and hence the studs 21 are retained in the bushings 19, while the flanges 20 of the latter, interposed between adjacent faces of the equalizer and the arms 13, are held in place and cannot fall out. This pivotal and sliding connection between the equalizer and the pair of cooperating levers is thus at once simple and effective, and obviates set-screws, or other fastening or retaining devices.

I provide a direct-acting lifting spring 22 for each harness, and herein it is shown as a compression spring, coiled about the guide 16 of its adjacent equalizer between the latter and the cross-bar 3, and cooperating directly with the equalizer. When a harness is depressed by the cam-operated means shown in Fig. 1 the corresponding equalizer 15 will be raised, as will be apparent, compressing its spring 22 and storing up energy therein, and when the depressing cam ceases to act the spring at once expands, pushing down the equalizer and through the connect-

ed levers lifting the harness. The lifting springs are made sufficiently strong and powerful to effect readily the elevation of the harness and overcome frictional resistance of the overhead parts, and they are laterally sustained and supported by the guides 16 extended through them, so that the springs cannot flex or be twisted out of proper position when compressed or expanded. Inasmuch as each harness is equipped with one of the spring-actuating lifting devices the movement of every harness is individualized and independent of all the other harnesses of the set, so that various combinations of movements can be employed. The lifting springs keep the usual treadle-rolls in close engagement with the cams, obviating backlash and lost motion, and as the springs act directly upon the equalizers their power is applied at the most effective points. The casting which sustains the lifting devices is so positioned beneath the fulcra of the rocking members that the necessary parts can be thoroughly lubricated without danger to the warp or parts of the loom structure, for the V-shaped bottom 6 of the casting is extended beneath all lubricated parts of the mechanism, and catches and collects any oil that may drop therefrom.

A very steady and smoothly running harness mechanism is secured by the construction embodying my invention, it is out of the way of the weaver, and takes the place and performs the functions of a dobby while occupying much less room and being much simpler in structure.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination, with a vertically-movable loom-harness, and cam-actuated means to depress it, of an overhead lifting device therefor comprising two rocking members operatively connected with the harness, equalizing means movable in a fixed vertical path between the fulcra of said rocking members, sliding and pivotal connections between the equalizer and said members, to cause said members to rock oppositely in unison, and a lifting spring acting directly upon said equalizing means.

2. The combination, with a vertically-movable loom-harness, and cam-actuated means to depress it, of an overhead lifting device therefor comprising two rocking members operatively connected with the harness, equalizing means positively and directly connected with and to cause said members to rock oppositely in unison, and a fixed upright guide for and upon which said equalizing means is slidable longitudinally.

3. The combination, with a vertically-movable loom-harness, and cam-actuated means to depress it, of an overhead lifting device therefor comprising two rocking mem-

bers operatively connected with the harness, equalizing means positively and directly connected with and to cause said members to rock oppositely in unison, and a lifting spring
5 fixed at one end and at its other end acting directly upon the equalizing means, and a fixed guide for said means and serving also to laterally support the spring.

4. The combination, with a vertically-
10 movable loom-harness, and cam-actuated means to depress it, of an overhead lifting device therefor comprising two rocking members operatively connected with the harness, equalizing means positively and directly con-
15 nected with and to cause said members to rock oppositely in unison, and a lifting spring above the equalizing means, bearing at its lower end upon said means and fixed at its upper end, and a fixed upright guide ex-
20 tended through the spring and the equalizing means and upon which the latter is vertically slidable.

5. The combination, with a reciprocating loom-harness, and means to move it posi-
25 tively in one direction, of a spring-actuated device to move it in the opposite direction comprising two rocking members operatively connected with the harness, a reciprocating equalizer positively and directly connected
30 with and to cause the rocking members to rock oppositely in unison, a fixed upright guide for and upon which the equalizer reciprocates, and an actuating spring cooperating directly with the equalizer.

35 6. The combination, with a vertically-movable, loom-harness, and means to depress it positively, of a spring-actuated lifting device therefor comprising two levers mounted on fixed fulcra and each having
40 its outer arm operatively connected with the harness, vertically-reciprocating equalizing means positively and slidably connected with the inner arms of said levers, to cause them to rock oppositely and equally, and a com-
45 pressible lifting spring acting directly upon the equalizing means.

7. The combination, with a vertically-movable, loom-harness, and means to depress it positively, of a spring-actuated lift-
50 ing device therefor comprising two levers mounted on fixed fulcra and each having its outer arm operatively connected with the harness, a vertically-reciprocating, horizontally-slotted equalizer between said levers,

the inner arm of each having a lateral stud, 55
a bushing on each stud slidable in the slotted portion of the equalizer, to positively connect the latter and the levers and cause the latter to rock oppositely and equally, an overhead, compressible lifting spring acting 60
directly upon the equalizer to depress it and thereby lift the outer ends of the levers and the harness connected therewith, and a fixed upright guide extended through the spring and the equalizer and upon which the latter 65
slides.

8. In loom-harness mechanism, a plurality of vertically - movable harness - members, means to depress them individually, and an independent lifting device for each harness 70
member, such device comprising two levers mounted on fixed fulcra located in the same horizontal plane, the corresponding levers of the several pairs being mounted side by side on one of the fulcra above the har- 75
ness members, a vertically-movable equalizer positively and slidably connected with the inner arms of each pair of levers to cause the same to rock oppositely and equally, draft connections between the sides of a harness 80
member and the outer arms of its two levers, and a lifting spring acting directly upon each equalizer to depress it and elevate the outer arms of its connected pair of levers.

9. In loom-harness mechanism, a plurality 85
of vertically - movable harness - members, means to positively and individually depress them, and an independent, spring-actuated lifting device for each harness-member, each device comprising two members mounted to 90
rock on fixed fulcra and operatively connected with a harness member, a vertically movable equalizer between and positively and slidably connected with each pair of rocking members, to cause the same to rock 95
oppositely and equally, and a lifting spring acting directly upon the equalizer to depress it and thereby through the connected rocking members lift the attached harness-member. 100

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

EDWARD S. STIMPSON.

Witnesses:

GEORGE E. CHANDLER,
E. D. OSGOOD.