No. 871,379. PATENTED NOV. 19, 1907.

N. TROYER.

CAN HEADING MACHINE.

APPLICATION FILED DEC. 16, 1905.

6 SHEETS—SHEET 1.

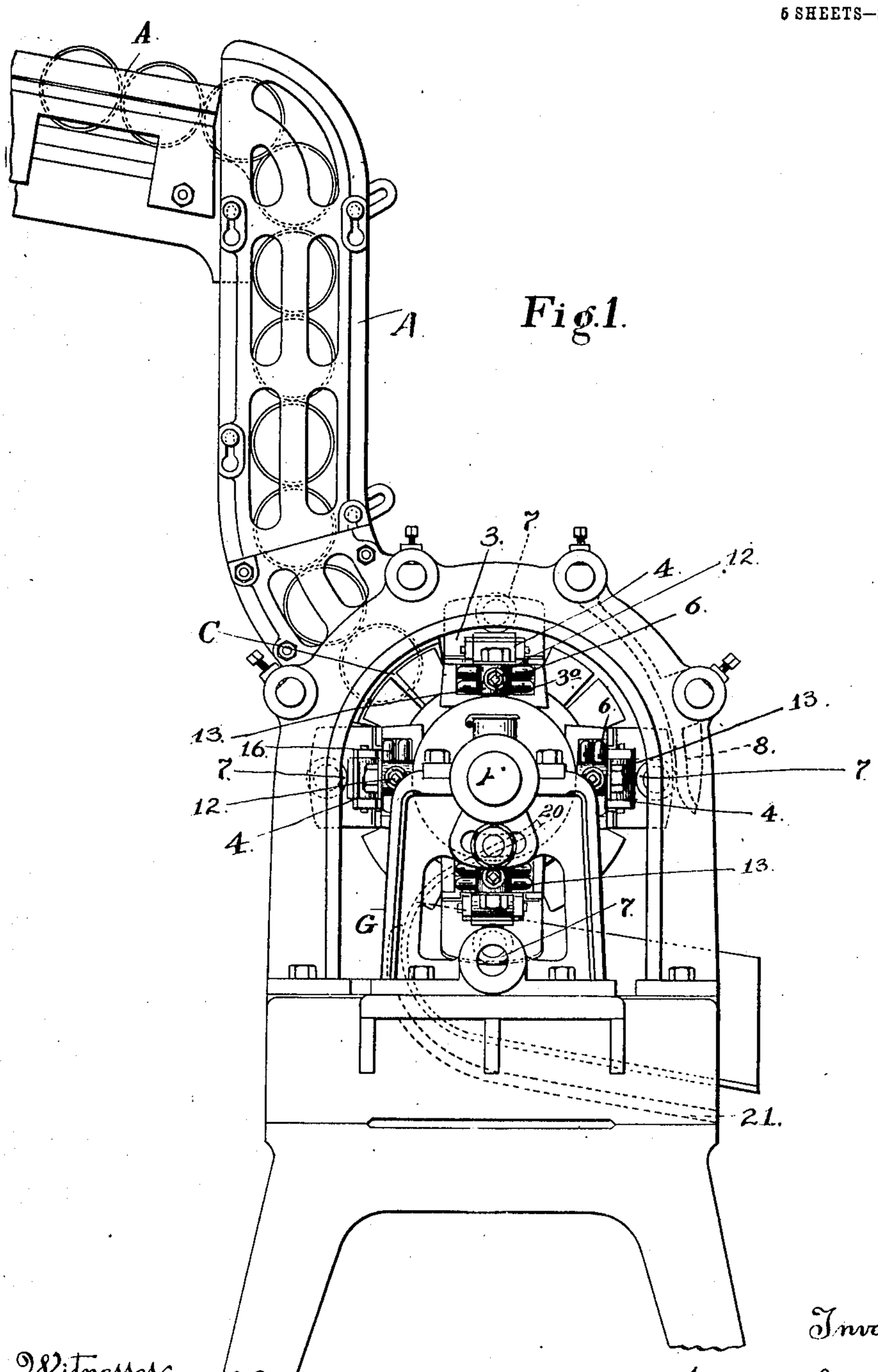

Fig. 1.

Witnesses:
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J. B. Towse

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6 SHEETS—SHEET 2.

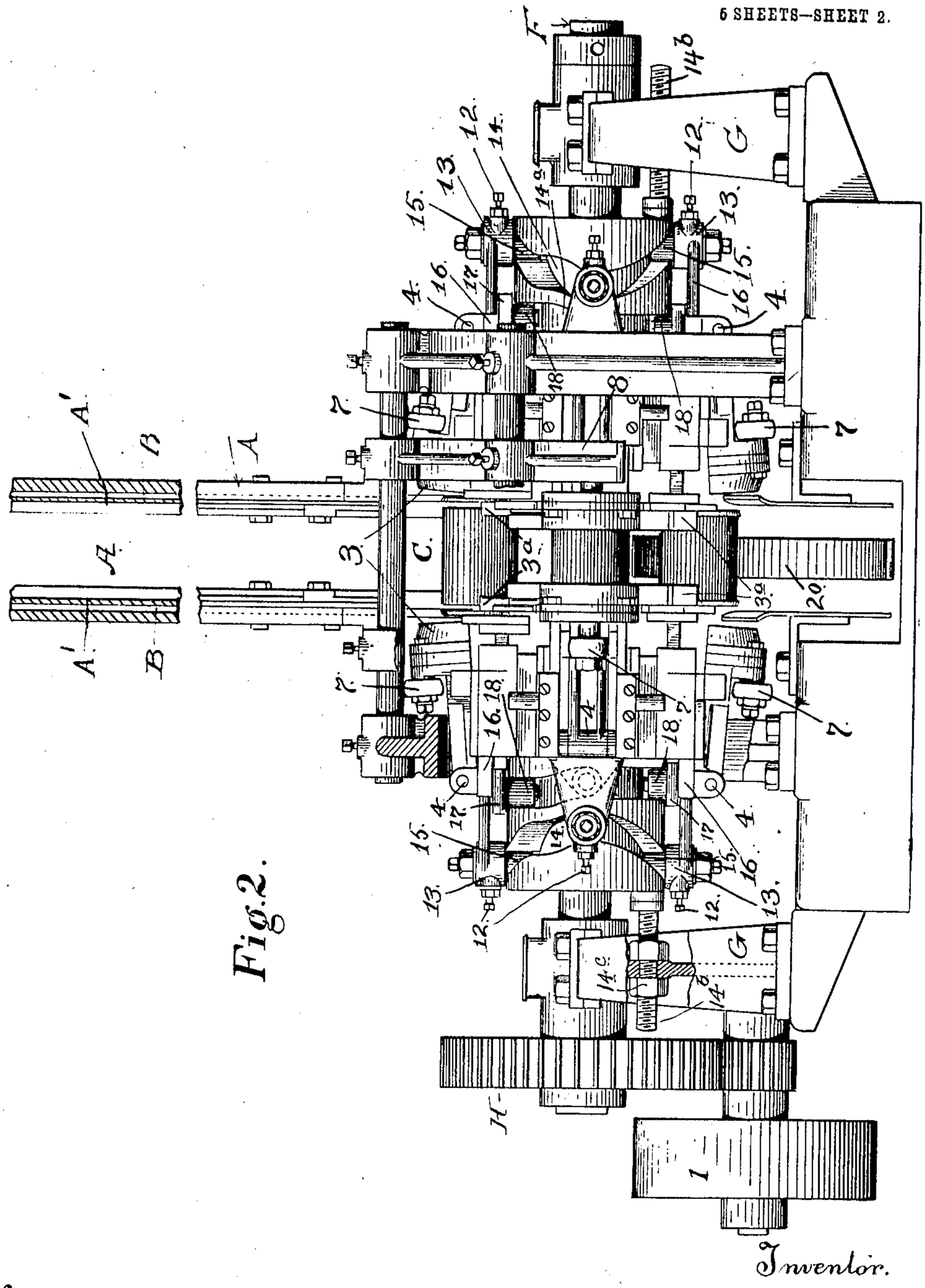

Fig. 2.

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5 SHEETS—SHEET 3.

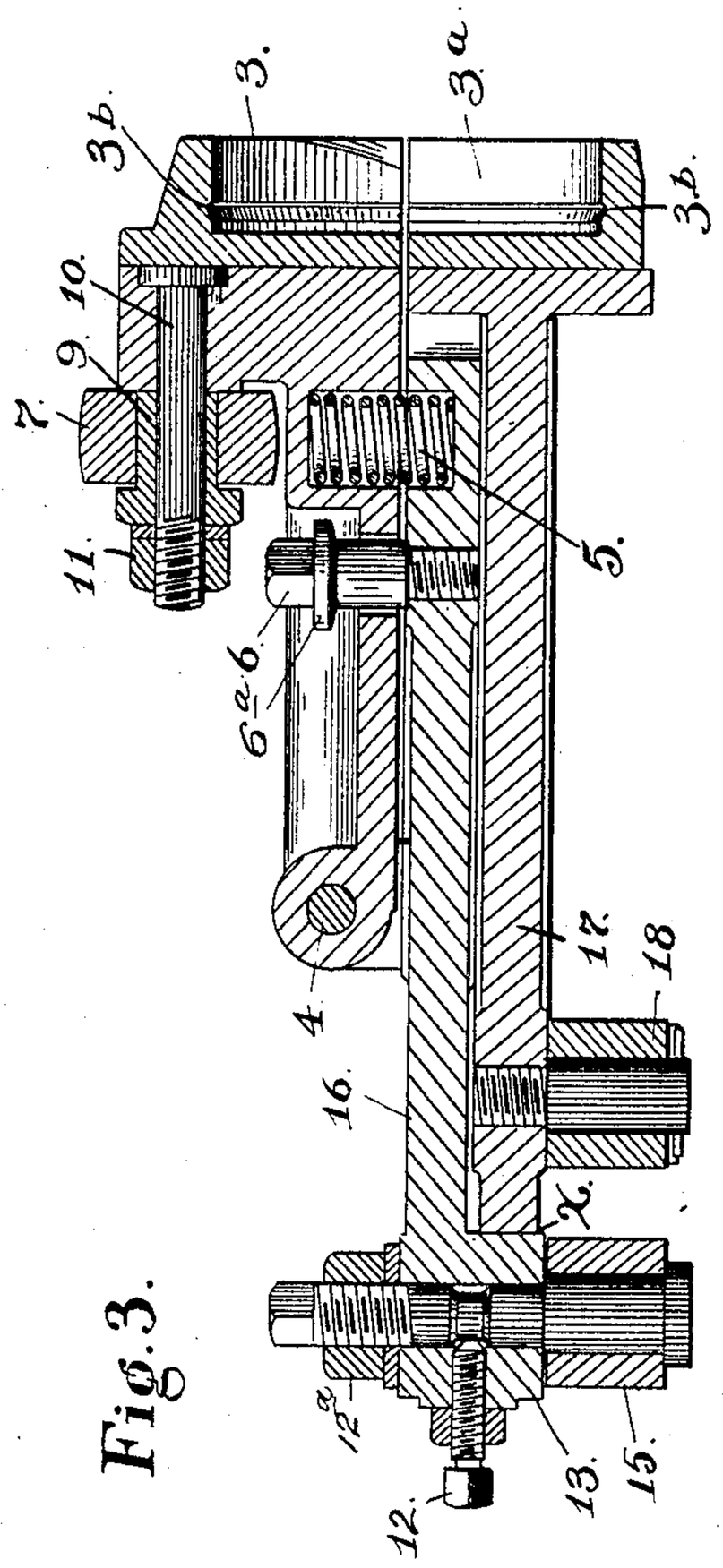

Fig. 3.

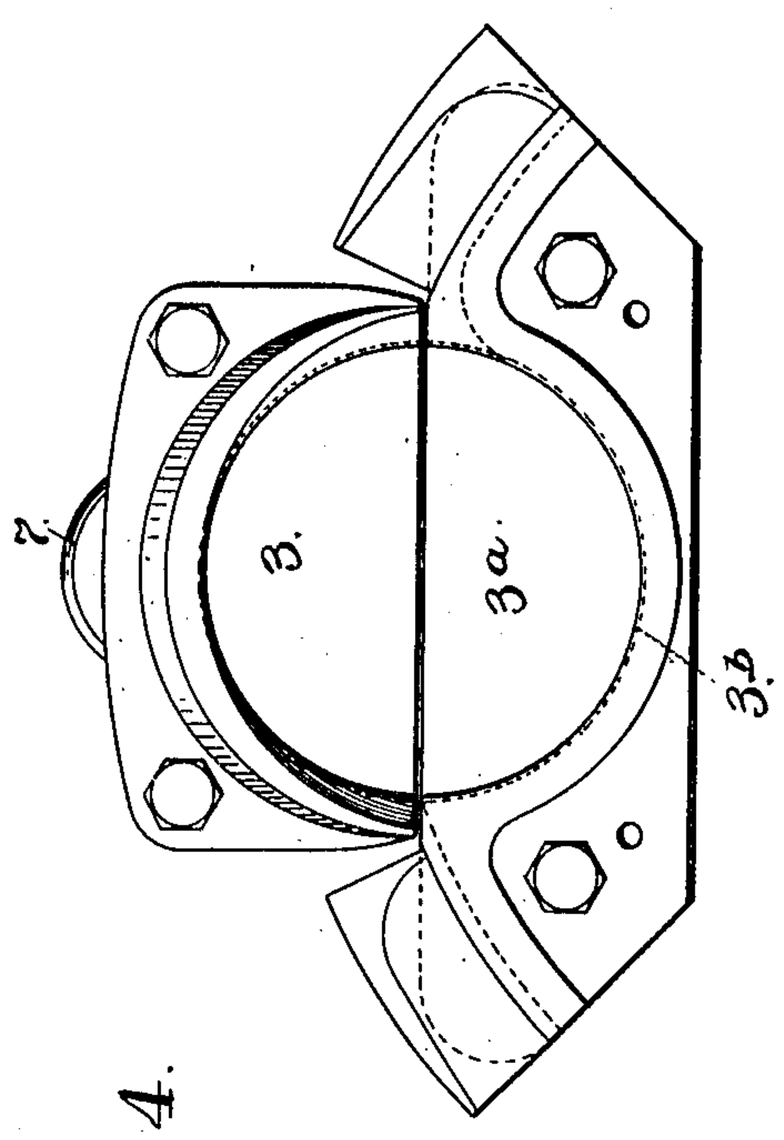

Fig. 4.

Witnesses:
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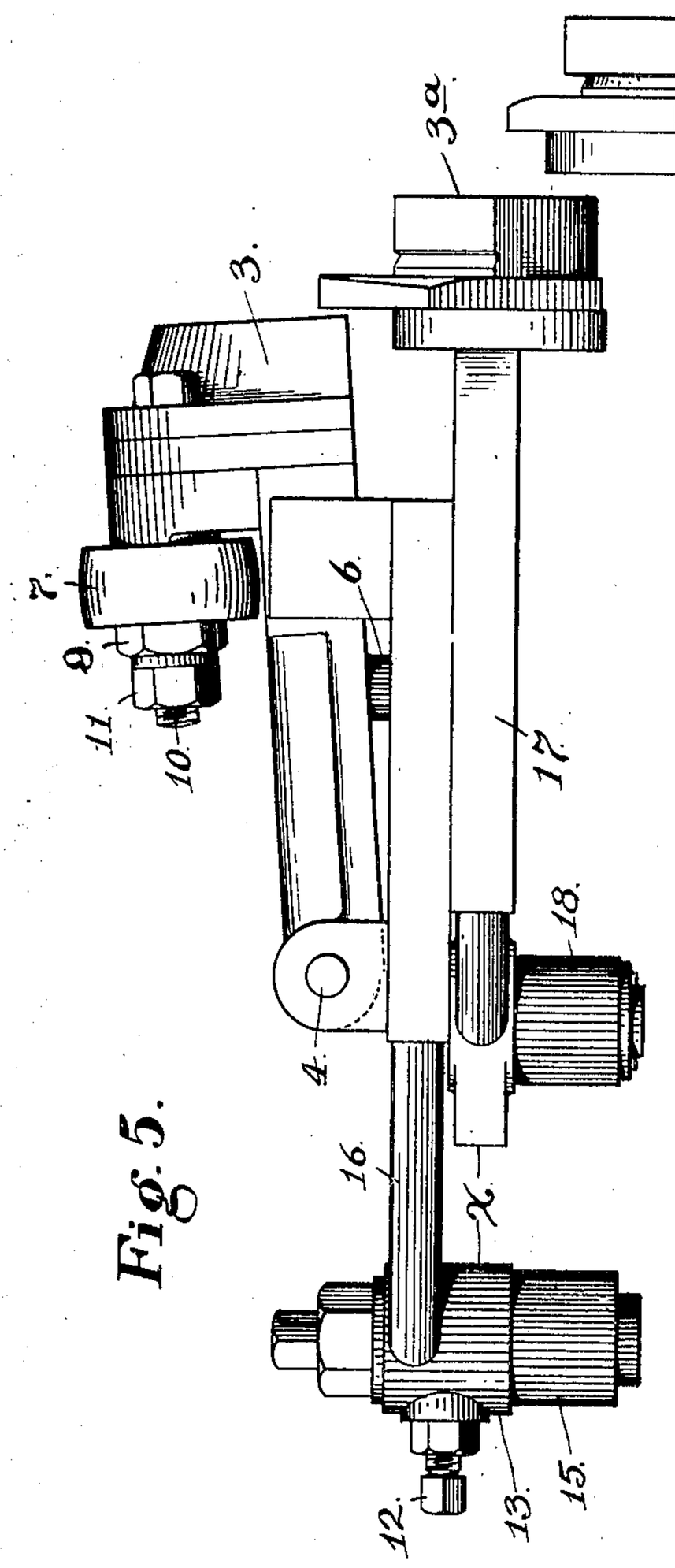

Fig. 5.

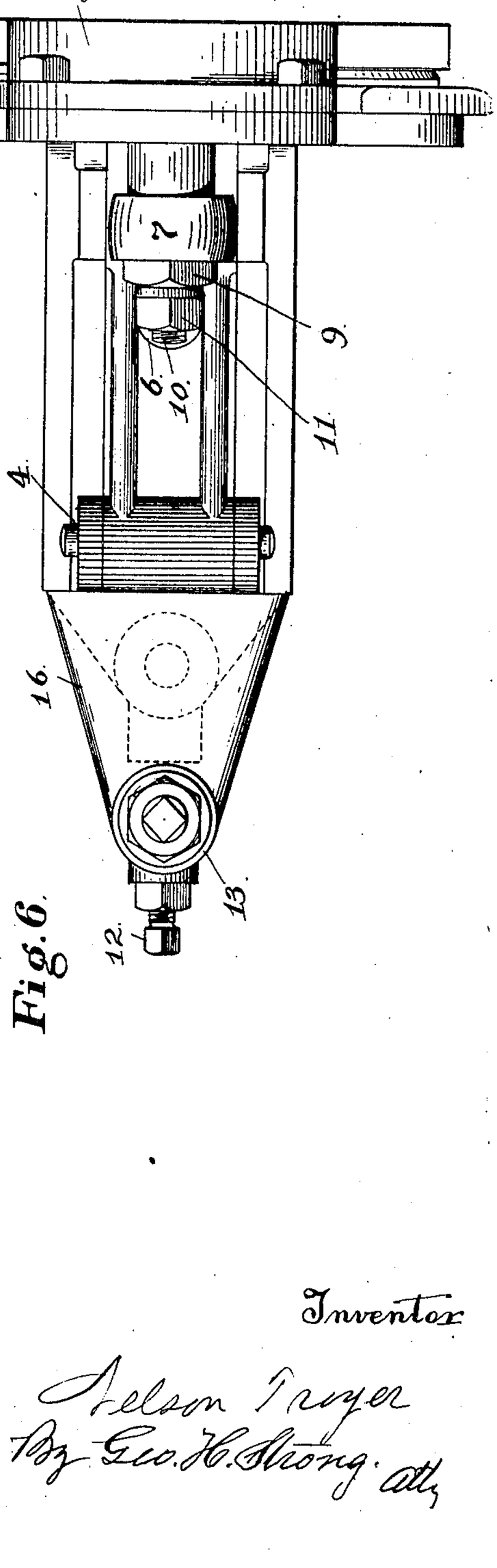

Fig. 6.

Witnesses:
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5 SHEETS—SHEET 5.

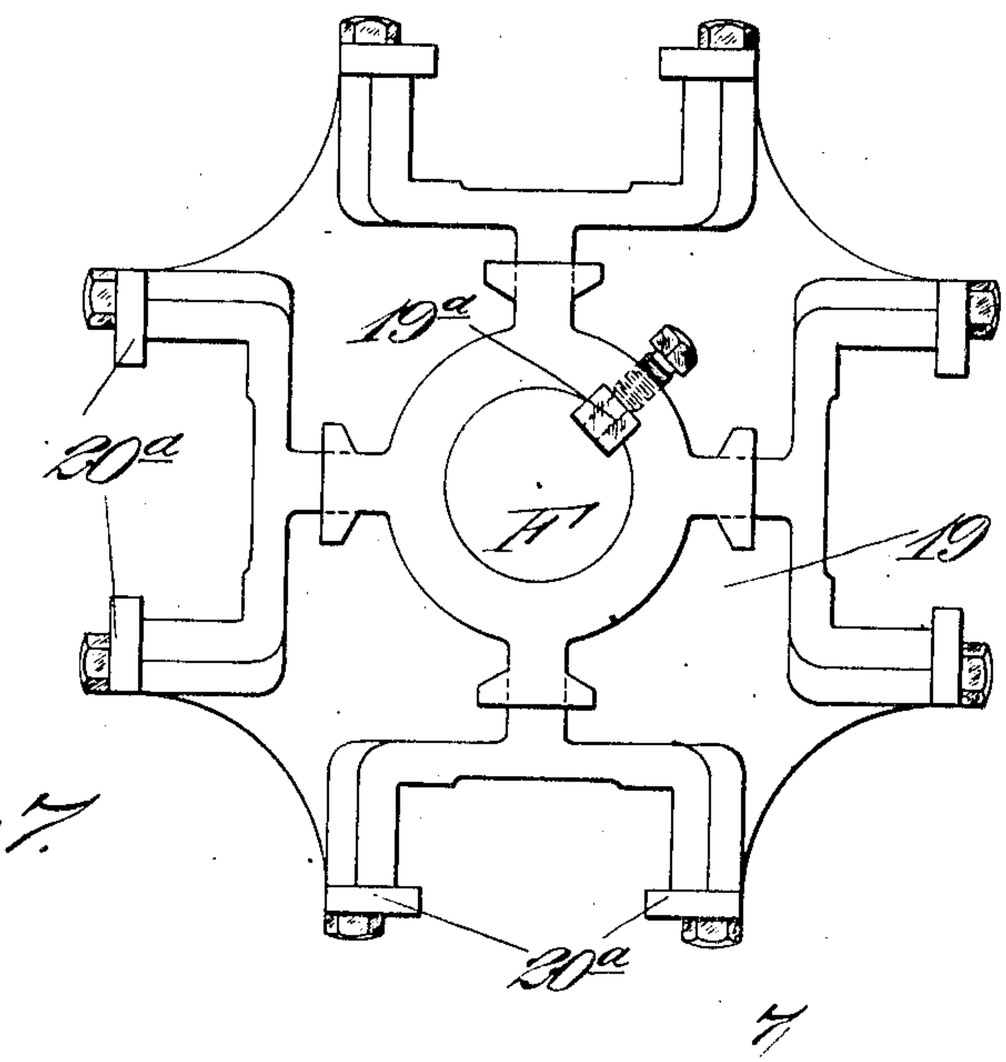

Fig. 7.

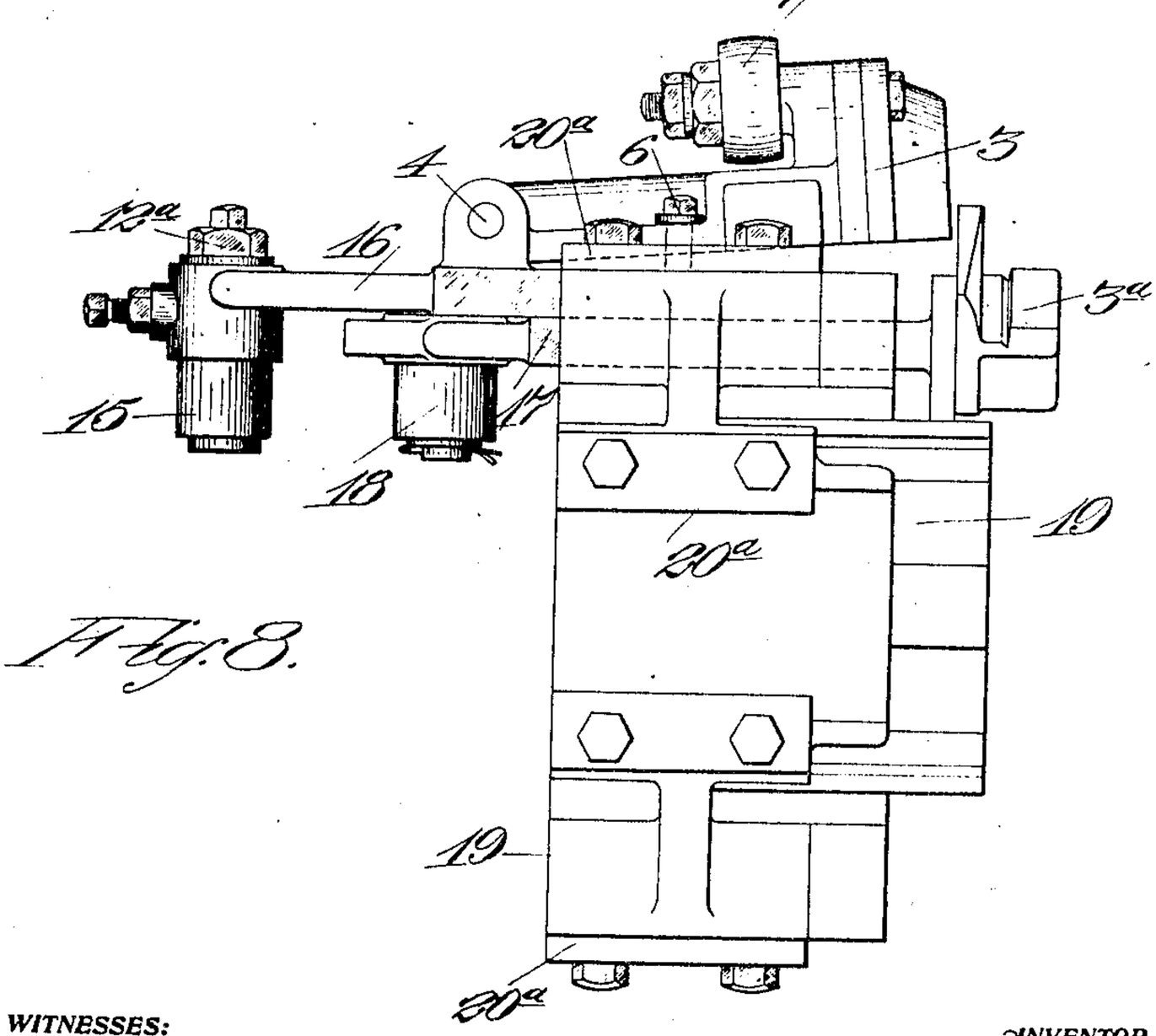

Fig. 8.

WITNESSES:

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INVENTOR

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BY

Geo. H. Strong.

ATTORNEY

UNITED STATES PATENT OFFICE.

NELSON TROYER, OF PORTLAND, OREGON.

CAN-HEADING MACHINE.

No. 871,379. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed December 16, 1905. Serial No. 291,999.

To all whom it may concern:

Be it known that NELSON TROYER, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, has invented new and useful Improvements in Can-Heading Machines, of which the following is a specification.

My invention relates to improvements in machines for heading cans.

It consists in the combination of parts whereby the heads may be applied to both ends of a can body simultaneously, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is an end view of the apparatus. Fig. 2 is a side elevation with parts broken away. Fig. 3 is an enlarged sectional elevation of one of the molds closed. Fig. 4 is an end view of the same. Fig. 5 is a side elevation of a mold open. Fig. 6 is a plan view of a mold. Fig. 7 is a side elevation of one of the duplicate supports for the molds. Fig. 8 is a side elevation of the same showing one of the molds in place and open.

It is the object of my invention to provide means by which can bodies are delivered in a substantially horizontal position to molds carried by suitable duplicate supports, and at the same time to deliver can heads to said molds so as to face opposite ends of the can. Suitable mechanism is provided whereby during the rotation of the duplicate supports, the molds are closed so as to aline the can heads with the can body, and the parts are subsequently moved to press the heads simultaneously upon the can body ends; the molds being afterwards opened, and the completed can delivered to a suitable discharge.

The machine is provided with suitable duplicate supports for the molds, one of these supports being shown detached in Figs. 7 and 8. These supports are mounted upon the shaft F, and secured thereto by keys 19^a. These supports carry two opposed sets of molds, one at each end of the position of the can body. As shown, there are four sets of molds carried by the duplicate supports and they are slidable thereon, being retained by guide plates 20^a. The duplicate supports carry the said sets of molds equi-distant around their periphery; said molds being adapted to receive can bodies and can heads which are delivered into the molds simultaneously with and opposite the ends of the can bodies. During the revolution of the duplicate supports the molds are closed upon the can bodies and heads, and the portion carrying the heads is advanced so as to place the heads upon the ends of the can bodies. Motion may be transmitted to revolve this apparatus from any suitable motor, and the intermediate mechanism for transmission is here shown in the form of gears, one of which, H, is mounted upon the shaft F, and power is transmitted to it from a pulley I. As many of the molds may be installed upon the duplicate supports as may be found desirable. I have found in practice that four of such molds operate very evenly and advantageously, but the number may be increased or diminished to suit the required capacity, and the operation is continuous and smooth.

Each mold consists of two parts 3—3^a. In this description I will call the part 3 the outer half, and the part 3^a the inner half. The outer half mold is hinged or fulcrumed to a plate or support 16 above the inner half, and turnable upon a pivot pin as at 4 so that its outer end may be opened and closed about said pivot pin. This outer half is elevated when released by a spring 5 supported in a socket in the plate 16, and acting against the part 3 of the mold. When thus opened and separated from the inner half it is capable of admitting the can head and the end of the body. It will be understood that there will be two of these molds axially in line with each other and opened and closed in unison so that the ends of the can body are received into the molds and a can-head is delivered into each portion in line with the ends of the can body. The description of the operation of one of these molds applies to both.

The upward movement of the outer half 3 of the mold when opened by the action of the spring 5 is limited by a stop 6, which consists of a screw-threaded shank fitting into the plate 16 and having a disk or collar 6^a formed upon it. The arm carrying the said outer half 3 of the mold is perforated so that the stop passes through the opening, said opening being large enough to allow the arm to move freely, and the enlarged collar 6^a upon the stop limits the motion of the outer half of the mold. 7 is a roller journaled upon the upper half 3 of the mold. 8, Figs. 1 and 2, is a cam so located that the roller 7 will travel in contact with the cam during a portion of the revolution of the apparatus. When the roller 7 comes in contact with the cam it is acted upon by the

cam to close the mold. The revolution of the central part and the movement of the molds will be clock-wise when looking at the end view Fig. 1. This roller 7 is mounted upon an eccentric sleeve 9 which is turnable upon a bolt 10, and is locked in place by a nut 11 which screws upon the bolt and against the eccentric. By loosening the nut, the eccentric may be turned so as to move the roller out or in and thus adjust it for any errors in wear. A plate or support 16 carrying the outer half 3 of a mold has upon the end opposite the mold a hub 13 through which passes a stud upon which is turnable a roller 15. That portion of the stud upon which the roller is turnable is eccentric to the part which passes through the hub, and the shaft is normally locked in place by a set screw 12 which screws into the hub and the point binds against the shaft. By loosening this screw and a lock-nut 12ª the stud may be turned around and with it the eccentric portion carrying the roller 15 so that the latter may be advanced in either direction, and as this roller travels in a cam slot 14, to be hereafter described, it will be manifest that the outer half of the mold can be adjusted endwise by these movements. The inner half 3ª of the mold is carried upon a plate 17, the rear end of which has journaled upon it a roller 18 and this roller of each inner half mold enters a cam slot 14ª which acts to retract the mold and release the can after the heads have been placed thereon as will be hereafter more fully described. The cams 14—14ª are fixed with relation to the turnable portions of the machine, and are prevented from turning by screw-threaded studs 14ᵇ passing through the pillow-blocks, as shown in Fig. 2, and held in place by lock-nuts 14ᶜ. By means of these lock-nuts the studs, and with them the cams, may be moved in or out, to allow minute compensations for wear and varying lengths of the cans as previously described.

The can bodies are delivered into a runway A which is formed in any suitable manner, and has an incline sufficient to allow the cans to roll down and pass from the runway into a substantially vertical channel or chute which carries the cans down in such position that they will be delivered to the molds as the latter arrive opposite the lower end of the chute. Exterior to the runway which carries the can bodies are channels or chutes B into which the can heads are placed standing vertically on edge, and maintained in this position within the channels, the inner walls of which are formed by the castings A′ which form the runways supporting the cans and on the outer side by plates, the two forming the channels or chutes B between which the can heads are supported. Both heads and cans reach the assembling portion of the apparatus together and are delivered to the molds at the point C. The can heads and bodies arriving at the machine, the cams 8 and 14ª having previously released the outer half molds 3, and allowed them to open, and also retracted the part carrying the outer half molds, the inner half 3ª will thus be exposed so that the can bodies and can heads may be delivered simultaneously into the molds. This opening of the molds takes place when they are approximately in a vertical line above the axis of the machine, and before the cans and heads have been delivered into the molds. The cam slots 14 then act upon the rollers 15, advancing the plate 16 and the outer half mold until the inner ends of the molds are substantially in the same plane, and the surface of the hub 13 has been advanced into contact with the inner end of the part 17 which carries the lower half mold 3ª as shown at X in Fig. 3. The rear faces of the counterbores 3ᵇ of both outer and inner halves will then be brought into the same plane, during this time the mold will have traveled from about the vertical position to a point about 45° in advance thereof. The rollers 7 of the outer half molds now pass beneath the stationary cams 8, and thus act to close the outer halves 3 of the molds down upon the inner halves 3ª. This closing of the molds rounds up and sizes the ends of the can body so that they may enter the can heads. This sizing may be determined by adjustment of the eccentric 9 as previously described. The two parts of the molds are then by reason of the contact of the hub 13 with the shoulder formed by the end of the part 17, in condition to be advanced in unison, and this is effected by the further movement of the machine and the action of the cams 14 which force the can heads upon the ends of the body. At this point the inner cam slots 14ª will in practice be so constructed as to allow a proper clearance, and not interfere with the action of the cam slots 14. The molds will now have reached a point about 90° away from the vertical or in a horizontal line through the axis, and at this point the rollers 7 leave the cams 8. This allows the springs 5 to press the outer half 3 of the mold open, turning upon its pivot or fulcrum point 4 until the stop 6 arrests its further movement as previously described. From this point to a point about 180° and in a vertical line through the axis, the outer half of the mold is moved back to its outward position by the action of the cams 14 upon the rollers 15. The opposing molds are now separated sufficiently to release the can by the action of the inner cam grooves 14ª upon the rollers 18 which separate the opposing molds sufficiently to release the can which now has its head securely fastened upon its opposite ends. The can thus released is extracted from the molds by means of a curved iron or extractor 20, and as the outer or

hinged half 3 of the mold has been withdrawn, the can simply resting in the inner half of the mold will be free to be lifted out by this extractor. From and by this extractor the cans are delivered into a runway 21 which delivers them to any desired point.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In an apparatus for heading cans, the combination of duplicate supports, segmental molds carried thereby, one of the parts of said molds being hinged and the other part of the same mold being adapted to first receive the can body and head, a horizontal-slidable support for the hinged half-mold, means for advancing the hinged half mold to register with the companion half-mold and to cause it to close upon the can body, and means for advancing the half-molds in unison.

2. In a can heading machine, the combination of duplicate supports, inner and outer half molds carried thereby, the outer half-mold being hinged and the inner half-mold being adapted to first receive the can body and head, a horizontal slide to which the outer half-mold is hinged, means for placing a can body in the inner hlaf-mold, said inner half-mold having a counterbored chamber, means for moving the outer half mold to register with the inner half-mold, and to close upon the can body, and means for advancing the half molds in unison to place the head upon the can body.

3. In a can heading machine, duplicate supports, inner and outer half molds carried thereby, cams by which the inner halves of molds are moved to and from each other, means by which can bodies are placed in said inner half molds, counter-sunk chambers in the molds and means for placing can heads therein and in line with the can bodies, cams by which the outer half molds are advanced longitudinally to register with the inner halves, and other cams to close the outer halves of the molds upon the inner halves, said first named cams then moving the molds to place the heads simultaneously upon opposite ends of the body.

4. In a can heading machine, the combination of duplicate supports, inner and outer half molds carried thereby, plates by which each half mold is carried, rollers on studs fixed to the plates, and cams at opposite ends of the machine with which the rollers engage to first hold the inner half molds to receive the can bodies and heads, the outer half molds being then moved to register with the inner half molds, and the opposed half molds being finally advanced together to place the heads upon opposite ends of the can body.

5. In a can heading machine, the combination of duplicate supports, inner and outer half molds carried thereby, roller-carrying plates upon which the half molds are borne, said outer half molds adapted to move at right angles with the companion inner half mold, limiting stops on the plates, and fixed cams with which each of the rollers engage, and by which the inner half molds are first held to receive can bodies and can heads, then the outer half molds are moved to register with the companion inner half molds to allow the half molds to be closed about the can bodies and heads, and to force the heads upon the ends of the bodies.

6. In a can heading machine, duplicate supports, inner and outer half molds adapted to receive can bodies and heads, roller carrying plates upon which the half molds are borne, fixed cams acting through the rollers to move the inner half molds longitudinally and independently, a hinge about which the outer half is opened outwardly from the inner half, a spring, and a stop by which the movement is effected and limited.

7. In a can heading machine, duplicate supports, inner and outer half molds adapted to receive can bodies and heads, roller-carrying plates upon which the half molds are borne, fixed cams acting through the rollers to move the inner half molds longitudinally and independently, a hinge about which the outer half is movable and a spring by which it is opened about the hinge, a roller carried upon said outer half, and a fixed cam against which the roller impinges to close the mold.

8. In a can heading machine, duplicate supports, inner and outer half molds carried thereby, a hinge about which the outer half is opened with relation to the inner half, a fixed cam, a roller carried by the outer half adapted to contact with the cam to close the mold, and an eccentric bushing turnable upon a stud on the half mold and upon which bushing the roller is revoluble, said bushing serving to adjust the half molds with relation to each other.

9. In a can heading machine, inner and outer half molds, plates upon which said molds are borne, cams by which said plates are movable with relation to each other to project the inner halves of the molds beyond the outer halves, stops by which the molds are caused to register when returned into the same plane, and means for adjusting the plates of the outer half molds with relation to the cams.

10. In a can heading machine, duplicate supports, inner and outer half molds carried thereby and adapted to receive can bodies and heads, cams by which the outer mold halves are retracted in line of their axes to uncover the receiving ends of the inner half molds, and runways and chutes through which the heads and bodies are delivered simultaneously into the inner half molds.

11. In a can heading machine, duplicate supports, inner and outer half molds adapted

to receive can bodies and heads, runways through which the can bodies and heads are simultaneously supplied to the molds, and mechanism by which the bodies and heads are assembled within said molds, said mechanism including slidable arms, a hinge joint about which the outer half mold may open, and cams by which the two parts of the molds are separated in the direction of their axes to admit the cans and heads, and subsequently returned and closed.

12. In a can heading machine, duplicate supports, molds consisting of inner and outer segments, a plate upon which the inner segment is carried, a second plate and hinged connection between the outer mold segment and said plate, whereby said outer segment may be opened and closed with relation to the inner one, a roller carried by said outer segment, a fixed cam with which said roller contacts during the movement of the parts to close the segments together and an eccentric bushing for said roller whereby it and the segment may be adjusted with relation to the actuating cam.

13. In a can heading machine, inner and outer segmental molds adapted to assemble can bodies and heads, parallel plates upon which segments are carried, a roller journaled upon the plate which carries the outer segment, a cam with which said roller engages, whereby the outer segment is reciprocated in the line of the axis of the mold, a roller journaled upon the outer segment, a hinge and a spring by which the outer segment is opened outwardly, and a fixed cam by which said segment is closed.

14. In a can heading machine, parallel slidable plates, each carrying one-half of a segmental mold, a hinged joint by which the outer plate is connected with the outer segment, a spring by which said outer segment is normally opened with relation to the inner one, a roller carried by the plate and a cam engaging said roller and reciprocating the plate and segment in a plane parallel with the axis of the mold and a stop contacting with the inner plate whereby the molds are brought to register when the outer segment has been returned.

15. In a can heading machine, parallel plates carrying respectively the inner and outer segments of opposed molds and cams by which the outer plates are retracted to allow a can body to be placed in the inner segments, said cams subsequently returning the outer segments, and stops by which the molds are maintained in register while both are advanced by the cam to force the heads upon the can body.

16. In a can heading machine, parallel slidable plates, inner and outer mold segments carried by said plates, rollers journaled upon said plates, inner and outer cams with which said rollers engage, the inner cam serving to hold the inner segments and the outer cams withdrawing the upper segments to admit a can body and heads, said outer cams subsequently acting to return the outer segments to register with the inner segments, hinge joints by which the outer segments may open and close with relation to the inner segments, and opening springs and limiting stops for said movement, journaled rollers and fixed cams with which said rollers contact to close the outer half molds upon the inner halves after the can and heads have been placed, said outer cams further acting to move the molds toward each other and force the heads upon the can body.

17. In a can heading machine, opposed outer and inner mold segments and plates upon which said segments are carried, rollers journaled upon the plates, cams with which the rollers engage whereby the outer segments are retracted with relation to the inner ones to admit a can body and heads, said cams subsequently returning the segments, and stops by which the movable segments are arrested to register with the inner segments, and eccentric bushings upon which the cam rollers are journaled, said bushings being turnable to provide endwise adjustment of the molds.

18. In a can heading machine, molds consisting of outer and inner segments mounted in pairs, joints about which the outer segments are opened and closed with relation to the inner ones, slidable carrying plates and cams by which said outer segments are retracted to expose the inner segments, means for delivering a can body and heads into the exposed inner segments, means by which the outer segments are returned and caused to register with the inner segments, means by which the outer segments are closed to shape the can body ends and bring them into line with the heads, and mechanism by which the opposed molds are moved toward each other to place the heads simultaneously upon the can body ends.

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

NELSON TROYER.

Witnesses:
H. J. Bigger,
Chas. F. Cooke.