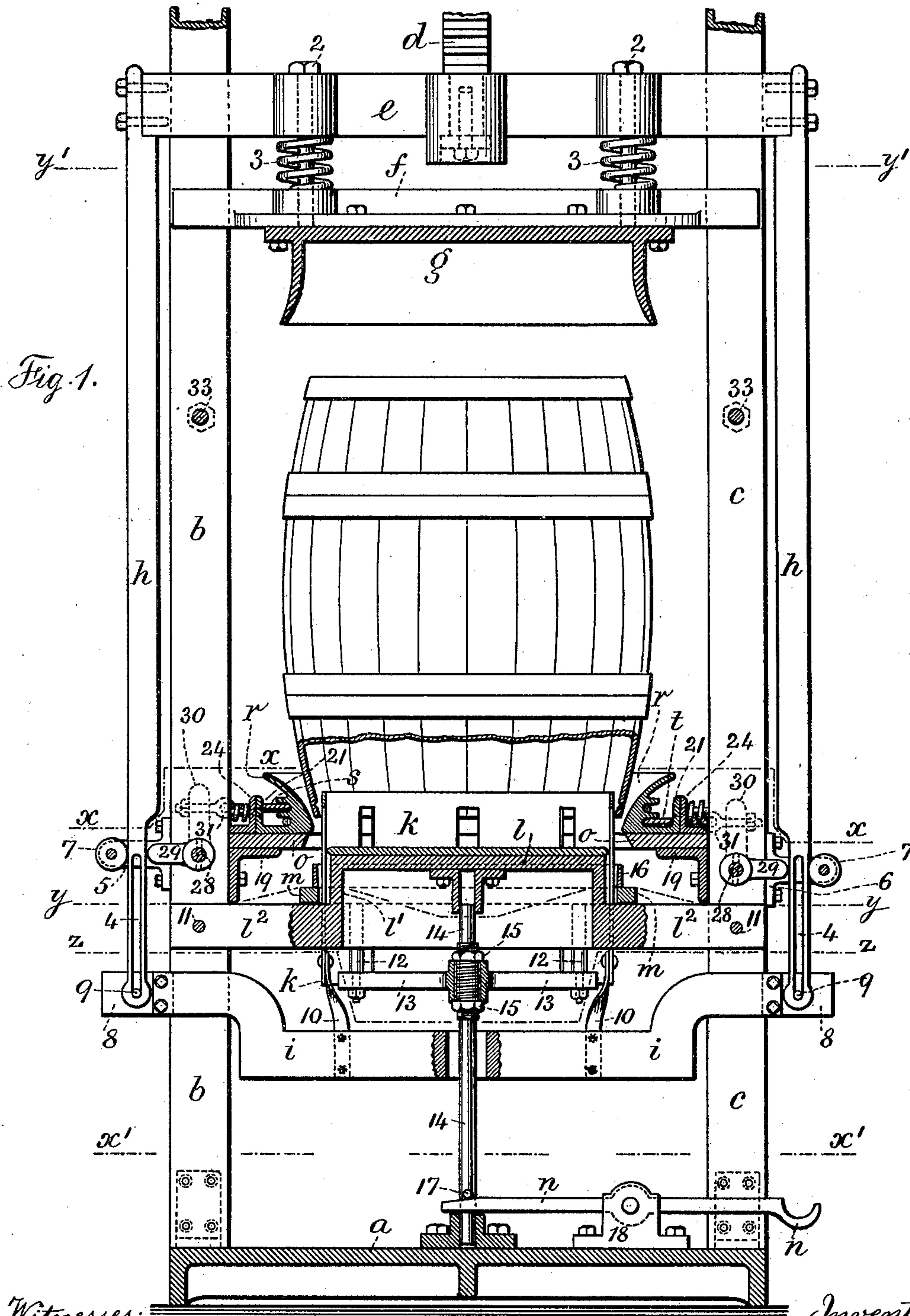


J. W. ANGUS.
BARREL HEADING MACHINE.

(Application filed Apr. 29, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
J. Stait
J. Chas. Smith

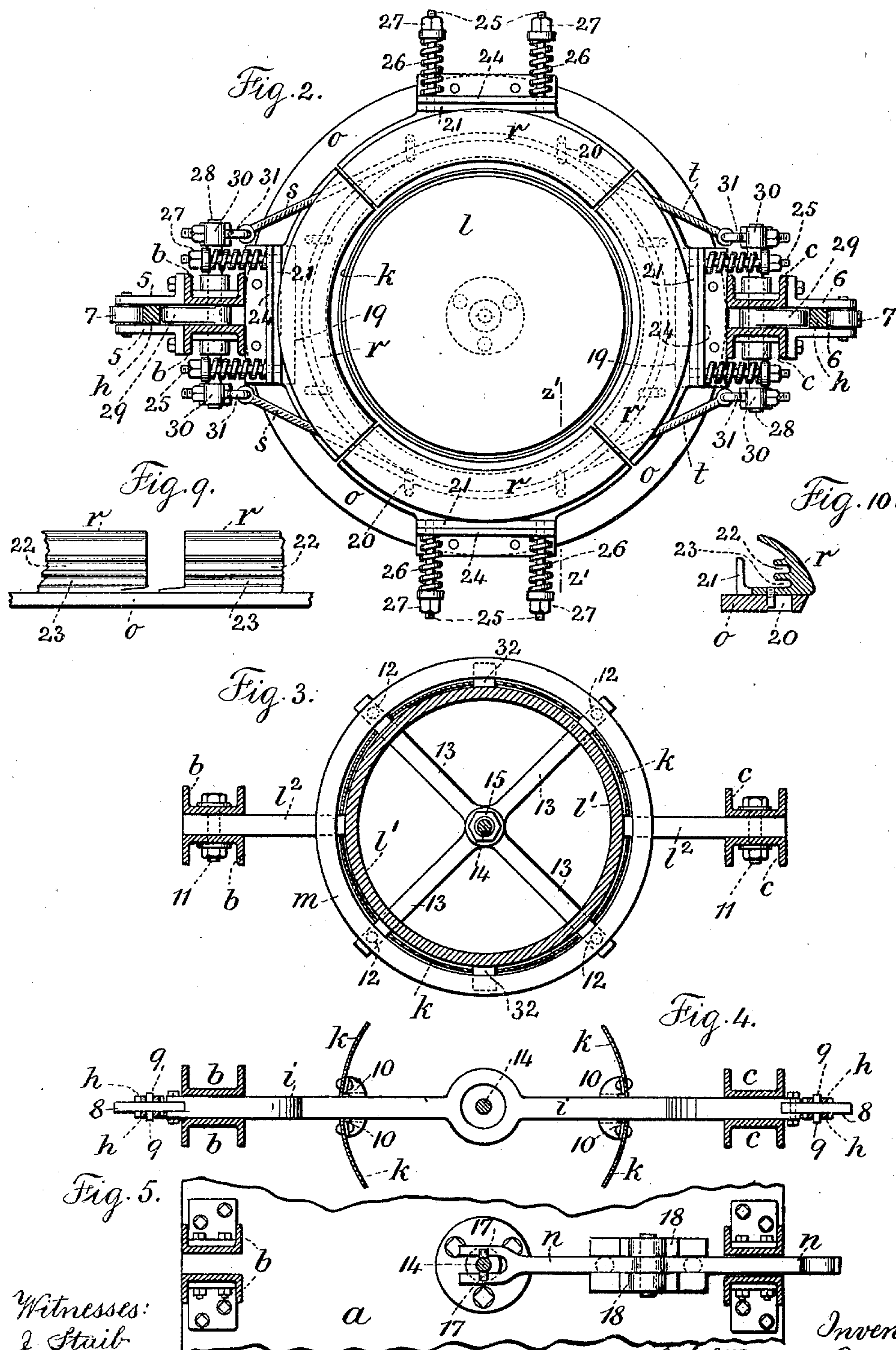
Inventor:
J. W. Angus
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(No Model.)

3 Sheets—Sheet 2.



Witnesses:
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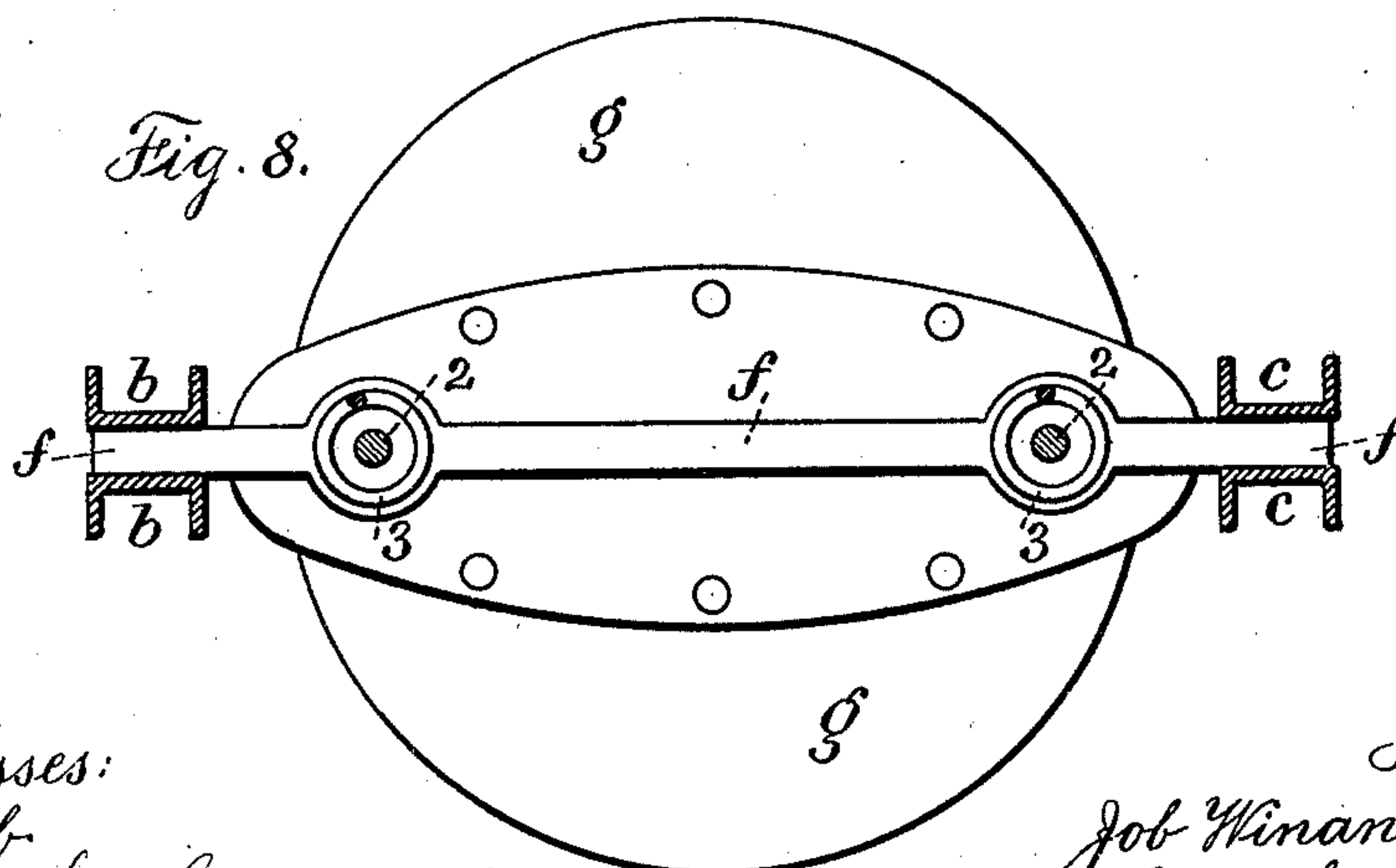
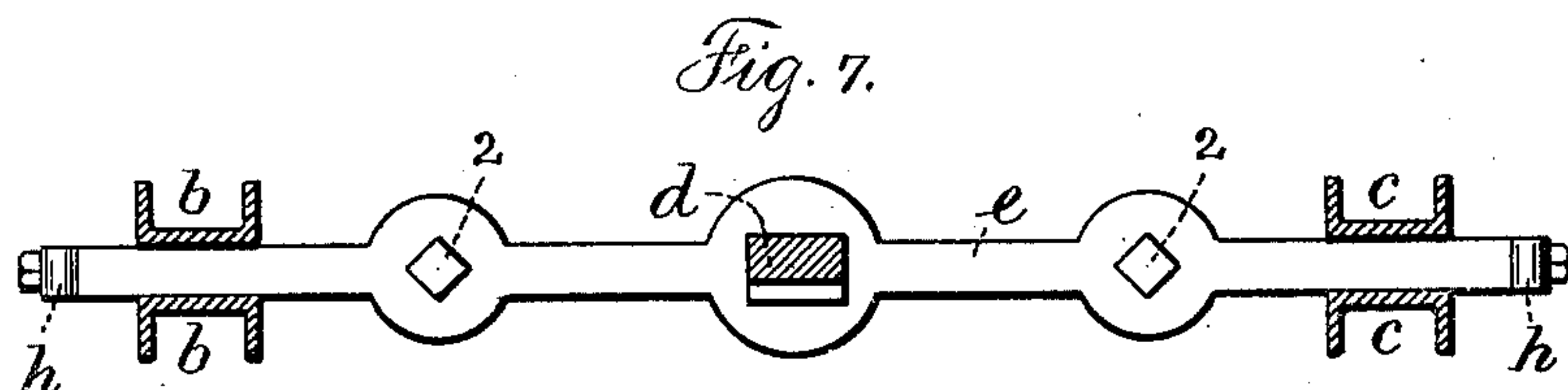
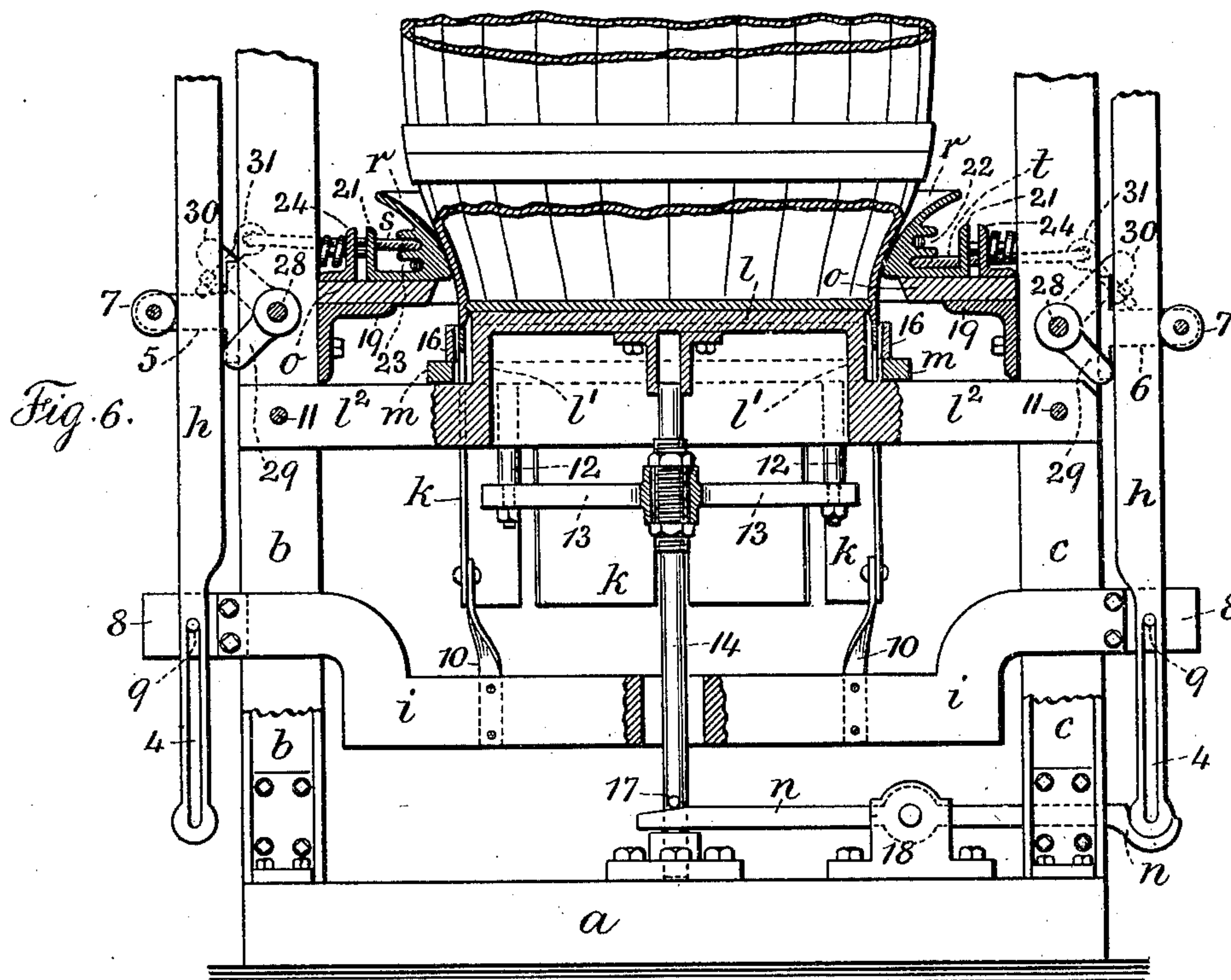
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J. W. ANGUS.
BARREL HEADING MACHINE.

(Application filed Apr. 29, 1901.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:
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Charles Smith

Inventor:
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attys.

UNITED STATES PATENT OFFICE.

JOB W. ANGUS, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO HIMSELF, AND
ERASTUS H. BARNES, OF BROOKLYN, NEW YORK.

BARREL-HEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 686,961, dated November 19, 1901.

Application filed April 29, 1901. Serial No. 57,885. (No model.)

To all whom it may concern:

Be it known that I, JOB WINANS ANGUS, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented an Improvement in Barrel-Heading Machines, of which the following is a specification.

My invention relates to the manufacture of that class of barrels known in the trade as "slack" barrels, such as are usually employed for sugar, flour, cement, and similar merchandise; and my invention relates particularly to devices for inserting the heads in such barrels, said heads consisting of loose pieces—that is, pieces not doweled or otherwise fastened together.

In carrying out my invention I employ devices for receiving, guiding, and supporting the open end of the barrel, an adjacent stationary circular platform for supporting the loose pieces forming the heads, devices for forcing the staves of the barrel into smaller circumferential area at the time when the parts forming the head are brought into their relation with the ends of the staves, and a device for supporting the hoop and means connected therewith for forcing the hoop upon the end of the barrel outside of the staves and adjacent to the head. These devices act automatically and progressively in the performance of their various functions, and they are actuated by a rack and vertically-movable cross-head, all of which are hereinafter more particularly set forth.

In the drawings, Figure 1 is a partial elevation and vertical section representing my improvement. Fig. 2 is a plan and partial section at the line xx of Fig. 1. Fig. 3 is a plan and partial section at the line yy of Fig. 1. Fig. 4 is a plan and partial section at the line zz of Fig. 1. Fig. 5 is a plan and partial section at the line $x'x'$ of Fig. 1. Fig. 6 is a partial elevation and vertical section at the lower part of the machine with one end of the barrel held in position engaging the parts forming the head and preparatory to the hoop being raised and forced around over the end of the staves. Fig. 7 is a plan and partial section of the parts at the upper end of Fig. 1. Fig. 8 is a plan and partial section at $y'y'$ of Fig. 1. Fig. 9 is a partial elevation of the ad-

jacent meeting edges of two of the ring-segments hereinafter described; and Fig. 10 is a cross-section through one of said ring-segments and the circular platform serving as a support therefor at $z'z'$, Fig. 2.

The metal base a , of any desired configuration, is provided with angle-iron standards $b c$ at spaced-apart intervals in connected pairs, the lower portions of said standards being fastened to the base by angle-iron brackets and rivets and the upper ends carried up and connected to any desired means of support. A rack d is connected at its lower end to a cross-head e , movable vertically between the pairs of angle-iron standards $b c$, the ends of the cross-heads extending beyond the standards and having connected to them the vertical bars $h h$, which bars depend from the ends of the cross-head. A cross-head f is located below the cross-head e and is connected thereto by bolts 2 and spaced apart therefrom by helical springs 3, the respective ends of the cross-head f being located between the angle-iron standards $b c$. The cross-head f is thus yieldingly supported from the cross-head e . A part of the cross-head f is an elliptical flange, to which a flanged driving-plate g is bolted. This driving-plate g in the cross-section, Fig. 1, has the appearance of an inverted saucer, and it is of a size approximately corresponding to one end of a barrel, so that the upper end of the barrel is received in this driving-plate, which not only moves the barrel downward, but at the same time centers the barrel in the machine. The lower ends of the vertical bars $h h$ are made slightly narrower in width and provided with mortises 4 and curved lower ends, and I provide and connect to the angle-iron standards $b c$ guide-brackets 5 6, the said vertical bars $h h$ being received between the parts of the guide-brackets, and the outer faces of these vertical bars rest against the peripheries of friction-rollers 7, mounted upon short pins extending between the brackets 5 6. The cross-head i is provided with end plates 8, securely fastened thereto and in which are pins 9, said pins passing through the mortises 4 in the lower ends of the vertical bars $h h$, this cross-head i being normally suspended by the said vertical bars and its pins 9.

I provide a steel cylinder *k*, vertically slot-
 ted at spaced-apart intervals, and bracket-
 arms 10 below the lower edge of the cylinder
 and connecting the said cylinder to the said
 5 cross-head *i* and by which the same is sup-
 ported. This steel cylinder surrounds the
 platform *l*, upon which are placed the sepa-
 rate pieces forming the barrel-heads, and said
 cylinder may be constructed of one or more
 10 pieces or parts connected or otherwise. The
 platform *l* is made integral with a ring-base
l' and with arms *l''*, extending therefrom in op-
 posite directions, and which arms pass be-
 tween the angle-iron standards *b c* and are
 15 securely connected thereto by bolts 11, so
 that the platform *l* and the parts connected
 therewith are fixed in the machine, or said
 platform *l* may be otherwise supported, if
 found desirable. A ring *m* surrounds the
 20 steel cylinder *k* and normally rests upon the
 arms *l''*. Posts 12 are connected to and depend
 from this ring *m*, and the posts 12 are in
 turn connected to cross-bars 13. The cross-
 bars have a sectional hub integrally threaded
 25 and surrounding a threaded portion of a cen-
 ter-post 14, upon which threaded portion are
 nuts 15, coming above and below the hub of
 the cross-bars, so as to lock the position
 thereof with reference to the post 14 and yet
 30 permit of the adjustability of the cross-bars
 with reference to the post, so that the ring
m may occupy the desired position in the
 machine. The lower end of the post 14 is
 guided in a socket on the base *a*, and the
 35 upper end is guided in an inverted socket on
 the under side of the platform *l*, there
 being an opening in the center of the cross-
 head *i* for the free movement of the post 14
 in relation to the cross-head *i*, or vice versa,
 40 and it will be noticed from Fig. 3 of the draw-
 ings that the posts 12 come outside of the ring
 base *l'* and vertically beneath the ring *m*, so
 that there is no interference in the move-
 ment of the parts.

16 represents the hoop to be forced around
 outside of the staves of the barrel adjacent
 to the head in the operation of heading a bar-
 rel, and this hoop rests upon the ring *m*, and
 it is raised into position by this ring *m*, the
 50 posts 12, cross-bars 13, and center-post 14,
 and upon the lower end of the post 14 is a
 cross-pin 17, coming above one end of a le-
 ver *n*, pivotally connected to a standard 18,
 secured to the base *a*, the other end of said
 55 lever being made with a curved or hook-
 shaped portion adapted to receive the curved
 lower end of one of the vertical bars *h* in the
 position of the parts represented in Fig. 6.

Upon the inner surfaces of the angle-iron
 60 standards *b c* I secure brackets 19, which
 serve as supports for the circular platform *o*.
 This circular platform *o* is provided with a
 series of parallel mortises 20, (see Figs. 2 and
 10,) and it supports the ring-segments *r*, there
 65 being four of these segments, by preference,
 which surround and are adapted to be brought
 forcefully into contact with the surfaces of

the barrel-staves. These ring-segments are
 provided on their under surfaces with pins
 in the mortises 20, the object of the mortises
 and pins being to insure positive radial move-
 70 ments for the ring-segments. These ring-
 segments are made with inclined convex
 inner surfaces with flat bases to rest upon
 and move over the surface of the circular
 75 platform and with central flanges 21 coming
 outside, and around the said ring-segments I
 provide peripheral grooves 22 23, the one
 above the other.

Flanges 24, four in number, are securely
 80 bolted to the platform *o*, two of them adja-
 cent to the angle-iron standards *b c* and two
 intermediate thereof, and the vertical faces
 of the flanges 24 and the flanges 21 meet and
 coincide in the normal position of the ring-
 85 segments, and I provide bolts 25 in pairs, and
 the bolts are securely fastened at one end in
 the flanges 21, made integral with the ring-
 segments, and extend loosely through the
 flanges 24. Around the bolts are springs 26
 90 and on the free ends of the bolts tension-nuts
 27. The office of the springs is to draw the
 ring-segments away from the center of the
 machine, so that their flanges 21 come up
 against the flanges 24 upon the platform *o*,
 95 and these springs yield as the ring-segments
 are forced toward one another and toward
 the center of the machine, and in these move-
 ments of the ring-segments they are guided
 by the pins in the mortises 20, as hereinbe-
 100 fore stated.

I provide short shafts 28, extending through
 bearings formed upon the angle-iron stand-
 ards *b c*. Upon said shafts and between said
 standards are cranks 29, and upon the ends
 105 of said cranks, outside of said standards, are
 cranks 30, in pairs, the cranks 30 being placed
 at right angles to the cranks 29, and tension-
 ropes *s t*, extending around the ring-segments
 and received in the peripheral grooves 22 23
 110 thereof, are connected at their respective
 ends by fastening devices 31 to the cranks
 30, the tension-rope *s* passing around in one
 direction and the tension-rope *t* in the oppo-
 site direction, and the respective ends of the
 115 ropes are connected by the fastening devices
 to the cranks at the opposite sides of the ma-
 chine.

Fig. 1 represents the devices in the position
 occupied as the barrel is placed in the ma-
 120 chine, and in the operation of the machine
 the cross-heads *e* and *f* are forced downward
 by the rack *d* and the mechanism operating
 the same. In this movement the upper end
 of the barrel passes into the driving-plate *g*,
 125 is centered thereby and moved down there-
 with, and the downward movement of the
 vertical bars *h h* with the cross-head *e* per-
 mits the cross-head *i* to descend by gravity
 and carry with it the steel cylinder *k*, and
 130 the slots in the steel cylinder receiving the
 cross-bars 13 provide for the downward move-
 ment of the steel cylinder independent of the
 said cross-bars and any movement that may

be imparted thereto or thereby to the ring *m*. The steel cylinder *k* is within the open end of the barrel and forms a guide therefor, and said parts may move downward to an appreciable extent before they are frictionally bound and held in place and prior to the barrel being forced down with and by the driving-plate *g*. As the offset portions of the vertical bars *h h* come in contact with the ends of the cranks 29 these cranks are moved downward, the shafts 28 are turned, the cranks 30 are moved outward and tension thereby applied to the ropes *s t* to draw the ring-segments *r* toward the center of the machine and toward one another and in contact with the surface of the barrel-staves to force the same together into a more intimate and close relation and at the same time to slightly bend the said staves and bring the end of the barrel with the descent of the steel cylinder *k* into engagement with the pieces forming the head upon the platform. This position of the parts is shown in Fig. 6, and in this position it will be noticed that the upper edge of the steel cylinder *k* is now below the ends of the barrel-staves and that the groove formed on the inner faces of the barrel-staves is in contact with the edge of the parts forming the cover, being held in this position by the tension applied by the ropes *s t* to the ring-segments *r*. In this position of the parts the lower end of the vertical bar *h*, at one side of the machine, rests in the curved end of the lever *n*, and the further downward movement of the parts from the position Fig. 6 brings the steel cylinder *k* against the arms *l*², simultaneously swings the lever *n*, raises the center-post 14, the cross-bars 13, the posts 12, and thereby the ring *m* and hoop 16, forcing the same around outside of the staves upon the end of the barrel adjacent to the head, completing the operation of heading the barrel at one end, the upward movement of the parts thereafter by the rack *d* raising the cross-head *e*, the cross-head *f*, and the arms *h h'*, releases the lever *n*, the center-post 14, and the parts connecting the same to the ring *m*, so that said parts fall by gravity to their normal position in Fig. 1, in which the ring *m* rests upon the arms *l*². In the upward movement, the pins 9 are engaged by the lower ends of the arms *h*, the cross-head *i* is elevated together with the steel cylinder *k*, and as the parts return to the position Fig. 1 the reduced lower ends of the arms *h h* release the cranks 29 and 30, so that the springs 26 act to separate the ring-segments *r*, returning the same, the tension-ropes, and the cranks 29 and 30 to their normal position preparatory to repeating the operations. Meanwhile the barrel has been removed from the machine, other strips placed upon the platform for another head, and the barrel overturned to insert the other head by a repetition of the operations of the machine as hereinbefore stated.

The relation of the cross-heads *f* and *e* is

made variable by means of the yielding helical springs 3, so that the cross-head *e* may approach the cross-head *f* as the springs automatically yield at the end of the downward movement of the barrel and while the same is firmly held and during the final movements of the cross-head *e* and arms *h*, when the strain is applied at the moment of connecting the head and putting on the hoop by forcing the same upward around the end of the barrel.

I have not in my invention shown or described the devices for operating the barrel-heading mechanism through the intervention of the rack *d* and cross-head *e* as prime movers, because the same form no necessary part of my invention and may be varied without changing the barrel-heading mechanism.

I have shown and prefer to employ guides 32, projecting from opposite sides of the ring-base *l'* and straddled by the steel cylinder *k*, these guides 32 and the arms *l*² acting together to control the vertical direction of the cylinder *k*. I have also shown and prefer to employ stop-bolts 33, secured to and extending across between the standards to limit the downward movement of the cross-head *f* and the driving-plate carried thereby.

I claim as my invention—

1. The combination with a support for the pieces forming the barrel-head, of devices passing within and supporting and guiding the barrel at its open end, means for permitting the same to move downward, a series of devices substantially as specified and acting around the staves to press the same together and against the pieces forming the head, means actuated diametrically and moving circumferentially for contracting the said devices, a support for a hoop and means for elevating the same and forcing the hoop around the end of the barrel adjacent to the head, substantially as set forth.

2. In a barrel-heading machine, the combination with a platform for supporting the pieces forming the head, of a guide for the barrel passing within its open end, yielding devices receiving the upper end of the barrel and for forcing the same down, devices for permitting the said guide to move downward with the movement of the barrel, so that the ends of the staves are brought into connection with the pieces forming the head, a series of devices surrounding the end of the barrel and means acting in opposite directions for moving the same toward one another and compressing the staves and holding the same with the head of the barrel in position, devices for supporting a hoop and other devices for elevating the same with the movement of the mechanism and forcing the hoop around outside of the staves at the end of the barrel and adjacent to the head, substantially as set forth.

3. In a barrel-heading machine, the combination with a fixed circular platform supporting the pieces forming the head, a surround-

ing vertically-movable cylinder extending within and forming a guide for the barrel and means for moving the said cylinder, a ring surrounding the cylinder and acting as a support for the hoop, and means for raising the said ring to force the hoop over the end of the barrel, a circular platform and supports therefor, a series of ring-segments upon said platform and surrounding the barrel, means for forcing said ring-segments together to compress the barrel-staves and to hold the same with the head in place during the movement of the hoop and means for returning the said ring-segments to their normal position, substantially as set forth.

4. In a barrel-heading machine, the combination with a fixed circular platform supporting the pieces forming the head, a surrounding vertically-movable cylinder forming a guide for the barrel and means for moving the said cylinder, a ring surrounding the cylinder and acting as a support for the hoop, and means for raising the said ring to force the hoop over the end of the barrel, a circular platform and supports therefor, a series of ring-segments upon said platform and surrounding the barrel, tension-ropes surrounding the ring-segments with their respective ends adjacent to opposite sides of the machine so that the pull is in opposite directions, means for operating the same to draw the segments toward one another and spring-actuated devices for returning the ring-segments to their normal position, substantially as set forth.

5. In a barrel-heading machine, the combination with a circular platform supporting the pieces forming the head, a cylinder forming a guide for the open end of the barrel and means for supporting and moving the same, a ring outside of the cylinder for supporting the hoop, means for raising and lowering the ring to force the hoop to place, vertical bars *h h* at opposite sides of the machine, a cross-head to which they are connected and means for moving the cross-head and the bars vertically, the lower ends of the bars being provided with mortises and offset edges, guide-brackets and friction-rollers at their ends between which the said bars move vertically, cross-shafts in the standards of the machine and cranks thereon actuated by the downward movement of the said vertical bars, and devices brought into operation by the movements of said cranks for forcing the barrel-staves toward one another and holding the same in engagement with the head while the hoop is being forced to place and devices for returning said parts to their normal position when released, substantially as set forth.

6. In a barrel-heading machine, the combination with a circular platform supporting the pieces forming the head, a cylinder forming a guide for the open end of the barrel, and means for supporting and moving the same, a ring outside of the cylinder support-

ing the hoop, means for raising and lowering the ring to force the hoop to place, vertical bars *h h* at opposite sides of the machine, a cross-head to which they are connected and means for moving the cross-head and the bars vertically, the lower ends of the bars being provided with mortises and offset edges, guide-brackets and friction-rollers at their ends between which the said bars move vertically, cross-shafts in the standards of the machine and cranks thereon actuated by the downward movement of the said vertical bars, tension-ropes and devices connecting the same with said cranks, radially-moving ring-segments within the grasp of the tension-ropes and springs for returning the ring-segments to a normal position when released, substantially as set forth.

7. In a barrel-heading machine, the combination with a rack *d*, of a cross-head *e* connected thereto and movable vertically thereby, a cross-head *f* and bolts 2 by which the cross-head *f* is suspended from the cross-head *e*, and helical springs 3 between the cross-heads *e* and *f* acting as cushions providing a yielding movement for the cross-head *f*, and a driving-plate *g* connected to and supported by the cross-head *f*, substantially as set forth.

8. In a barrel-heading machine, the combination with the base and angle-iron standards in connected pairs supported upon and connected to the base, a circular bed supporting the parts forming the head of the barrel, arms carrying the platform and extending between and connected to the standards, the cross-heads *e f* and *i* extending across the machine between and guided by the said standards, devices connecting the cross-heads *e* and *i* and devices connected to and brought into operation by the movement of said cross-heads and parts for effecting the operation of heading the barrel, substantially as set forth.

9. In a barrel-heading machine, the combination with a circular platform supporting the pieces forming the barrel-head, of a ring surrounding the said platform, a vertically-movable post, cross-bars connected to the post and short posts connecting the cross-bars to said ring and means for raising the said center post and ring, substantially as and for the purposes set forth.

10. In a barrel-heading machine, the combination with a circular platform supporting the pieces forming the barrel-head, of a ring surrounding the said platform, a vertically-movable post, cross-bars connected to the post and short posts connecting the cross-bars to said ring, and a pivoted lever, a cross-pin on the center post above the lever and devices having a vertical movement in the machine and adapted to come in contact with the free end of the lever for raising the post and the said ring, substantially as and for the purposes set forth.

11. In a barrel-heading machine, the combination with a vertically-movable post having

an exteriorly-threaded portion, of the ring *m*, the depending posts 12 connected thereto, the cross-bars 13, an interiorly-threaded hub portion connecting the cross-bars 13 and surrounding the threaded portion of the post whereby the position of the ring *m* may be vertically adjusted, and clamping-nuts 15 also upon the threaded portion of the post for locking the position of the parts after adjustment, substantially as set forth.

12. In a barrel-heading machine, the combination with a circular platform supporting the pieces forming the barrel-head, of the steel cylinder *k* surrounding the platform forming a guide for the open end of the barrel and vertically slotted at spaced-apart intervals to permit the steel cylinder to straddle other movable parts, a cross-head *i* and connections therefrom for supporting the steel cylinder, and means for imparting a vertical movement to the cross-head, substantially as set forth.

13. In a barrel-heading machine, the combination with vertical standards, of brackets connected thereto, a circular platform *o* supported thereby, ring-segments carried by the said platform, flanges bolted to the platform and forming stops in one direction for the outward movement of the ring-segments, devices for holding the ring-segments against said flanges and devices acting in opposite directions around and against the said ring-segments to draw the same toward one another and toward the center of the machine around the barrel, substantially as set forth.

14. In a barrel-heading machine, the combination with vertical standards, of brackets connected thereto, a circular platform *o* supported thereby, flanges 24 secured to the circular platform adjacent to the standards and intermediate thereto, ring-segments supported by the platform and each provided with integral flanges adjacent to the flanges 24, bolts connected to the flanges of the ring-segments and extending through the flanges of the platform, springs around the bolts and nuts for applying tension for holding the ring-segments normally with the flanges together, and devices acting independent of the said springs and against their force and surrounding the ring-segments from opposite directions and adapted to force the said segments toward one another and the center of the ma-

chine and around the barrel substantially as and for the purposes set forth.

15. In a barrel-heading machine, the combination with vertical standards, of brackets connected thereto a circular platform *o* supported thereby, flanges 24 secured to the circular platform adjacent to the standards and intermediate thereto, ring-segments supported by the platform and each provided with integral flanges adjacent to the flanges 24, bolts connected to the flanges of the ring-segments and extending through the flanges of the platform, springs around the bolts and nuts for applying tension for holding the ring-segments normally with the flanges together, and tension-ropes surrounding the ring-segments from opposite sides of the machine, shafts in the standards of the machine, cranks at the ends of the shafts and to which the respective ends of the ropes are connected, cranks placed centrally of the said shafts and between the standards, and means operating by vertical movement for swinging the cranks and the shaft to apply tension to the ropes and force the ring-segments toward one another, substantially as set forth.

16. In a barrel-heading machine, the combination with the standards, brackets connected therewith and the circular platform supported thereby, of a series of ring-segments each comprising a flat base, an inclined convex portion, an integral flange and peripheral grooves upon the outer surface of the convex portion, substantially as set forth.

17. In a barrel-heading machine, the combination with the standards, brackets connected therewith and the circular platform supported thereby, of a series of ring-segments each comprising a flat base, an inclined convex portion, an integral flange and peripheral grooves upon the outer surface of the convex portion, and pins extending downward from the said ring-segments in parallel mortises in the said platform, and means for moving the said ring-segments in opposite directions, the said pins and mortises compelling the said movement to be in radial lines, substantially as set forth.

Signed by me this 23d day of April, 1901.

J. W. ANGUS.

Witnesses:

GEO. T. PINCKNEY,

S. T. HAVILAND.