

No. 844,411.

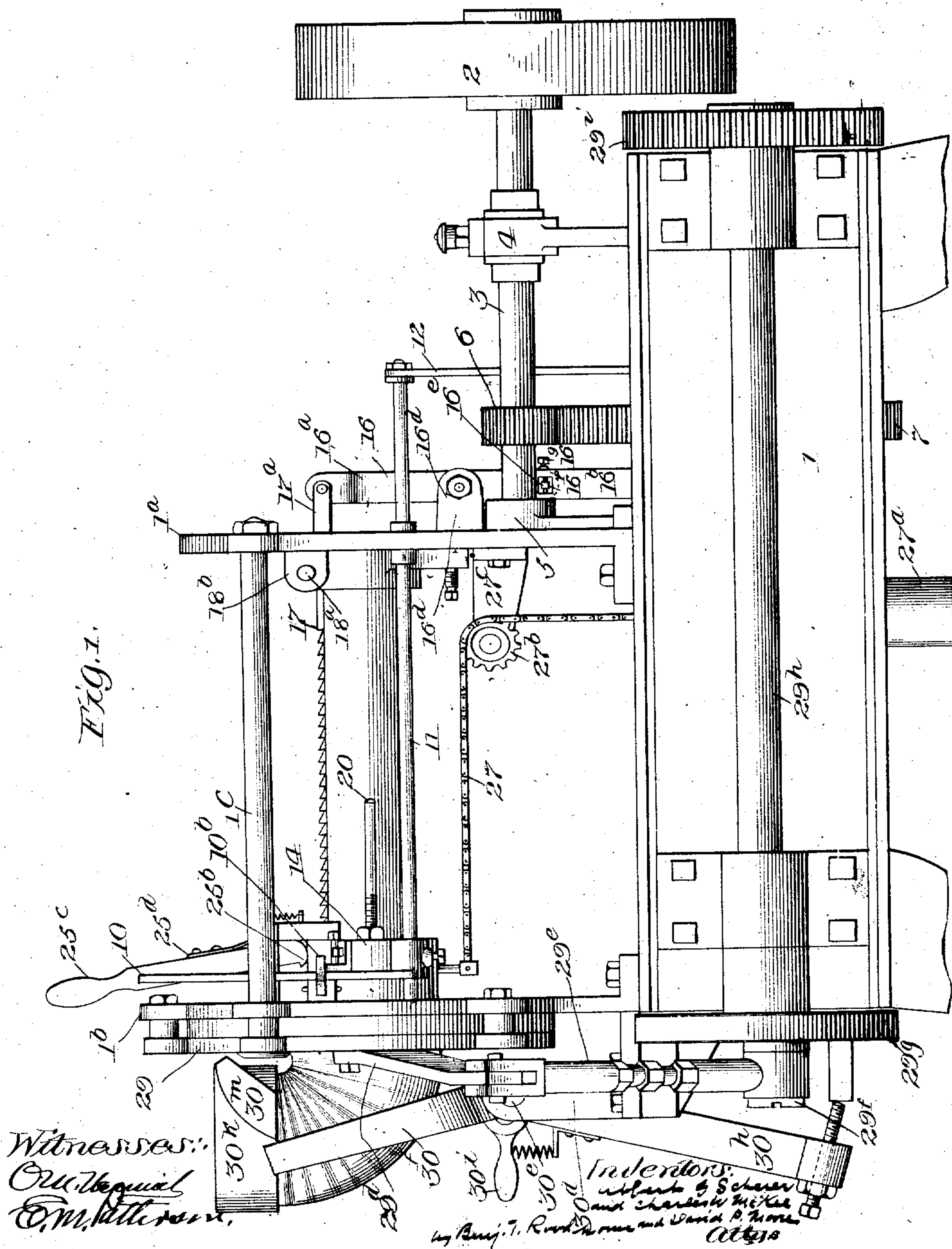
PATENTED FEB. 19, 1907.

A. G. SCHERER & C. W. McKEE.

MACHINE FOR MANUFACTURING SHEET METAL ELBOWS.

APPLICATION FILED SEPT. 29, 1904.

6 SHEETS—SHEET 1.



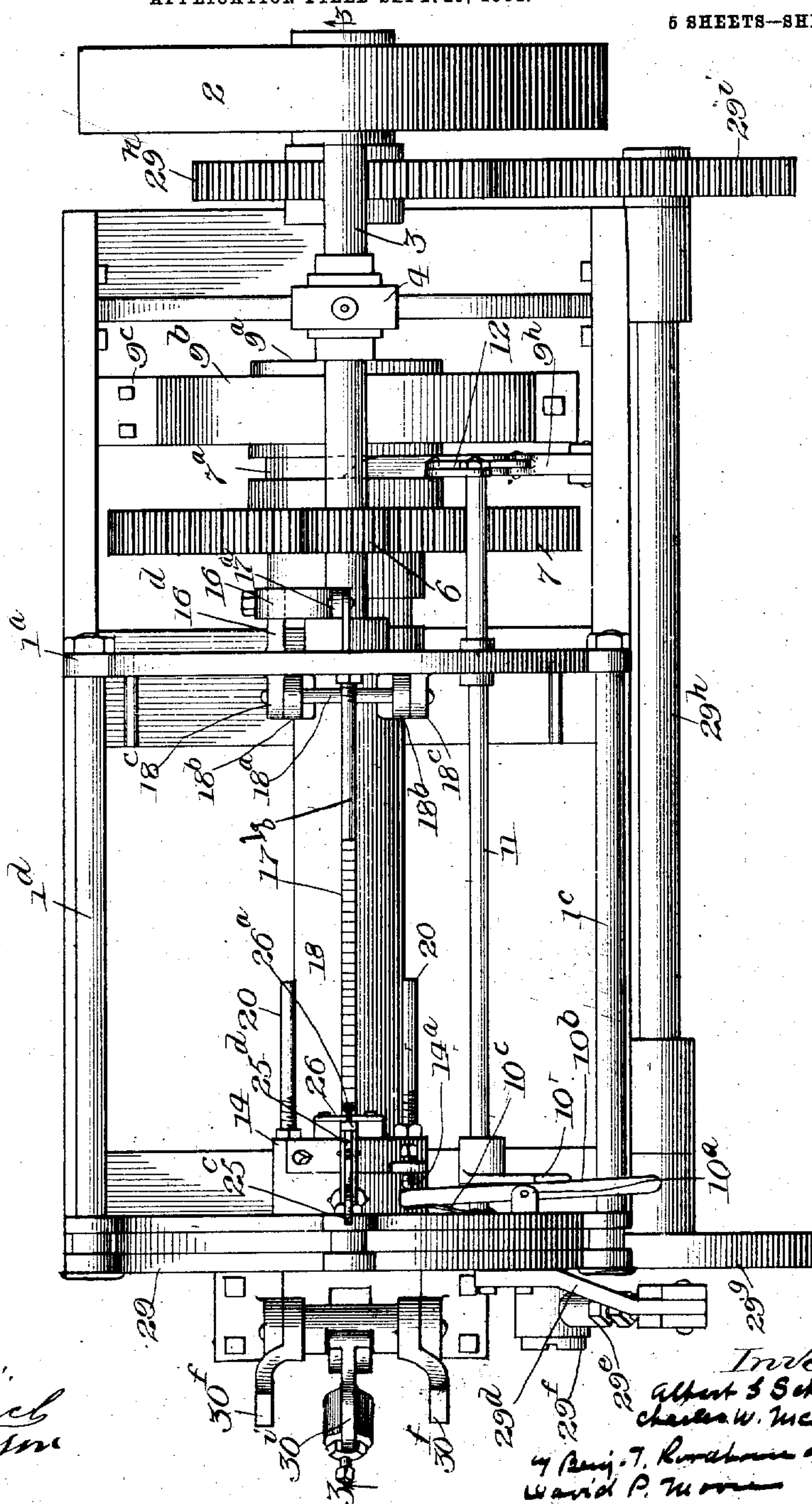
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5 SHEETS—SHEET 2.

Fig. 2.



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by Benj. T. Runkle and
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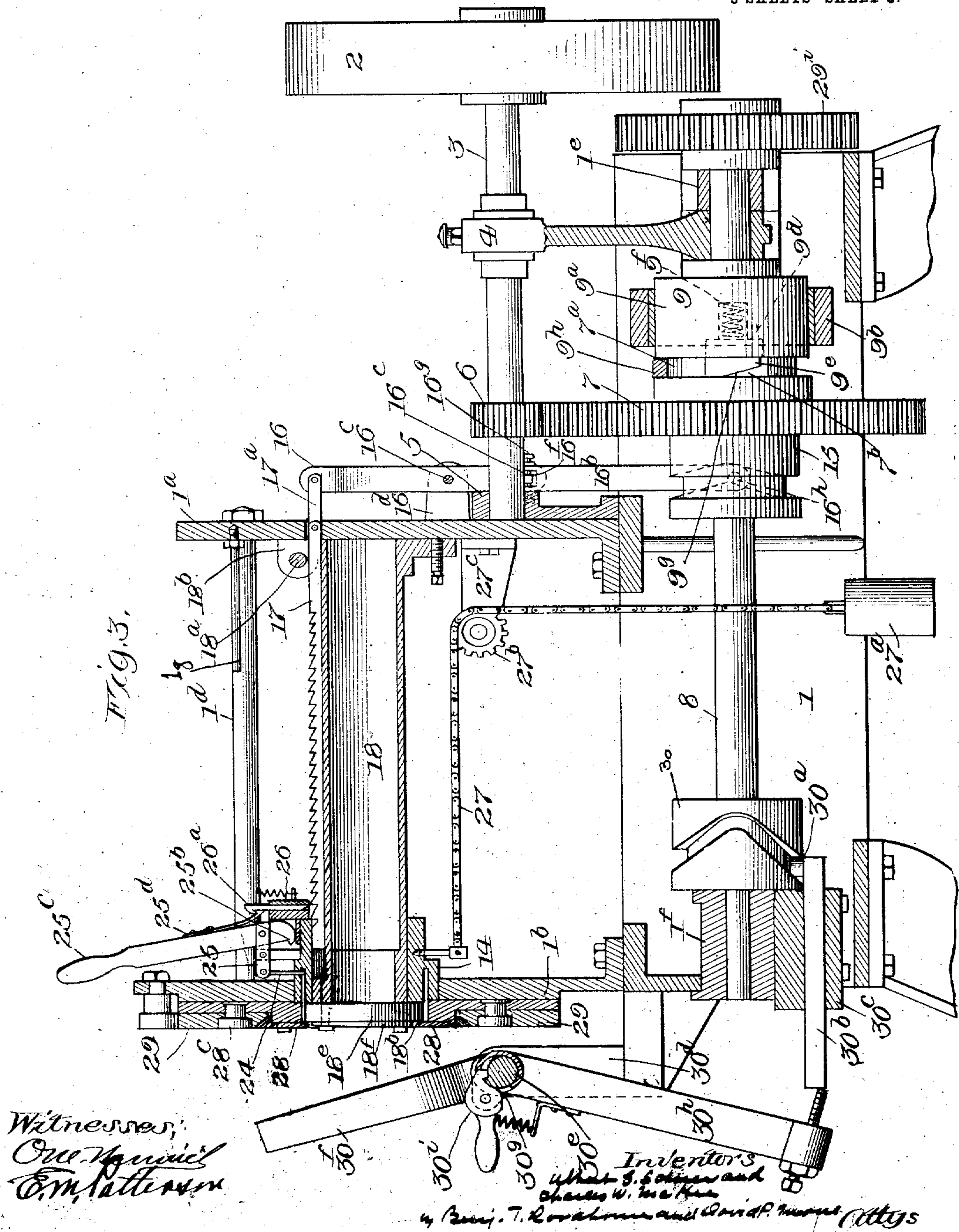
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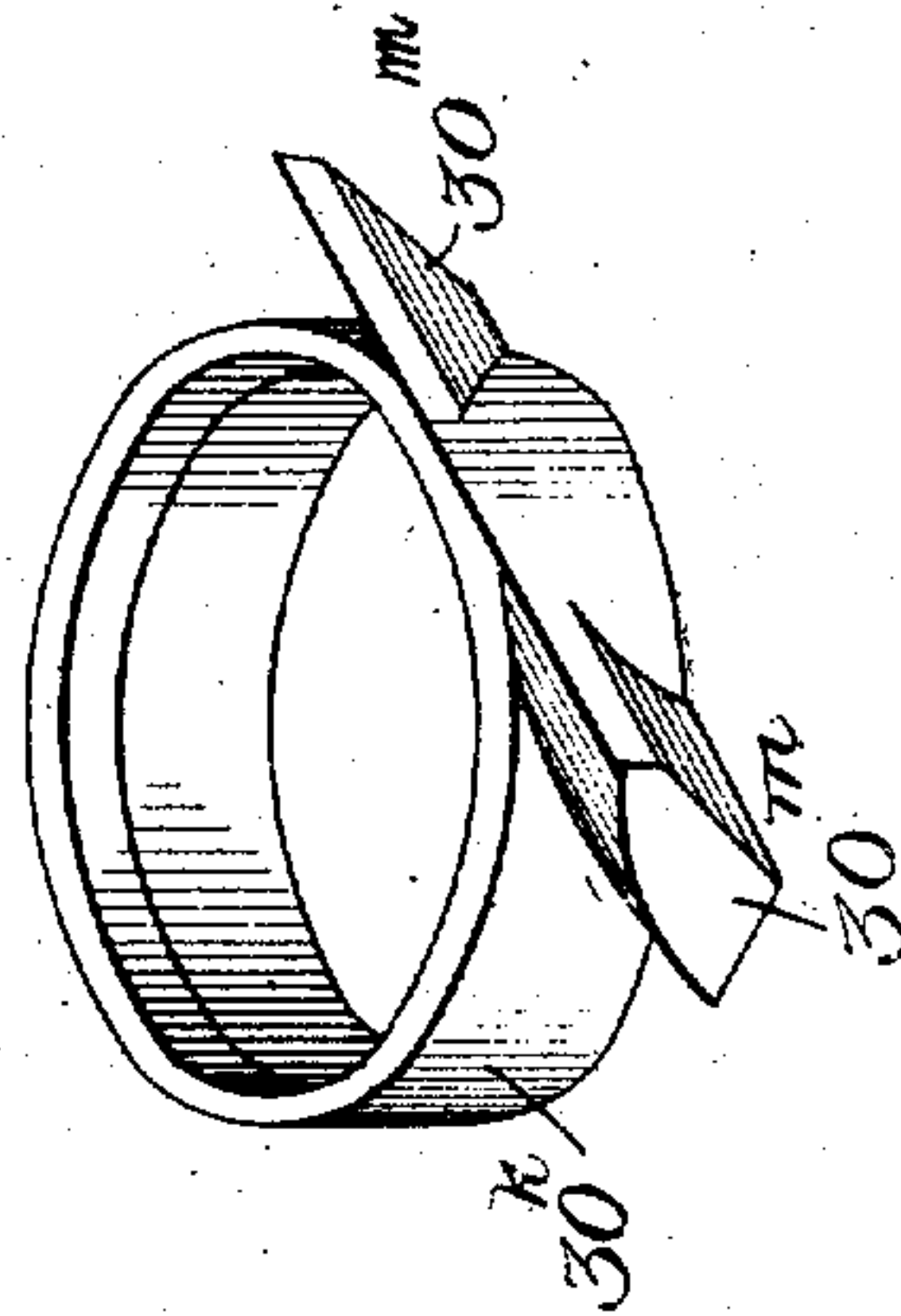
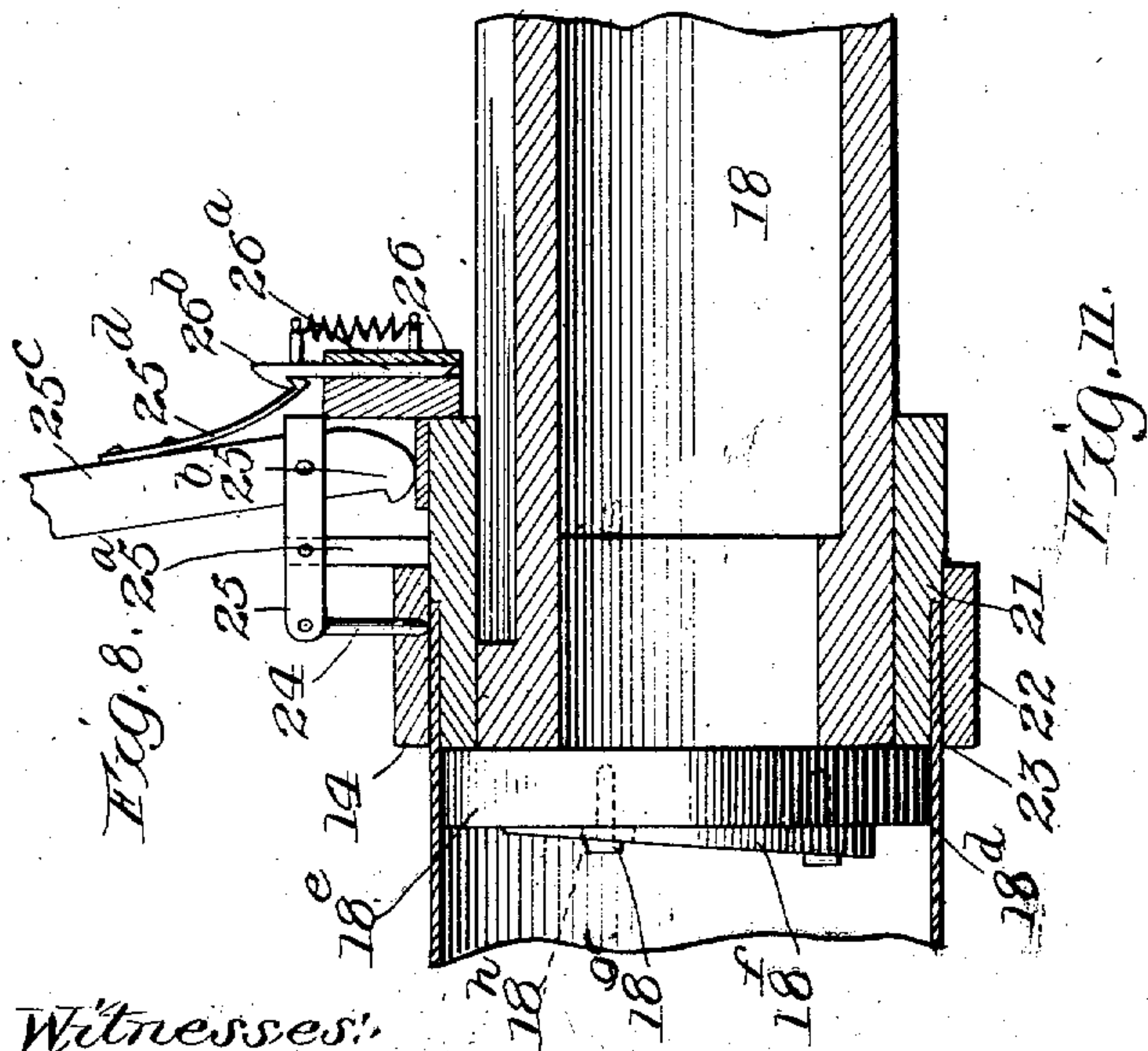
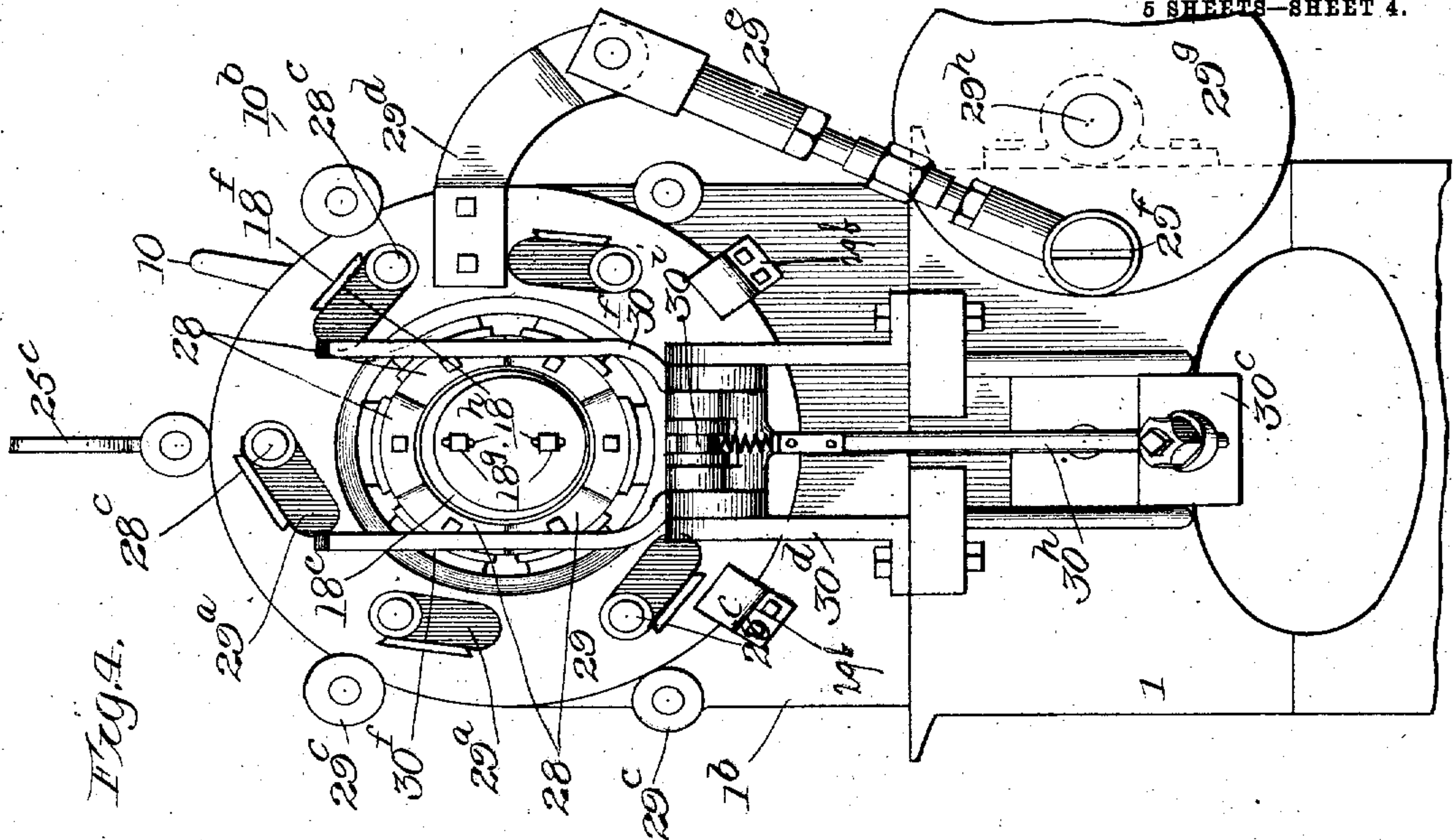
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5 SHEETS—SHEET 4.



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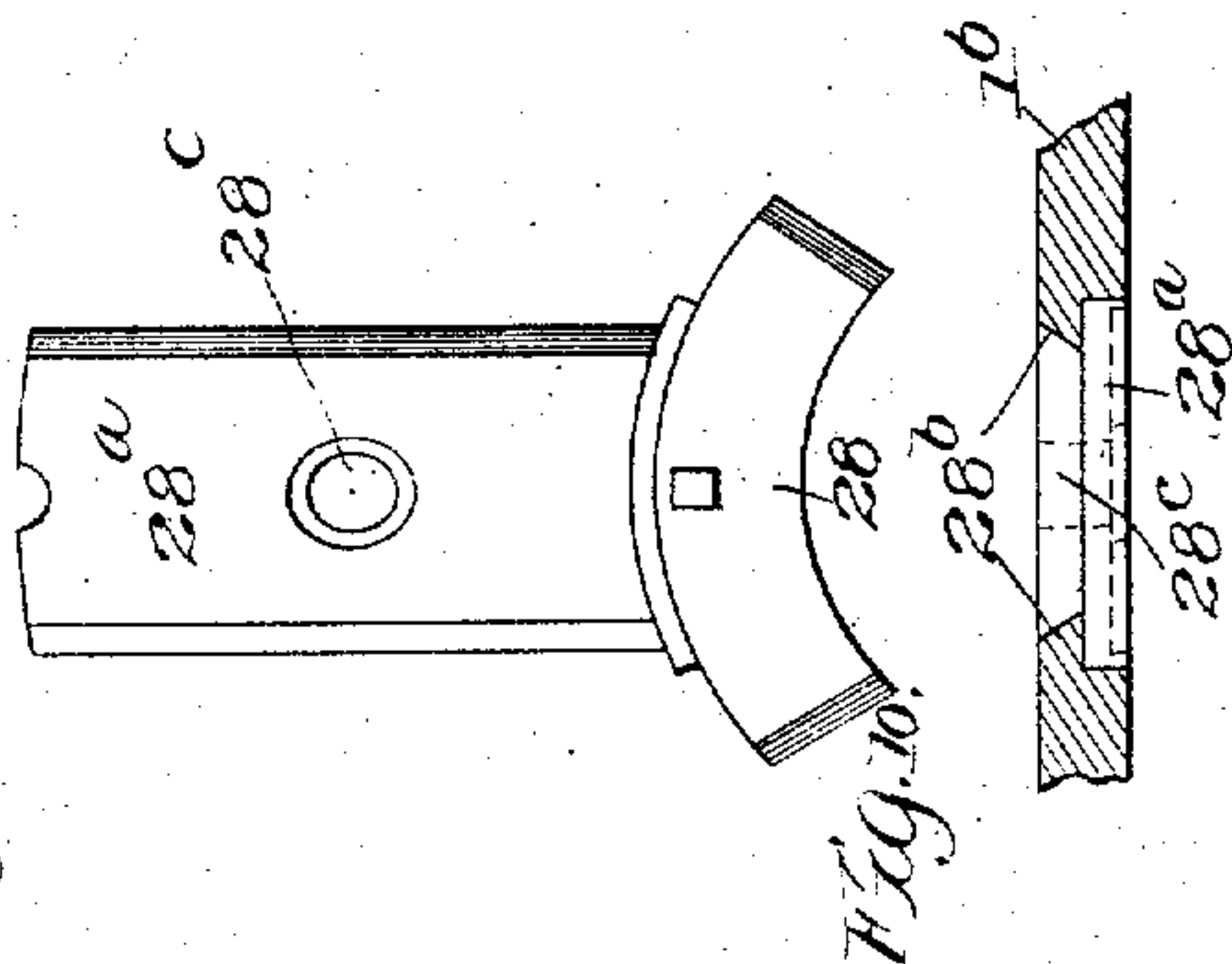
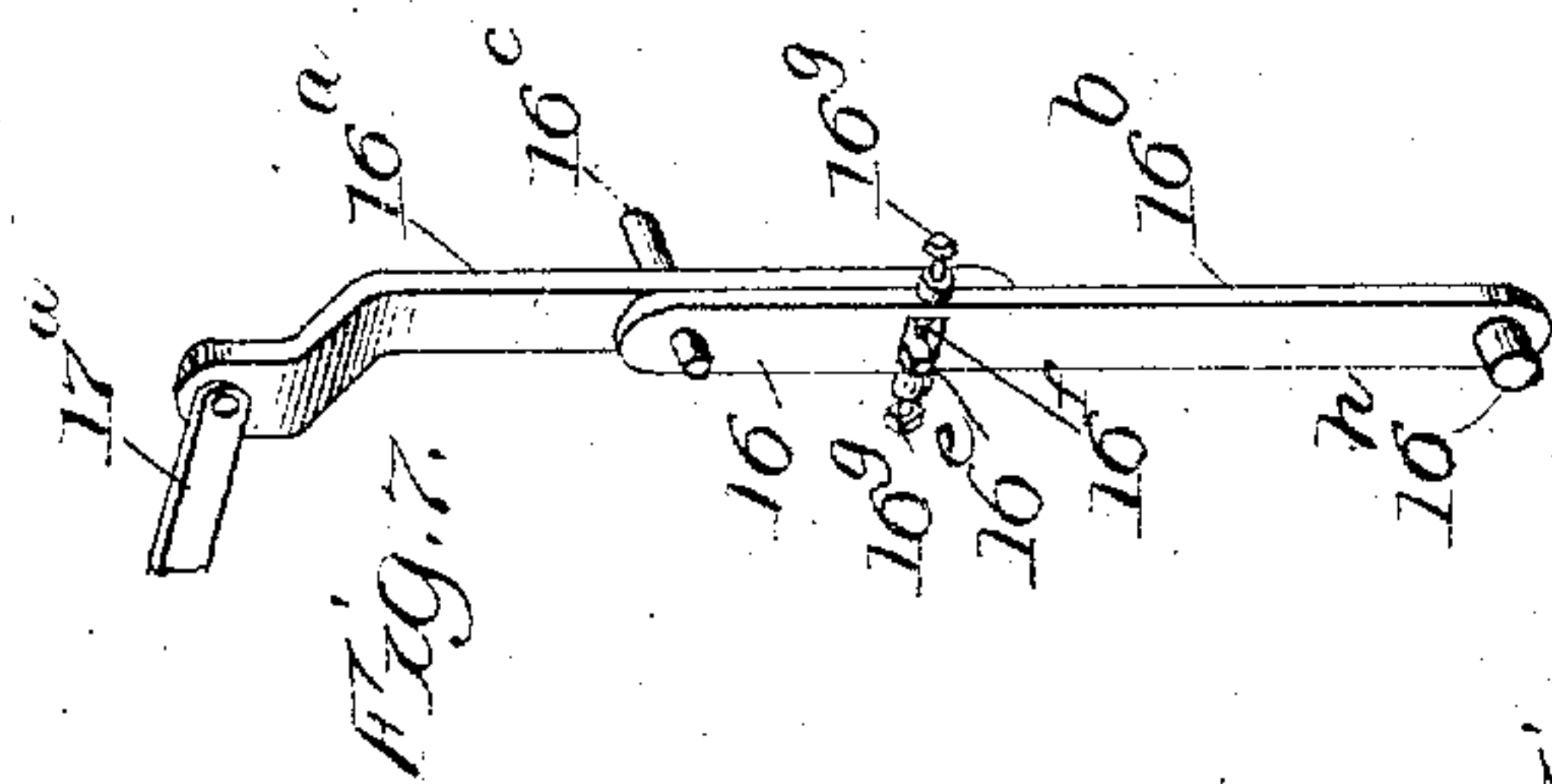
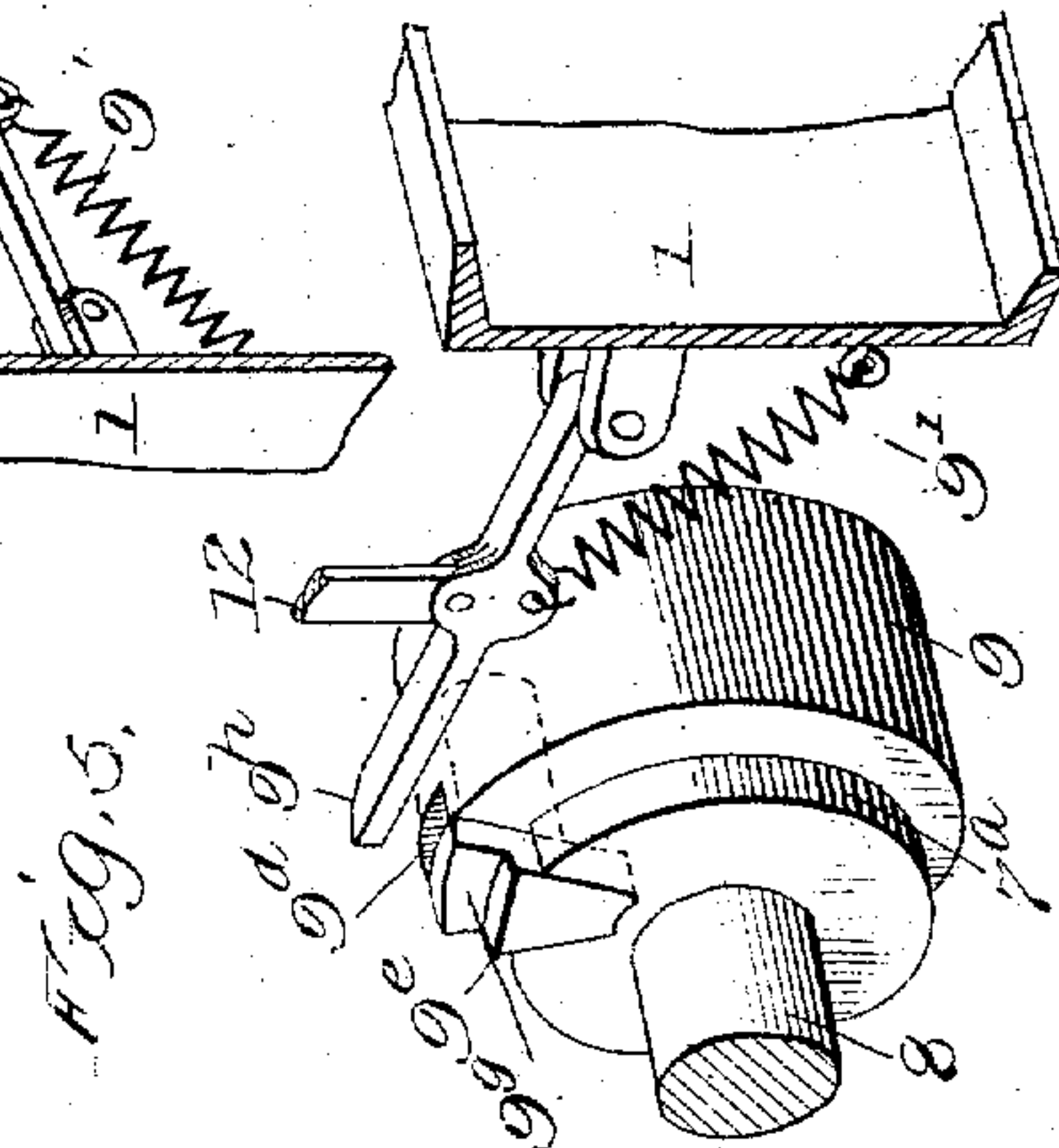
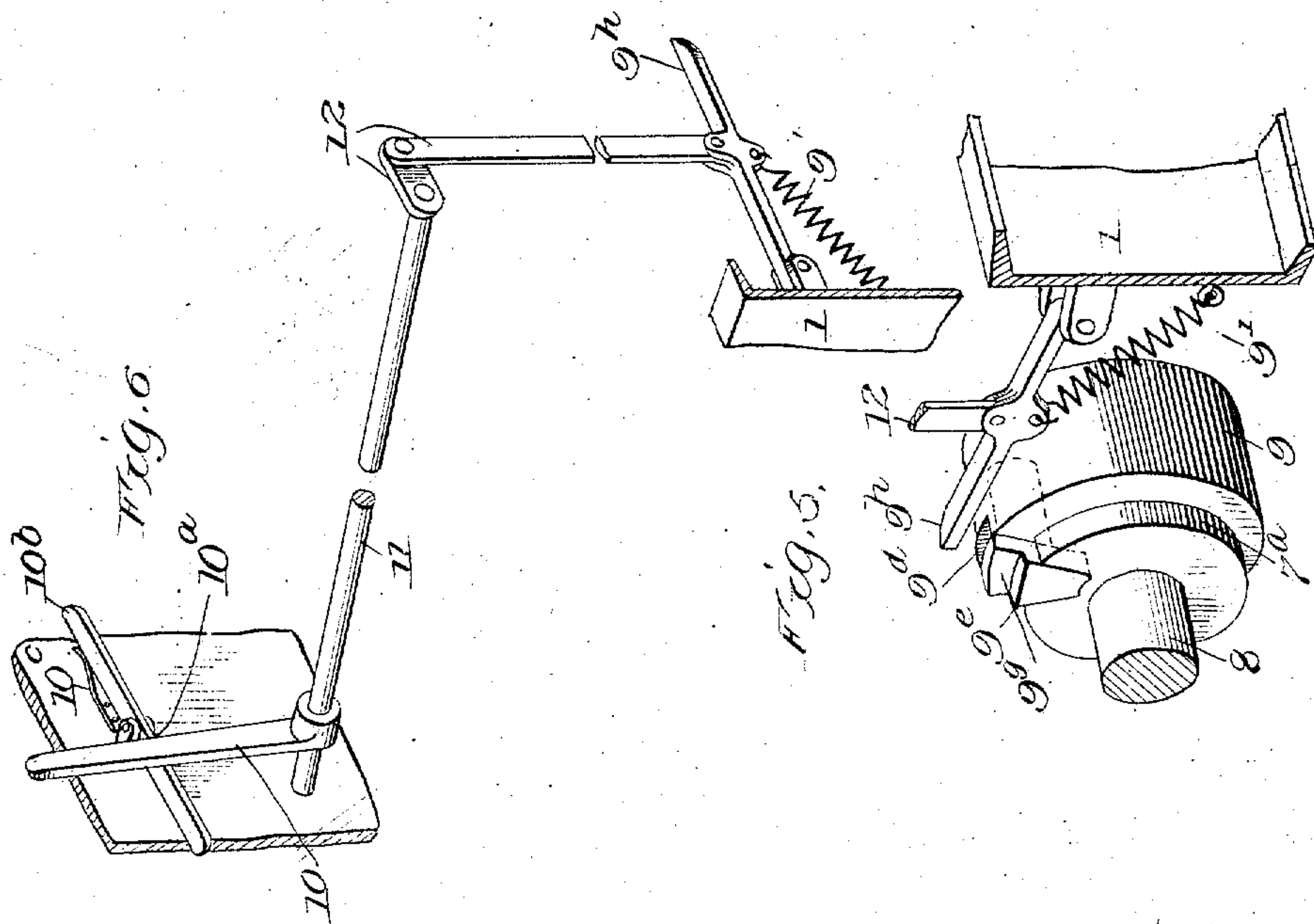
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A. G. SCHERER & C. W. McKEE.

MACHINE FOR MANUFACTURING SHEET METAL ELBOWS.

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5 SHEETS—SHEET 5.



Witnesses:

Our Friend
E. M. Patterson

Inventors
Albert G. Scheuer and
Charles W. McKee
by *Benj. T. Rowland and David P. Moore*
Attys

UNITED STATES PATENT OFFICE.

ALBERT G. SCHERER AND CHARLES W. McKEE, OF CHICAGO, ILLINOIS,
ASSIGNORS TO ARTHUR W. GLESSNER, OF GALENA, ILLINOIS.

MACHINE FOR MANUFACTURING SHEET-METAL ELBOWS

No. 844,411.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed September 29, 1904. Serial No. 226,475.

To all whom it may concern:

Be it known that we, ALBERT G. SCHERER and CHARLES W. McKEE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Manufacturing Sheet-Metal Elbows, of which the following is a specification.

This invention relates to an improved machine for producing corrugated stovepipe-elbows; and the main object of the invention is to produce a machine in which after the blank of the elbow has first been made into a tube or cylinder said cylinder will be received, corrugated, and bent into an elbow, as will presently appear.

To attain these objects, the invention consists of a new and improved machine of this character embodying novel features of construction and combination of parts substantially as disclosed herein.

In the accompanying drawings, Figure 1 is a side elevation of the complete machine. Fig. 2 is a top plan view of the complete machine. Fig. 3 is a longitudinal central section of the complete machine on line 3-3 of Fig. 2. Fig. 4 is a front elevation of the machine. Fig. 5 is a perspective view showing the detail of the clutch 9. Fig. 6 is a perspective view of the mechanism adapted to operate the clutch 9 and throw the machine into and out of operation. Fig. 7 is a perspective view of the lever for operating the spline. Fig. 8 is a vertical sectional view of the outer end of the barrel or horn and the head 14 with a broken-off section of pipe held therein. Fig. 9 is a detail of a crimping-knife and the reciprocating arm for same. Fig. 10 is a top plan view of Fig. 9, partially in section. Fig. 11 is a perspective view of head 30*.

The numeral 1 designates a base in which and upon which is mounted the improved machinery for bending and corrugating the stovepipe-elbows. Bolted to the said base 1 are the vertical plates 1^a and 1^b. These plates are connected and secured rigidly together at the top of their sides by the rods 1^c and 1^d. Power is applied through a belt or any known means to drive the wheel 2, mounted upon a shaft 3, which is journaled in the boxings 4 and 5 and carries a small

gear 6, which meshes with a large gear 7, journaled upon a lower parallel shaft 8. The shaft 8 is journaled in the frame 1 at 1^e and 1^f and is adapted to be thrown into operative connection with the gear 7 by means of the clutch 9.

The clutch 9 is composed of the cylinder 9^a, revolving in the bearing 9^b, attached to the frame 1 at 9^c. At 9^d the cylinder is recessed to receive the clutch-dog 9^e, which is actuated by the spring 9^f toward the hub 7^a of the gear 7. The hub 7^a is recessed at 7^b to receive and engage the clutch-dog 9^e. The clutch-dog 9^e is beveled at 9^g, so that when the piece 9^h is drawn between the cylinder 9^a and the hub 7^a by means of the spring 9ⁱ it strikes the bevel 9^g and forces the clutch-dog out of engagement with the recess 7^b and permits the gear 7 to rotate without rotating the shaft 8. The clutch 9 is adapted to be thrown into operation through the medium of the lever 10, the reciprocating rod 11, and links 12. The lever 10 is readily accessible to the operator at the operating or front end of the machine, as clearly shown in Figs. 1, 2, and 4.

As will be clearly seen in Figs. 2 and 6, when the operating handle or lever 10 is thrown to the right the machine is put in operation through the withdrawal of the piece 9^h from between the cylinder 9^a and the hub 7^a and the engagement of the clutch-dog with the recess 7^b. The handle or lever 10 is engaged and retained against the action of the spring 9ⁱ by the lever-arm of catch 10^b, which arm is actuated by the spring 10^c. The operation of the machine can be stopped at any time by manipulation of the lever-arm of catch 10^b, but it is also automatically stopped when the operation of corrugating the elbow has been completed by means of the bolt or projection 14^a (clearly shown in Fig. 2) on the advancing head 14 contacting the lever-arm of catch 10^b to disengage it from the lever 10, which permits the spring 9ⁱ to draw the piece 9^h between the cylinder 9^a and the hub 7^a and throw the clutch out of operation.

Upon the shaft 8 we mount a cam 15, which is adapted to reciprocate the lever 16, thereby imparting to the toothed spline 17 a reciprocating motion.

As clearly shown in Fig. 7, the lever 16 is composed of two arms 16^a and 16^b. These

two arms are journaled upon the bolt 16^c, carried by the bracket 16^d, which said bracket is bolted to the rear face of the vertical plate 1^a. The top end of the arm 16^a is connected with the toothed spline 17 by means of the link 17^a. The lower end of the arm 16^a is provided with the lug 16^e. At the middle portion of the arm 16^b is the aperture 16^f, into which the lug 16^e protrudes. The set-screws 16^g are provided to adjust the latitude of play to be allowed to the lug 16^e. The lower end of the arm 16^b is provided with the lug 16^h, which engages with the cam 15. By limiting and adjusting the play of the lug 16^e by means of the set-screws 16^g it is possible to regulate and change the latitude of reciprocation of the toothed spline 17, thereby making it possible to adjust the feed of the machine, the amount of metal in each corrugation, and the number of corrugations in the elbow.

To the vertical plate 1^a is hinged the barrel or horn 18 by means of the bolt or pin 18^a passing through the bifurcated bracket 18^b, integral with and forming a part of the end of said barrel or horn 18, and the brackets 18^c, which are integral with and form a part of the plate 1^a. This construction maintains the barrel or horn 18 in a horizontal position, but permits of a vertical movement of said barrel or horn 18 during the operation of corrugating to be described hereinafter.

Traveling on the barrel or horn 18, in which the toothed spline 17 slides, is the head 14, the rearward motion of said head being limited by means of the rods 20. As clearly shown in Figs. 3 and 8, the head 14 is provided with the annular shoulder 21, over which is driven the ring 22, thus leaving an annular groove 23, in which to insert the end of the pipe to be corrugated. The pipe is held in the groove during the operation of corrugating by means of the pin 24, which is operated through the lever 25, pivoted to the post 25^a by means of the cam 25^b, carried upon the lower end of the lever-handle 25^c, which said handle is pivoted at a short distance above the cam 25^b to one end of the lever 25. The head 14 also carries a block 26, in which works a spring-actuated tooth or pawl 26^a, the lower end of which engages the teeth of the toothed spline 17 and the upper end of which is provided with the tooth or pawl 26^b. On the back of the lever-handle 25^c is provided a spring-catch 25^d, so that when the handle 25^c is pushed backwardly to release the crimped elbow the spring-catch 25^d engages the top pawl 26^b of the pawl 26^a. When the handle 25^c is brought forward to again secure a fresh section of the pipe, the spring-catch 25^d lifts the pawl 26^a from engagement with the teeth of the toothed spline, permitting the head 14 to be returned to its most rearward position. As the head 14 reaches this position the rod or projection 1^s

strikes the spring-catch 25^d, thereby releasing the pawl 26^a, which falls into engagement with the teeth of the toothed spline.

The pawl 26^a is retained firmly against the teeth of the toothed spline 17, and the head 14 upon the withdrawal of the pawl 26^a, as above set forth, is returned to its farthest rearward position by means of the chain 27 and the weight 27^a, the said chain being adapted to pass over the sprocket-wheel 27^b, journaled on the arm 27^c.

The crimping of the pipe is performed by the plates or knives 28, (shown in Figs. 3, 4, 9, and 10,) which are carried upon one end of the arms 28^a, which are slidably mounted in the channels 28^b. The arms 28^a are each provided with the pins 28^c, which extend outwardly into their respective diagonal slots 29^a, provided in the circular plate 29. It is apparent that when the plate 29 is revolved the arms 28^a will be forced inward or outward, according to the direction of revolution, by reason of the pins 28^c being in engagement with the diagonal slots 29^a. The edges of the arms 28^a are beveled and reciprocate in the oppositely-beveled channels 28^b, provided in the face of the vertical plate 1^b. The diagonal slots 29^a are so cut that when the pins 28^c, working in them, have spread the crimping knives or plates to their most extended position a certain additional circular play is permitted in which the crimping plates or knives are neither opening nor closing. During this time the pipe is moved forward by means of the spline and its auxiliary mechanism, heretofore described, to the proper position for the next succeeding corrugation.

The circular plate 29 is revolvably mounted upon the face of the vertical plate 1^b by means of the brackets 29^b and the flanged and unflanged roller 29^c. The circular plate 29 is reciprocally revolved by means of the arm 29^d, integral with or bolted to said plate 29 through the connecting-rod 29^e, the lower end of which is journaled upon the pin 29^f, set into the face of the wheel or disk 29^g. The wheel or disk 29^g is integral with the shaft 29^h, which carries upon its other end the cog 29ⁱ. The cog 29ⁱ meshes with the cog 29^j, carried by the shaft 8.

As will be seen in Fig. 3, the top plates or knives 28 are about one-eighth of an inch thick where the deep narrow corrugations of the throat of the elbow are formed. The plates gradually thicken toward the bottom, where they are about five-eighths of an inch thick where the broad shallow corrugations at the back of the elbow are formed. These plates are adapted to press the material of the pipe positively over the annular shoulder 18^d to form the corrugations.

On the outward end of the barrel or horn 18 is mounted the disk 18^e, having a slightly smaller diameter than the pipe to be corru-

gated, the outer edge of which forms the shoulder 18^d, heretofore referred to. To the face of the disk 18^e is bolted the disk 18^f by means of the bolts 18^g passing through vertically-elongated bolt-holes 18^h. In this manner the plate or disk 18^f is vertically adjustable. The top of the disk 18^f is narrow, being about one-quarter of an inch thick, and the bottom broadens out to a thickness of one-half of an inch. The disk 18^f is vertically adjusted upon the face of the disk 18^e, so that the bottom of the disk 18^f is above the annular shoulder 18^d a distance equal to the depth of the broad shallow corrugations at the back of the elbow. In the operation of corrugating all of the crimping knives or plates contract or are pushed toward the center equally; but when the broad bottom plates 28 have accomplished the corrugating of the broad shallow corrugations at the back of the elbow their continued action upon the broad lower edge of the disk 18^f elevates the entire pivoted barrel or horn 18 and in this manner assists in forming the deep narrow corrugations in the throat of the elbow already commenced by the contraction of the narrow top crimping or corrugating plates or knives.

For bending the elbow the following mechanism is provided: Upon the forward end of the shaft 8 is mounted the cam 30, into which projects the lug 30^a, carried by the piece 30^b, the said piece 30^b being reciprocated in the boxing 30^c by the revolution of the cam. Upon the outer surface of the plate 1^b and between the outer end of the piece 30^b and the circular plate 29 are provided the brackets 30^d, in which is journaled the axle 30^e, which has the arms 30^f integral therewith. Between the arms 30^f the axle 30^e is provided with a longitudinal depression or angular recess 30^g. Pivoted upon said axle 30^e is the lever 30^h, the lower free end of which comes opposite the outer end of the reciprocating piece 30^b. The upper end of the lever 30^h is recessed through to the axle 30^e and carries in said recess the spring-actuated catch 30ⁱ, which engages with the angular recess 30^g when the arms 30^f are elevated, so that the motion of the reciprocating piece 30^b causes the arms 30^f to move toward the plate 1^b.

A head 30^k, provided with the wings 30^m, is placed upon one end of the tubular piece of metal to be corrugated. The other end of said tubular piece is secured in the annular groove 23 of the head 14, and through this operation the head 14 is returned to its most rearward position by the action of the weight 27^a, as heretofore described. This brings the lugs or wings 30^m directly above the arms 30^f, and when said arms are elevated to a point to cause the engagement of the spring-catch 30ⁱ with the recess 30^g the arms and lugs are brought into operative proximity. When the head 30^k is thrown forward by the action

of the reciprocating toothed spline and its mechanism, as heretofore explained, the wings 30^m contact and throw forward the arms 30^f; but as the crimping operation is taking place the cam 30 throws forward the piece 30^b, which impinges upon the lever 30^h, thus through the catch 30ⁱ rotating the axle 30^e and throwing back said arms 30^f to the same position they occupied before being thrown forward. This results in bending the elbow the proper amount at the same time the corrugations are being formed.

After the pipe is made into an elbow the arms 30^f can be depressed in order to remove the elbow by depressing the spring-catch 30ⁱ.

From the foregoing description, taken in connection with the drawings, it will be seen that a section of stovepipe will be corrugated and bent to the form of an elbow automatically after being inserted in the described machine.

What we claim as new, and desire to secure by Letters Patent, is—

1. A machine for manufacturing sheet-metal elbows having corrugated means, feeding means and means for adjusting the coaction of the forementioned means to vary the number of corrugations in elbows of the same angle.

2. In a machine for manufacturing sheet-metal elbows, corrugating means, receiving means, means for actuating the receiving means to feed metal to the corrugating means and means for adjusting the latitude of motion imparted to the receiving means.

3. In a machine for manufacturing sheet-metal elbows, corrugating means, receiving means, means for actuating the receiving means to feed metal to the corrugating means and means for adjusting the location and latitude of feed imparted to the receiving means.

4. In a machine of this character, the combination of a barrel, a spline mounted in said barrel, a receiving-head mounted on said barrel, means for adjustably connecting said head with said spline to move said head upon said barrel, corrugating means, bending means and mechanism adapted to coact with the above-mentioned means to corrugate and bend a stovepipe.

5. In a machine of this character, the combination of means for receiving a cylindrical tube, means for producing circumferential corrugations thereon and adjustable means for feeding the tube to the corrugating means consisting of two members pivoted upon the same bearing one end of one of said members being in operative connection with the receiving means the other end of said member protruding into an aperture in the second member, said second member being provided with means for adjusting the size of said aperture and for engaging an operative cam.

6. In a machine of this character, the combination of a form for holding the section of

pipe, adjustable means for limiting the inward movement of the pipe, a form for receiving the other end of the pipe, means for corrugating the pipe, means for engaging the last-mentioned form to bend the pipe to form an elbow and automatic means for stopping the operating mechanism.

7. In a machine of this character, the combination of a barrel, corrugating means adapted to press the metal of a section of pipe over the end of said barrel to form a corrugation and a plate adjustably attached to the end of said barrel adapted to coact with the corrugating means to produce deeper corrugations upon one side of said pipe.

8. In a machine of this character, the combination of a frame, a power-shaft mounted therein, another shaft mounted in the frame, a clutch mechanism to cause the last-mentioned shaft to receive motion from the power-shaft, a barrel mounted in the upper portion of the frame, a spline mounted in the barrel, a cam, a lever connected with said cam and said spline to reciprocate said spline, means slidably mounted upon said barrel to receive the pipe to be corrugated adapted to be thrown forward by the motion of said spline, means for limiting the forward motion imparted by said spline, means carried by said receiving means to operate the clutch and stop the machine, means adapted to engage the outer end of the pipe and mechanism for coacting with said last-mentioned means to bend the pipe.

9. In a machine of this character, the combination of corrugating means, a barrel for supporting the material while subject to the action of the corrugating means, a head slidably mounted upon said barrel to receive the material and hold it in proper relation to the barrel and the corrugating means, a spline slidably mounted in said barrel, means for reciprocating said spline, means carried by said head adapted to engage and receive motion from said spline upon its forward stroke and means for preventing said stroke from driving said head too far forward consisting of a weight carried by a chain attached to said head and running over a sprocket in a position opposite to the direction of said stroke.

10. In a machine of the character described, the combination of a frame, a power-shaft mounted therein, an auxiliary shaft provided with means for connecting it operatively with the power-shaft, a pair of cams carried by the auxiliary shaft, a barrel mounted in said frame, a spline movably mounted in said barrel, a lever connecting said spline with one of said cams, a head mounted upon the barrel, and adapted to receive motion from said spline, to carry the material to be operated upon, a head adapted to engage the opposite end of the material provided with oppositely-arranged lugs, a yoke provided

with upwardly-projecting arms for engaging the lugs, and an arm extending downwardly and operated upon by the other of said cams to operate the yoke and bend the pipe.

11. In a machine of this character, corrugating means in combination with a vertically-movable barrel or horn whereby certain of the corrugating members, after having formed the broad shallow corrugations at the back of the elbow, operate to press the barrel carrying the pipe upward into a position where the other corrugating members form the deep corrugations necessary at the throat of an elbow.

12. In a machine of this character, the combination of means for holding a section of pipe, means for feeding the section forward and means for forming circumferential corrugations upon said pipe consisting of corrugating-plates each of which forms a segment of a circle, radiating arms carrying said plates, and means for radially reciprocating said arms so that the plates are moved to form a corrugation.

13. In a machine of this character, corrugating means in combination with means for supporting the metal while subject to the action of the corrugating means adapted to coact with said corrugating means and to be moved thereby so as to present the metal unequally to the action of the corrugating means.

14. In a machine of this character, the combination of means for holding a section of pipe, means for feeding the section forward, means for forming corrugations upon said section consisting of corrugating-plates each of which forms an arc of a circle, radiating arms carrying said plates, a pin carried by each of said radiating arms and a reciprocally-revoluble member provided with oblique slots into which said pins project.

15. In a machine of this character, the combination of means for holding a section of pipe, means for feeding the section forward, means for forming corrugations upon said section consisting of corrugating-plates each of which forms an arc of a circle, radiating arms carrying said plates, means for radially reciprocating said arms so that said plates are moved to form a corrugation, and means coacting with said corrugating means to bend the section.

16. In a machine of this character, in combination with crimping means, bending means consisting of a lever-arm with means to vibrate same, one end of said lever-arm being journaled upon and capable of being thrown into operative connection with an axle carrying other arms which engage lugs carried by a collar adapted to be attached to one end of the pipe to be corrugated.

17. In a machine of this character, in combination with corrugating means, means for holding the pipe to be corrugated consisting

of a collar having an annular groove into which to insert the pipe, a pin capable of being projected into said annular groove after the pipe has been inserted to hold said pipe firmly in place, a lever for depressing said pin and a cam and handle for actuating said lever.

18. In a machine of this character, in combination with corrugating means, means for holding the pipe to be corrugated, means for feeding said pipe to the crimping means, and means for automatically connecting and positively disconnecting said holding means and said feeding means consisting of a spring-actuated tooth or pawl, a spring-catch carried by said holding means to engage said tooth or pawl and positively disengage it from said feeding means, a rod carried upon the frame of the machine to contact with said spring-catch to disengage it from said tooth or pawl and permit said tooth or pawl to return to engagement with said feeding means.

19. In a machine of this character, in combination with crimping means, means for holding a pipe while being corrugated, adjustable means for feeding said pipe to said corrugating means consisting of a reciprocating toothed spline, an upper lever connected at its upper end with said reciprocating spline, said upper lever being journaled at its middle portion and provided with a lug at its lower end, a lower arm journaled at its upper end upon the same bearing as carries the upper lever and having an aperture at its middle portion in which engages the lug carried by the upper lever, set-screws limiting the play of said lug in said aperture, a pin carried upon the lower end of said lower arm and means for operatively engaging said pin.

20. In a machine of this character, in combination with corrugating means, feeding means, means for holding a pipe while being corrugated, means for preventing the forward action of the feeding means from feeding the pipe irregularly and returning the holding means to its farthest rearward position consisting of a sprocket-chain attached to said holding means and carried over a

sprocket located in the direction of the desired pull and a weight attached to the other end of said sprocket-chain.

21. In a machine of this character, the combination of corrugating means, feeding means, means for holding a section of pipe while being corrugated, means for preventing the section from being fed irregularly, and means for actuating said holding means to return it to its farthest rearward position upon being released from the feeding means.

22. The combination in a stovepipe-elbow-making machine of means for holding the section, means for feeding the section forward, a series of three or more corrugation-formers adapted to form circumferential corrugations and means for bending the section and converging the corrugations thus formed.

23. In a machine of this character, corrugating means, means for supporting the metal while subject to the action of the corrugating means and adjustable means adapted to coact with the corrugating means to change the presentment of metal to the corrugating means.

24. In a stovepipe-elbow-making machine, a series of three or more radially-reciprocating corrugation-formers gradually increasing in width from one side of the elbow to the other.

25. In a stovepipe-elbow-making machine, a series of three or more radially-reciprocating corrugating-formers gradually increasing in width and means for converging the corrugations formed by said formers.

26. The combination in a stovepipe-elbow machine of a series of corrugation-formers operating to form corrugations gradually increasing in width and decreasing in depth and means for compressing the deep portions and converge the respective corrugations.

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT G. SCHERER.
CHARLES W. McKEE.

Witnesses:

JNO. W. YEDLAN,
JOHN DANIEL WILD.

Correction in Letters Patent No. 844,411

It is hereby certified that in Letters Patent No. 844,411, granted February 19, 1907, upon the application of Albert G. Scherer and Charles W. McKee, of Chicago, Illinois, for an improvement in "Machines for Manufacturing Sheet-Metal Elbows," an error occurs in the printed specification requiring correction, as follows: In line 90, page 3, the word "corrugated" should read *corrugating*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of March, A. D., 1907.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

of a collar having an annular groove into which to insert the pipe, a pin capable of being projected into said annular groove after the pipe has been inserted to hold said pipe firmly in place, a lever for depressing said pin and a cam and handle for actuating said lever.

18. In a machine of this character, in combination with corrugating means, means for holding the pipe to be corrugated, means for feeding said pipe to the crimping means, and means for automatically connecting and positively disconnecting said holding means and said feeding means consisting of a spring-actuated tooth or pawl, a spring-catch carried by said holding means to engage said tooth or pawl and positively disengage it from said feeding means, a rod carried upon the frame of the machine to contact with said spring-catch to disengage it from said tooth or pawl and permit said tooth or pawl to return to engagement with said feeding means.

19. In a machine of this character, in combination with crimping means, means for holding a pipe while being corrugated, adjustable means for feeding said pipe to said corrugating means consisting of a reciprocating toothed spline, an upper lever connected at its upper end with said reciprocating spline, said upper lever being journaled at its middle portion and provided with a lug at its lower end, a lower arm journaled at its upper end upon the same bearing as carries the upper lever and having an aperture at its middle portion in which engages the lug carried by the upper lever, set-screws limiting the play of said lug in said aperture, a pin carried upon the lower end of said lower arm and means for operatively engaging said pin.

20. In a machine of this character, in combination with corrugating means, feeding means, means for holding a pipe while being corrugated, means for preventing the forward action of the feeding means from feeding the pipe irregularly and returning the holding means to its farthest rearward position consisting of a sprocket-chain attached to said holding means and carried over a

sprocket located in the direction of the desired pull and a weight attached to the other end of said sprocket-chain.

21. In a machine of this character, the combination of corrugating means, feeding means, means for holding a section of pipe while being corrugated, means for preventing the section from being fed irregularly, and means for actuating said holding means to return it to its farthest rearward position upon being released from the feeding means.

22. The combination in a stovepipe-elbow-making machine of means for holding the section, means for feeding the section forward, a series of three or more corrugation-formers adapted to form circumferential corrugations and means for bending the section and converging the corrugations thus formed.

23. In a machine of this character, corrugating means, means for supporting the metal while subject to the action of the corrugating means and adjustable means adapted to coact with the corrugating means to change the presentment of metal to the corrugating means.

24. In a stovepipe-elbow-making machine, a series of three or more radially-reciprocating corrugation-formers gradually increasing in width from one side of the elbow to the other.

25. In a stovepipe-elbow-making machine, a series of three or more radially-reciprocating corrugating-formers gradually increasing in width and means for converging the corrugations formed by said formers.

26. The combination in a stovepipe-elbow machine of a series of corrugation-formers operating to form corrugations gradually increasing in width and decreasing in depth and means for compressing the deep portions and converge the respective corrugations.

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT G. SCHERER.
CHARLES W. McKEE.

Witnesses:

JNO. W. YEDLAN,
JOHN DANIEL WILD.

Correction in Letters Patent No. 844,411

It is hereby certified that in Letters Patent No. 844,411, granted February 19, 1907, upon the application of Albert G. Scherer and Charles W. McKee, of Chicago, Illinois, for an improvement in "Machines for Manufacturing Sheet-Metal Elbows," an error occurs in the printed specification requiring correction, as follows: In line 90, page 3, the word "corrugated" should read *corrugating*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of March, A. D., 1907.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

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