(No Model.) 2 Sheets—Sheet 1.

W. H. H. SISUM.

RIVETING MACHINE.

No. 326,252. Patented Sept. 15, 1885.

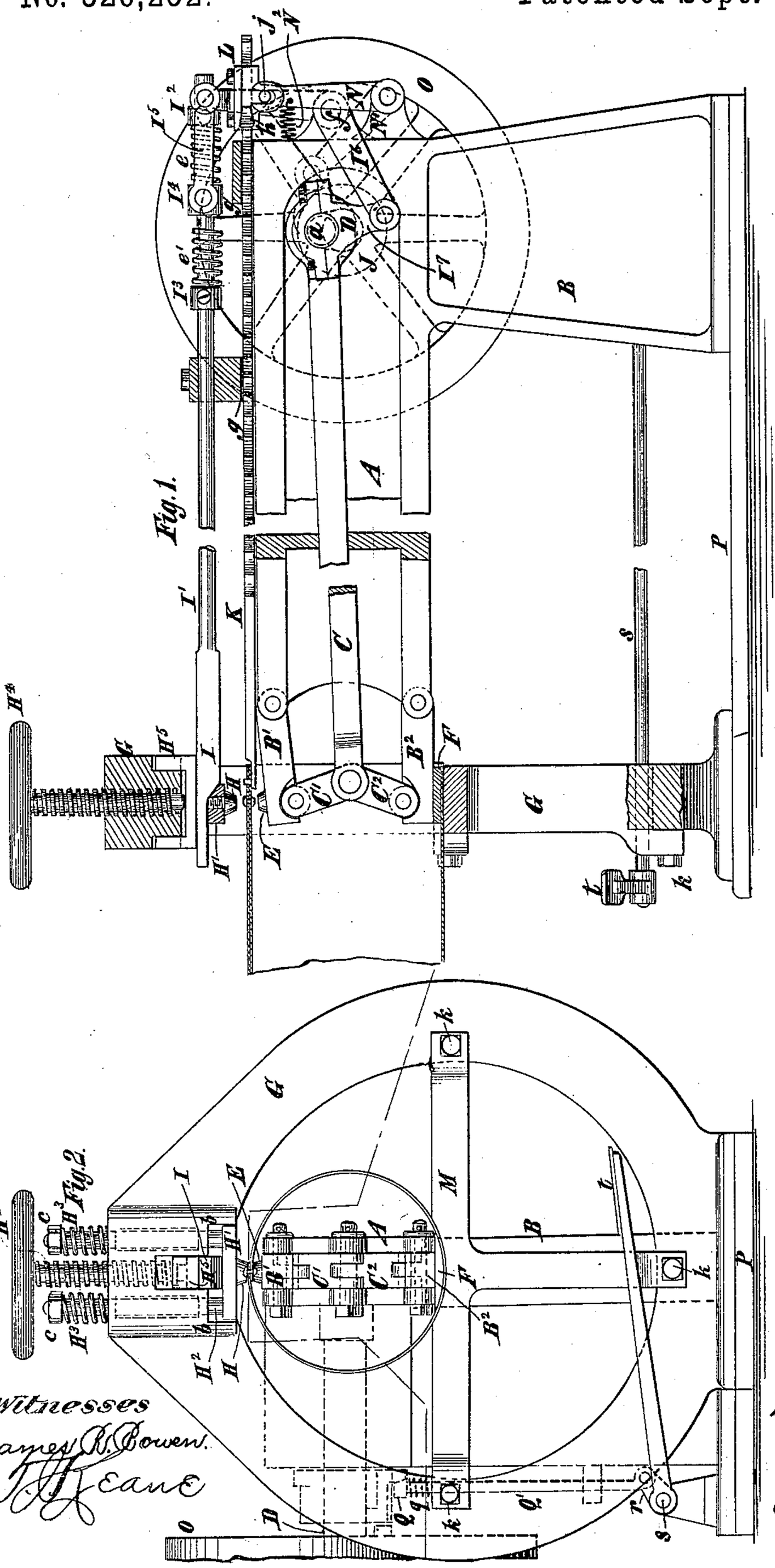

Fig. 1.

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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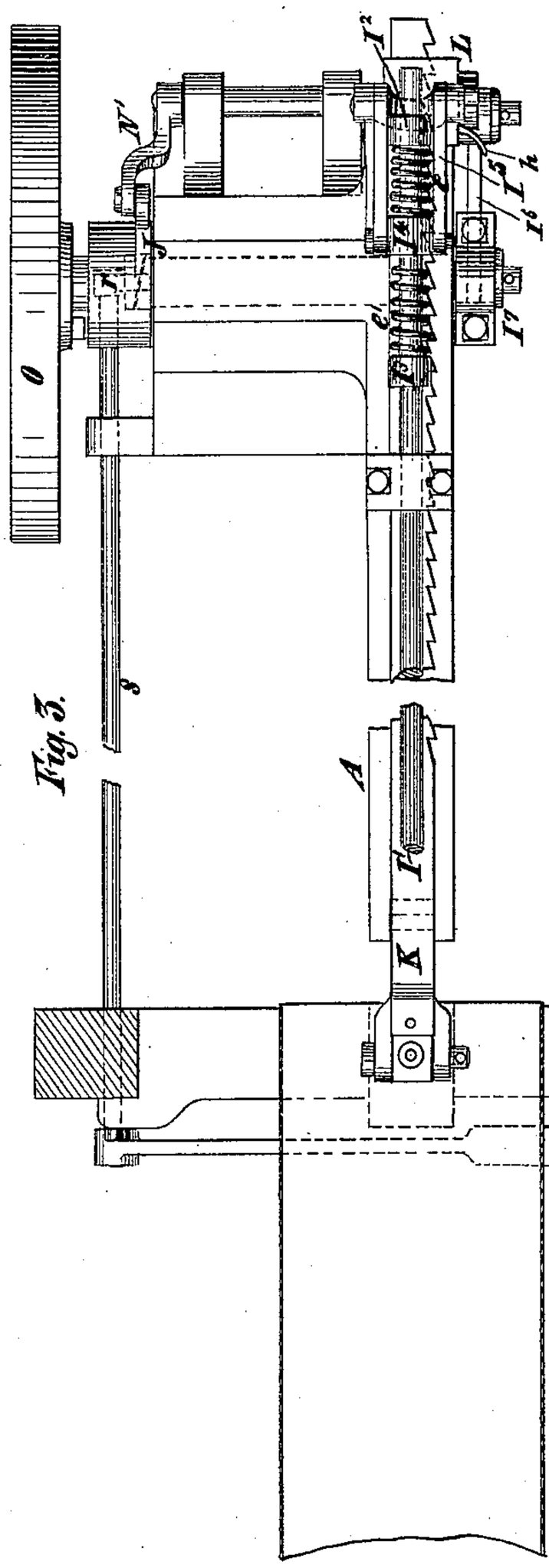

Fig. 3.

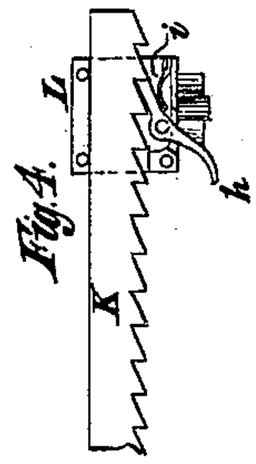

Fig. 4.

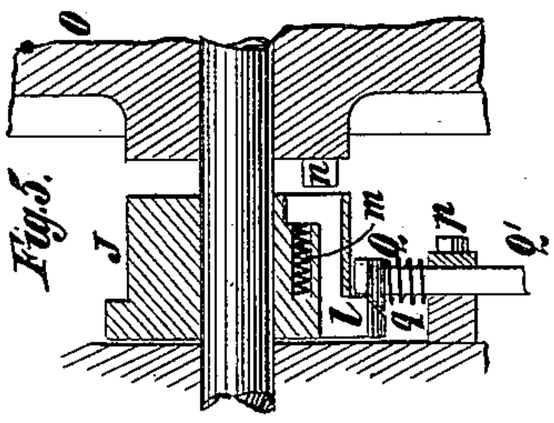

Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM H. H. SISUM, OF BROOKLYN, NEW YORK.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 326,252, dated September 15, 1885.

Application filed April 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. SISUM, of Brooklyn, in Kings county and the State of New York, have invented a certain new and useful Improvement in Riveting-Machines, of which the following is a specification.

My improvement is especially applicable to machines for riveting the cylindric bodies of boilers; but it may be embodied in machines for riveting other structures or articles.

The improvement consists in a riveting-machine comprising novel details of construction and combinations of parts, which are hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a sectional side view of a machine embodying my improvement, and especially adapted for use in riveting the cylindric bodies of boilers. Fig. 2 is an end view of the same. Fig. 3 is a plan thereof. Fig. 4 is a detail view illustrative of mechanism whereby the boiler to be riveted is fed along; and Fig. 5 is a detail view of a portion of the driving-shaft, the hub of the driving-wheel, and a cam which is arranged on said shaft.

Similar letters of reference designate corresponding parts in all the figures.

A designates a stake over which the boiler-bodies are fed during the process of riveting. As shown, it consists of a flat piece of metal stiffened at the top and bottom by laterally-extending flanges; but it may be of any other suitable form. It is rigidly secured at the rear end to a supporting-post, B, and may be cast therewith in one integral structure.

To the forward end of the stake A arms B′ B^2 are pivoted, and connected to these arms are toggles C′ C^2, which are also connected to each other and to a rod, C. This rod C is at the rear end connected with a crank, *a*, on the driving-shaft D. As the driving-shaft rotates, the crank *a* causes the toggles C′ C^2 to alternately force the arms B′ B^2 away from and draw them toward each other. The upper arm, B′, has mounted on the upper side, and near the forward end, a header, E, whereby the heading of the rivets is performed; and the lower arm, B^2, is provided on the under side, and near the outer end, with a shoe, F, which is adapted to bear against the interior of the lower portion of the boiler-body while the riveting is performed. Preferably the face of this shoe is arc-shaped, so as to conform to the surface of the boiler-body against which it bears.

G designates a frame having an opening in the central portion, into which the stake A extends. This frame, as here shown, has its opening made of circular shape; but this is not essential, although perhaps more desirable than any other shape would be. This frame and the post B are secured to a base-plate, P. The upper portion of this frame, which is adjacent to the arm B′, has combined with it an abutment, H, for sustaining the rivet during the operation of riveting. The abutment is moved down at each heading operation.

M designates a saddle fitted to the frame G below the shoe F, and secured to the frame by screws *k* or otherwise. It will be observed that in the operation the strain exerted by the toggles C′ C^2 will be sustained wholly by the frame G, and hence that the springing of the stake A is prevented.

The abutment H, as here shown, is attached to a holder, H′, which works in a recess, *b*, in the frame G, and has attached to it two rods, H^2, that extend upward through the said frame. Above the frame springs H^3 are applied to these rods H^2, so as to bear against the top of the frame, and also against nuts *c*, applied to the upper ends of the said rods. These springs exert a constant tendency to lift the abutment H.

H^4 is a screw which works through the upper portion of the frame G and impinges against a plate, H^5, and is free to move upward and downward in a recess in the said portion of the frame.

I designates a bar which operates between the plate H^5 and the abutment-holder H′. Said bar comprises a wedge or inclined surface and portions of different thicknesses at the ends of the wedge or inclined surface. The incline of the bar I is on the under side. When it is forced farther in between the plate H^5 and the abutment-holder H′, it impels the abutment downward against the resistance of the springs H^3 and retains it there; but when it is drawn outward so that its narrower portion is brought

between the plate H^5 and the abutment-holder, the springs H^3 raise the abutment. As the force of the wedge is sustained by the plate H^5, it is obvious that by manipulating the screw H^4 this plate may be adjusted so as to lower the bar I and abutment H. The wedge, however, always imparts a movement of definite length to the abutment. The bar I has secured to it a rod, I′, which works through a bearing arranged on the top of the stake A. On this rod I′ two collars, I^2 I^3, are rigidly fastened by set-screws or otherwise, and between these a collar, I^4, is fitted to the rod so that it may slide freely thereon. Springs *e e′* are arranged on the rod I′, respectively between the collar I^2 and the collar I^4, and between the collar I^3 and the said collar I^4. The collar I^4 is connected by a link, I^5, with one arm of a bell-crank lever, I^6, mounted on a stud, *f*. A link, I^7, connects the other arm of the said bell-crank lever with the crank *a*.

It will be readily understood that when the bell-crank lever I^6 impels the collar I^4 rearward the spring *e* is compressed, so that it will draw the wedge rearwardly, and that when the said collar I^4 is moved forward the spring *e′* is compressed, so that it will force the wedge forwardly. Thus the wedge will be reciprocated with a yielding action, and if for any reason the wedge should be temporarily prevented from moving, force would be merely stored up in the spring which is compressed, to move it as soon as it shall become capable of moving.

I will now proceed to describe the means whereby the boiler-body to be riveted is fed along.

K designates a slider-bar supported in bearings *g* on the top of the stake, and having at the forward end a hook, with which the first hole of the boiler-body engages when the same is placed in the machine. This bar has on its side a series of ratchet-teeth, which severally are of a length corresponding with the distances between the centers of the rivet-holes in the boiler-body.

L is a slide which reciprocates along the rear end portion of the bar K beyond the stake A. It contains a pawl, *h*, which is actuated by a spring, *i*, to engage with the ratchet-teeth of the bar K. The pawl has a handle extending through the slide, so that it can be conveniently manipulated to effect the disengagement of the pawl from the ratchet-teeth. This slide is connected to an arm, N, by means of a pin, *j*, working through a slot in the said arm. An arm, N′, is rigidly secured to a rock-shaft, to which the arm N is affixed, and it bears against the periphery of a cam, J, which is rigidly secured on the driving-shaft D. A spring, N^2, holds the arm N′ against the cam J. Each time the cam rotates, it reciprocates the slide L and causes the bar K to be fed one tooth farther, thus presenting a new hole in the boiler-body to the header E and abutment H. When the riveting of the boiler-body is completed, the pawl *h* is disengaged from the ratchet-teeth of the bar K and the bar moved forward to its initial position.

The machine always stops with the crank *a* in an upright position.

The several parts are timed relatively to operate as follows: A hot rivet is inserted in the second hole of the boiler-body, and the latter is fed rearward to present the rivet to the abutment H and header E. Next the wedge I is forced forward to impel the abutment H down on the rivet, and subsequently the toggles C′ C^2 operate to force the header E upward to cause it to head the rivet. Then the toggles withdraw the header E, the wedge is moved rearward to permit the abutment H to rise, and the boiler-body is fed rearward to present a rivet in another hole to the abutment and header.

Preferably the machine will not operate continuously. Therefore I mount the driving-wheel O loosely on the driving-shaft D, and connect it to the driving-shaft when the machine is desired to operate by means of a clutch. The clutch shown is not of my invention, but nevertheless I will describe it briefly. A pin, *l*, is inserted in a transverse recess in the cam J and impelled toward the hub of the driving-wheel O by a spring, *m*. When this pin protrudes in this direction, it engages with a pin, *n*, affixed to the hub of the driving-wheel O, and thereupon the rotary motion of the latter is transmitted to the driving-shaft. The end of the pin *l* which is farthest from the hub of the driving-wheel is made wedge-shaped, and tapers in the direction of the circumference of the cam J.

Q designates a reversely-tapering wedge, which is affixed to a rod, Q′, supported in bearings *p*, and impelled upward by a spring, *q*. The rod Q′ is connected to an arm, *r*, extending from a rock-shaft, *s*, from which extends, near the front of the machine, a treadle, *t*. When the operator is about to insert a rivet in one of the holes of the boiler-body, he releases the treadle, and thereby allows the spring *q* to impel the wedge Q upward, so that it will obtrude itself in the way of the wedge-shaped end of the pin *l*. This pin is then drawn away from the driving-wheel O, and the driving-shaft D is thereupon released therefrom. When he has inserted the rivet and desires the machine to operate again, he depresses the treadle and retracts the wedge Q, whereupon the pin *l* engages with the pin *n* and causes the driving-wheel to rotate the driving-shaft.

The saddle M can be removed and replaced by another of different size to adapt the machine to a boiler-body of a different size from that shown, and for a very large boiler-body no saddle will be necessary.

Of course this machine is not restricted in its use to riveting boiler-bodies, but may be used for various analogous articles. If a ro-

tary feed instead of a longitudinal feed is provided, rivets arranged in rows around the boiler-bodies might be headed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the holder H′, the rods H^2, the springs H^3, and the bar I, comprising a wedge, substantially as specified.

2. The combination of the holder H′, the rods H^2, the springs H^3, the plate H^5, the screw H^4, and the bar I, comprising a wedge, substantially as specified.

3. The combination of the holder H′, the bar I, comprising a wedge, the rod I′, the collars I^2 I^3 I^4, the springs *e e′*, and means for operating the collar I^4, substantially as specified.

4. The combination of the holder H′, the bar I, the rod I′, the collars I^2 I^3 I^4, the bell-crank lever I^6, and the crank *a*, substantially as specified.

5. The combination, in a riveting-machine, of a movable header and a movable shoe, hinged arms to which they are attached and which are adapted to enter a boiler-body, toggles for operating said hinged arms, and a rod connected with the center joint of the toggles for actuating them, substantially as specified.

6. The combination, in a riveting-machine, of a movable header and a movable shoe, hinged arms to which they are attached, a stake to which said arms are pivoted, all adapted to enter a boiler-body, and toggles for actuating said header and shoe, substantially as specified.

7. The combination of the header E, shoe F, hinged arms B′ B^2, the toggles C′ C^2, the rod C, and the crank *a*, substantially as specified.

8. The combination, in a riveting-machine, of a movable abutment for sustaining a rivet, a wedge for moving said abutment, a movable header, a hinged arm carrying said header, and a toggle for operating said header, substantially as specified.

9. The combination, in a riveting-machine, of a movable abutment, a wedge for moving said abutment, a movable header, and a movable shoe adapted to enter a boiler-body, hinged arms, to which said header and shoe are attached, and toggles for operating said arms, substantially as specified.

10. The combination, in a riveting-machine, of a stake adapted to enter a boiler-body, an abutment for sustaining a rivet, a wedge for operating the abutment at each heading operation, a movable header, means for operating the header, and a frame which sustains the strain exerted by the means which operate the header, substantially as specified.

11. The combination of the slider-bar K, the reciprocating slide L, provided with the pawl *h*, the arms N N′, spring N^2, and cam J, substantially as specified.

12. A riveting-machine having, in combination, a support for the work to be riveted, a pair of moving and automatically-acting dies for heading rivets arranged on opposite sides of the work to be riveted, mechanism for automatically and intermittently feeding forward the work to be riveted while the dies are not acting, and mechanism for operating the two dies.

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