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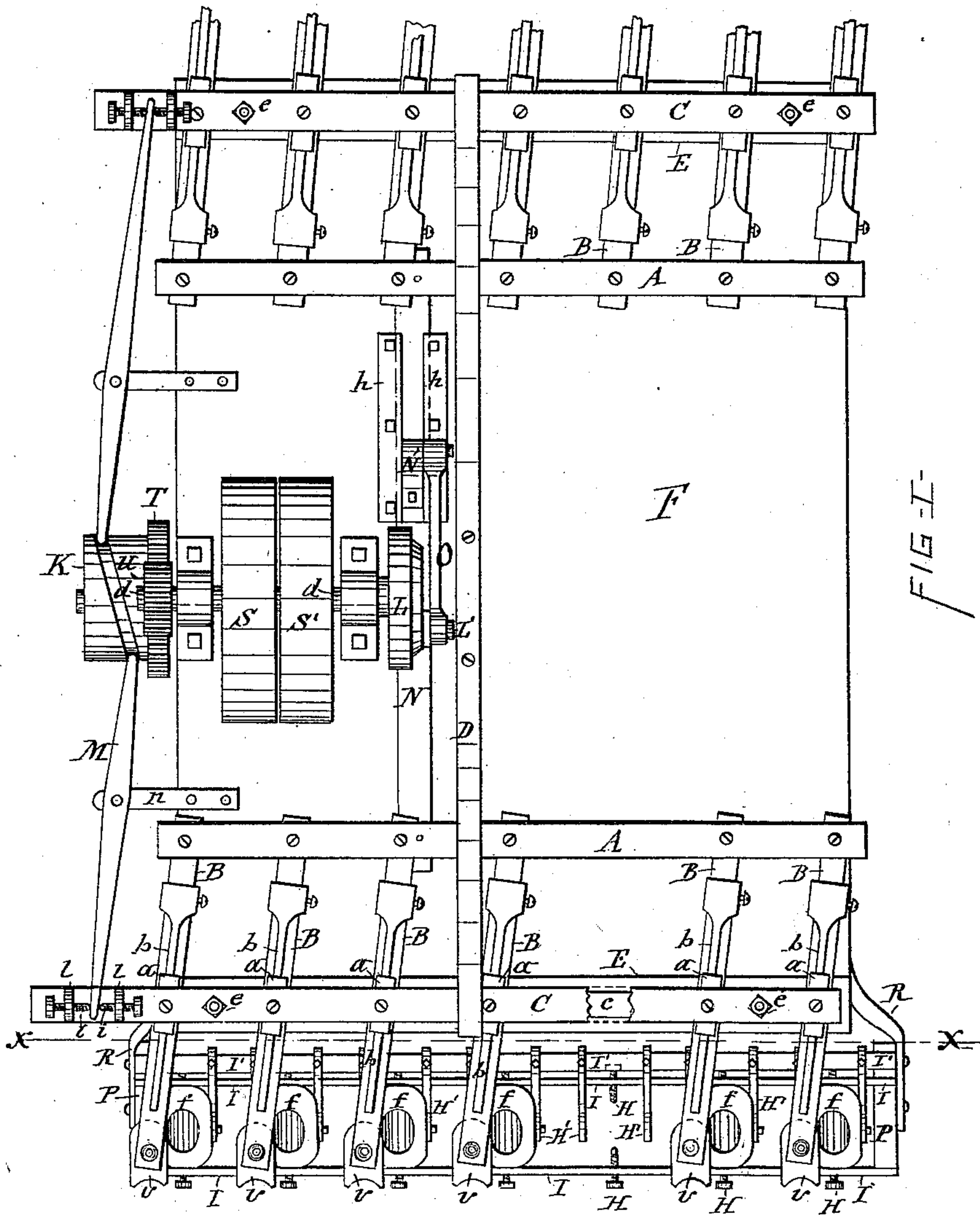
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E. U. SCOVILLE & C. OWEN.

MACHINE FOR GRINDING VALVES ON THEIR SEATS.

No. 347,130.

Patented Aug. 10, 1886.



WITNESSES

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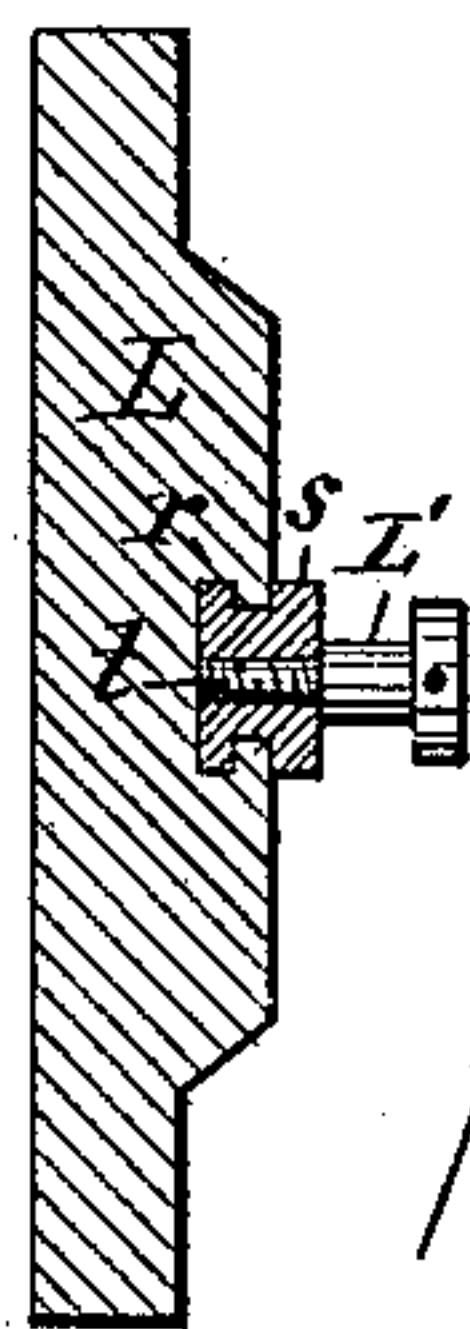
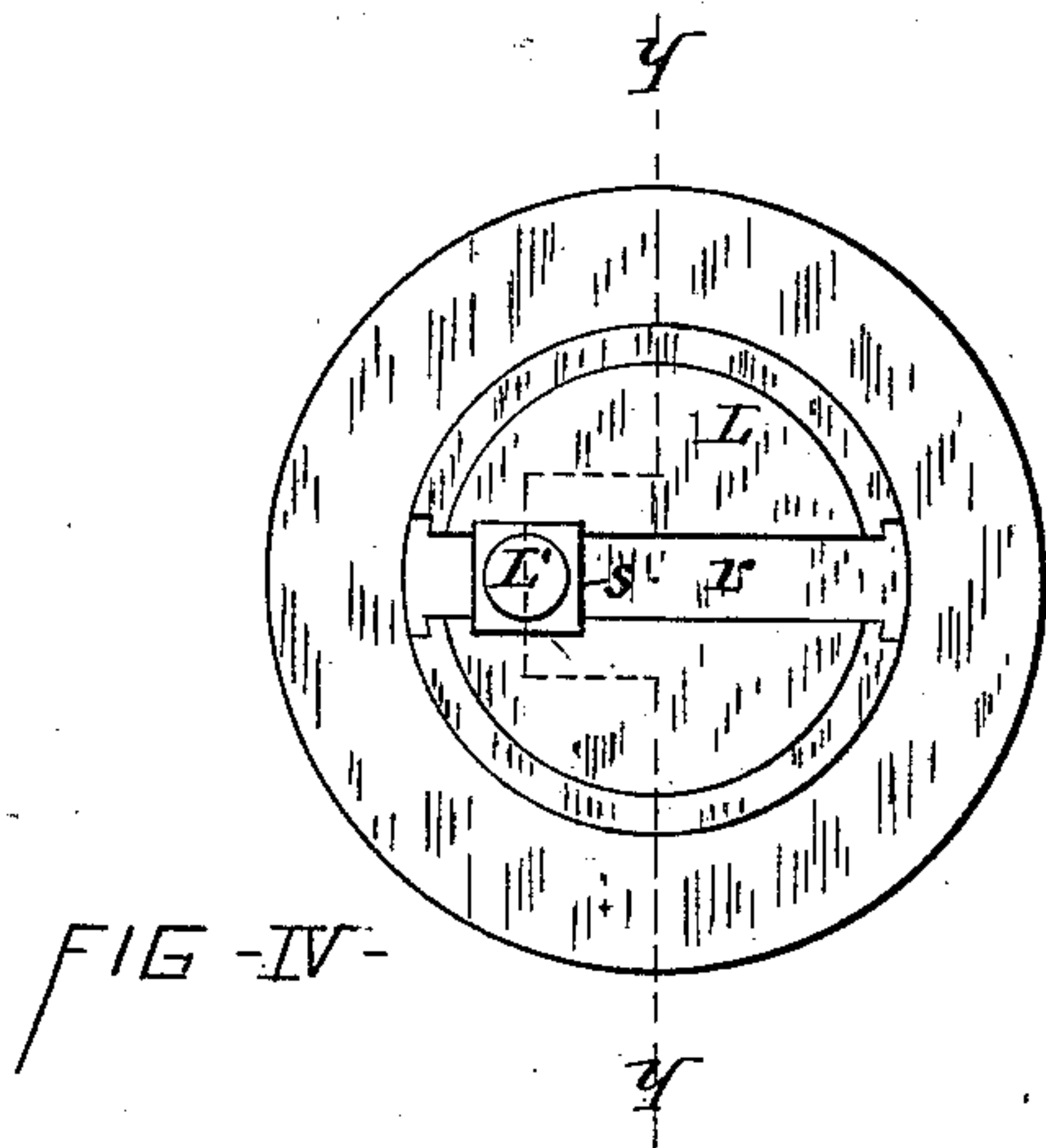
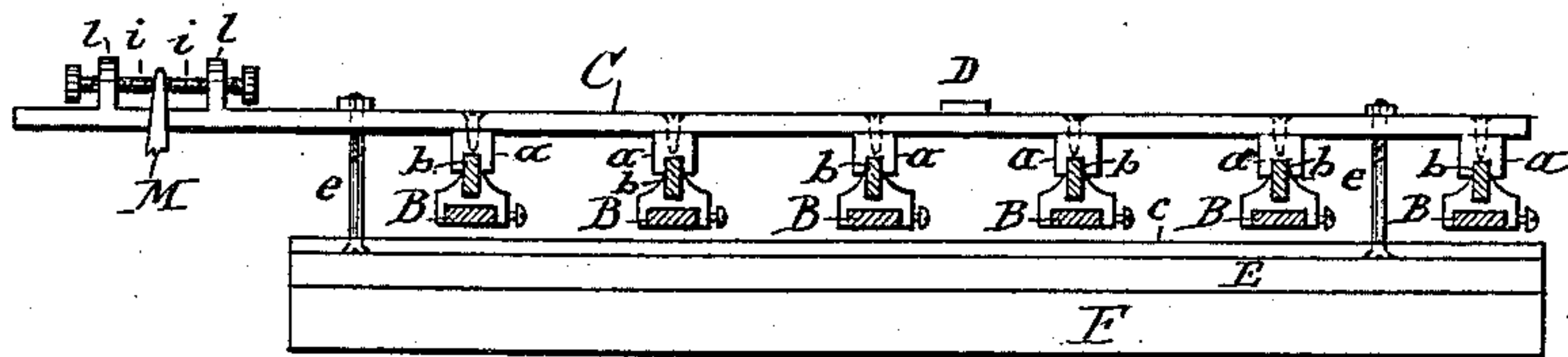
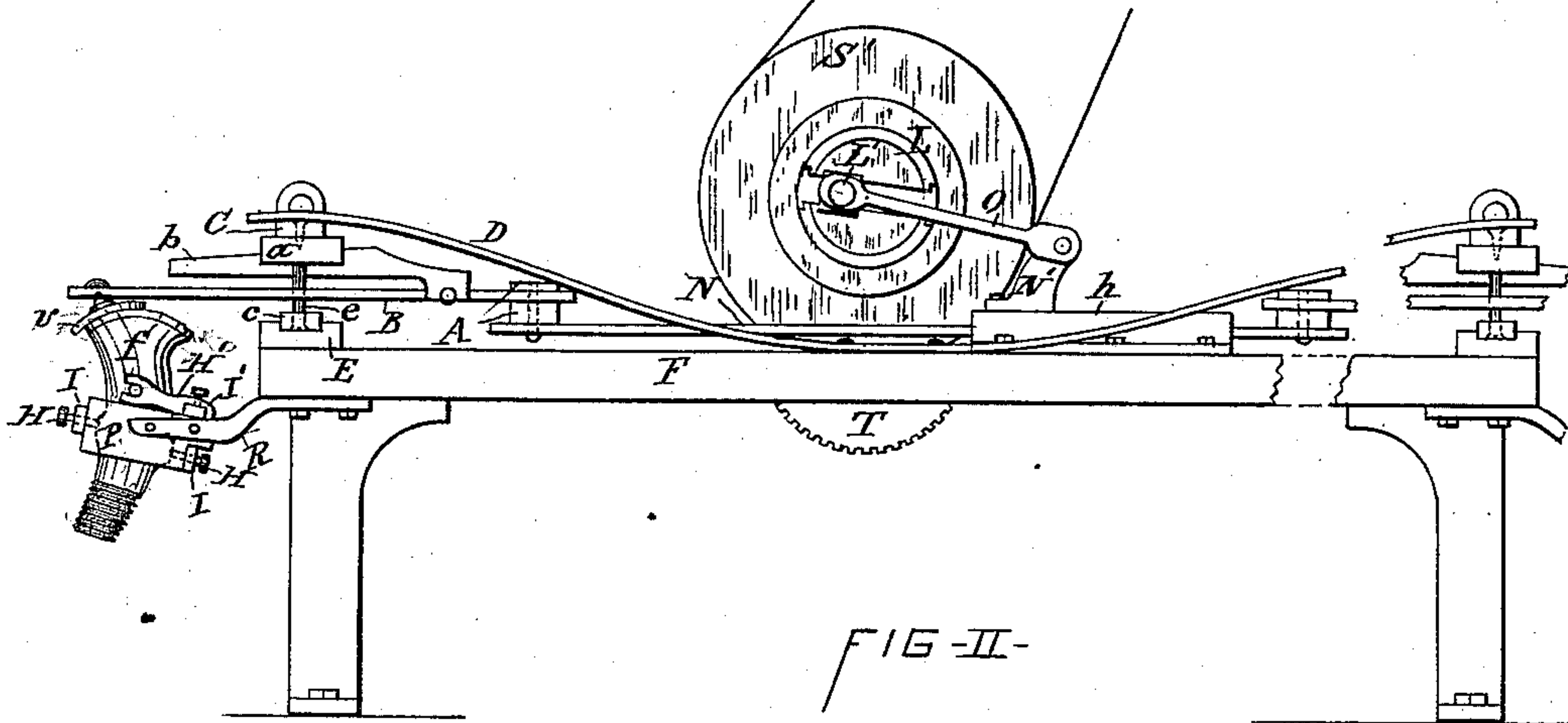
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# UNITED STATES PATENT OFFICE.

ELIJAH U. SCOVILLE AND CLINTON OWEN, OF MANLIUS, NEW YORK.

## MACHINE FOR GRINDING VALVES ON THEIR SEATS.

SPECIFICATION forming part of Letters Patent No. 347,130, dated August 10, 1886.

Application filed October 6, 1885. Serial No. 179,098. (No model.)

*To all whom it may concern:*

Be it known that we, ELIJAH U. SCOVILLE and CLINTON OWEN, of Manlius, in the county of Onondaga, in the State of New York, have  
5 invented new and useful Improvements in Machines for Grinding Valves on their Seats, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 The purpose of this invention is to accurately and expeditiously grind a number of valves on their respective seats, and more particularly to grind the curved valve on the correspondingly-curved face at the discharge end  
15 of the faucet for which we have obtained Letters Patent of the United States No. 301,759, dated July 8, 1884.

The invention consists, essentially, of a series of holders for the valve-seats or faucets,  
20 reciprocating valve-carriers arranged over the valve-seat holders, and pivoted connections between the valves and valve-carriers, whereby said valves are allowed to conform their positions to the contour of the valve-seats.

25 The invention also consists in the combination, with the valve-seat holders, reciprocating head, and valve-carrying arms pivoted thereon, of a guide arranged to carry the valve-carrying arms back and forth across the valve-seat  
30 holders laterally from the movement of the reciprocating head, said movement causing the valve to be ground uniformly over the entire valve-seat; and it also consists in the combination, with the reciprocating head and  
35 the valve-carriers connected therewith, a slide connected with said head, and the pitman connected with the slide, of a crank-pin connected with the crank adjustably in relation  
40 to its distance from the axis of the crank, by which arrangement the stroke of the valve-carrier can be varied according to the length of the valve-seats to be operated on; and the invention furthermore consists in novel devices for securing the valve-seats or faucets  
45 in proper position on the frame, all as hereinafter more fully described, and specifically set forth in the claims.

In the annexed drawings, Figure I is a plan view of our invention, with portions broken  
50 away to better illustrate certain details of the machine. Fig. II is a side elevation of the

same. Fig. III is a transverse section on line *x x*, Fig. I. Fig. IV is a face view of the adjustable crank; and Fig. V is a transverse section on line *y y*, Fig. IV.

Similar letters of reference indicate corresponding parts.

F represents the main supporting-frame of the machine, which frame consists, mainly, of a stout table or platform mounted on cast-iron  
60 legs, which are bolted to the floor. Horizontally across the front of the frame F are extended three bars, I I I', which are secured at their ends to plates P, supported on rigid  
65 arms R, firmly bolted onto the frame and projecting therefrom. One of the bars I is in front of the other two bars and sufficiently distant therefrom to receive between them  
a series of valve-seats, which in this case are represented in the form of faucets *f*, hav-  
70 ing at the discharge ends segmental faces, on which correspondingly-curved valves *v* are to be ground. Said faucets are held in a row and adjustable in position with their  
segmental faces upward by means of set-  
75 screws H H, extending through the bars I I, and bearing on the front and back of the faucets, and arms H', connected to the bar I', and having their free ends bifurcated to receive  
80 the trunnions formed on the sides of the faucets. The faucets are thus hung on the arms H'. The set-screws H pressing on the front of the faucets retain the latter on the arms  
H', and the other set-screws H, bearing on the back of the faucets below the front set-screws,  
85 serve to adjust the faucets so as to carry the valve-seats thereof in their requisite position to be ground, as hereinafter described. The set-screws H H and arms H' thus constitute  
90 the holders for the valve-seats, and will hereinafter be referred to under said designation.

A represents a reciprocating head or bar extended across the top of the frame F, parallel with the row of valve-seat holders, and is  
95 moved toward and from the same by the instrumentalities hereinafter described.

On the reciprocating head A are pivoted a series of valve-carrying arms, B B, which are flexible vertically and have their free ends  
100 extended over the valve-seat holders, and are provided thereat with a pivoted connection for the valves, which connection consists of a



socket or indentation in the under side of each arm B and a stud-pin projecting from the back of the valve *v* into the aforesaid socket. This pivoted connection between the valve and its carrier B allows said valve to rock and conform its position to the contour of the valve-seat.

Across the series of valve-carrying arms B is extended a bar, C, which receives a reciprocating motion at right angles to that of the head A, as hereinafter explained, and is guided in its movement by a longitudinally-grooved guide-bar, E, secured to the frame F underneath the bar C, in the groove of which guide-bar is mounted a slide, *e*, connected with the bar C by bolts *e*, as shown in Figs. II and III of the drawings. To the under side of the bar C are pivoted a series of guide-blocks, *a*, in which slide arms *b b*, firmly clamped on the valve-carrying arms B B. The free ends of the said arms B B are thus carried laterally back and forth by the reciprocating bar C, and the valves *v* are moved both longitudinally and laterally over the valve-seat. Said movement of the valves causes the same to be ground uniformly over the entire valve-seat, and produces a perfectly-tight joint between them. A spring-bar, D, secured to the top of the frame F, and bearing with its free end on top of the bar C, applies the requisite pressure to the valve-carrying arms B B.

The head A and bar C receive their respective reciprocating movements by the following instrumentalities: Parallel with the bar C is the driving-shaft *d*, mounted on pillow-blocks or suitable bearings secured to the top of the frame F back of the head A. S and S' designate, respectively, the driving-pulley and the loose pulley connected with the aforesaid shaft in the usual and well-known manner. Near the center of the frame F is a crank, L, secured to the driving-shaft *d*, and under this crank is a slide, N, mounted on a guide, *h*, firmly attached to the top of the frame F at right angles to the head A, with which one end of the slide N is connected. A rigid arm, N', rising from the slide N has on its upper end a wrist-pin, *n*', and the pitman O, connected with said wrist-pin and with the crank-pin L', connects the slide N with the crank, so that the rotation of the latter imparts reciprocating movement to the head A through the medium of the slide N N'. In order to admit of regulating the length of the stroke of the head A according to the length of the valve-seat to be ground, we secure the crank-pin L' on the crank arm or disk L, adjustably in relation to its distance from the axis of the crank, and this we accomplish by means of a block, *s*, sliding in a diametrical groove, *r*, in the face of the crank-disk L, said groove being T-shaped in cross-section, and the block *s* formed correspondingly to retain it in the groove, as shown in Figs. IV and V of the drawings. The wrist-pin L' is provided with a screw-threaded shank, *t*, which passes through a correspond-

ingly screw-threaded eye in the block *s* and bears on the face of the groove *r*, and thereby holds the said block in its required position. By turning the wrist-pin L' so as to loosen the block *s*, the latter can be moved toward or from the axis of the crank to carry the wrist-pin to its required position in relation to said axis, where it can be retained by tightening the wrist-pin. On the side of the frame F is secured a trunnion or gudgeon, on which is pivoted a cam-wheel, K, and a gear-wheel, T, which latter meshes in a pinion, U, attached to the end of the driving-shaft *d*. On an arm, *u*, or other suitable support, is pivoted a lever, M, one end of which engages the cam-groove of the wheel K, and the opposite end projects between two set-screws, *i i*, working in lugs *l l*, attached to the top of the bar C. The revolution of the driving-shaft *d* causes the cam-wheel K to impart oscillating motion to the lever M, and this in turn imparts reciprocating motion to the bar C. The set-screws *i i* constitute an adjustable connection between the lever M and bar C, allowing said bar to be shifted longitudinally on the said connection, so as to cause the arms B B to carry the valves in their requisite positions over the valves to be ground.

It will be observed that the described machine can be extended almost indefinitely to contain a great number of valve-seat holders arranged in a row with a corresponding number of valve-carriers B B over them; and they may be arranged at opposite sides of the frame F, and motion can be transmitted to the second set of valve-carriers from the same driving-shaft, crank, and cam-wheel by a second and similar set of reciprocating heads, A, reciprocating bar C, and lever M, and an extension of the slide N, as represented in Fig. I of the drawings.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A machine for grinding slide-valves on their seats, comprising holders for the valve-seats, reciprocating valve-carriers arranged over the valve-seat holders, and pivoted connections between the valves and valve-carriers, whereby said valves are allowed to conform their positions to the contours of the valve-seats, substantially as set forth.

2. In combination with the valve-seat holder, a reciprocating head arranged movable toward and from the said holder, a valve-carrying arm pivoted on said head, and having its free end over the valve-seat holder, and a guide arranged to carry the free end of the valve-carrying arm back and forth across the valve-seat holder laterally from the movement of the reciprocating head, substantially as set forth.

3. In a machine for grinding slide-valves on their seats, the combination of a main supporting-frame, a series of valve-seat holders arranged in a row on said frame, a reciprocating



ing head, a series of valve-carriers connected to said head and extending over the valve-seat holders, and pivoted connections between the valves and their carriers, substantially as 5 and for the purpose set forth.

4. The combination of a main supporting-frame, a series of valve-seat holders arranged in a row on said frame, a reciprocating head, a series of valve-carriers extending from the 10 said head over the valve-seat holders, and a spring pressing the aforesaid carriers toward the valve-seat holders, substantially as and for the purpose set forth.

5. The combination of a main supporting-frame, a series of valve-seat holders arranged in a row on said frame, a reciprocating head arranged movable toward and from the valve-seat holders, valve-carriers extending from the said head over the valve-seat holders, and 20 a reciprocating bar arranged movable at right angles to the movement of the aforesaid head, and carrying with it the free ends of the valve-carriers, substantially as described and shown.

6. In combination with the valve-seat holders H H', I I, and I', the reciprocating head A, the valve-carrying arms B B, pivoted at one end on the said head, and having the opposite end over the said holders, the reciprocating bar C, arranged movable at right angles 30 to the movement of the head A, guides *a a* on the bar C, and guide-arms *b b* on the arms B B, sliding in the guides *a a*, whereby the free ends of the valve-carrying arms are moved laterally simultaneously with their longitudinal movement, substantially as described and shown.

7. In combination with the valve-seat holders H H', I I, and I', and reciprocating head 40 A, the valve-carrying arm B, flexible vertically and pivoted at one end on the head A, and having its free end over the said holders, and the spring D, arranged to press on the intermediate portion of the arm B, substantially as set forth.

8. In combination with the frame F and the series of valve-seat holders H H', I I, and I', arranged in a row on said frame, the reciprocating head A, flexible valve-carrying arms 50 B B, pivoted on said head, and having their free ends over the said holders, the arms *b b*, clamped on the arms B B, the bar C, extended across the arms *b b* and reciprocating at right

angles to the movement of the head A, and guides *a a*, pivoted on the bar C and having 55 sliding through them the arms *b b*, and the spring D, pressing on the bar C, substantially as described and shown.

9. In combination with the frame F and a series of valve-seat holders, H H', I I, and I', 60 arranged in a row on said frame, the reciprocating head A, valve-carrying arms B B, pivoted on said head, guide-arms *b b* on the arms B B, the bar C, extended across the arms *b b* and reciprocating at right angles to the head 65 A, guides *a a*, pivoted on the bar C, the guide E on the frame F, and the slide *c*, mounted on said guide and connected with the bar C, substantially as described and shown.

10. In combination with the frame F and reciprocating valve-carriers B B, the bars I I 70 I', extended across the front of the frame F, underneath the carriers B B, the set-screws H H, extending through the bars I I, and the arms H', connected to the bar I', and having their 75 free ends bifurcated, substantially as described and shown.

11. In combination with the reciprocating head A, arms B B, pivoted on said head, and the reciprocating bar C, arranged to move at 80 right angles to the movement of the head A, and carrying with it the free ends of the arms B B, the driving-shaft *d*, the cam-wheel K, and crank L, attached to said shaft *d*, the pivoted lever M, arranged to transmit motion from the 85 cam-wheel to the bar C, the slide N N', connected with the head A, and the pitman O, connecting said slide with the crank L, substantially as described and shown.

12. In combination with the reciprocating 90 head A, valve-carrying arms B B, connected therewith, slide N N', and pitman O, the crank-pin L', secured on the crank L adjustably in relation to its distance from the axis of the crank, substantially as and for the pur- 95 pose set forth.

In testimony whereof we have hereunto signed our names and affixed our seals in the presence of two attesting witnesses, at Manlius, in the county of Onondaga, in the State 100 of New York, this 19th day of September, 1885.

ELIJAH U. SCOVILLE. [L. S.]

CLINTON OWEN. [L. S.]

Witnesses:

BRONSON CLARK,

W. E. ACKERMAN.