

(No Model.)

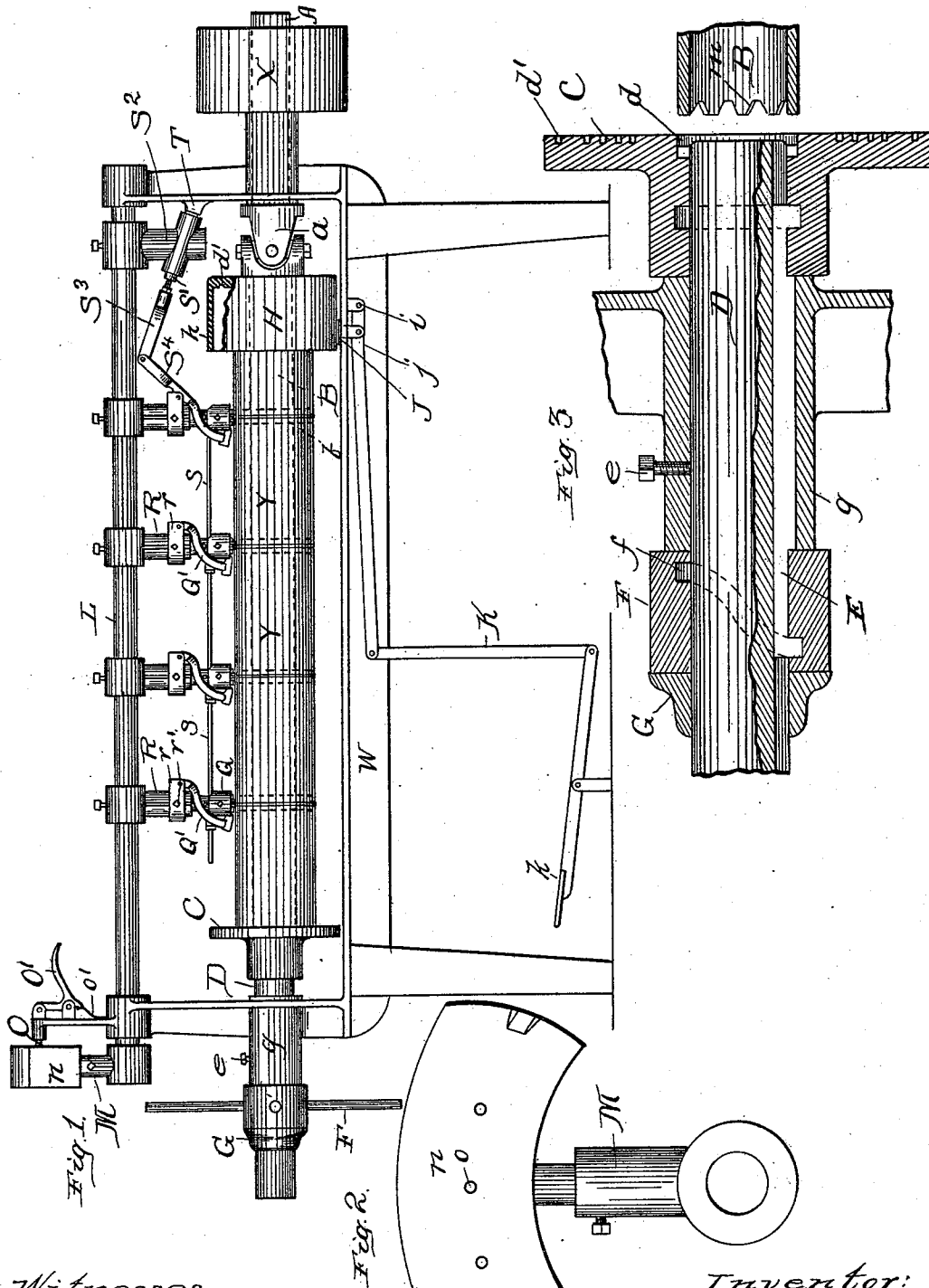
2 Sheets—Sheet 1.

A. G. SCHERER.

MACHINE FOR SEAMING SECTIONAL SHEET METAL PIPES.

No. 523,687.

Patented July 31, 1894.



Witnesses.

Lew. C. Curtis.
H. W. Munday.

Inventor:
Albert G. Scherer

By Munday, Evans & Adcock,
his Attorneys

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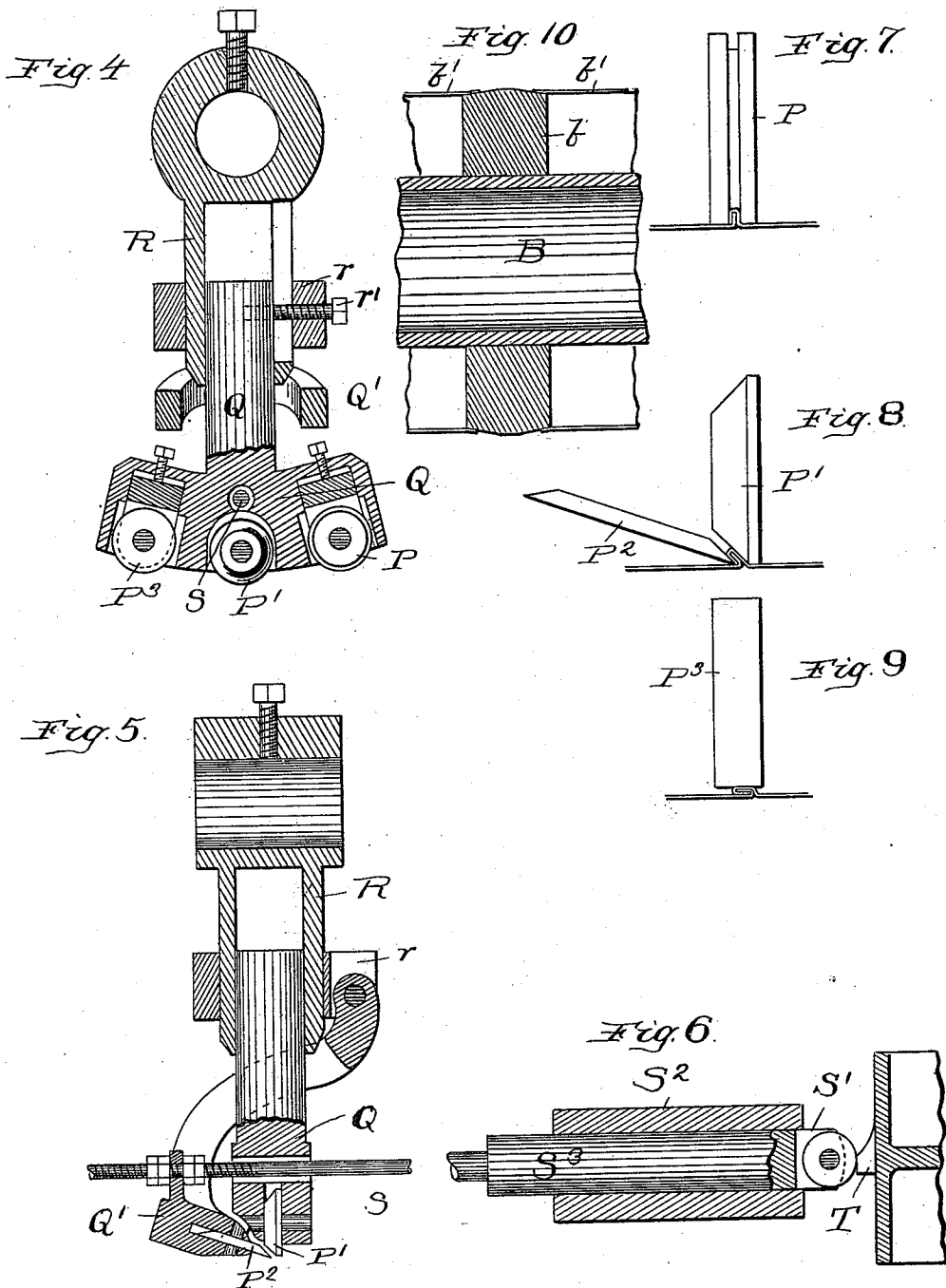
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UNITED STATES PATENT OFFICE.

ALBERT G. SCHERER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE EXCELSIOR STEEL FURNACE COMPANY, OF SAME PLACE.

MACHINE FOR SEAMING SECTIONAL SHEET-METAL PIPES.

SPECIFICATION forming part of Letters Patent No. 523,687, dated July 31, 1894.

Application filed November 8, 1893. Serial No. 490,384. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. SCHERER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Seaming Sectional Sheet-Metal Pipes, of which the following is a specification.

This invention relates to mechanism for securing together sections of sheet metal piping so as to form therefrom long lengths adapted to be used for conveying warm air from furnaces to the rooms of buildings, and in other places where such pipes are suitable. My endeavor in the invention has been to produce a machine adapted to unite three or more sections at one time, and thereby to economize time and labor in the operation, all the joints being formed simultaneously.

The invention consists in the novel construction and novel combinations of parts hereinafter set forth and more particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improved machine. Fig. 2 is an elevation of a part of the mechanism for holding the seaming rollers in operative position. Fig. 3 is a longitudinal section of the movable head for supporting one end of the horn upon which the pipe sections are supported. Fig. 4 is a vertical section of one of the seaming heads. Fig. 5 is a vertical section of the same at right angles to the section given in Fig. 4. Fig. 6 is a sectional view showing the device for positioning the movable roller used on one of the seaming operations. Figs. 7, 8 and 9 show the different steps taken in the seaming. Fig. 10 is a partial longitudinal section of the horn.

In said drawings W represents a suitable supporting frame in which the moving parts are mounted. Power is communicated by means of the pulley X mounted upon one end of a shaft A which is joined to the horn B by a universal coupling shown at a.

Upon the horn B are mounted collars b located under the joints of the pipes and adapted to support the pipes interiorly during the seaming operations. I also preferably connect these collars by sheet metal tubes b' which serve as guides to the end of the pipe

while the latter is being pushed over the horn into position and prevent the edges from striking the side faces of the collars. The collars and guides are of course changeable to suit different diameters of pipes.

At the farther end of the horn a movable head C is provided in which that end of the horn may be centered and supported while the seaming is being done, and which is adapted to be drawn away from the horn after the operation to permit the taking off of the seamed pipe and the putting on of the unseamed lengths. To adapt the head C to the performance of its various functions, it is mounted loosely on the end of a stationary shaft D, and is provided with a central recess d upon its side face adapted to receive the horn. The end of the horn is toothed as at m and the recess in the head is so made as to conform to the teeth, so the horn may communicate rotary motion to the head. Annular grooves d' are also cut in the side face of the head into which the edge of the pipe may be inserted, enough of the grooves being provided to accommodate all the sizes of pipe operated upon in the machine. The shaft is held stationary in some suitable way, as for instance by the set screw e.

To slide the head a hand wheel F is mounted upon the shaft, and said wheel has an interior spiral groove f which receives one end of the key E, the other end of the key engaging with a straight interior groove in the head. The hand wheel is free to rotate so that when the wheel is turned, the engagement of the key E with both the wheel and the head will cause a sliding motion by the key which is communicated to the head. The wheel is of course confined as to its location upon the shaft by the nut G upon one side and the bearing g upon the other side.

When the head is moved forward it engages the end of the horn and receives the rotary motion of the latter, and it also receives and supports the edge of the pipe in one of its side grooves. The horn is further provided at the end near the driving pulley with a head H having grooves d' corresponding to the grooves in head C, and adapted to receive and support the forward end of the pipe in the same manner that the rear end thereof is

supported by the head C, and this head H is also desirably provided with an overhanging flange *h* adapted to encompass the pipe.

When the engagement by the horn with the head C is broken, the end of the horn unless sustained will naturally fall, and to prevent any marked descent which might strain the junction of the horn with the driving shaft, I provide under the flanged head H a suitable support J. This support is placed as near the head as may be without interference with the rotation of the horn. This support is also preferably made use of in raising the horn when it is desired to bring it in alignment with the movable head C, and this is accomplished by mounting said support upon a lever *j* pivoted to the frame of the machine at *i* and connected with a vertical rod K operated by a treadle lever *k*. When the movable head is drawn back the horn is of course free to be swung upon the universal coupling sufficiently to bring its end beyond the periphery of the head, in which position it will be supported by the support J, and this positioning allows the ready putting on and taking off of the pipe.

The pipe sections Y Y being positioned upon the horn and the head C being moved into engagement with the horn, it will be seen that the horn and pipe may be rotated by starting the pulley X and the seaming operations may then be proceeded with. These are performed by proper seaming tools located over each of the joints between the sections Y Y.

I have shown at Fig. 1 five sections of pipe being united, and there are therefore four sets of seaming rolls embraced in the machine. These seaming rolls are all supported from a shaft L located in a plane above that of the horn. This shaft may either rock or be given an entire revolution at each seaming operation, and it has an operative position for each separate operation in the seaming. To lock it in these several operative positions, I provide it with an upwardly projecting arm M carrying a flat surfaced plate or weight *n*, and this plate has a series of openings *o* each adapted to receive a locking bolt O, operated by an elbow thumb lever O' having a spring *o'* for keeping the bolt in locking engagement.

In each set of seaming rolls are a grooved roll P for compressing the flanged parts of the seam, the coacting beveled rollers P' and P² for bending over the seam, and the plain surfaced roll P³ for flattening the seam. Of these the rolls P P' and P³ are journaled in the lower ends of T shaped supports Q, adjustably held in hangers R mounted upon the shaft L, and the rolls P² are journaled in the ends of curved arms Q' pivoted upon collars *r* encircling the hangers and adjustably held thereon by set screws *r'*. The several rolls are located upon the supports Q as shown, whereby in the first operative position of the shaft L, all the rolls P are brought into ac-

tion, in the second operative position the rolls P' and P² do their work, and in the third operative position the flattening rolls are caused to operate. After the last operation the shaft L is turned through the remaining portion of a revolution so as to bring the first rolls P again to the work.

In order that the rolls P² may be moved up to the work at the proper time, I connect all their supporting arms Q' to a horizontal rod S and actuate that rod in such manner as to lower the rolls against the seam by means of a cam T attached to the frame of the machine, a slide S' having an anti-friction roller in its lower end, and moving in ways formed in a hanger S² depending from shaft L, and a rod S³ adjustable as to length and connecting said slide with an upward extension S⁴ of the nearest one of the arms Q'. The cam T is of course so located as to actuate the slide and through it give simultaneous motion to all the arms Q' at the proper time to bring the rolls P² to the work, and the shaft L remains stationary with the slide resting upon the crown of the cam during the time said rolls are working.

It will be noticed that my machine readily permits all the adjustments necessary to accommodate the different diameters of pipe. I also prefer to secure the hangers adjustably upon the shaft L as that permits their being shifted to suit the location of the joints, which of course would be necessary if the sections varied in length.

The plate *n* in addition to the function already given it, is preferably made heavy enough so that it may counterbalance substantially the weight of the seaming tools and their supporting devices, so that shaft L will be under easy control at all times.

Of course the seaming tools must be adapted to the kind of seam made, and I do not wish to be limited to the particular ones shown.

I claim—

1. The combination in a machine for seaming together the ends of a series of pipe sections, of a horn for supporting the pipe sections, supports at both ends of said horn, and a set of seaming rolls for each joint, said rolls being provided with supports whereby the corresponding rolls of each set may be brought into action simultaneously, substantially as set forth.

2. The combination in a machine for seaming together the ends of a series of pipe sections, of a horn for supporting the pipe sections, supports at both ends of said horn, and a set of seaming rolls for each joint, said rolls being provided with supports adapted to be locked in different positions to bring all the rolls of each set successively into operation, substantially as set forth.

3. The combination in a machine for seaming together the ends of a series of pipe sections of a horn for supporting the pipe sections, and a set of seaming rolls for each joint, said rolls being provided with supports all of

which are mounted upon the same shaft, substantially as specified.

4. The combination in a machine for seaming together the ends of a series of pipe sections, of a horn for supporting the pipe sections, and a set of seaming rolls for each joint, said rolls being provided with supports all of which are mounted upon the same shaft, and said shaft being provided with means whereby it may be locked successively in the various operating positions, substantially as specified.

5. The combination in a machine for seaming together the ends of a series of pipe sections, of a rotating horn for supporting the pipe sections, and a set of seaming rolls for each joint, said rolls being provided with supports whereby the corresponding rolls of each set may be brought into action simultaneously, substantially as specified.

6. The combination in a machine for seaming together the ends of a series of pipe sections, of a rotating horn for supporting the pipe sections, and a set of seaming rolls for each joint, said rolls being provided with supports adapted to be locked in different positions to bring all the rolls of each set successively into operation, substantially as specified.

7. The combination in a machine for seaming together the ends of a series of pipe sections, of a horn for supporting the pipe sections, and a set of seaming rolls for each joint, said rolls being provided with supports consisting of the shaft L, the hangers secured to the shaft and the supports for the rolls secured in the hangers, substantially as specified.

8. The combination with the horn of several sets of seaming rolls, supports for said rolls embracing movable arms upon which some of the rolls are journaled, means whereby said movable arms are united together, and means for actuating said arms, substantially as specified.

9. The combination with the horn, of several sets of seaming rolls each embracing a roll P², movable arms upon which said rolls P² are journaled, a connecting rod to which said arms are joined, and means for moving said arms simultaneously, substantially as specified.

10. The combination with the horn, of several sets of seaming rolls each embracing a roll P², movable arms upon which said rolls P² are journaled, a connecting rod to which said arms are joined, the cam, the slide and mechanical connections between the slide and the arms, substantially as specified.

11. The combination in a seaming machine, of the series of seaming devices, the shaft upon which all said devices are mounted, and the counterbalance n, substantially as specified.

12. The combination in a seaming machine, of the series of seaming devices, the shaft upon which all said devices are mounted, and the

counterbalance n, serving also as a part of the mechanism for locking said shaft in its various positions, substantially as specified.

13. In a seaming machine for seaming three or more pipe sections together, the combination with the seaming devices of a horn permanently supported at one end and having a removable support at the other end, adapted to rotate with the horn, substantially as specified.

14. In a seaming machine for seaming three or more pipe sections together, the combination with the seaming devices of a horn hinged or flexibly joined to its support at one end and having a removable support at the other end, substantially as specified.

15. In a seaming machine for seaming three or more pipe sections together, the combination with the seaming devices of a horn hinged or flexibly joined to a rotary shaft at one end, and provided with a removable centering support at the other end, substantially as specified.

16. In a seaming machine for seaming three or more pipe sections together, the combination with the seaming devices of a horn hinged or flexibly joined to a rotary shaft at one end, and provided with a rotatable and sliding head at the other end, substantially as specified.

17. The combination in a seaming machine, of the horn, the rotary driving shaft, the flexible coupling uniting the horn and shaft, and the removable head C, substantially as specified.

18. In a seaming machine, a horn joined to the machine by a flexible joint at one end, and having a removable support at the other end, whereby the last mentioned end is adapted to be swung outward for the putting on and taking off the pipe, substantially as specified.

19. In a seaming machine of the kind herein specified, the combination of a rotating horn adapted to be swung at one end, a removable support for said swinging end, and the seaming devices, substantially as specified.

20. The combination with the swinging and flexibly joined horn, having the flanged head of the support J, operating and located substantially as set forth.

21. The combination with the swinging and flexibly joined horn, having the flanged head, of the support J, lever devices for raising said support, and sliding head C, substantially as specified.

22. The combination with a horn supported by a flexible joint at one end and a removable support at the other end, of means essentially such as described for supporting the horn after the withdrawal of the removable end support, substantially as specified.

ALBERT G. SCHERER.

Witnesses:

L. E. CURTIS,
H. M. MUNDAY.