

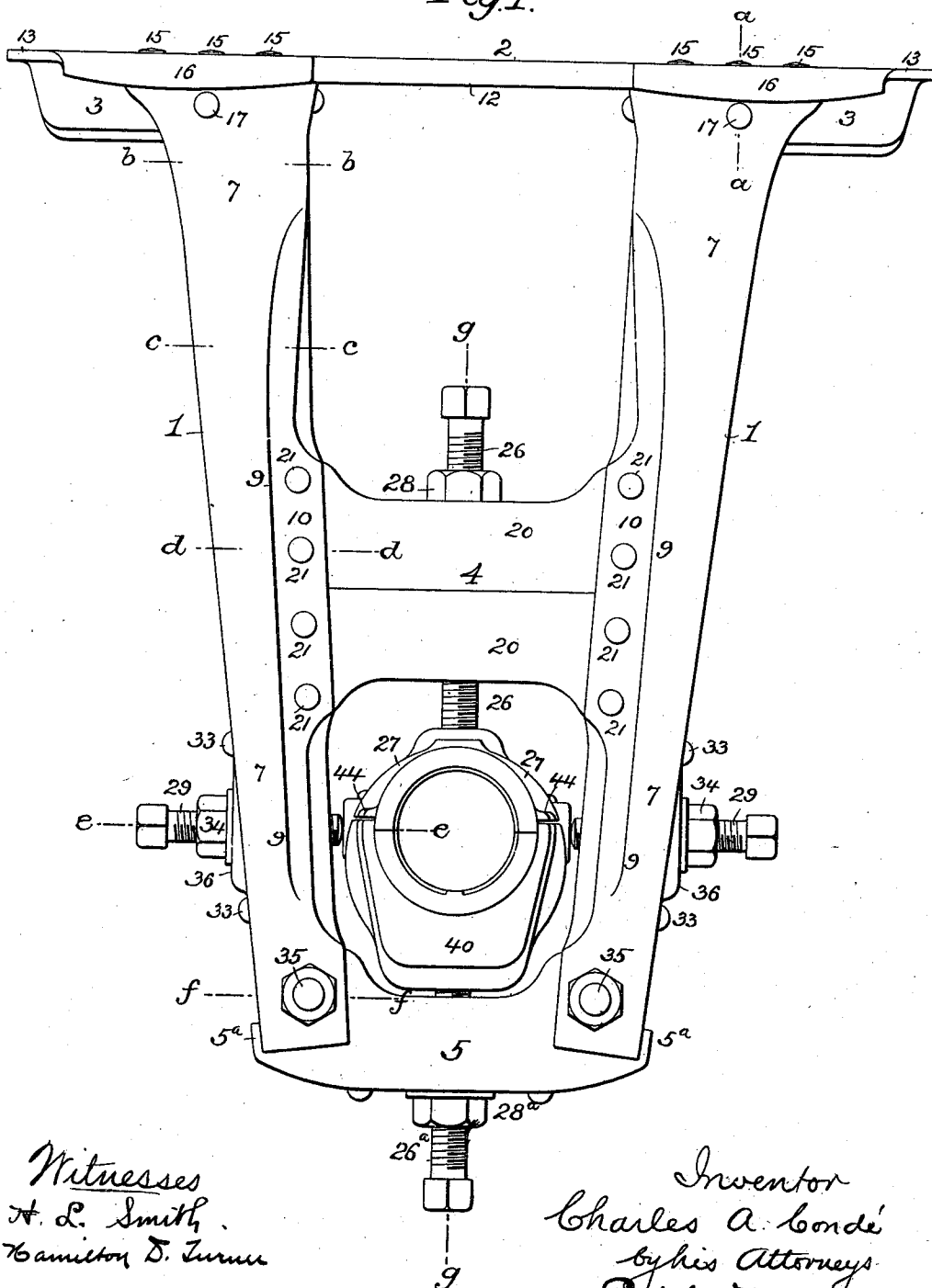
966,527.

C. A. CONDÉ.
SHEET METAL SHAFT HANGER.
APPLICATION FILED AUG. 31, 1906.

Patented Aug. 9, 1910.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses
H. L. Smith.
Hamilton D. Turner

Inventor
Charles A. Condé
by his Attorneys
Smith & Taylor

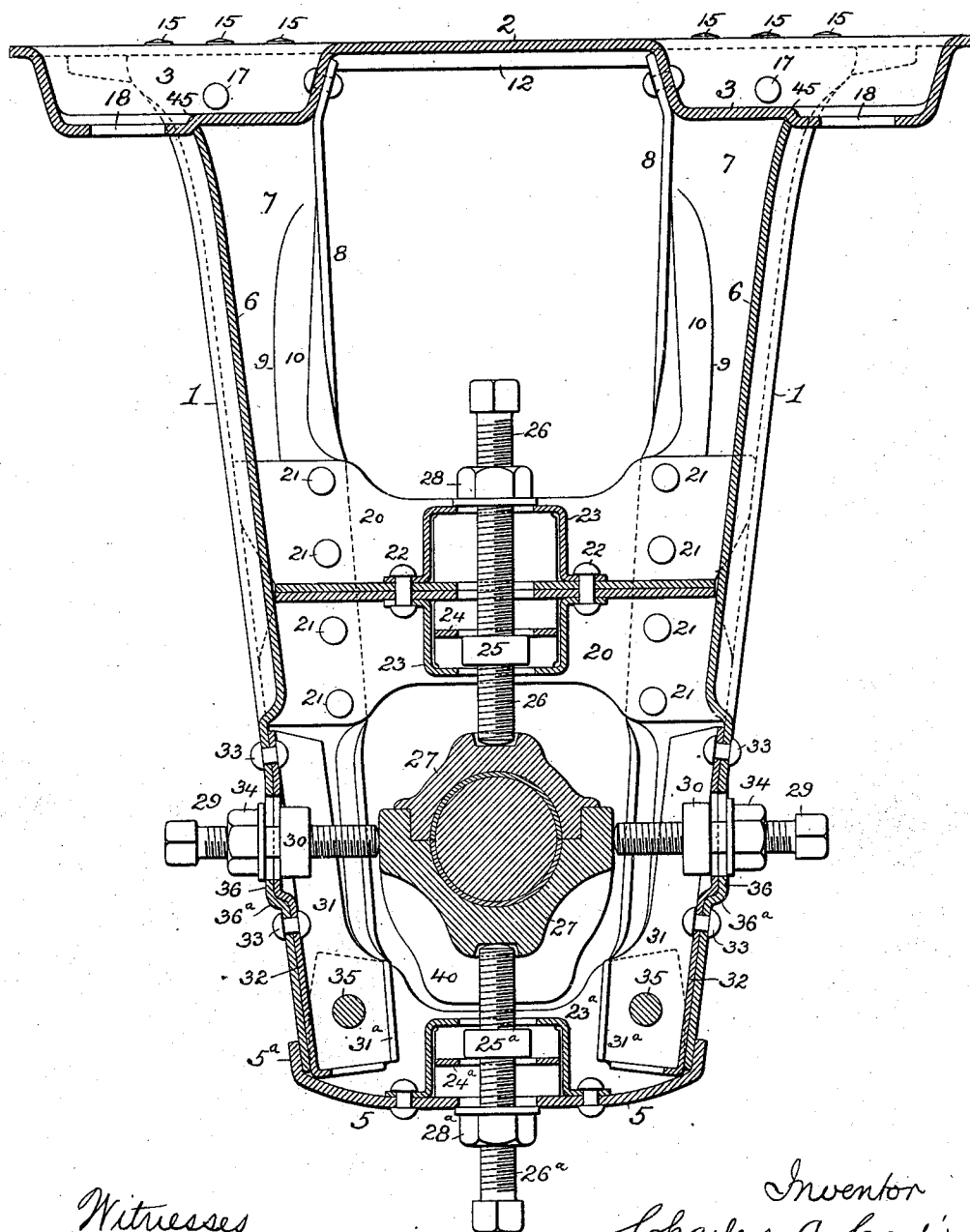
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6 SHEETS—SHEET 2.

Fig. 2.



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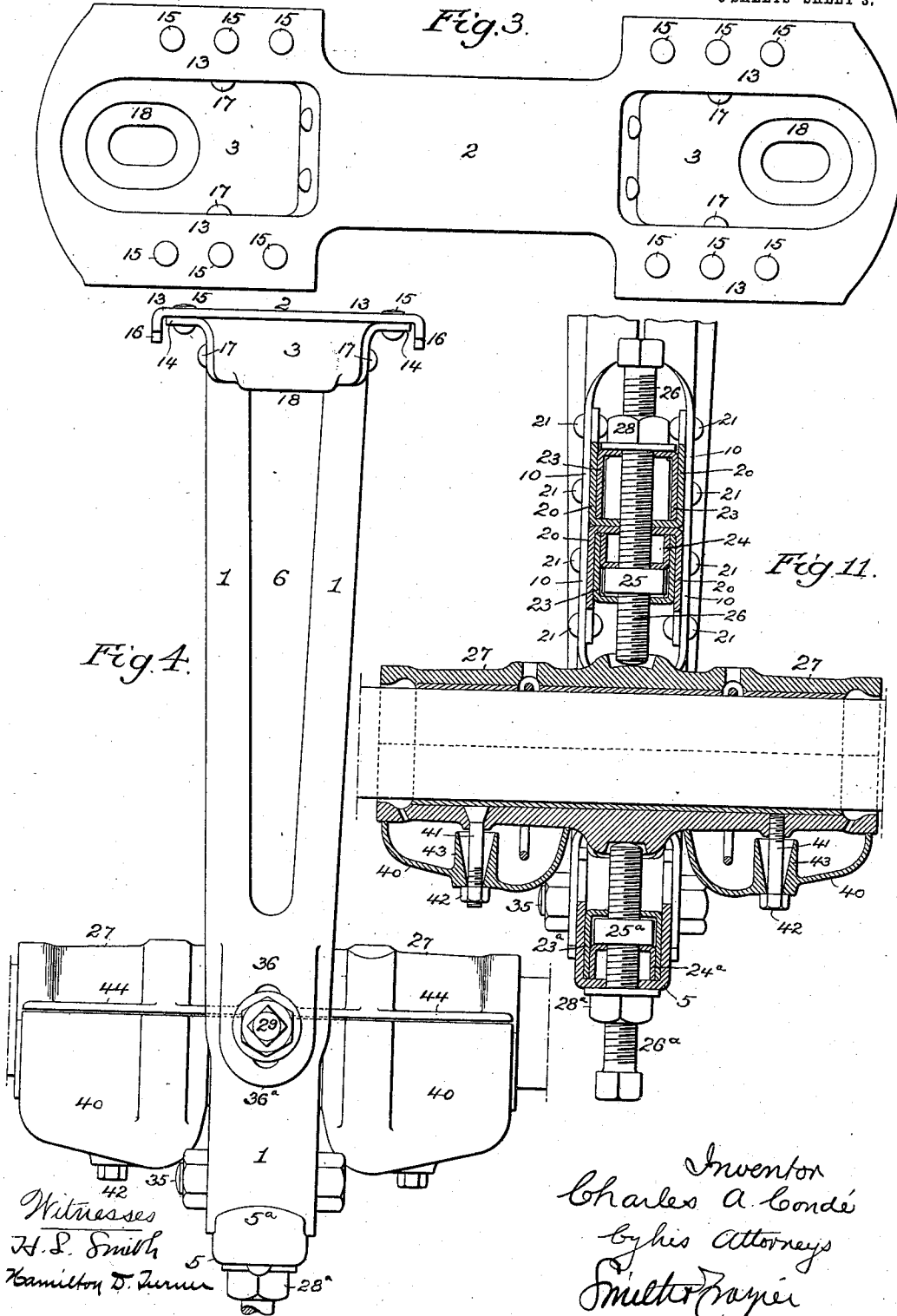
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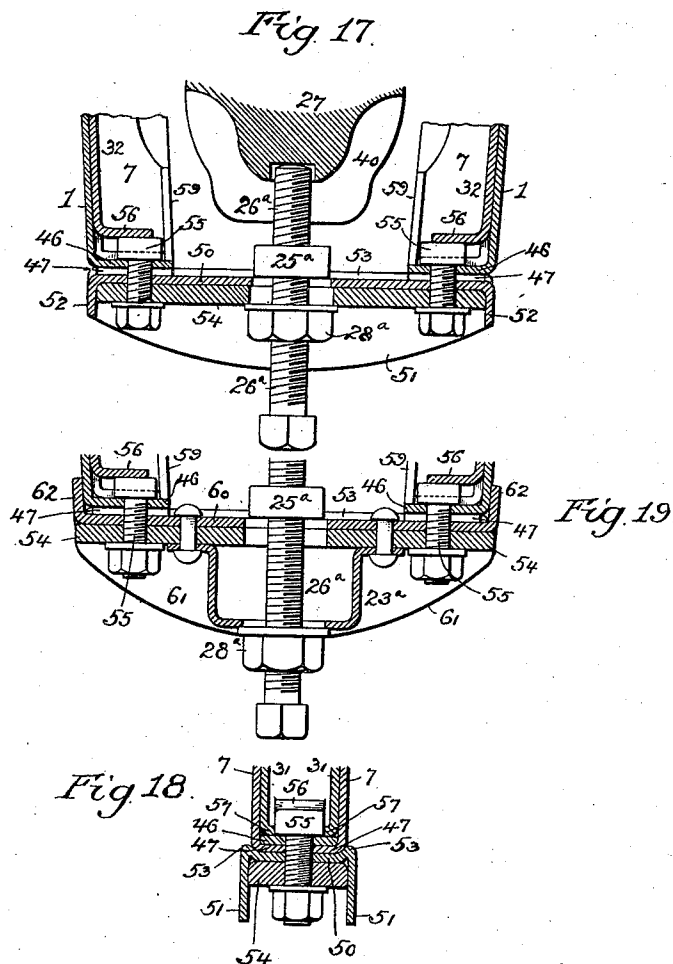
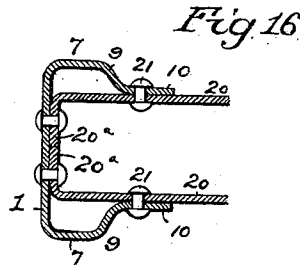


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6 SHEETS—SHEET 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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SHEET-METAL SHAFT-HANGER.

966,527.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed August 31, 1906. Serial No. 332,816.

To all whom it may concern:

Be it known that I, CHARLES A. CONDÉ, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Sheet-Metal Shaft-Hangers, of which the following is a specification.

The objects of my invention are to so construct a shaft hanger of wrought metal, preferably sheet metal, as to provide the maximum of strength and rigidity in proportion to the weight of metal employed; to so shape the various members of the hanger that they can be readily struck up from cold metal by means of appropriate dies; to facilitate the assembling and securing together of the various members of the hanger, and to so proportion the thickness of the various members of the hanger, that they will best perform their intended function. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of a sheet metal shaft hanger constructed in accordance with my invention; Fig. 2 is a longitudinal sectional view of the same; Fig. 3 is a plan view of the sole plate and foot portions of the hanger; Fig. 4 is an end view; Fig. 5 is a section on the line *a—*a**, Fig. 1; Fig. 6 is a section on the line *b—*b**, Fig. 1; Fig. 7 is a section on the line *c—*c**, Fig. 1; Fig. 8 is a section on the line *d—*d**, Fig. 1; Fig. 9 is a section on the line *e—*e**, Fig. 1; Fig. 10 is a section on the line *f—*f**, Fig. 1; Fig. 11 is a section on the line *g—*g**, Fig. 1; Fig. 12 is a blank from which one of the legs of the hanger is produced, and Figs. 13 to 19 are detached views illustrating special or modified constructions of various members of the hanger within the scope of my invention.

The hanger shown in Figs. 1 to 4 is composed of four main parts, namely: the opposite legs 1—1, the sole plate 2 with struck-up or depressed foot portions 3, the intermediate transverse brace 4, and the bottom yoke 5. Each of the legs of the hanger is produced from a blank of the character shown in Fig. 12, said blank tapering gradually from top to bottom and being provided with the necessary bolt and rivet holes or slots, and also with a T-shaped slot 1^a at the upper end. The blank is shaped by bending it into an approximately rectangular

cross sectional form to constitute what is, in effect, a box girder, in order to secure the strength and rigidity attending a structure of that type. The back of each leg is stiffened and strengthened by means of an inwardly projecting rib 6, and in its upper portion the sides 7 of each leg are straight and parallel, and the inwardly bent flanges 8 on the inside of the leg meet, or almost meet, each other, as shown in Fig. 6. At a lower point the sides 7 of the leg are bent inwardly to form shoulders 9 and wings 10 disposed in closer relation to each other than the sides of the leg, for receiving and being secured to the opposite flanges of the intermediate brace 4, as shown in Fig. 8, these wings 10, however, at points above and below the brace attachment, being formed with diagonally and inwardly bent flanges 11, as shown in Fig. 7, this conformation serving to longitudinally stiffen and strengthen each leg, in order to prevent deformation of the same under the strains to which it is subjected. The lowermost portion of each leg has straight parallel sides, without shoulders or flanges, for the purpose of receiving the opposite flanges of the brace yoke 5, as shown in Fig. 10.

The sole plate 2 has down-turned edge flanges 12, and is widened at each end so as to form, on each side of the depressed or struck-up foot 3, a base 13 for the support of the outwardly bent flanges 14 at the top of each leg, said base and flanges being secured together by rivets 15 or other available means, and each base portion being stiffened by means of a downwardly bent edge flange 16. (See Fig. 5.) In some cases this edge flange may be bent in under the flange 14 of the leg, as shown for instance in Fig. 13, so as to secure the leg flange and sole plate base together without the aid of rivets or other independent fastenings. The inner web of each leg overlaps and is secured to the inner web of the depressed foot 3, as shown in Fig. 2, and the sides of said depressed foot fit within the opposite sides of the top portion of the hanger leg, as shown in Fig. 5, and are preferably secured thereto by means of rivets or like fastenings, 17. The lower web of each foot 3 is provided with a slotted seat 18 which serves as a bearing for the head or nut of the bolt whereby the hanger is se-

cured to the beam, post, ceiling, or other portion of the room or apartment in which said hanger is to be mounted. The formation of the T-shaped slot 1^a in the blank for the hanger leg, provides the desired opening in the upper portion of said leg for the reception of the depressed foot, while still preserving the full length of flange 14, for attachment to the sole plate.

If desired, the opposite feet 3 may be disconnected from each other, especially in short hangers, or, instead of the foot-plates and sole-plate constituting parts of an integral structure, as shown in Fig. 1, they may be separate members riveted or otherwise secured together, as shown for instance in Fig. 14.

The intermediate transverse brace 4 is composed of two U-shaped members 20 placed back to back, the opposite side flanges of these members contacting with the inner faces of the wings 10 of the legs and being secured thereto by means of rivets 21 or equivalent fastenings, these U-shaped members being of such length as to abut at the ends against the back members of said side legs, as shown in Fig. 8, in order to relieve said rivets or other fastenings from the lateral shearing strain to which they might otherwise be subjected. In some cases it may be advisable to provide the brace members 20, with inturned flanges 20^a (Fig. 16) which lie against the inner face of the back web of the leg 1 and are riveted or otherwise secured thereto, these rivets either supplementing or supplanting the rivets 21. In this construction the rib 6 is preferably discontinued throughout the central portion of the leg. The abutting back portions of the brace members 20 are secured together by rivets or equivalent fastenings 22, which also serve to secure to the brace the opposite flanges of upper and lower box-like structures 23 composed of bent plates of sheet metal whose opposite inturned end flanges bear against the inner faces of the side flanges of the brace members 20, as shown in Fig. 11.

Within the lower box member 23 is a transverse yoke 24, and between the latter and the bottom part of said lower box member 23 is confined a nut 25 to which is adapted the upper confining screw 26 for the hanger 27, the top portion of the upper box member 23 serving to support the lock nut 28, whereby said confining screw 26 is secured in position after adjustment, said box member and yoke being laterally slotted, as shown in Fig. 2, in order to permit such lateral adjustment of the confining screw 26 as may be necessary.

The hanger 27 is retained in position laterally by engagement with lateral adjusting and retaining screws 29, each of which engages a nut 30 confined between the opposite

flanges 31 of a U-shaped reinforcing plate 32 which abuts against the back web of the leg 1 and is secured thereto by means of rivets 33 or equivalent fastenings, the lock nut 34 for each of the lateral screws 29 bearing against said back web of the leg, as shown in Fig. 2, said web, as well as the web of the reinforcing plate 32, being slotted vertically to permit of vertical adjustment of said retaining screws 29. This portion of the hanger therefore presents, as shown in Fig. 9, a hollow open-faced leg, a trough-shaped part arranged in the leg with its bottom wall in abutment with the wall thereof, a screw penetrating the abutting walls, and nuts on said screw whereof one is held against rotation by said trough-shaped part and the other is arranged outside of the leg. The reinforcing plates 32, by preference, extend down to the bottom of each of the side legs 1 and the side flanges 31 of said reinforcing plates are perforated for the reception of the bolts 35, whereby the side flanges of the bottom yoke 5 are secured to the side flanges 7 of the legs, as shown in Fig. 10, said yoke also having, at each end, an upturned stay 5^a which bears against the back web of the corresponding side leg, and thus serves to aid in retaining the yoke in its proper lateral position and aids to that extent in relieving the bolts 35 from lateral shearing strain.

The lower portion of the side flanges of each of the reinforcing plates 32, have inturned flanges 31^a, as shown in Fig. 10, whose edges abut, and thus form a box, which prevents deformation of the lower portion of either leg of the hanger or the end of the yoke engaging the same, by reason of the pressure of the transverse bolt 35.

In connection with the yoke 5 is employed a box-like structure 23^a and transverse yoke 24^a similar to those employed in connection with the lower member of the center brace 4, the yoke 24^a securing in place a nut 25^a to which is adapted the lower supporting and adjusting screw 26^a of the hanger, the lock nut 28^a for said supporting and adjusting screw bearing upon the bottom web of the yoke 5, as shown in Figs. 2 and 11.

The back webs of the side legs 1 are, by preference, so shaped as to form bosses 36 with vertical faces for contact with the lock nut 34 of the lateral adjusting and confining screws 29, in order that the latter may be disposed horizontally instead of at an angle, although, when the latter disposition of the lateral screws 29 is not an objection, these bosses 36 may be dispensed with and the inclination of the back webs of the side legs of the hanger may be continuous throughout. The reinforcing plates 32 are shaped to conform to the bosses 36, and shoulders 36^a are formed at the base of each boss for engagement with a corresponding shoulder on the

reinforcing plate, whereby vertical support for each reinforcing plate is provided independently of the bolts or rivets whereby it is secured to the leg of the hanger.

5 I may, in constructing the transverse center brace 4, employ, instead of two U-shaped members placed and secured back to back, a single integral structure of H-shaped cross section, such as shown in Fig. 15, said structure being either a rolled channel bar of that
10 form or a casting of iron or steel, preferably of a malleable character.

In connection with each of the opposite projecting portions of the lower member of the shaft box 27 I prefer to use a drip cup or oil receiver consisting of a box 40 open at the top and shaped at the ends to conform to the external shape of the box member in connection with which it is used.

20 Where the seat 18 for the head of the securing bolt or nut is formed on the foot piece 3, a shoulder 45 is produced and the upper edge of the back web of the corresponding leg of the hanger abuts against this shoulder, as shown in Fig. 2, thereby making a neat joint and causing the leg and foot to mutually brace each other. A plan of constructing the lower connecting yoke of the hanger and connecting it to the legs
30 of the same, alternative to that shown in Figs. 1 and 2, is represented in Figs. 17 and 18. The back web of each leg is turned inwardly to form a flange 46, which is underlapped by the flanges 47, formed by turning in the side webs of the leg, these
35 flanges 47 being confined between the flange 46, and the web of the yoke 50, which has depending side webs 51 and depending end webs 52, upwardly projecting shoulders 53 being formed at the junction of the top and side webs of the yoke, which shoulders slightly overlap the sides of the leg, and serve as a lateral brace for both the yoke and leg. The yoke is stiffened and strengthened
45 by an inserted bar 54, and the said bar, the yoke and the flanges 46 and 47 of each leg are connected together by vertical bolts 55, although they may be riveted together if desired. The bar 54 serves as a bearing for
50 the lock nut 28^a of the lower box supporting and adjusting screw 26^a, the nut 25^a which is engaged by said screw resting upon the top of the yoke and being prevented from turning by engagement with the side
55 flanges 53 of the same.

In that form of hanger shown in Figs. 17 and 18, the reinforcing plate 32, is bent at the lower end, so as to overlap and vertically confine the head of the bolt 55, as
60 shown at 56 in Fig. 17, and said head is prevented from turning by contact with inturned flanges 57 at the lower ends of the side webs 31 of the reinforcing plate, as shown in Fig. 18, as well as by inturned
65 flanges 59 at the inner edges of said side

webs, as shown in Fig. 17. Another form of lower yoke is shown at 60 in Fig. 19, said yoke having downturned side flanges 61, but having upturned ends 62 which bear against the back webs of the legs 1 as in the hanger first described. This yoke is combined with a strengthening bar 54, but has the lower lock nut 28^a seated upon a box shaped member 23^a similar to that used in the other types of hanger which I have illustrated, in order to render said nut more readily accessible than when it is contained between the opposite side flanges of the yoke.

The metal of which the legs 1 of the hanger are composed is preferably thinner or lighter than the metal from which the feet 3 and the bottom yoke 5 are made, as the conformation of the side legs which I have adopted enables me to obtain the necessary strength and rigidity in these members without the use of metal as heavy as that which is desirable in the other members of the hanger. Even these latter members of a hanger constructed in accordance with my invention, however, can be composed of relatively thin metal, and can consequently be comparatively light, the shaping of the various members being relied upon to impart the necessary strength and rigidity to the same. In no case is the shaping of such character (except, perhaps, in the case of the feet 3) that it cannot readily be imparted to the cold metal by means of comparatively simple dies, and as the only other elements of the completed hanger are ordinary commercial rivets, bolts, nuts, and set screws which can be purchased at a low price and in any desired quantity, the cost of my improved hanger is small as compared with that of previous sheet metal hangers with which I am familiar, while the work of assembling the various parts is also of such a simple character that it can be performed without the aid of highly skilled and consequently high-priced labor.

The socket in the upper half of the shaft box 27, for the reception of the lower end of the upper adjusting screw 26, has a longitudinally convex base formed on a curve whose axis is at the bearing point of the lower adjusting screw 26^a in the socket in the lower half of the shaft box, hence the said box can rock to a limited extent on this axis in order to adapt itself to slight departures of the shaft from true horizontal alignment.

I claim:—

1. A sheet metal shaft hanger having opposite side legs, each composed of a single piece bent to form a substantially closed form of box-shaped girder extending from the foot to the portion which supports the bearing, substantially as described.

2. A sheet metal shaft hanger having opposite side legs, each bent to form a sub-

stantially closed form of box-shaped girder extending from the foot to the portion which supports the bearing, and having at an intermediate point parallel side wings and an intermediate transverse brace having flanges secured to said side wings.

3. A sheet metal shaft hanger having opposite side legs, each bent to form a substantially closed form of box-shaped girder extending from the foot to the portion which supports the bearing, and having, at an intermediate point and at its lower end, parallel side wings, an intermediate transverse brace having flanges secured to the intermediate side wings, and a bottom yoke having flanges secured to the lower side wings.

4. A sheet metal shaft hanger having opposite side legs, each bent to form a substantially closed form of box-shaped girder and having sides bent at an intermediate point to form wings which are more closely related than the sides of the girder.

5. A sheet metal shaft hanger having opposite side legs, each bent to form a substantially closed form of box-shaped girder extending from the foot to the portion which supports the bearing, and having sides bent at an intermediate point to form wings which are more closely related than the sides of the girder, and an intermediate transverse brace having flanges closely related to said wings.

6. A sheet metal shaft hanger having opposite side legs bent to form, substantially, a box girder with sides bent at an intermediate point to form wings which are more closely related than the sides of the girder, and an intermediate transverse brace having flanges secured to said closely related side wings the legs having inwardly bent flanges above and below said side wings.

7. A sheet metal shaft hanger having opposite depending legs, each bent to form, substantially, a box girder having, at an intermediate point and at its lower end, parallel side wings, and having, above said intermediate side wings and between the same and the lower side wings, inturned flanges.

8. A sheet metal shaft hanger having opposite side legs bent to form, substantially, a box girder, said legs having, at an intermediate point, parallel side wings, and an intermediate transverse brace extending from one leg to the other and abutting against the back webs of the legs, and having side flanges secured to the side wings of the legs.

9. A sheet metal shaft hanger having opposite side legs bent to form, at an intermediate point, parallel side wings, and an intermediate transverse brace having a horizontal web extending from one leg to the other said brace also having, at its ends, inturned flanges abutting against and secured to the back webs of the legs.

10. A sheet metal shaft hanger having opposite side legs bent to form, at an intermediate point, parallel side wings, and an intermediate transverse brace extending from one leg to the other and having side flanges abutting against and secured to the side wings of the legs, and inturned end flanges abutting against and secured to the back webs of the legs.

11. A sheet metal shaft hanger consisting of opposite depending side legs each having a back and opposite side members and struck-up foot pieces separate from the legs and extending longitudinally beyond the same but contained between the opposite side members of said legs at the upper ends of the latter.

12. A sheet metal shaft hanger consisting of opposite depending side legs each having a back and opposite side members and struck-up foot pieces contained between the opposite side members of said legs at the upper ends of the latter and secured at their inner ends to the inner webs of the legs, said foot pieces having base plates secured to laterally extending flanges on said legs.

13. A sheet metal shaft hanger consisting of opposite depending side legs each having a back and opposite side members and struck-up foot pieces contained between the opposite side members of said legs at the upper ends of the latter and having base plates which are secured to laterally extending flanges on said legs, and have depending flanges beyond said lateral flanges of the legs.

14. A sheet metal shaft hanger consisting of opposite depending side legs having, at the top, an expanded portion presenting lateral flanges projecting outwardly beyond the side members of the legs, and a sole plate secured to said flanges and having depending side flanges beyond the same.

15. A sheet metal shaft hanger consisting of opposite depending side legs having laterally extending flanges at the top, and a sole plate secured to said flanges and having depending side flanges beyond the same, which flanges are bent in under the side flanges, said sole plate also having at each end a struck-up foot piece which is contained between the side webs of the legs.

16. A sheet metal shaft hanger having depending legs, each having a back with opposite side flanges struck-up feet contained between the side flanges of the legs and closed at both inner and outer ends and having inner webs secured to overlapping portions of the inner webs of the legs.

17. A sheet metal shaft hanger having depending legs, each having a back with opposite side flanges struck-up feet contained between the side flanges of the legs and having bottom webs with shoulders against

which abut the upper ends of the back webs of the legs.

18. A transverse brace for a sheet metal shaft hanger, said brace consisting of upper and lower U-shaped members disposed back to back and having said back members perforated for the passage of an adjusting screw, and secured together to form a horizontal web.

19. A sheet metal shaft hanger having a transverse brace member, a box-adjusting and retaining screw, a nut engaging the same, and a yoke plate and box secured to said brace and serving to retain said nut.

20. A sheet metal shaft hanger having a transverse brace member with a horizontal web, a shaft-box adjusting and retaining screw, and a box-like structure secured to said horizontal web of the brace and providing a bearing for a lock nut applied to said screw.

21. A sheet metal shaft hanger having depending side legs, side-adjusting and retaining screws for the shaft box, reinforcing plates secured internally to said depending side legs, and nuts engaging said adjusting screws and prevented from turning by the side flanges of said reinforcing plates.

22. A sheet metal shaft hanger having opposite side legs, a yoke connecting the same at the bottom of the hanger, securing bolts for said yoke, side adjusting screws for the shaft box and reinforcing plates through which said screws pass, said plates also extending downwardly to receive the yoke-securing bolts.

23. A sheet metal shaft hanger having opposite side legs, a yoke connecting the same at the bottom of the hanger, securing bolts for said yoke, and reinforcing plates applied to the lower portions of the side legs and having side flanges through which pass the yoke-securing bolts, said side flanges having inturned and abutting ends.

24. A sheet metal shaft hanger having opposite side legs, a yoke connecting the same at the bottom of the hanger and secured to said side legs by horizontal bolts passing transversely through side flanges of the legs and yoke, and reinforcing plates abutting against the inner faces of the back

webs of the side legs at the lower portion of the same and secured to said back webs.

25. A sheet metal shaft hanger having opposite side legs, with shouldered back webs and reinforcing plates abutting against the inner faces of said back webs and having shoulders engaging those of the back webs and receiving vertical support therefrom.

26. A sheet metal shaft hanger having side legs with opposite parallel side wings at the lower end, a transverse yoke having side flanges bearing against said side wings, reinforcing plates also having side flanges overlapping those of the yoke, and transverse securing bolts passing through the side wings of the legs and through the side flanges of said yoke and reinforcing plates.

27. A sheet metal shaft hanger having opposite depending side legs, each consisting of a single piece bent to form a substantially closed form of box girder, extending from the foot to the portion which supports the bearing and through the side leg having a stiffening rib pressed up therefrom.

28. A sheet metal shaft hanger having opposite depending side legs, each bent to form substantially a box girder, the back web of each leg having a stiffening rib pressed up therefrom and projecting inwardly from said web.

29. The within described blank for the side leg of a sheet metal shaft hanger, said blank being shaped to conform to the shape of the leg and having in its upper edge a T-shaped slot.

30. In a shaft hanger, the combination of a hollow open-faced leg, a trough-shaped part arranged in the leg with its bottom wall in abutment with the wall thereof, a screw penetrating the abutting walls, and nuts on said screw, whereof one is held against rotation by said part and the other is arranged outside of the leg.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES A. CONDÉ.

Witnesses:

HAMILTON D. TURNER,
KATE A. BEADLE.