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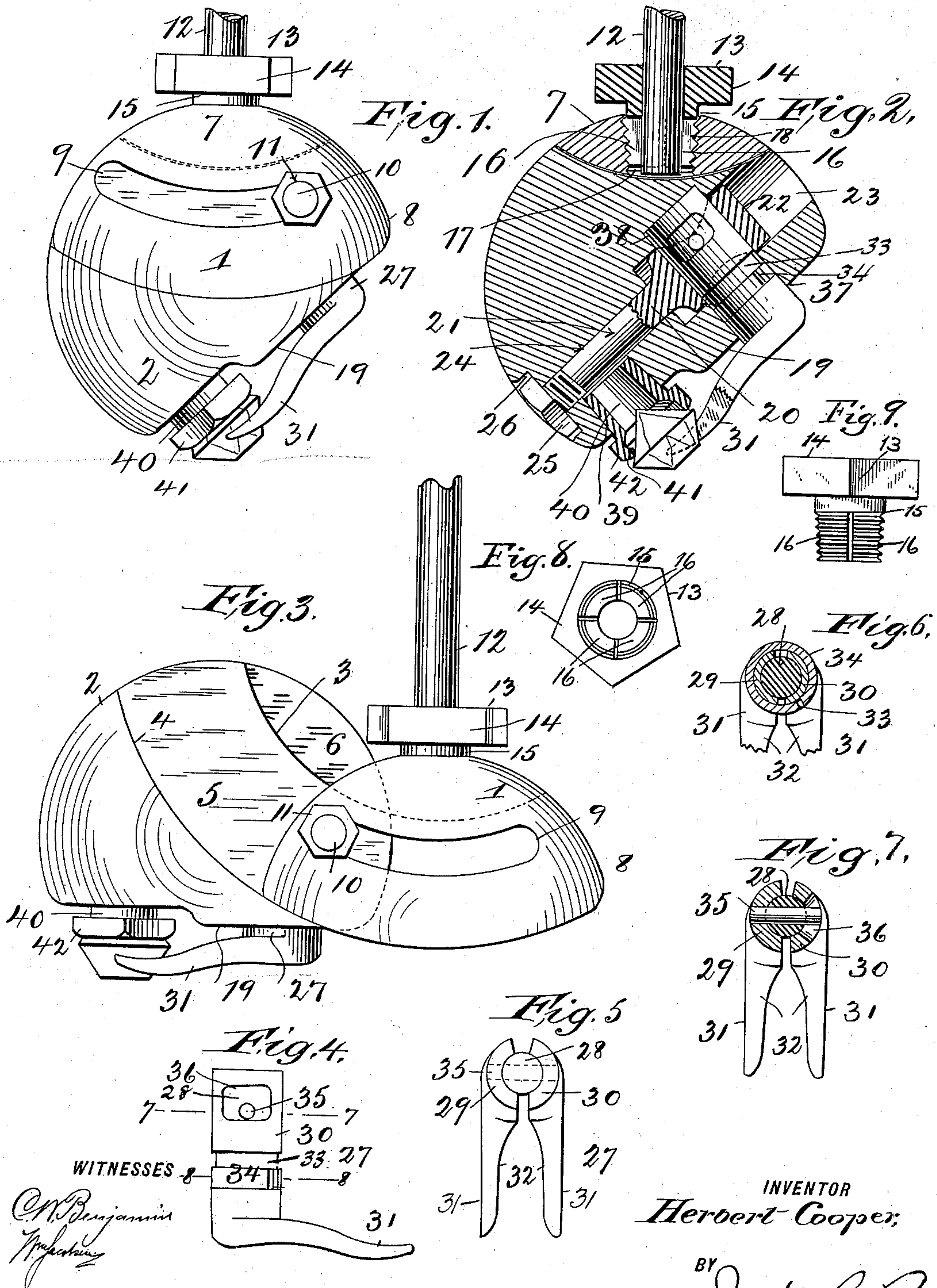
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H. COOPER.

DOP FOR DIAMOND CUTTING AND POLISHING.

(Application filed Nov. 5, 1896.)

(No Model.)



UNITED STATES PATENT OFFICE.

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DOP FOR DIAMOND CUTTING AND POLISHING.

SPECIFICATION forming part of Letters Patent No. 609,141, dated August 16, 1898.

Application filed November 5, 1896. Serial No. 611,118. (No model.)

To all whom it may concern:

Be it known that I, HERBERT COOPER, a citizen of the United States, residing at Jersey City, county of Hudson, and State of New Jersey, have invented new and useful Improvements in Dops for Diamond Cutting and Polishing, of which the following is a specification.

My invention relates to improvements in devices employed in the art of diamond cutting or polishing, and specifically it relates to improvements in the tool known as a "dop" or holder for the stone during the cutting or polishing operation.

Prior to my invention dops have been constructed by forming a metal cup having a stem for holding the cup, in which latter molten metal was poured to form a convex projecting surface in the cup, the stone being set in the molten metal at a point on its surface which will give the desired angle to the stone and present the required facet to the cutting or polishing tool, and to change the angle it was necessary to melt or otherwise remove the stone out of the metal and reset it therein in the same way. This method of holding the stone and adjusting it in relation to the supporting-frame is entirely superseded by my invention, in which the dop is a permanent tool, the casting of metal avoided, the stone readily secured or removed therefrom or its angle readily altered and firmly maintained, and the change from facet to facet readily accomplished, thus entirely dispensing with the employment of skilled labor for setting the stone in the dop.

My invention consists in the details of construction and combination of parts hereinafter described, and further pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a front elevation of the dop; Fig. 2, a substantially central sectional elevation; Fig. 3, a front elevation showing the clamp-section adjusted on the stem-section to present the crown of the stone to the cutting or polishing tool. Fig. 4 is a side elevation of the clamping-jaw inverted and reversed. Fig. 5 is a plan view of the same. Fig. 6 is a section through the stem of the clamp on the line 8 8, Fig. 4. Fig. 7 is a like view on the line 7 7, Fig. 4. Fig. 8 is an in-

verted plan view of the sleeve-nut by which the stem is held, and Fig. 9 is a side elevation of the same.

Similar numerals of reference indicate like parts throughout the several views.

In the drawings, 1 and 2 represent, respectively, the clamp and stem sections of the dop, each of which are pieces of cast metal, so configured that when clamped together, as indicated in Fig. 1, it will present substantially a spherical or globular appearance closely approximating the shape of the dop heretofore employed.

The "clamp-section" 2, so called because of its having the clamp for holding the stone in place, is greater in bulk than the "stem-section" 1, also so called by reason of its having the supporting-stem secured thereto and which may hereinafter be referred to as the "stationary" section, and said clamp-section is provided at the top with two segmental shoulders 3 and 4, formed by cutting out the metal of the section to form the flat-faced recesses 5 and 6, the lower edges of which are the shoulders 3 and 4, the recess 6 being the deepest, the shoulder 4 being flush with the exterior of the section. The segment thus removed (or which the section 2 lacks to form the partially globular or spherical body) is utilized to form the section 1, it being understood that both sections are cast separately, the upper inner portion of the section 1 having a projecting shoulder 7, interlocking with the recess 6, the lower portion 8 of the section 1 engaging the recess 5, the lower surface of the parts 7 and 8 being segmental and concentric with the shoulders 3 and 4.

When the sections 1 and 2 are clamped together, their exteriors are flush. A transversely-extending and segmental slot 9 is formed in the part 8 of the section 1, and to the body of the section 2 at the recess 5 is secured a threaded pin or stud 10, which extends through the slot, and on the end of the stud is a nut 11, lying against the section, by means of which the two sections can be held together in any position of adjustment.

At 12 is a rod or stem by means of which the stem-section 1 may be secured to a supporting-frame. Such supporting-frame is held against vibration, (its use being well un-

derstood in the art,) and the stem 11 is secured thereto, so as to be maintained substantially perpendicular during the cutting or polishing operation, which position the stem 12 has been given in the drawings, the importance of which will be hereinafter noted.

The stem 12 is detachably secured to the dop and is directly secured to the section 1 by means of a sleeve-nut 13, the head portion 14 being squared to receive a wrench or the like, the sleeve being formed into a tapering projection 15, provided with an external thread, the projection being divided into spring-arms 16 to form a clamp for gripping the stem, which passes through a longitudinal aperture in the nut.

The projection 7 of the stem-section 1 is provided with a conical hole 17, in which is formed an internal thread 18, and by screwing the nut into the hole the spring-arms 16 are forced against the stem 12, firmly binding the parts together. A few turns of the nut in the opposite direction will free the dop from the stem, if desired.

The clamp-section 2 has a portion planed off, as at 19, to provide an operative surface for the manipulation of the clamp and socket hereinafter described. This surface extends at an angle to the perpendicular axis of the stem 12 when the parts are in the position shown in Fig. 2 and lies horizontal to said axis when adjusted as in Fig. 3, the former showing the grinding or polishing of one of the angular facets and the latter the crown or top of the stone.

The clamping and socket devices are as follows: At 20 is a lock-bolt lying inside the clamp-section 2 and extending therein parallel with the surface 19, the lock-bolt comprising a threaded shank 21 and an enlarged circular eye or collar 22, transversely apertured, the clamp-section having an inclined circular aperture 23 to receive the collar 22 and a like and smaller aperture 24 to receive the shank 21. The end of the shank is provided with a nut 25, which is received within a countersink 26 in the section 2.

The clamp 27 is shown in detail in Figs. 4, 5, 6, and 7 and comprises a central stem or pillar 28, about which lies two segmental and concentric shanks or stems 29 30, each one being provided with an outwardly-extending clamping-foot 31, having angularly-disposed inner faces 32. The shanks 29 30 and the pillar 28 form a circular stem, of which the clamping-feet form the extremity thereof; and one of the shanks—in this case 30—is made revoluble on the pillar 28, so as to allow of the clamping-feet 31 being brought together or moved apart to accommodate them to stones of varying dimensions, the other shank 29 being fastened to the pillar by solder or the like, or the shank 29 and pillar 28 can be formed in one piece.

I have provided means for allowing the feet 31 to be moved out of horizontal alignment to enable them to embrace a stone at

varying points on its surface, and to secure this end and also to hold the two shanks together and to secure other results I employ the following: Each of the shanks is provided with a circumferential groove 33, and in these grooves is fitted a ring 34, narrower than the groove, which holds the shanks together and allows of their relative revoluble movement, while at the same time the grooves being deeper than the ring the shank 30 can be moved longitudinally on the pillar 28, or vice versa, to disalign the feet 31 without separating the parts; and to more fully secure the shank 29 and pillar 28 together and to a certain extent limit the vibration of the shanks in relation to each other I pass a pin 35 through the pillar 28 and shank 29, which extends into a slot 36, formed in the shank 30, the slot being of a width preferably corresponding to the aggregate movement of the pin and of a height to allow of the longitudinal adjustment of the shanks and feet before stated.

The stem of the clamp is received in a circular aperture 37, formed in the face 19 of the section 2 and so disposed as to cause the clamp-stem to cross the aperture 23 at right angles thereto and to bring the feet 31 substantially parallel to such surface, a circular recess 38 being formed in the section 2 on the opposite side of the aperture 23 to seat the end of the clamp-shank, the apertures 37 38 forming a bearing for the clamp, against which the shanks are forced by the nut 25 to hold the clamp in the dop in its proper position of projection therefrom and to grip the shanks 29 30 to hold them in their particular position of adjustment.

The face 19 of the section 2 is provided with a conical aperture 39, in which is seated a conical and hollow ferrule 40, having an annular seat 41 at the lower end to receive the stone, as shown in Fig. 2, and a squared head 42, by means of which the ferrule can be freed from its seat in the dop, the ferrule acting as a socket to receive the stone and allow of its being adjusted to the required angle therein, the pressure of the clamp-feet 31, which embrace the stone at their inclined faces 32, holding the stone firmly in the seat 41 and forcing the cone of the ferrule into its conical seat, the faces 32 and the conical seat for the ferrule preventing the stone turning in its seat or out of the angular disposition given it.

It is apparent that many changes and modifications can be made in the construction herein described without departing from the spirit of my invention.

I claim—

1. The combination in a dop, of the stem 12 secured to the dop, an adjustable clamp having a stem and a plurality of independently-movable gripping-fingers, said clamp being bodily adjustable in the direction of the length of the clamp-stem, means for securing said clamp in its position of adjust-

ment, and a detachable stone-socket secured in the dop within the plane of movement of said fingers, substantially as described.

2. In a dop, the combination with the perpendicular stem 12, the dop-section 1 secured to the stem and provided with an upwardly-curving slot, the section 2 bodily adjustable in a circular and perpendicular arc on section 1, and a transversely-extending bolt 10 passing through the slot in section 1 and secured to the section 2, whereby said adjustment is had, the section 2 having a clamping mechanism for holding a stone, substantially as described.

3. The combination with the stem 12 secured to the section 1, the section 2 bodily adjustable in a circular and perpendicular arc on section 1, and a clamp carried by section 2 having a stem adjustable in the direction of its length, and securing means for said clamp, substantially as described.

4. In a dop, the combination with the stem 12, the dop-section 1 secured thereto, the section 2, both sections having horizontal and perpendicular faces 3, 4, 5, 6, thereby forming an interlocking guide, a horizontally-disposed bolt 10 extending out from the section 2, and passing through an upwardly-extending and segmental slot formed in the section 1, a nut on the bolt, and a stone-clamping mechanism carried by section 2, substantially as described.

5. The combination in a dop, of a clamp comprising a stem and a plurality of independently-movable gripping-fingers extending therefrom, the stem being movable in the dop, means for holding a stone in the dop located within the plane of movement of said fingers, and a bolt for securing the fingers and clamp in position in relation to said means, substantially as described.

6. In a dop, the combination with a dop-section having a supporting-stem, a second dop-section supported on the first section so as to be vibrated upwardly in the plane of an arc of a circle, a stone-clamp in said rotatable section having a stem movable in the direction of its length and normally disposed at an angle to said supporting-stem and adapted to be moved into parallelism therewith, feet on the stem, a stone-socket in the latter section within the plane of movement of said feet, and means for securing said clamp-stem in position, substantially as described.

7. In a dop, the combination with the clamp-stem movable in the dop and comprising a plurality of shanks having gripping-feet, a stone-securing socket in the dop and a screw-operated bolt in the dop embracing said shanks and binding said stem in place, substantially as described.

8. The combination in a dop having a stem, of a clamp comprising a stem, a plurality of shanks provided with gripping-fingers, said shanks being adjustable in the direction of their length, and means for securing said

shanks in their position of adjustment in said dop, substantially as described.

9. The combination in a dop, of a clamp comprising a central stem and gripping-fingers having shanks rotatable about and movable lengthwise on said stem, the clamp being bodily adjustable in the dop in the direction of its length, and means for securing said clamp and fingers in either of its or their positions of adjustment in said dop, substantially as described.

10. The combination in a dop, of an adjustable clamp provided with adjustable gripping-fingers, and means for securing said clamp and fingers in their position of adjustment in said dop, substantially as described.

11. The combination in a dop, of the clamp having a stem movable in the direction of its length, and clamping-feet extending outwardly from said stem, and means for adjustably securing said stem in the dop, said means engaging the stem and being movable transversely of said stem, substantially as described.

12. The combination in a dop, of a clamp comprising a stem and adjustable clamping-feet extending therefrom, a socket for receiving a stone secured to the dop within the plane of movement of said feet, and means for longitudinally adjusting said clamping-feet in relation to the socket, substantially as described.

13. In a dop, the combination with the body thereof, of a clamp having a stem and outwardly-projecting clamping-feet, said feet being separable, a socket, and means for adjustably securing said feet in relation to said socket, substantially as described.

14. In a dop, the combination with the body thereof, of a clamp comprising the stem, and feet extending therefrom, said feet being adjustable longitudinally on the stem in relation to each other, a socket held in said body, and means for securing said feet in their position of adjustment in relation to said socket, substantially as described.

15. The combination with the dop-section, of the longitudinally-movable bolt having an apertured eye, an aperture formed in the said section for receiving said bolt, further apertures formed in said body whose axes cross the first-mentioned aperture, a clamp having a stem passing through said latter apertures and an aperture formed in the eye of the bolt, and outwardly-extending clamping-feet on said clamp, substantially as described.

16. The combination with the dop-section, of the longitudinally-movable bolt having a threaded shank 21 and an enlarged apertured collar 22, and a clamp having a circular stem passing through apertures in the said section and embraced by said collar, and outwardly-extending feet on said clamp, substantially as described.

17. The combination in a dop, of a clamp having a longitudinally-movable stem and

separable gripping-feet extending therefrom, a socket detachably secured in said dop, and means for securing said feet in their position of adjustment over said socket, substantially as described.

5 as described.

18. A clamp comprising the separable shanks, having independent feet, and means for securing the said shanks revolubly upon each other, substantially as described.

10 19. The combination with the clamp-shanks, each having an outwardly-extending foot, and means for securing the shanks together, substantially as described.

15 20. The combination with the clamp-shanks, each having an independent foot, a central circular pillar partly embraced by said shanks, and means for securing said shanks rotatably upon each other, substantially as described.

20 21. The combination with the segmental shanks, the central pillar secured to either of said shanks, each of the shanks having circumferential grooves, and a ring in said groove for securing said shanks together, each
25 of the shanks having independent projecting feet, substantially as described.

22. The combination with the segmental clamp-shanks, a central circular pillar 28 secured to either of said shanks, a pin secured to either of said shanks and said pillar, and 30 a slot formed in the opposite shank through which said pin passes, substantially as described.

23. The combination with the segmental clamp-shanks, each shank having an outward- 35 ly-projecting foot, circumferential grooves formed in the said shanks, a ring embracing said shanks in said grooves, the ring being of a width smaller than the longitudinal width of the grooves, substantially as described. 40

24. The combination with the segmental clamp-shanks, of the interposed pillar, a pin extending from said pillar, a slot in one of said shanks into which said pin projects, said slot being longitudinally wider than the di- 45 ameter of said pin, substantially as described.

Signed in the city, county, and State of New York this 2d day of November, 1896.

HERBERT COOPER.

Witnesses:

WM. JACOBSEN,
SERENA B. KUHN.