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J. MANN

1,994,585

OBSTETRICAL FORCEPS

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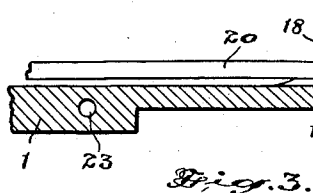


Fig. 3.

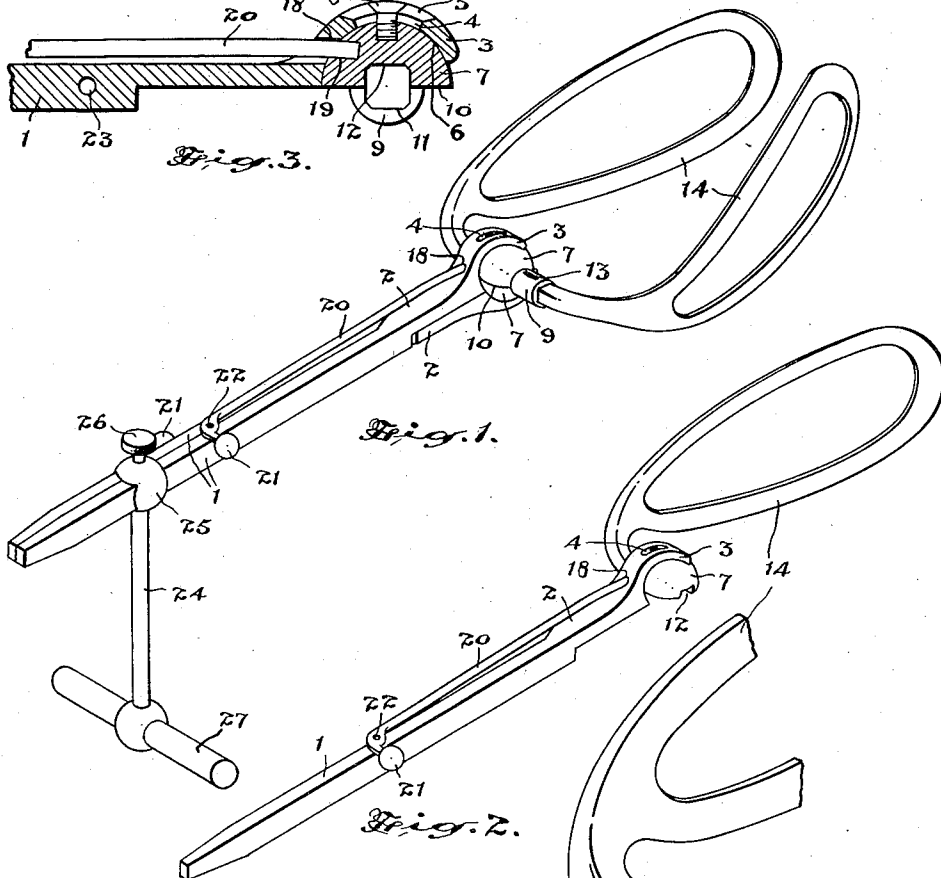


Fig. 1.

Fig. 2.

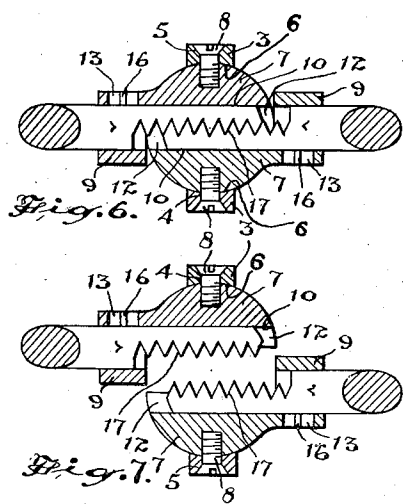


Fig. 6.

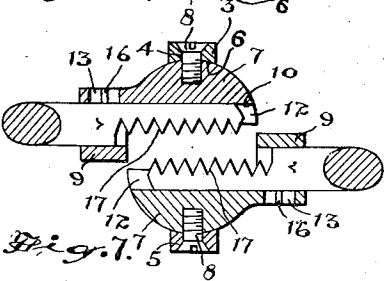


Fig. 7.

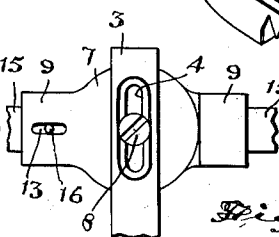


Fig. 4.

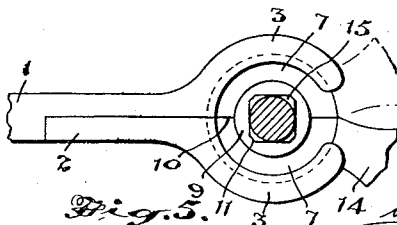


Fig. 5.

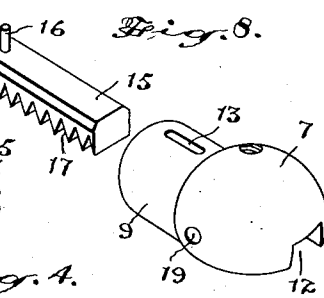


Fig. 8.

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UNITED STATES PATENT OFFICE

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OBSTETRICAL FORCEPS

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14 Claims. (Cl. 128—323)

The principal objects of this invention are to minimize the dangers to both mother and child in the use of forceps in the act of obstetrication and to provide an instrument which will enable the obstetrician to adjust the blades at various angles and spacing to obtain a grip which will not injure the child, and which will enable the application of the required force without injury to the mother.

The principal features of the invention consist in the novel construction of the forceps whereby the blades are pivotally mounted with a universal connection, on a separable pair of shank or handle members and said blades are capable of lateral adjustment in relation to the shank portions to effect a varied spacing therebetween to fit the head of the infant in accordance with its size and which will be locked securely in the assumed spacing.

A further and important feature consist in the novel construction of the swivel support of the blades whereby they may be readily separated to facilitate their placement and whereby the swivel members are temporarily locked against swivel movement during the placement operation and released from the locking means to operate on a universal joint when the separated blades and shank members are interlocked.

In the accompanying drawing Figure 1 is a perspective view of the assembled instrument.

Figure 2 is a perspective view of one of the sections as used in the placement operation.

Figure 3 is an enlarged longitudinal mid-sectional view showing the swivel connection and the means for locking same.

Figure 4 is a plan view of the swivel connection.

Figure 5 is a side elevational view of the swivel connection.

Figure 6 is a sectional detail of the swivel connection assembled showing the means of adjustment of the blades.

Figure 7 is a sectional detail of the swivel connection showing the separable sections apart.

Figure 8 is a perspective detail of a portion of one of the adjustable blades separated from the swivel head.

In the practice of obstetrics it is necessary at times to use forceps to aid delivery and the ordinary instrument is formed of two rigid members made separable to enable the placement of the blades on either side of the head of the child, these are then connected together and form a rigid instrument which when force is applied thereto frequently results in serious injury to the mother and possibly to the child.

In the present device the shank member is capable of considerable pivotal movement in relation to the blades and the manipulation of the instrument in the hands of the skilled obstetrician enables a considerable range of movement in applying the necessary force to effect delivery, consequently injury of the mother is avoided.

As shown in the accompanying drawing, the handle member is formed of a pair of shanks 1 which are adapted to fit snugly side by side and are provided with offset portions 2 which overlap.

The ends 3 of each of the offset portions 2 of the shanks are curved in substantially semi-circular form and each is provided with a longitudinal slot 4 extending therethrough, the upper portion 5 of said slot being bevelled.

The inner surface 6 of each of the curved ends 3 is formed part spherical in cross section to receive the semi-spherical head 7 which is secured therein by a countersunk headed screw 8 which is capable of movement longitudinally of the slot in the curved end. A universal joint is thus formed in which the pair of members 7 rotate freely in the direction of the slots 4 in the ends of the members 2 and pivot on the screws 8 in a plane transverse to the plane of rotation.

The head members 7 are each provided with a boss 9 which projects half of its depth beyond the flat face 10 of the hemi-spherical portion and a squared orifice 11 extends longitudinally through the boss, and a half portion thereof continues in the form of a slot 12 across the head.

These two members when fitted together form a spherical head with a squared orifice extending completely therethrough. Slots 13 are formed lengthwise of the bosses 9.

The forcep blades are formed of curved loops 14 having squared shank ends 15 which fit into the squared orifices 11, and pins 16 secured in these shank ends extend into the slots 13 and thus secure the blades in the head members but permit a limited sliding movement. The shank ends 15 are cut away so that they overlap each other within the squared orifice of the head when assembled and the meeting faces are provided with interlocking teeth 17. It will be understood that when the handle shank members 1 are separated the shank ends 15 of the forcep blades may slide freely in their respective heads and when the handle members are brought together as illustrated in Figure 1, the toothed shank members will engage as illustrated in Figure 6 and the blades will then be rigidly held from lateral displacement relative to each other.

Each of the handle shanks 1 is provided with

a hole 18 extending through the base of the curved end 3 and the hemi-spherical head portions 7 are provided with holes 19 to register therewith.

Each handle shank is provided with a rod 20 which is inserted through the hole 18 to enter the hole 19 and lock the head and the blade carried thereby. These rods are each formed with handle ends 21 provided with pins 22 adapted to enter a small hole in the handle shank and the rods are formed of spring metal and remain securely in position.

The half members of the forceps when thus assembled as shown in Figure 2, are quite rigid and the obstetrician may manipulate the blade into position. When both blades are positioned the handle shanks are brought together into their interlocking position, one of the shanks having a hole 23 therein to receive a dowel pin on the other. As the separate elements of the forcep are thus brought together the teeth 17 engage in accordance with their positioning by the operator and they then become securely locked.

Upon the bringing of the handle shanks together the handle member 24 which is provided with a head 25 having a squared orifice, is placed over the shanks and secured in position by a thumb screw 26.

The handle 24 is provided with a T-head 27 to be grasped in the hand of the obstetrician.

When the instrument has been placed in position and the handle secured thereon the lock rods 20 are released and withdrawn thereby releasing the spherical head of the blade section and permitting the handle shanks to swivel on their universal connection.

The arrangement of the handle 24 at right angles to the shank members 1 permits of the manipulation of the instrument so that while the direction of the force applied is in proper alignment, the handle shanks will be raised to any desired angle to avoid injury to the patient.

The device herein described is extremely simple and of such construction that it can be readily separated for cleaning and sterilizing and by reason of its flexibility, it will enable the operator to apply his skill with the assurance of avoiding many conditions which with the instruments hitherto used are unavoidable.

A very important factor in this construction is the universal joint connection between the blades and the operating shank which permits manipulation of the shank at any angle in relation to the blades, and through the contact of the screws 8 in the slots 4 rotative force may be applied to the blades to correct the position of the child's head as well as tractive force to assist delivery. Further, this universal joint enables forcep blades with cephalic curves being applied in an inverted position permitting application to a head located in a posterior position.

What I claim as my invention is:—

1. An obstetrical forceps having blades mounted upon the handle for universal tilting movement and being each slidably adjustable in a direction transversely thereof.

2. An obstetrical forceps comprising a pair of separable handle members, each having a curved end of semi-circular form provided with a slot disposed in the longitudinal direction of the handle, a hemi-spherical head rotatably mounted in each of said curved ends, a headed screw secured in each of said heads and slidably engaging said slot, means for locking said head from rotation, and a blade mounted on each of said heads and

slidably adjustable in a direction transversely of said slot.

3. In an obstetrical forceps the combination with a pair of separable handle members, each having a curved end of semi-circular form, a hemi-spherical head rotatably secured in each of said curved ends, each head having a blade extending therefrom, said curved ends each having a hole therethrough and each head having a hole to register with the hole in the curved end, of a resilient rod slidably inserted through the hole in the curved end and the hole in the head to lock the members together, and means for locking said rods to the handle under tension to prevent accidental extraction of the rods from locking position.

4. An obstetrical forceps comprising a pair of separable handle members, a head pivotally mounted on each of said handle members, a blade having a shank non-rotatably and slidably mounted in each of said heads, and means for locking the shanks of said blades from a sliding movement.

5. An obstetrical forceps comprising a pair of separable handle members, a head pivotally mounted on each of said handle members, a blade having a shank non-rotatably and slidably mounted in each of said heads, said blade shanks fitting together and each having interlocking teeth adapted to secure the shanks from relative sliding movement.

6. An obstetrical forceps comprising a pair of separable handle members, each having a curved end of semi-circular form, a hemi-spherical head rotatably mounted in each of said curved ends and having an offset boss, said boss having a squared hole therethrough, blades each having a squared shank slidable one in each of said heads, said shanks having reduced end portion formed with interlocking teeth, and means for securing said handle shanks and said heads and toothed blade members in interlocking engagement.

7. An obstetrical forceps comprising a pair of cephalic blades mounted for relative movement, means guiding said blades to cause the same to move bodily apart or together, an equal distance apart throughout their length, means for rigidly holding same in adjusted positions, and a shank mounted to rotate in a plane transverse to the common plane of said blades.

8. An obstetrical forceps comprising a spherical head, a pair of cephalic blades mounted for parallel sliding adjustment in said head, means for locking said blades in spaced adjustments, and a shank embracing said head and freely rotatable thereon in a plane transverse to the plane of the sliding support of said blades.

9. An obstetrical forceps comprising a pair of cephalic blades each having inturned shank ends adapted to interlock in several positions for the spacing of the blades, a head embracing said interlocking shank ends, and a shank embracing said head and rotating free in a plane transverse to the axis of said shank ends.

10. An obstetrical forceps having a pair of blades and shanks connected together with a universal joint capable of applying a turning force to the blades at various angular positions of the shank, said blades being both adjustable transversely of the shanks without altering their relative angularity.

11. An obstetrical forceps comprising a pair of separable handle members each having a semi-circularly slotted end, blades having interlocking hemi-spherical ends rotatably mounted in said

handle members, and pivots engaging said slotted ends thereby forming a split universal joint capable of transferring a torsional turning force to the blades irrespective of the angular position to which the handles may be swung.

5 12. An obstetrical forceps having separable handle sections presenting a part spherically walled socket therebetween, a spherical member universally adjustable in said socket, and blade members having shank ends extending into said spherical member respectively from opposite sides thereof and adjustably retained therein.

10 13. An obstetrical forceps having a handle shank and a member mounted in the handle shank for universal swinging adjustment relative thereto, a pair of blade members each individually

slidably adjustable relative to said member and to each other to permit a balanced spacing of the blades, and means for locking said blades in adjusted positions.

14. An obstetrical forceps having a handle shank and a member mounted in the handle shank for universal swinging adjustment relative thereto, a blade member slidably mounted in said member, a second blade member slidably mounted in said member parallel to the other member, whereby the blades are adjustably spaced without altering their relative angular relation, and means for locking said blades together in their adjusted relation.

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