United States Patent

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[73] Assignee

[54] **METALLIC COMPONENT FOR INTRAUTERINE CONTRACEPTIVE DEVICE**
9 Claims, 6 Drawing Figs.

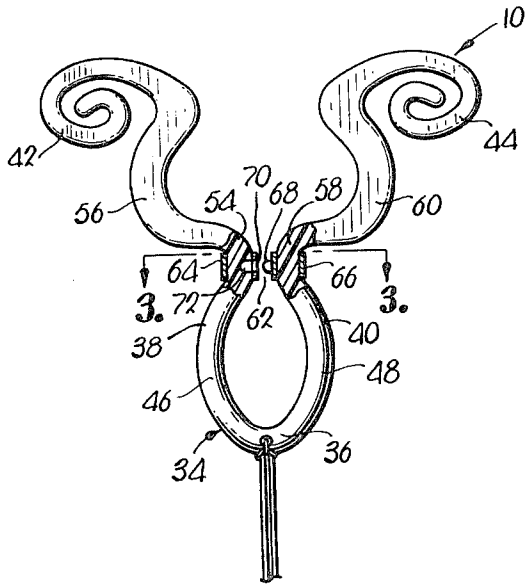
[52] **U.S. Cl.** **128/130,**
[51] **Int. Cl.** **A61f 5/46**
[50] **Field of Search** 128/128, 129, 130, 131, 270

[56] **References Cited**
UNITED STATES PATENTS

982,996	1/1911	Rowell	128/130
3,291,125	12/1966	Robinson	128/130
3,467,087	9/1969	Lebech et al.	128/130

Primary Examiner—L. W. Trapp
Attorney—Schmidt, Johnson, Hovey & Williams

ABSTRACT: An intrauterine contraceptive device having a loop that is normally closed during use and when properly positioned within the uterus but capable of opening when not properly positioned within the uterus. A metallic component which may form a part of the releasable structure of the loop enhances the contraceptive effect of the device.



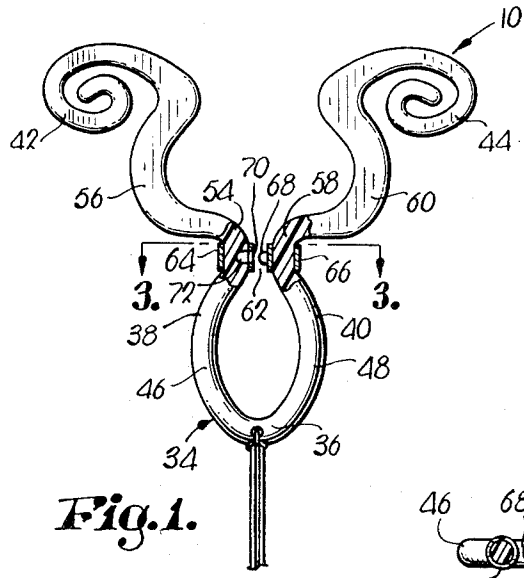


Fig.1.

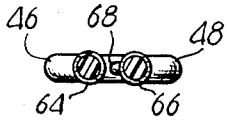


Fig.3.

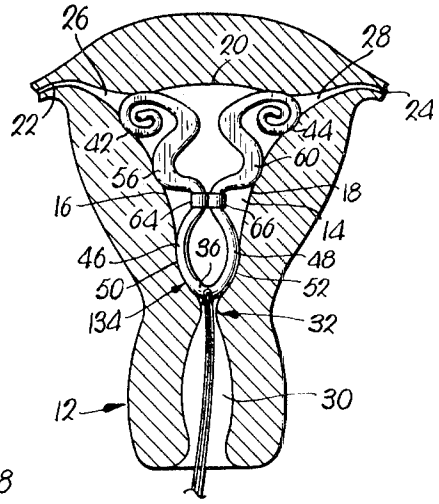


Fig.2.

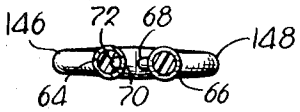
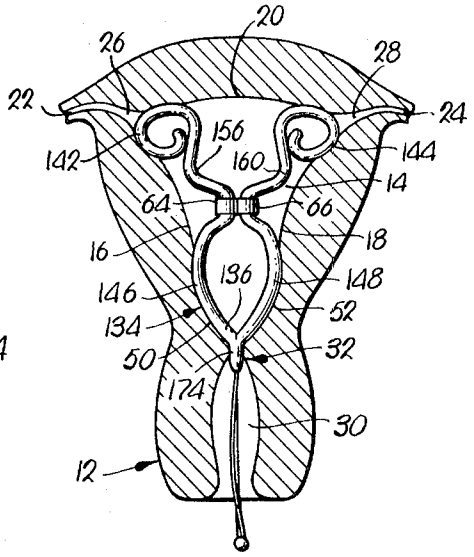


Fig.6.

Fig.5.



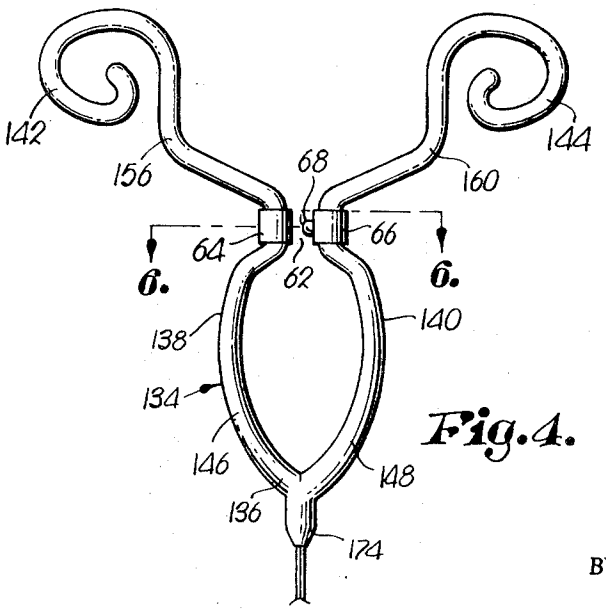


Fig.4.

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METALLIC COMPONENT FOR INTRAUTERINE CONTRACEPTIVE DEVICE

Intrauterine devices for use as contraceptives are today widely accepted because of their effectiveness and safety. One of the few reasons, however, for their not meeting with complete and unqualified approval is the rare possibility of potential injury resulting from inexpert and highly negligent insertion procedures. Extremely limited reports have been made of lodgement of the device within the abdominal cavity at the time of insertion as the result of such negligence. In such rare instances, the use of a closed loop in the device could result in an intestinal block which might not easily be discovered and result in dangerous consequences.

It is an important object of my present invention, therefore, to provide an intrauterine contraceptive device which retains the advantages of the closed loop principle, while at the same time, presenting an open loop in the event of lodgement of the device in the abdominal cavity as a result of accidental penetration into such cavity during negligent insertion of the device into the uterus.

Another important object of the instant invention is to enhance the contraceptive effect of an intrauterine device by the inclusion of a metal component as a part thereof.

Still another important object of my instant invention is to include the metal component as a part of a releasable coupling which maintains the loop closed throughout the time the device is operably located within the uterus.

My U.S. Pat. Nos. 3,234,938, 3,291,125 and 3,364,927 are incorporated herein by reference as may be necessary or desirable for a full and clear understanding of the instant invention.

In the drawings:

FIG. 1 is a fragmentary, front elevational view of an intrauterine device made pursuant to my present invention;

FIG. 2 is a fragmentary view similar to FIG. 1 on a reduced scale illustrating the device in place within the uterus;

FIG. 3 is a cross-sectional view taken along line 3–3 of FIG. 1;

FIG. 4 is a fragmentary, front elevational view of a second form of my instant invention;

FIG. 5 is a view similar to FIG. 2 illustrating the form of the invention in FIG. 4 on a reduced scale within the uterus; and

FIG. 6 is a cross-sectional view taken along line 6–6 of FIG. 4.

Device 10 is constructed of a resilient, yet pliable material and is designed for insertion into the uterus 12 by tubular means, such as that taught in my above referenced U.S. Pat. No. 3,234,938. The uterine cavity 14 is defined by uterine walls 16, 18 and 20 with fallopian tubes 22 and 24 communicating with the cavity 14. Disposed at the zone of communication are mouths 26 and 28 of the tubes 22 and 24, respectively. The cervix 30 communicates with the other end of cavity 14, with the uterus mouth 32 disposed therebetween.

Device 10 comprises a generally U-shaped loop 34 having a bight 36 for disposition across the cervix and a pair of arms 38 and 40 extending upwardly from the bight 36. Each arm 38 and 40 has an upper head 42 and 44, respectively, for disposition in the mouths 26 and 28, respectively. A portion 46 of arm 38 and a similar portion 48 of arm 40 are bulged outwardly and disposed to extend upwardly from bight 36 for engagement with the uterus 12 at respective zones of engagement 50 and 52 on walls 16 and 18.

Arm 38 has a bend 54 disposed between portion 46 and head 42, and an outwardly bowed flute 56 disposed between bend 54 and head 42. Similarly, arm 40 has a bend 58 located between portion 48 and head 44, and a flute 60 disposed between bend 58 and head 44. As illustrated in FIG. 1 and FIG. 4, the device 10 may be structured such that arms 38 and 40 are normally separated slightly at bends 54 and 58 such that a gap 62 is presented therebetween.

Subjacent the bight 36 on arms 38 and 40 at bends 54 and 58 is structure in the nature of a pair of bands 64 and 66 for preventing overlapping and crossing of the arms 38 and 40 in response to muscular activity of the uterus. Band 66 fits snugly around arm 40 and has a protuberance 68 projecting outwardly from band 66 into the gap 62. The band 64 fits tightly about arm 38 and presents protuberance-receiving means in the form of an opening 70 through band 64 which directly communicates with a cavity 72 in the arm 38.

In use, the device 10 may be inserted into the uterus by tubular means as hereinabove mentioned, with arms 38 and 40 compressed against one another in the inserter with protuberance 68 engaging opening 70 and cavity 72. Once inside the uterus, the device 10 is expelled from the inserter and assumes the position shown in FIG. 2 with the bands 62 and 66 remaining engaged.

During uterine contraction, the uterus walls 16 and 18 move toward one another and portions 46 and 48 being flexible, will be pushed inwardly. As a result of this action, additional surface area along portions 46 and 48 will come into engagement with walls 16 and 18. Since the arms 38 and 40 are restrained from overlapping one another, the engagement of protuberance 68 and cavity 72 creates a fulcrum effect at the bends 54 and 58 which acts on the arms 38 and 40 to cause heads 42 and 44 to be urged laterally outwardly and into mouths 26 and 28. Thus, the possibilities of expelling device 10 become minimized during such contractions of the uterus 12.

On rare occasions sufficient force might be exerted to push the device 10 completely through the uterine wall 20 upon expulsion of the device from the tubular inserter. Should this occur, the lack of surface engagement between portions 46 and 48 and the uterine walls 18 and 20 would allow the arms 38 and 40 to spring back slightly at bends 54 and 58 with protuberance 68 becoming disengaged with cavity 72. With the arms 38 and 40 resuming their natural positions as shown in FIG. 1, the gap 62 would be reestablished and an open loop presented which would less easily become entangled with the intestines.

It is important at this juncture to note that the formation of a gap 62 when the device 10 is in its natural state is not a prerequisite for effective operation and use of this device. It is necessary, however, that the device 10 be so constructed that arms 38 and 40 will at least be permitted yield should material such as an intestine become disposed within the loop 34, such that removal of the arms 38 and 40 about the intestine will be greatly facilitated.

The form of my invention shown in FIGS. 4, 5 and 6 presents a generally U-shaped loop 134 having a bight 136 and a pair of arms 138 and 140 extending upwardly therefrom. A stem 174 integral with loop 134 depends from the bight 136 for disposition within the uterus mouth 32. Each arm 138 and 140 has an upper head 142 and 144, respectively, for disposition in the mouths 26 and 28 of the fallopian tubes 22 and 24 substantially as shown in FIG. 5. Bulged portions 146 and 148 engage the walls 16 and 18 of the uterus, and outwardly bowed stretches 156 and 160 are disposed for contact with walls 16 and 18 upon contraction of the uterine muscles. Structure for preventing the arms 138 and 140 from overlapping during said contraction of the walls 16 and 18 comprises the same components as shown in FIGS. 1 through 3.

It is particularly noteworthy at this juncture that during extensive testing and research on my invention, it was noticed that having one or more of the bands 64 and 66 made of metal augmented the contraceptive properties of my device such that significantly improved results were obtained. Particularly, using copper as the base metal for the bands provided the most significant improvement over those devices using other materials for the bands.

The instant invention provides a device which is prepared for even that rare occasion when it may be pushed through the uterine wall during insertion. By retaining the basic looped design of my earlier inventions which helped solve the expulsion problem and yet providing a releasable closed loop within its structure, my instant invention is a device which may be used with confidence of effectiveness and without fear of injury.

I claim:

1. A device for intrauterine use comprising:

a generally U-shaped loop having a bight for disposition across the cervix and a pair of arms extending upwardly from the bight,

each arm having a head for disposition in the mouth of a corresponding fallopian tube,

there being an outwardly bulged portion in each arm respectively adjacent said bight disposed for engagement with the uterus and for actuation inwardly by the latter at the zones of engagement therebetween during contraction of the uterine muscles; and

structure on said arms remote from said bight for preventing overlapping and crossing of the arms at said structure in response to muscular activity of the uterus,

said structure and said arms forming a closed ring when the device is in the uterus,

said structure being releasable, presenting an open ring when the arms are permitted to spread apart at said structure,

said structure including a protuberance on one of the arms extending toward the other of said arms, and

a protuberance-receiving means on the other of said arms.

2. A device for intrauterine use as claimed in claim 1,

said one arm being provided with a band,

the protuberance being on the band.

3. A device for intrauterine use as claimed in claim 2,

said other arm being provided with a band,

said protuberance-receiving means being an opening in the band of the other arm.

4. A device for intrauterine use as claimed in claim 3, at least one of said bands being metal.

5. A device for intrauterine use as claimed in claim 1,

said other arm being provided with a band,

said protuberance-receiving means being an opening in the band.

6. In an intrauterine device having a pair of interconnected arms provided with juxtaposed portions remote from the interconnection of the arms to present a closed loop when the portions are juxtaposed, structure on said arms at said portions for preventing overlapping and crossing of the arms, said structure including:

a protuberance on one of the arms extending toward the other of said arms; and

protuberance-receiving means on the other of said arms releasably accepting said protuberance to thereby permit said arms to move apart at said portions thereof and present an open loop.

7. In an intrauterine device as claimed in claim 6, said one arm being provided with a band, the protuberance being on the band.

8. In an intrauterine device as claimed in claim 7, said other arm being provided with a band, said protuberance-receiving means being an opening in the band of the other arm.

9. In an intrauterine device as claimed in claim 6, said other arm being provided with a band, said protuberance-receiving means being an opening in the band.