This invention relates to new and useful improvements in a drill bit guide.

It is an object of this invention to provide a means for guiding a drill bit for boring passageways for conduits, such as electrical conduits, through intra-wall obstructions.

It is another object of the invention to provide a drill bit guide formed of detachable sections of conduit having novel means for maintaining the conduits in rigid relation during drilling operations.

In building construction, where the building is completed, there is usually a plate covering the top of the inner and outer walls, and an intermediate plate, or fire stop, consisting of a beam, such as a two by four board mounted horizontally between the inner and outer walls and parallel with the top plate. If it is desired to install an additional electrical outlet, a passageway must be formed through the fire stop and top plate to permit the installation of an electrical conduit. A means for forming such a passageway through the top plate forms the subject matter of another invention. It is an object of this invention to provide means for inserting a bit mounted on the end of a flexible shaft into the box opening in the inner wall, with sections of conduit through which the cable passes, forming a rigid guide for the bit having means for bracing the joined sections of conduit against movement while the shaft and bit are rotated forming the passageway.

With the above and other objects in view, the invention has relation to certain novel features of construction, operation and arrangement of parts more particularly described in the following specifications and illustrated in the accompanying drawings, wherein:

FIGURE 1 is a side elevational view of the device, showing the walls of a building, in cross section, and the device in position to effect a drilling operation through a fire stop.

FIGURE 2 is an enlarged side elevational view of the drill bit receiving section, showing the bit mounted therein.

FIGURE 3 is an end view of the section shown in FIGURE 2, taken on the line 3—3 of FIGURE 2.

FIGURE 4 is an end view of another section of the guide, shown mounted between the walls of a building.

FIGURE 5 is an enlarged side elevational view, partly in cross section, of the support means employed, and

FIGURE 6 is an elevational view, in cross section, showing the final section of conduit with the movable sleeve mounted thereon and the cable extending through the conduit and illustrating the coupling of the sections of conduit.

Referring now more particularly to the drawings, the numeral 1 designates the drill receiving section having the outwardly flared legs 2, 2 and the end plate 3 on which suitable pointed projections as 4, 4 are mounted to assist in retaining the member in position for drilling. A passageway 5 is formed in the plate 3 for the passage of the bit 6. The stem 7 is tubular through which the flexible cable 8 passes and at the end opposite the bit receiving section, a collar 9 is mounted. Between the legs 2, 2 is a bushing 34 forming a bit shank guide. The bit shank 35 is internally threaded at one end to receive the bit stem 36, and the cable 8 is anchored to the other end of the shank 35, in any suitable manner. A plurality of sections of conduits 10, 10 of varied lengths are provided which are rigid and tubular and have a colar 11 mounted on one end thereof.

A tubular conduit section 12 is curved to provide entry between the walls of the building, as 13, 14, and adjacent the upper end of this section are mounted a pair of suitable supporting members 15, 15. Adjacent the other end of the section 12 is a downwardly and outwardly projecting socket 16.

When the device is mounted in a building, the supporting member 17, having the telescoping sections 18, 19, is mounted on the floor of the building, as 20, with the detachable foot 21 receiving the lower end of the supporting member 17, the lower end of the member 17 being rounded and the upper end of the foot 21 having a socket 22 formed therein to receive the lower end of the member 17 in a swivel relation, so that the angle of the projecting socket 16 will assure outward as well as upward pressure on the section 12. The upper end of the telescoping section 19 is externally threaded as 23 to receive the jack 24 and is provided with the external flange 25 to limit the downward movement of the jack 24. Adjacent the upper ends of the supporting section 17 and the telescoping member 18, are suitable internally threaded ports in which are mounted suitable locking means, as the members 26, 27.

When it is desired to prepare a wall for an outlet box, the box opening 28 is cut in the inner wall 14 and the flexible cable 8 is threaded through the bit receiving section 1 until the bit 6 is positioned between the legs 2, 2 with the shank 35 mounted in the bushing 34, and the section 1 is then inserted through the opening 28 and another section, as 10, small end first, is passed over the cable 8 and inserted through the opening 28, and by the user pulling on the cable 8, the small end of the conduit 10 seats in the collar 9 of the section 1. Sufficient additional sections 10 are similarly mounted, the small end of the sections fitting in the collar 11 of the preceding section, until the fire stop, as 29, is reached by the plate 3, then the section 12 is mounted on the cable 8 so that the legs 15, 15 contact the outer wall 13, and the supporting member 17 is then placed in position for inserting the upper end of the telescoping section 19 into the socket 16, adjusting the sections 18, 19 to support the section 12, and then locking the sections 18, 19 in position through the locking means 26, 27, and securely embedding the points 4, 4 of the plate 3 in the fire stop and wedging the conduit sections in place by rotating the jack 24, moving same upwardly on the threaded end of the section 19 against the section 12, and the legs 15, 15 against the outer wall 13.

The section 12 does not have a collar mounted on either end, so that the upper end fits into the collar 11 of the last straight section 10 mounted between the walls 13, 14. The remaining straight sections of conduit are then mounted on the cable 8, collar first, so that the outwardly projecting end of the section 12 is received by the collar 11 of the first section so mounted. The last section 10 is a short one, and a sleeve 30 is mounted on the projecting end of this section, and a chuck 31 is then mounted on the end of the cable 8, and the sleeve 30 moved over the exposed cable. A bushing as 33 is formed in one end of the sleeve 30 to prevent whipping of the cable 8 during rotation. An electric drill, such as 32, shown in dotted lines, may then be mounted on the chuck 31 and as the cable 8 is rotated, the drill bit 6 will penetrate the fire stop 29, the bushing 34 maintaining the bit in vertical alignment until the cutter blades of the bit have penetrated the fire stop to act as a guide to maintain a straight vertical cut and the bushing 33 of the sleeve 30 is moved against the extended end of the last section of conduit, the user will know he has penetrated the fire stop.

Only sufficient conduit sections 10 are provided to
cover the cable 8, when in coupled position with the section 12, less sufficient coverage to permit longitudinal movement of the cable to penetrate the fire stop. The fire stop is usually formed of a two by four board, so that said cable need move but two inches. By leaving a three inch clearance, the user will be assured more than the necessary amount of movement and provides a safe margin for assurance of complete penetration. However, in as much as the conduit sections are of varied lengths, the end section may be of the length desired to effect sufficient longitudinal movement of the cable 8 to accomplish the necessary penetration. The workman will ascertain the distance of the fire stop from the box opening, and then lay out his sections of conduit, selecting the desired lengths, so that the end of the lowermost section will be immediately above the box opening. No section of conduit will be of greater length than may be easily inserted into the area between the walls through the box opening 28. The remaining conduits will then cover the remaining length of cable, with the allowance for longitudinal movement of the cable. If a greater distance of movement is desired, the short length of conduit on the end of the string of conduits may be removed and a longer sleeve employed.

Where the object to be penetrated is a sufficient distance from the box opening, the entire length of straight conduits may be employed, with the section 12 mounted on the lower end of this string, and the sleeve 30 mounted on the extended end of the section 12. Similarly, where the stop is immediately above the position of the box opening, all of the sections 10 may be mounted on the cable outside of the walls 13, 14, with the collar 9 of the bit receiving section 1 receiving the upper end of the section 12.

While the foregoing is considered a preferred form of the invention, it is by way of illustration only, the broad principle of the invention being defined by the appended claims.

What we claim is:

1. In a drill bit guide, a tubular bit receiving member, a plurality of interlocking conduits in which a flexible cable is mounted, one of said conduits being curved and having a laterally projecting fixed supporting member adjacent one end and a supporting member detachably mounted extended laterally from a point adjacent the other end.

2. In a drill bit guide, a tubular bit receiving member, a plurality of interlocking conduits in which a flexible cable is mounted, one of said conduits being curved and having a laterally projecting fixed supporting member adjacent one end and a supporting member laterally extended and detachably mounted adjacent the other end, said supporting member being vertically adjustable.

3. In a drill bit guide, a tubular bit receiving member, a plurality of interlocking conduits in which a flexible cable is mounted, one of said conduits being curved and having a laterally projecting members adjacent one end and a supporting member detachably mounted adjacent the other end, said supporting member having a detachable foot mounted to the lower end thereof and having vertically adjustable telescoping sections and a vertically adjustable jack mounted on the upper end of the uppermost of said telescoping sections.

4. In a drill bit guide for a drill bit rotated by a flexible cable, a drill bit receiving section through which a flexible cable is extended, means on said section for anchoring said section in the desired position, a plurality of interlocking tubular sections through which said cable extends, each section having a collar on one end and shaped to be received by a collar on the other end and means for maintaining said sections, in rigid position while said sections are extended through a wall and said flexible cable is rotated.

5. In a fire stop boring device, a flexible cable having a bit mounted on one end thereof, a plurality of rigid interlocking conduits mounted on said cable, one of said conduits being curved to pass through an opening in a wall of a building, and said curved conduit having means extending laterally therefrom for rigidly supporting said conduits while said flexible cable is being rotated.

6. In a drill bit guide for drilling operations between the inner and outer walls of a building, a plurality of straight tubular drill shaft conduits of varied sizes, a curved tubular drill shaft conduit, means for maintaining said conduits in joined relation with each other, with the curved conduit extending through an outlet opening in the inner wall, a bit receiving section mounted on one end of said joined conduits, a bit shank guide in said bit receiving section, vertically adjustable means movable into connection with said curved conduit to exert upward and outward pressure thereon maintaining all of said conduits in rigid drilling position.

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