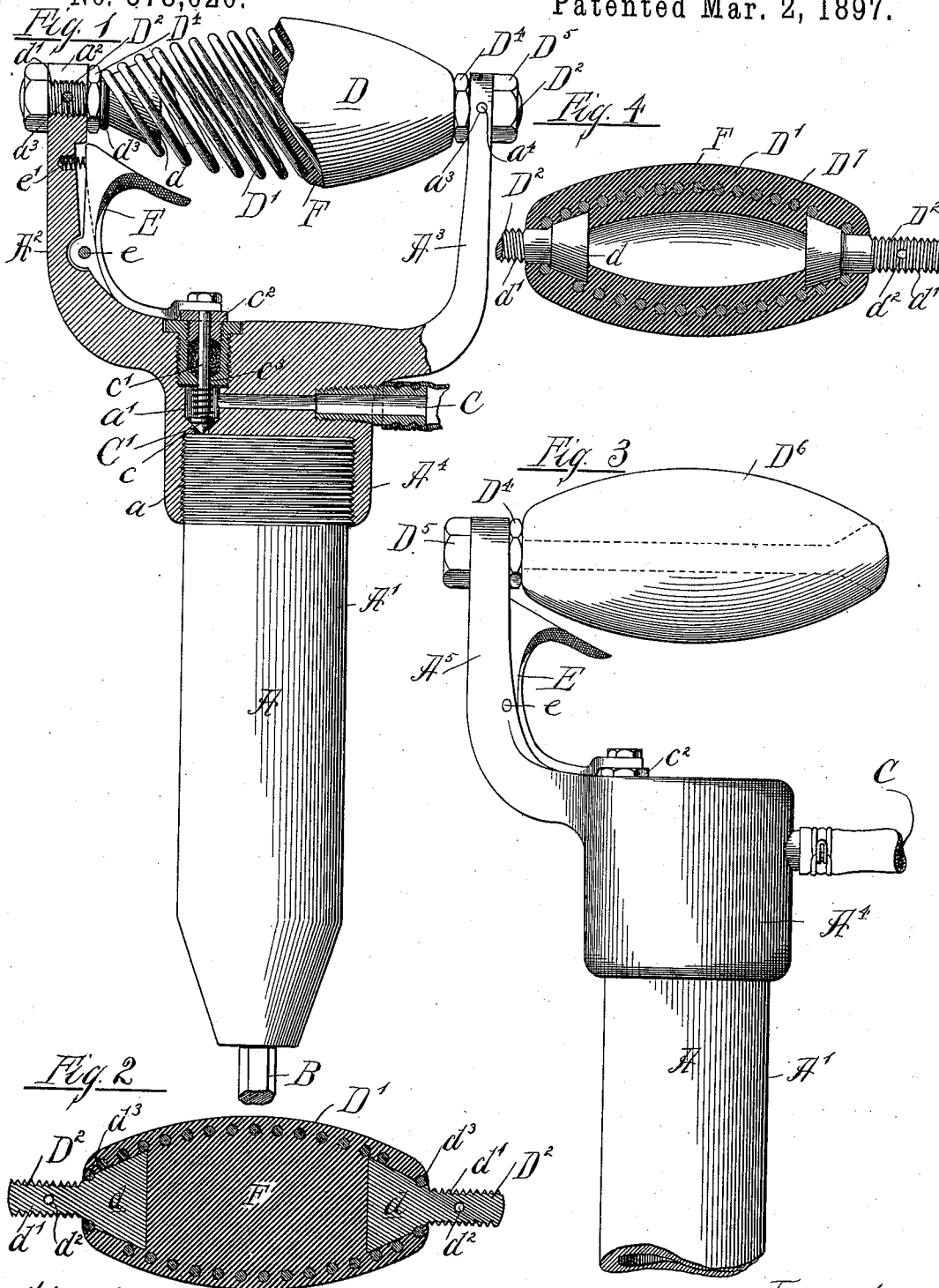


(No Model.)

W. M. MORSE.
HANDLE FOR PNEUMATIC TOOLS.

No. 578,020.

Patented Mar. 2, 1897.



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UNITED STATES PATENT OFFICE.

WILLIAM M. MORSE, OF CHICAGO, ILLINOIS.

HANDLE FOR PNEUMATIC TOOLS.

SPECIFICATION forming part of Letters Patent No. 578,020, dated March 2, 1897.

Application filed November 25, 1895. Serial No. 570,048. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. MORSE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Handles for Pneumatic Tools, Bicycles, and other Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in handles adapted for use on parts of machines or devices which are subject to such vibration when in use as to cause discomfort or injury to the operator grasping the handle.

More specifically the invention relates to an improved cushioning grip or handhold, and includes also certain features of improvement in pneumatic-tool holders, for use with which said handle-grip is specially adapted.

The object of the invention is to provide a simple practical device of the character referred to which will absorb or cushion the vibration of the part to which it is applied to such an extent as to greatly mitigate or entirely avoid discomfort to the operator.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims, and the same will be readily understood, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, parts being shown in vertical section, of one embodiment of my invention as applied to a pneumatic-tool holder. Fig. 2 is an axial section of the grip proper removed from the handle. Fig. 3 is a modified form of handle. Fig. 4 is a view similar to Fig. 2, showing a handle-grip of modified construction interiorly.

The invention is herein shown as applied to a pneumatic-tool holder, such as is used for calking, chiseling, riveting, and the like, but it is to be understood that the invention is also applicable to many other uses where it is necessary or desirable to cushion the vibration of the part of the machine to which the handle is applied, and that the present description therefore sets forth but one out of many possible embodiments of the invention.

Referring to said drawings, A designates, as a whole, a pneumatic-tool holder, compris-

ing a body or shank A', within the lower end of which is mounted a tool B, which is reciprocated by means of suitable mechanism contained within the body A, actuated by air or gas supplied under pressure to the said mechanism through a suitable inlet C, and a handle consisting of yoke-arms A² A³, mounted upon the upper end of the shank or main body A', and a handle-grip D, mounted to extend between the upper ends of said yoke-arms.

The particular construction of the yoke-arms is not essential, but said arms are conveniently, and as herein shown, formed integral with a central body or cap A⁴, which is provided with an internally-screw-threaded socket *a* at its lower end, adapted to fit upon the correspondingly-threaded upper end of the shank A', as indicated clearly in Fig. 1 of the drawings. The part A⁴ is provided with a longitudinally-extending aperture *a'*, the lower end of which opens into the interior of the shank A', said aperture being arranged to intersect and communicate with the inlet C, which extends inwardly through the side wall of the said part.

C' designates a spring-actuated throttle-valve arranged to fit upon a seat *c*, formed at the lower end of said aperture *a'*, and provided with a valve-stem *c'*, mounted to slide vertically in suitable gland members *c² c³*, threaded within the upper part of the said aperture *a'*, the purpose of said throttle-valve being to control the flow of air or gas to the tool-actuating mechanism of the tool-holder.

The valve C' is arranged to be lifted from its seat, so as to permit the entrance of air, by means of a trigger or curved retracting-lever E, pivoted between its ends, as at *e*, to the inner side of the yoke-arm A². The lower end of the retracting-lever is slotted to engage the upper headed end of the valve-stem C', so as to lift the latter when the lever is oscillated upon its pivot, while the upper end of said lever is curved so as to extend inwardly away from the yoke-arm and longitudinally beneath the handle-grip D. The said lever is normally held at a distance from the handle-grip and in position to hold the valve closed by means of a coiled spring *e*, interposed between the yoke-arm and the upper part of the lever, while the length and conformation of the upper end of the lever is such as to afford

a suitable finger-hold, which may be grasped and the lever held retracted by one or more of the same fingers which embrace the handle-grip. Now, describing particularly the construction of the said handle-grip D, D' designates a spring-wire wound or bent, preferably, into a helix having the form of an elongated oval, the individual turns of the said coil or helix being wound parallel with each other with intervening spaces between each, preferably about equal in width to the thickness of the wire.

In order that the spring-body may be more yielding when subjected to a bending strain or pressure exerted in a direction at right angles to the axis of the coil, the turns of the coil are wound with a relatively long pitch, so as to stand at a considerable angle to such line of pressure. This, however, is obviously not strictly essential, inasmuch as the size of the wire from which the coil is formed may be varied to provide the required degree of elasticity. It may also be noted in this connection that a plurality of springs, or one or more springs composed of a plurality of strands, may be used, if desired, instead of the single spring shown herein.

In order to afford means for attaching and supporting the ends of the handle-grip, studs D² D² are arranged to extend axially within the ends of the coil, provided with conical heads $\bar{d}$ $\bar{d}$, which fit the interior form of said ends and support the latter throughout the length of said headed portion. The ends of the studs which protrude from the ends of the coil are screw-threaded, as indicated at $\bar{d}'$ $\bar{d}'$, to receive jam-nuts D⁴, which form clamping-shoulders at the juncture of the head and body portions of the studs, and clamping-nuts D⁵, which coact with said jam-nuts to secure the handle-grip within slots a^2 a^2 , formed in the upper ends of the yoke-arms A² A³. Each of said studs D² is also provided with a transverse aperture $\bar{d}^2$ $\bar{d}^2$, adapted when the grip is in position between the yoke-arms to register with key-apertures a^3 a^3 , formed through the slotted ends of the yoke-arms, through which may be inserted suitable keys or pins a^4 a^4 . It may be noted in this connection that in practice the coils are usually wound or formed upon the studs D² D², the first turn of each end of the coil being carried around the stud at right angles to its axis, or without pitch at the juncture of the tapered head portion with the body portion thereof, as indicated at $\bar{d}^3$ $\bar{d}^3$, Fig. 1. This, however, is not essential, inasmuch as the said studs D² may be inserted in place by forcing them between the turns of the coil in the larger part of the latter and then passing the ends outwardly therefrom. After the spring-body has been thus formed and the stud properly secured in place within the latter the entire handle-grip, save only the protruding screw-threaded portions of the studs, is filled and covered with plastic rubber or other suitable material F, so applied as to cover the exterior of the spring-body

and to conform, approximately, to the external form thereof, as shown clearly in section Fig. 2. The handle-grip thus filled and covered with a solid mass of plastic rubber may thereafter be subjected to a vulcanizing process which renders the rubber elastic and of sufficient hardness to retain its form in use, but yielding enough to coact with the spring or resilience of the wire coil to absorb the vibrations of the handle. The handle-grip thus formed is inserted in place between the yoke-arms with the end studs thereof engaging the slots a^2 a^2 and the keys inserted in place, after which the locking or clamping nuts D⁵ D⁵ will be placed upon the ends of the studs D², exterior to the yoke-arms, the object being to provide a positive connection between the ends of the handle-grip and the yoke-arms and one which will not become loosened when subjected to severe and long-continued vibrations.

The operation of the device will be obvious from the foregoing description, it being understood that the tool remains in operation as long as the trigger or retracting-lever is held compressed toward or against the handle-grip, and that it will be so held by one of the fingers, (usually the front or index finger,) which embraces the grip in holding the tool.

In Fig. 3 I have shown a modification which is constructed substantially like that shown in said previously-described figures, excepting that the handle-grip D⁵ is in this instance supported by a single arm A⁵, which corresponds to the arm A' of the prior construction, but is made somewhat heavier and stronger than the latter. The supporting-stud upon which the handle-grip is mounted is also made somewhat longer, so as to support the body of the grip through a somewhat greater extent, the opposite end of the handle-grip being finished uniformly with the remainder of the exterior thereof. The stud may of course, if desired, be extended the full length of the grip, as indicated in dotted lines in Fig. 3.

In Fig. 4 is shown a modification in which the grip D⁶ instead of being filled in solid with rubber is made hollow, the rubber being arranged to cover the spring-coil to a considerable depth both outside and inside of the latter. In other respects the handle-grip is constructed like that shown in Figs. 1 and 2. Obviously such a construction will be somewhat more yielding or resilient than one in which the rubber is solid, and for some purposes will be preferable.

While I have herein shown what I deem to be the best embodiment of my invention, yet it will be obvious that the details of construction may be varied somewhat without departing from the spirit of the invention and without involving more than mechanical skill. The shape of the coil of the spring or springs, for example, may be varied. I do not therefore wish to be limited to the precise details shown, but, inasmuch as the construction shown is an exceedingly practical and eco-

nomical one, specific claims have been made thereto in addition to the claims of broader scope.

Any resilient or yielding body suitably formed to constitute a hand-grip proper and any means for suitably securing the same to the fixed part of the machine or apparatus to which the said grip is applicable I desire to be considered as within the scope of my invention and claims.

I claim as my invention—

1. As a new article of manufacture, a grip for a handle consisting of a spring embedded in rubber or other suitable material, and a stud rigid with the grip and projecting from it for supporting or securing said grip.

2. A grip for a handle consisting of a helical coil of spring-wire wound into the form of an elongated oval, the individual turns of which coil are parallel and wound with a relatively long pitch, an enveloping mass of rubber within which said coil is embedded, and means for supporting the handle-grip comprising a stud upon the handle projecting within and fitting the interior of the end of the coil, substantially as set forth.

3. A grip for a handle-bar consisting of a helical coil of spring-wire wound into the form of an elongated oval, embedded in a solid mass of rubber or other elastic material

and supported at its ends by a stud projecting within the coil a short distance only.

4. A handle consisting of a helical coil of spring-wire wound into the form of an elongated oval, the individual turns of which coils are parallel and wound with a relatively long pitch, a mass of rubber filling and covering said coil, and means for supporting the handle-grip embracing yoke-arms, studs mounted upon said yoke-arms provided with flaring or conical head portions arranged to extend within the ends of said handle-grip a short distance only, whereby said handle-grip is left unsupported throughout its central portion and free to yield, substantially as described.

5. A grip for a handle consisting of a coil of spring-wire of helical form embedded in rubber or other suitable material, a stud rigid with the grip and projecting from it for supporting or securing said grip.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 20th day of November, A. D. 1895.

WILLIAM M. MORSE.

Witnesses:

TAYLOR C. BROWN,
WILLIAM L. HALL.