2. Sheets. Sheet. 1.

Treadwell & Lamson.

Channelling Stone.

No. 110,404. Patented Dec. 20. 1870.

Fig. 4.

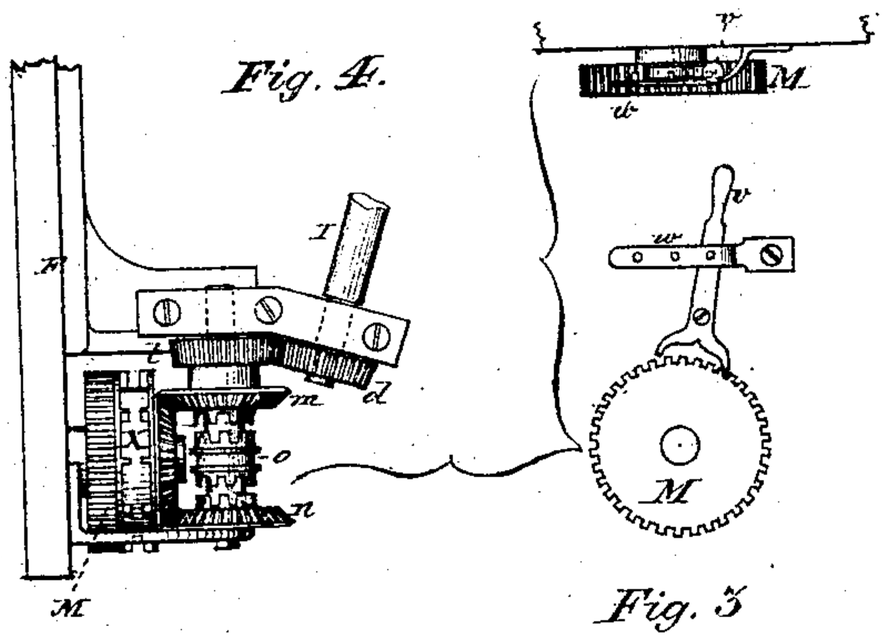
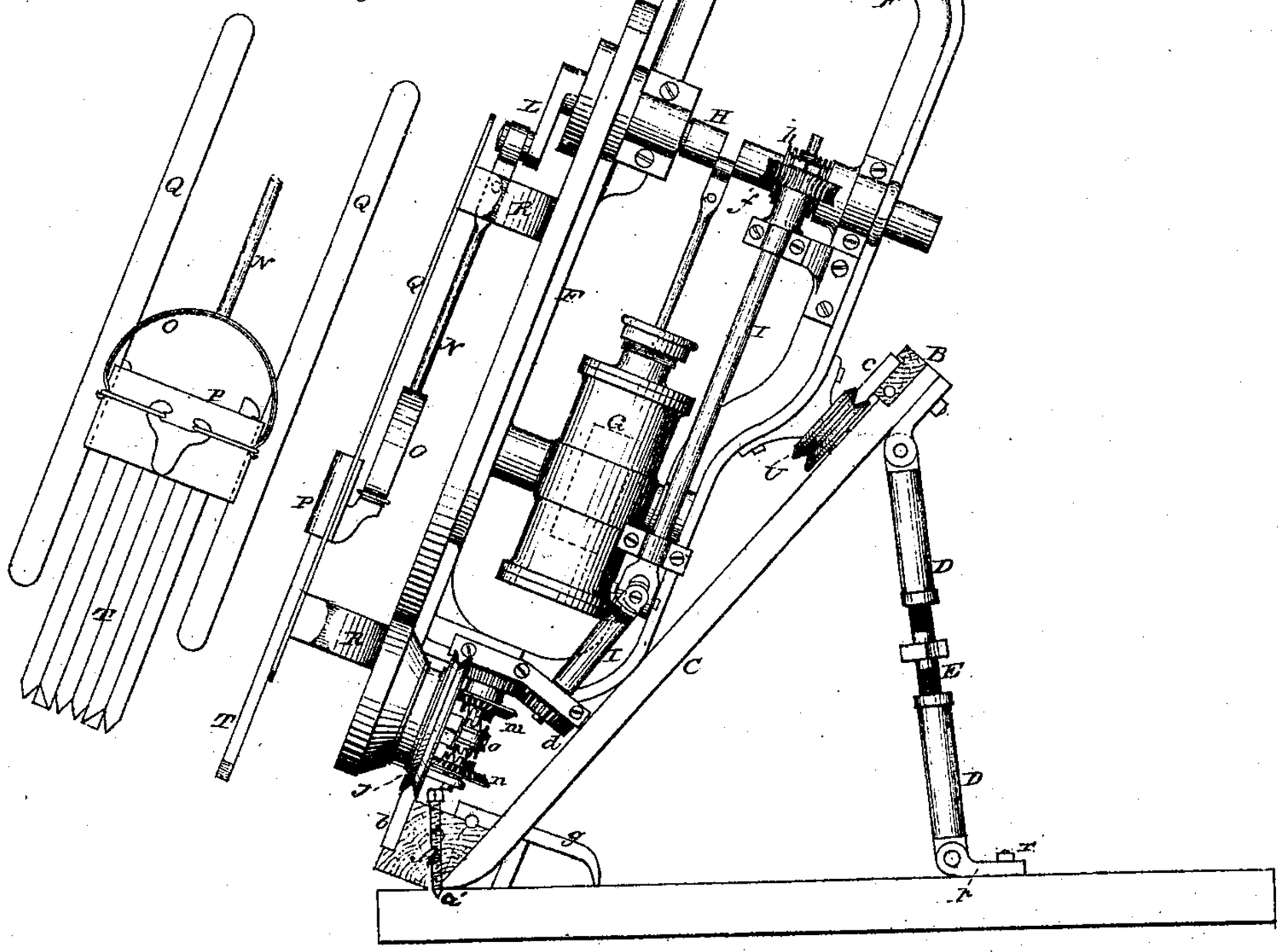


Fig. 5

Fig. 1.



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2. Sheets, Sheet 2.

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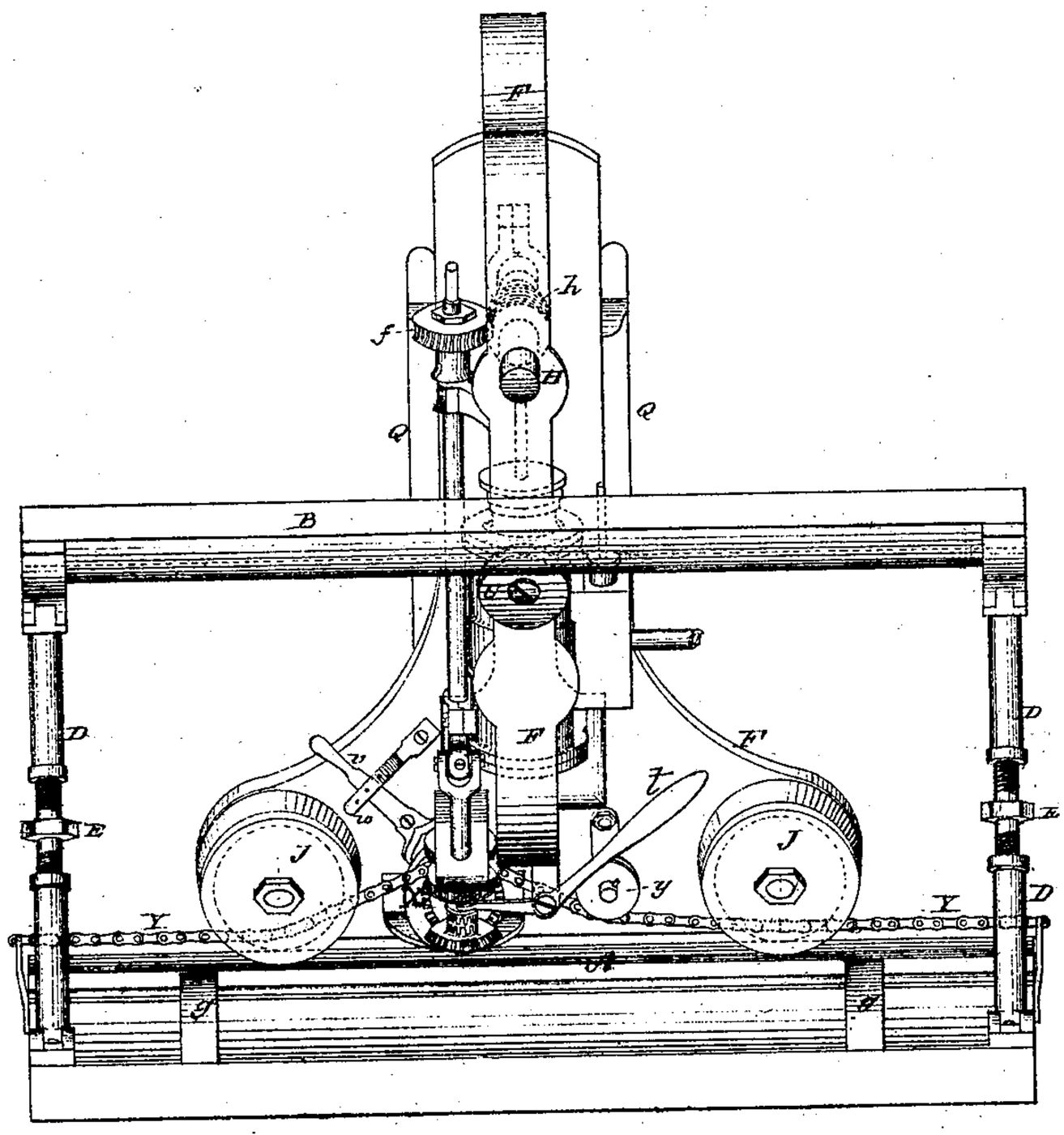
Channelling Stone.

No. 110,404. Patented Dec. 20. 1870.

Fig. 2.



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United States Patent Office.

FRANCIS C. TREADWELL, JR., OF NEW YORK, N. Y., AND EBENEZER G. LAMSON, OF WINDSOR, VERMONT; SAID TREADWELL ASSIGNS TO SAID LAMSON.

Letters Patent No. 110,404, dated December 20, 1870.

IMPROVEMENT IN STONE-CHANNELING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, FRANCIS C. TREADWELL, Jr., of New York, N. Y., and EBENEZER G. LAMSON, of Windsor, in the county of Windsor and State of Vermont, have invented certain Improvements in Machinery for Channeling or Cutting Stone, of which the following is a specification, reference being had to the accompanying drawing.

Our invention relates to machines for channeling or grooving stone in quarries; and

The invention consists in a novel construction of the track or frame for supporting the machine, and in a novel construction of the machine to adapt it to be used on the said track or frame, all as hereinafter more fully explained.

Figure 1 is an end elevation of our improved frame or track, with a channeling-machine mounted thereon;

Figure 2 is a rear elevation of the same; and

Figures 3 and 4 are views of portions of the machine detached.

It has been customary heretofore to construct these machines to run on a track made like a railway, and having two parallel rails laid upon the bed of the rock to be cut. In order to use such machines and tracks, it is necessary to have a place prepared of the full width and length of the track, on the face of the bed or rock, on which to locate the track, and in some quarries this requires the expenditure of much time and labor, especially where the strata of the rock is inclined or the surface uneven.

The object of our present invention is to provide a track and a machine that can be used more advantageously, and with less expense in the preparation of the bed or face of the quarry, and that is better adapted for use in ravines, tunnels, or similar places. To do this we construct a track or frame that can be arranged to stand in an upright or inclined position, as represented in fig. 1. This track consists of a single stick of timber, A, at the bottom, and a top bar, B, the two being firmly connected by suitable cross-ties and braces, so as to make a light and rigid frame.

To the lower bar we secure a metallic bar or rail, *b*, and to the upper one we attach a similar rail or bar, *c*, both having V-shaped edges, as represented in fig. 1.

To the upper bar B we pivot two or more braces, D, to the lower end of which are hinged blocks or foot-pieces *p*, provided with holes for the insertion of bolts for clamping them to the bed or face of the rock. These braces may be simply rigid bars, or they may be composed of two parts, which are made tubular, and are united by a rod, E, having a right and left-hand screw cut thereon, so that, by turning this rod, the braces can be lengthened or shortened for the purpose of adjusting the frame or track at any desired angle. For the purpose of preventing the track from slipping, and also to afford bearings on which the track may be turned as it is adjusted, we insert a bolt in the lower rail, the point of which protrudes from its under side, as represented at *a'*, fig. 1.

The machine to be used with this track consists of an open frame, F, which has mounted in it an oscillating steam-engine or cylinder, G, provided with suitable valves and fixtures. In the upper portion of this frame is located a shaft, H, which is driven by the engine, and which shaft extends through the front side of the frame F, and has attached to it a crank, L, which is connected by a pitman, N, and box-spring, O, or other yielding device, to the cross-head or clamp P, which holds the drills or cutters T, and which plays to and fro on the guide-bars Q, secured by brackets R to the front side of the frame F, as shown in fig. 1. The frame F is widened out laterally at the bottom in front, and has a grooved wheel, J, journaled to it at each corner, as shown in fig. 2. A similar wheel, U, is also secured to the rear side of the frame F, at such a height that, when the wheels J are placed on the lower rail, this wheel U will engage with the under edge of the upper rail, thus holding the machine on the track in a position that will enable it to be moved back and forth thereon.

In order to feed the machine back and forth on the track, we use the following feed-mechanism: To the lower rail of the track we secure a sprocket-chain, Y, which is arranged parallel with the face of the rail, and is securely fastened at each end, as represented in fig. 2. On the frame F, midway between the wheels J, we mount a sprocket-wheel X, which has attached to it another wheel, M, having notches on its periphery, as shown in fig. 4. This sprocket-wheel X is also provided on its rear face with a circle of bevel-gear teeth, which engage with two bevel-gear wheels, *m* and *n*, one arranged to engage with its upper, and the other with its lower face, and both turning loosely on the same shaft. A clutch, *o*, is placed on the shaft between these wheels *m* and *n*, the clutch *o* being arranged to slide to and fro on its shaft to engage with either of the wheels *m* or *n*, but being prevented from turning on the shaft by means of a feather or spline, in the usual manner in such cases. At its upper end this shaft has secured upon it rigidly a pinion, *l*, which gears into a corresponding pinion, *d*, secured to the lower end of a shaft, I, which, being provided with a universal joint, and mounted in suitable bearings attached to the frame F, extends upward to the driving-shaft H, as represented in figs. 1 and 2. At its upper end this shaft I is provided with a worm-wheel, *f*, which engages with a screw-wheel or sleeve, *h*, on the driving-shaft, by which means motion is imparted to the feed-mechanism be-

low. The chain Y being secured to the lower rail at each end, as previously stated, is passed under both of the wheels J, which are provided with a groove for that purpose, and over the sprocket-wheel X, and under an adjustable tightening-pulley *y*, as represented in fig. 2; so that, when motion is imparted to the feed-mechanism, as previously described, the machine is fed along on the track by the sprocket-wheel X taking hold on the chain Y.

A lever, *t*, suitably arranged, as shown in fig. 2, serves to move the clutch *o*, so as to engage with either of the wheels *m* or *n*, and thus causes the machine to travel either forward or back, as desired.

For the purpose of locking the machine fast and holding it in position, and preventing it from slipping or running either way on the track, when the latter is inclined, we pivot a double-pronged lever or dog, *v*, to the frame F, in a suitable position to engage on either side with the notched wheel M, as shown in fig. 2.

A spring arm, *w*, provided with a series of notches, is secured to the frame F, at right angles to the handle of the dog *v*, so as to engage with a pin or projection on the latter, and thus lock the dog in any required position.

When the dog *v* is thrown to one side, one of its prongs will engage with the wheel M on that side. When reversed it will lock into the wheel on the opposite side; and when secured midway between these extremes, both prongs will be held clear from the wheel, as is necessary when the machine is being fed along, the function of this dog *v* and the notched wheel M being simply to lock and hold the machine stationary, as before stated.

It is obvious that the track or frame which supports the machine may be constructed entirely of iron, if preferred, and may be of any desired length. In using it the rail A is secured to the bed-rock by clamps *g*, or any equivalent means; and the foot of the braces D is secured to the rock by a bolt, *r*, passing through the foot *p* and into a hole drilled for it in the rock. Any required number of hinged braces may be used, and, if desired, bars may be connected to the bed-rail A, and made to extend at right angles therefrom backward, far enough for the foot of the braces to be connected thereto, thus forming a triangular frame. This latter, however, we do not consider best, especially if the bed-rock be uneven or irregular on its surface.

It will be seen that, with this style of track and machine, the whole apparatus may be made much lighter than those which have a frame or bed made like a car-body or truck, and which run on a horizontal track having two parallel horizontal rails laid on the face of the rock, and which usually have their boiler mounted on the truck, or on an additional truck drawn or pushed by the one which supports and carries the engine and cutting apparatus, it being understood that, in this case, the engine is to be supplied with steam from a boiler located at a distance from the machine, and to which it is to be connected by a rubber or other flexible tube.

A machine and track thus constructed can be set at work in almost any location or position, without the great expenditure of time and money usually required to prepare the face of the quarry for the old style of machines.

The track being trussed or braced, so as to render it rigid in its vertical plane, can be set on the rock at any inclination lengthwise, and may be supported at its ends alone, thus passing over hollows or uneven places on the rock. It is obvious that it may be adjusted at any desired inclination laterally, so as to cut the grooves at right angles to the strata or layers of the rock, when the latter have a dip, or are inclined in any direction; or that it may be inclined to cut the groove in an inclined position, or at an angle to the face of the strata or layer of rock, as is sometimes necessary.

By this method of construction, also, a much less force or number of men is required to move, adjust, and operate the machine; besides which it can be used in localities and positions where the old style machines cannot be used.

It is obvious that, if preferred, instead of having grooved wheels running on a V-shaped rail, the rails may have grooves formed in them, and the wheels made to run in the grooves in the rails; but this plan we do not consider as good as the former.

It is also obvious that, instead of a single wheel at the top, two or more may be used, and that, instead of a wheel, simple stationary guides may be used, working on the upper rail, or in a groove therein.

It it also further obvious that, instead of the devices shown for imparting motion to the feed mechanism from the main shaft, other devices or means may be used, if preferred.

It is also obvious that guys or lines may be used instead of the braces for holding and adjusting the track or frame in the required position, and that, when used in a tunnel or chasm, the frame or track, or the guiding-rail thereof, may be attached to or supported by the ledge or walls, and thus dispense with both braces and guys.

We have described what we consider the best form of mechanism for operating the channeling-chisels or cutters; but we do not limit ourselves thereto, because it is obvious that various other well-known ways of working drills or chisels can be applied with good effect, our invention not being of any special way of operating the channeling-chisels, or of the chisels themselves, but of a mode or means of supporting and guiding them when operating in a quarry.

Having thus described our invention,

What we claim, and desire to secure by Letters Patent, is—

1. In combination with a stone-channeling mechanism, a track or guide-frame, consisting of a lower supporting-rail and an upper guide-rail, supported in any suitable manner, constructed and operating substantially as described.

2. In combination with a stone-channeling machine, a track or guide-frame, having a lower and an upper supporting and guiding-rail, with the adjustable braces for supporting the frame or track in an upright or inclined position, substantially as herein described.

3. The combination of the rail or track A, having the chain Y secured thereto, with the machine having the griping-wheel X and the pinions *m* and *n* and sliding clutch *o*, all mounted thereon, the whole being arranged to operate substantially as described, for feeding the machine forward or back on the track, as herein set forth.

4. The arrangement of the notched wheel M and the bifurcated lever *v*, in connection with the feed-wheel X for locking the machine fast on the frame at any desired point, substantially as set forth.

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