No. 1,747. PATENTED AUG. 28, 1840.

W. MONTGOMERY.

MACHINERY FOR PREPARING OAKUM.

Fig. 1

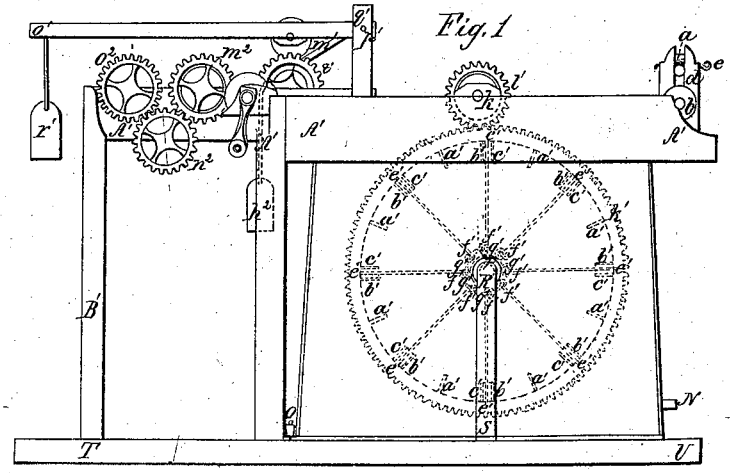


Fig. 4

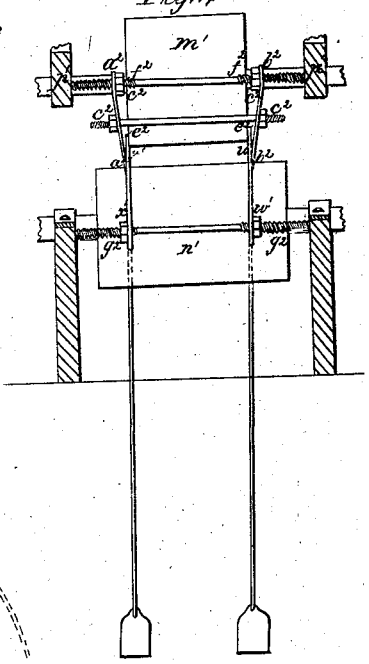


Fig. 2

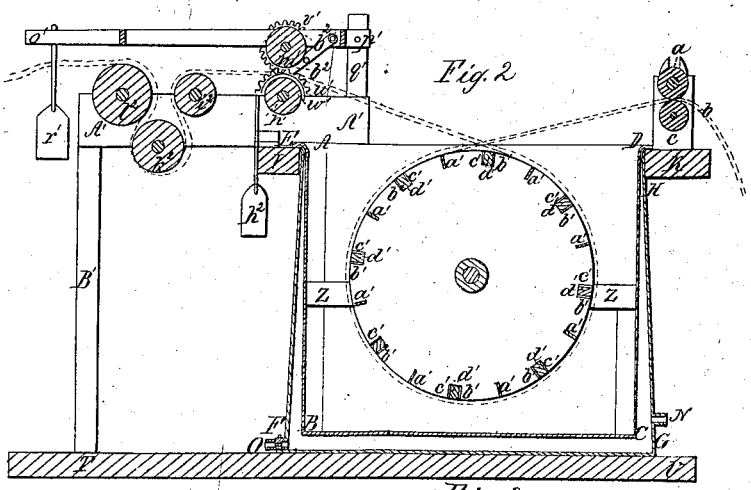
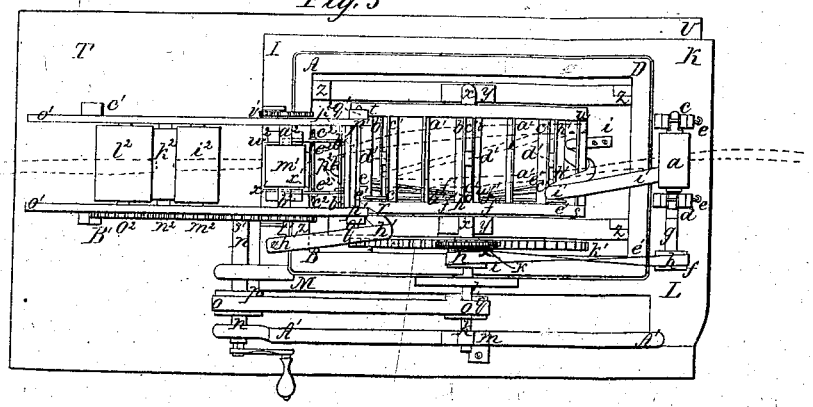


Fig. 3



UNITED STATES PATENT OFFICE.

WILLIAM MONTGOMERY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINERY FOR TAPRING SLIVERS OR BANDS OF HEMP AND MAKING OAKUM OF THE SAME.

Specification forming part of Letters Patent No. **1,747**, dated August 28, 1840.

To all whom it may concern:

Be it known that I, WILLIAM MONTGOMERY, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Machinery for Tarring Slivers or Bands of Hemp and Forming Oakum of the Same.

These improvements, the principles thereof, the application of said principles by which the same may be distinguished from other inventions, together with such parts, improvements, or combinations I claim as my invention and hold to be original and new, I have herein described and set forth, the said description, taken in connection with the accompanying drawings, herein referred to, composing my specification.

The object of my invention is to prepare oakum from the Cordilla hemp, or "tow," (sometimes so called,) which is of much poorer quality than the Russia hemp, inasmuch as the fibers of the former are shorter than those of the latter, though equally sound and new, and sufficiently good for the above-mentioned purpose, as it produces a better quality of oakum than that obtained in the manner now practiced from the tarred rope and yarn.

Another object of my invention is to prepare the oakum in a proper roving or sliver, so that without any further preparation than that of being properly dried, after passing through the operation of my machinery, it can be applied to its purpose of calking the seams of vessels, &c.

The figures of the accompanying plate of drawings represent my improvements. Figure 1 is a side elevation, Fig. 2 a longitudinal vertical section, and Fig. 3 a plan or top view, of the machine, Fig. 4 being a detailed view of some of the parts.

An important arrangement in my machinery is that for heating the tar and keeping it in a state of solution, the operation of which, being a branch by itself, will be separately described. A hollow rectangular vessel, A B C D, formed of sheet-iron or other proper material, receives the tar to be used. Another box, E F G H, formed of the same material, and having diverging sides, as shown in the drawings, is arranged around the former vessel, so as to leave the space between the sides and bottoms of the vessels shown in Fig. 2. The top of the vessel E F G H fits closely to that of the vessel A B C D, both being turned over and firmly attached to the frame-work I K L M, Figs. 2 and 3, which may be supported in any proper manner by stanchions, or attached, as shown in the different figures, or in any other suitable manner, to the other parts of the frame-work of the machine, which will be hereinafter mentioned. Steam is introduced from any proper generator into the space between the vessels A B C D and E F G H, through an aperture, N, Fig. 2, cut through one side of the exterior vessel, E F G H, and very near the bottom of the same. It will be seen that the steam, by its elasticity, will expand through the space between the vessels, and that the caloric contained in the steam will be imparted to the tar in the inner vessel through the sides of the same, and as the space is of greater dimensions at the bottom than at the top, where the vessels are in contact, the greater quantity of the steam will be in the position to produce the greatest effect. This method of heating or dissolving the tar, by which it can be raised in its temperature nearly to the boiling-point, is much preferable to that of heating it by a constant fire formed of the different kinds of fuel, inasmuch as the heat, being diffused around the inner vessel, dissolves the tar more effectually, and at the same time keeps it in such a state of solution as not to evaporate, but to retain the spirit or essence of the tar, which is very desirable in the operation, as it is this ingredient, and not the rosin, which constitutes its great value in imparting strength, durability, and flexibility to the article to which it is applied. A stop-cock at O, Fig. 2, will allow the condensed steam to be withdrawn when necessary.

In order to prevent any accident from an undue pressure of steam, an opening is formed in the side of the exterior vessel, which is closed by a valve, P, as shown in Fig. 1, on one end of an elastic arm, R S, the other end being attached to the wood-work T U, Fig. 1. By this arrangement it will be seen that any surplus or redundancy of steam will escape through the opening P, and thus liability to explosion or other damage in the vessels is removed.

Having completed the description of the

machinery and method by which the tar is prepared, I now proceed to that of the principles and mode of operation of that part of the apparatus which has for its object the production of the oakum, or saturating the hemp or tow with tar. The hemp being first prepared in suitable rovings or slivers by any of the various contrivances for such purposes, these rovings are placed in cans at the back of the machine.

Two feeding-rollers, *a b*, are arranged at the back of the machine near the edge of the inner vessel, A B C D. The journals of these rollers are formed of any proper metal, and are arranged in slots in the upright posts or standards *c d*, Figs. 1, 2, and 3, the journals of the lower roller, *b*, resting and revolving in the bearings formed by the bottom of the slots, while the upper roller, *a*, rests on and adjusts itself by its own weight to the surface of the lower roller, being prevented from moving upward too far by metallic pins *e e*, passing through the standards *c d* above the journals of said roller. Motion is imparted to the lower roller by means of the pulley *f*, Fig. 3, on the extension *g* of the journal of the roller *b*, a cross-band, *h h*, from said pulley *f* passing round the pulley *i* on the shaft *k k*, the shaft having bearings at *l m*, the pulleys and shaft *k k* deriving their motion from the driving-shaft *n n* by the operation of the band *o o* and pulleys *p* and *q*, arranged, respectively, on the shafts *n n* and *k k*. One or more rovings from cans before mentioned being passed through the feeding-rollers *a b* are turned or wound as one sliver or band around the large reel *r s t u*, in the manner represented by red lines in Figs. 2 and 3, the construction and operation of which reel, together with the parts immediately connected to the same, may be thus described: The sides *r s t u* are formed of solid metal or other suitable material, and are firmly fixed on the shaft *v w*, the journals *x x* of which shaft rest and revolve in proper bearings at *y y* in the frame-work *z z z z*, Figs. 2 and 3, which is properly arranged in the inner vessel, A B C D, being immersed, together with the greater portion of the reel, in the tar in said vessel. Single cross-bars *a' a'* and double ones *b' b' c' c'*, Figs. 1, 2, and 3, are inserted alternately between the sides *r s t u* of the reel, near the perimeters of the same, the double ones being divided in the center by solid partitions *d' d'*, &c., Figs. 2 and 3.

The ends *e' e'* of movable radial arms or bars *e' f' e' f'*, &c., Figs. 1 and 3, are arranged between the double bars *a' a' b' b'*, as seen in the drawings, the other ends being curved or hooked into the several staples, as shown by dotted lines at *g' g' g'* in the side *r s*, and moving loosely in the opening between the bars, as will readily be perceived by an examination of Figs. 1 and 3. Strips of metal *h' h' h' i' i' i'* are arranged, as seen in Fig. 3, before and behind the reel, so as respectively to guide and move the radial arms from the side *r s* of the reel to the partitions *d d*, &c., and vice versa. The strip *h h* is inclined from the side *r s*, while that denoted by *i i i* is inclined toward the same, both being curved or bent so as to be nearly concentric with the circumference of the reel. The object of this arrangement is that, when the roving or sliver passes down to be immersed and saturated with the tar, it may be pressed to the other side of the partitions *d' d'* to make room for that which follows, and to prevent the end which has been prepared from lapping on or touching that portion which comes from the feeding-rollers.

The reel is revolved by means of the cogged wheel *k'*, arranged on one end of the shaft *v w*. This wheel is revolved by the cogged pinion *l'* on the shaft *k k*, which is turned in the manner above described. It will readily be perceived that the surface of the reel should move a little faster than the surfaces of the feeding-rollers, and that the proportions of the gearing, pulleys, &c., should be such as to produce this effect. The manner of effecting this arrangement, being understood by mechanics in general, will require no further explanation on my part.

After the hemp is sufficiently saturated with the tar it is passed through the drawing-rollers *m' n'*, which serve to press out any superfluous quantity of tar from the roving. The journals of the lower roller, *n'*, are arranged in proper bearings in the frame A' A', supported, as seen in the Figs. 1, 2, and 3, by the stanchions B' C'. The journals of the upper roller, *m'*, (which is not so wide as the lower roller,) have bearings in the movable levers *o' p' o' p'*, the ends *p' p'* turning on pivots passed through the uprights *q' q'*, Figs. 1, 2, and 3, while the ends *o' o'* are properly weighted, as seen at *r'*, so as to cause the upper roller, *m'*, to press with sufficient force on the lower roller, *n'*. The surfaces of these rollers should move a little faster than the surface of the reel, motion being imparted to the rollers by means of the pinion *s'* on the driving-shaft *n n*, engaging with the cogged wheel *t'* on one journal of the lower roller, *n'*, while a cogged wheel, *u'*, on the opposite journal, engages with the cogged wheel *v'* on the journal of the upper roller, *m'*, and gives it its requisite motion in a proper direction. The tar which is pressed from the roving is prevented from collecting in drops or bodies on that part which has passed through and is in front of the rollers (which would render it unfit for use) by means of the curved guides *w' w' x' x'*, Fig. 4, which are kept in close contact with the sides of the roller *m'* by means of the ends of the arms a^2 a^2 b^2 b^2 pressing against the said guides *w' w' x' x'*, which arms a^2 a^2 b^2 b^2 may be pressed together by the nuts c^2 c^2, &c., and screws cut on the rods e^2 e^2 f^2 f^2. The latter rod, f^2 f^2, being arranged in the levers *o' p' o' p'*, serves to support the arms a^2 a^2 b^2 b^2 and rod e^2 e^2 *f*. The curved guides *w' w' x' x'* are attached at one end to the rod g^2 g^2, properly arranged in the frame A' A', which ends may be pressed together by

nuts and screws, as shown in the drawings, the other ends being properly weighted at h^2, so as to keep the guides w' w' x' x' in close contact with the surface of the lower roller, n', to which their curvature is adapted. After passing through the drawing-rollers m' n' the roving is still further drawn by being passed through the system of rollers i^2 k^2 l^2, the journals of which have proper bearings in the frame A′ A′, as shown in Fig. 2, and are connected together by the series of cogged wheels m^2 n^2 o^2, engaging with each other, which are moved by the pinion s' on the driving-shaft n n, which engages with the wheel m^2. The surface of the roller l^2 moves faster than that of the drawing-roller m', and the surface of each of the rollers k^2 l^2 moves faster than that of the roller which precedes it, which arrangement serves to separate the fibers of the oakum or draw them a little apart, which renders the operation of picking entirely unnecessary, as after being properly dried the oakum, prepared as above described, is fit for use either in a sliver or in convenient-size rovings, into which the band or sliver may be easily separated.

It is well known that the usual method of preparing oakum from hemp is to form it into yarns, and after saturating it with tar to untwist and pick the same, so as to have the fibers separate and loose, and that previous to adapting it to the seams of vessels it is necessary to spin the oakum by hand; but it will be seen from the description above given that a greater part of this preparation is superseded by my machinery, which renders my apparatus a great labor-saving machine.

Having thus described my improvements in machinery, I shall now proceed to specify such parts or combinations as I claim as my invention—

1. Saturating the hemp or sliver by a revolving reel, r s t u, immersed in the tar, and also, in combination with the reel, the movable radial arms f', f', and c, playing between the double bars a' a' b' b' of the reel, and also the guiding-strips of metal h' h' i' i', arranged as described, the said combination being for the purpose, hereinbefore specified, of sliding part of the roving, as it passes to be immersed in the tar, to the opposite side of the reel, to make way for the portion which comes from the feeding-rollers.

2. The combination of the system of the rollers m' n' and i^2 k^2 l^2, with the reel r s t u, arranged substantially as described, the first set, m' n', serving to keep out any superfluous quantity of tar from the sliver, and the second set, i^2 k^2 l^2, being so constructed and operated that the surface of each succeeding roller shall move faster than that which precedes it, which separates and draws out the fibers and supersedes the necessity of picking, &c.

3. The combination of the curved guides w' w' x' x', (the ends of which are weighted, as described,) arms a^2 a^2 b^2 b^2, (operated by means of the screws on the rods e^2 e^2 f^2 f^2 and nuts c^2 c^2 d^2 d^2,) with the rollers m' n', for the purpose of preventing the tar from getting in lumps or masses on the oakum after it has passed through the said rollers.

In testimony that the above is a true description of my said invention and improvement I have hereto set my signature this 11th day of June, in the year of our Lord 1840.

WILLIAM MONTGOMERY.

Witnesses:
R. H. EDDY,
EZRA LINCOLN, Jr.