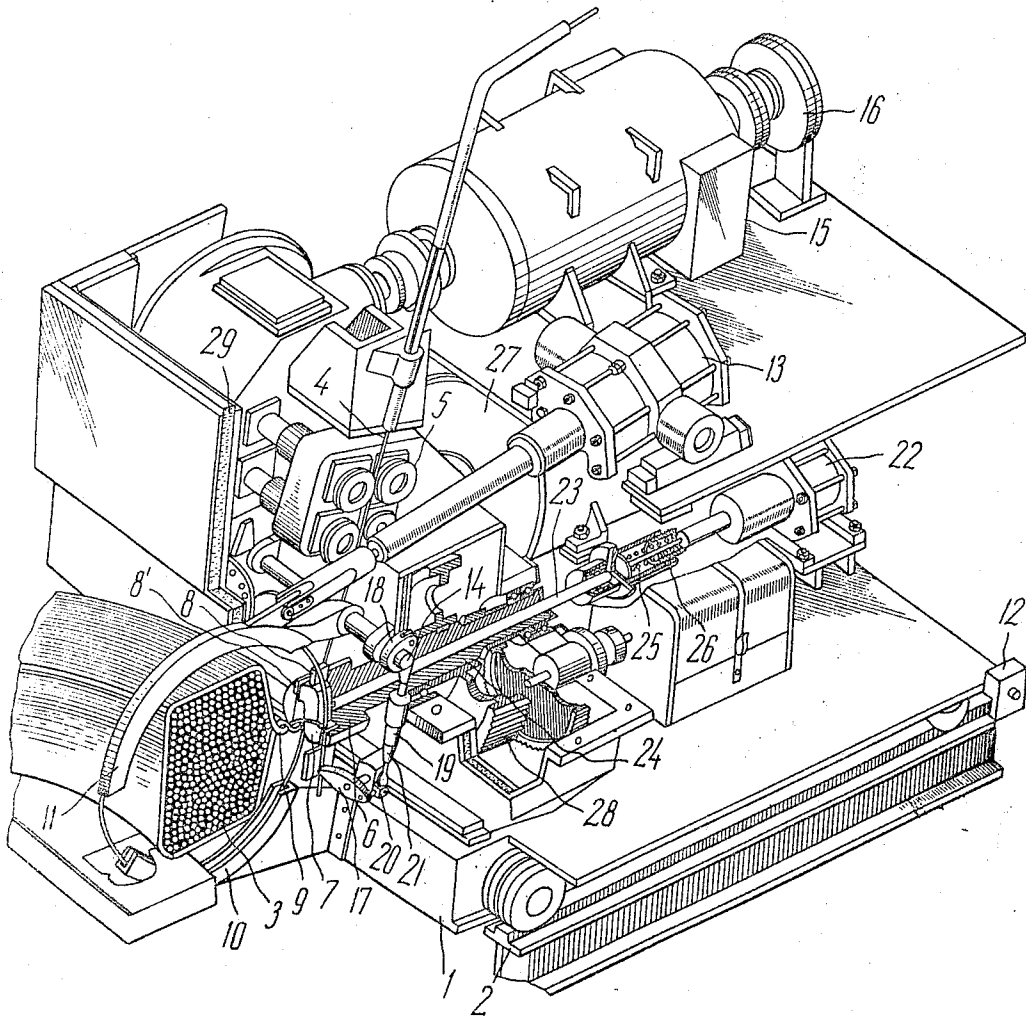


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MACHINE FOR TYING COILS AND PACKS OF IRON FOR INSTANCE
OF ROLLED IRON WITH WIRE
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1

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MACHINE FOR TYING COILS AND PACKS OF IRON FOR INSTANCE OF ROLLED IRON WITH WIRE

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1 Claim

ABSTRACT OF THE DISCLOSURE

A machine for tying coils or packs of rolled iron with wire which includes a frame carrying wire delivering or feeding rollers, tongs type guides to pass the wire around the pack to be tied at a tying station and a head for producing a twist joint and cutting off the wire after the twist joint is produced, and in which inclined beams extend downwardly away from the tying station and one of the frame or beams is provided with rolling contact members so that the machine can freely roll by gravity to a rear position after the wire that has been twist jointed is severed and which likewise permits the frame to roll to the tying station when a pack is enveloped by wire.

The invention relates to iron-and-steel equipment, in particular to machines adapted for tying coils and packs of iron, for instance of rolled iron, with wire.

There are known machines for tying coils and packs of rolled iron with wire delivered with the aid of rollers into the tongs-type guide ways to make it pass round the pack to be tied, to then produce a twist joint, to cut the wire ends with the aid of a binding head provided with knives and clamps for wire. However, the conventional machines of such kind do not always ensure an easy escape of the wire ends from the clamps of the binding head after they are cut and the twist joint is produced. This interferes with the operating rate of the tying machine when it is used under production conditions. The object of the invention is to eliminate the above-mentioned disadvantage.

The main object of the invention is to work out such a machine for tying coils and packs of rolled iron with wire which will differ from the conventional tying machines by a higher reliability in its operation and will ensure an easy escape of the wire ends from the slots of the binding head.

The object is achieved by providing a machine for tying coils and packs of rolled iron with wire including wire delivering rollers, tongs-type guide ways for the wire to pass round the pack being tied and a head with slots intended for producing a twist joint and cutting the wire off, all said units being mounted on a bogie. According to the invention the machine is equipped with a device allowing the bogie to reciprocate, during tying, relative to a base where the pack to be tied is placed, the reciprocation ensuring an escape of the wire ends from the head slots after a twist joint is produced.

The device allowing the bogie to reciprocate is made in the form of beams mounted so as to incline in the direction opposite to the tying station, said beams ensuring a free rolling of the bogie therealong off to the extreme rear portion after the wire is twist-jointed and cut off, the beams also allowing the bogie to be rolled up to the pack when the latter is enveloped with wire.

2

The appended drawing shows one of the possible embodiments of the machine proposed herein (a general view, partly in section).

All the main units of the machine proposed herein are mounted on a bogie 1, placed on beams 2, which are made so as to slightly incline in the direction opposite to the station of tying the pack of rolled iron 3. (The beams can be set on the bogie itself, and the running rolls on the base.)

The wire 4 used for tying the pack 3 is delivered, by means of reversible rollers 5, into the head and tongs-type guide ways. The head comprises a binding rotating head 6 proper, a head housing, an adjustable end clamp 7 and knives 8 and 8' and is intended for gripping the front end of the wire and holding it in place, making a twist joint 9 and cutting the wire off.

The tongs-type guide ways comprise a lower stationary tong member 10 and an upper movable tong member 11 having a pointed end. The end of the tongs member is pointed to ensure the closing of the tongs member when tying loose coils of iron.

When closed, the tongs-type guide ways embrace the pack being tied. This forms a closed duct along which the wire is delivered and embraces the pack being tied.

When in the initial position, the bogie 1 is at the stop 12, the upper tongs member 11 is lifted with the aid of an air-operated cylinder 13 to its extreme position and locked by a limit switch connected with the axle 14 of the upper tong member, said limit switch sending an impulse to deliver a pack of rolled iron 3 to the tying machine.

The axes of the binding head 6 coincide with those of the head housing (not shown in the drawing) and with those of the tongs-type guide ways.

The end clamp 7 intended for clamping the wire ends in the slots of the binding head 6 is advanced to the foremost position.

After the pack 3 is delivered, the upper tongs member 11 goes down, embraces the pack 3 and forms a closed duct, for the wire to pass therethrough, by contacting the lower tongs member 10. The limit switch sends a signal that the tongs-type guide ways are in their contacted position and allows the electric motor 15 of the draw rollers 5 to be switched on. Then the wire 4 is delivered into the left-hand slot of the binding head 6, passes round the pack 3 along the tongs-type guide ways, enters the right-hand slot of the binding head 6 and stops. The signal to stop the draw rollers 5 is given by a special pulse transmitter 16.

The front end of the wire 4 occurs between the stationary knife 8 of the head housing and the tack clamp 17 which is open at this time for a free passage of the wire. The tack clamp 17 is opened with the aid of a cam 18 set on the axle of the upper tong member 11, said cam turns the tack clamp 17 with the aid of a pusher 19 and a lever 20 while the tong member 11 goes down (the pusher, the lever and the tack clamp being fastened on the housing of the binding head).

After the wire 4 is delivered, the air-operated cylinder 13 transmits motion to the upper tongs member 11 and the latter opens, the cam 18 releasing the pusher 19, the lever 20 and the spring 21 that closes the tack clamp which blocks up the wire holding it in place while the tying operation is performed.

When the rollers 5 reverse, the given loop of the tying wire escapes from the slot of the lower tongs member and tightly embraces the pack being tied.

While all this is being done, the bogie 1 is drawn up along the beams 2 to the pack being tied.

After the pack has been embraced with wire the rollers 5 stop. The end clamp is actuated by the air-operated

cylinder 22 through rod 23 passing inside a hollow spindle 24 of the binding head 6 and moves along its axis clamping the wire ends in the slots of the binding head 6. The clamping force is selected and adjusted by preliminarily shortening the spring 25 which is done by screwing-in a threaded sleeve 26. The most favourable clamping force selected, the wire will not break at the twist joint 9 while the tying will be strong enough.

Thereafter, the binding head 6 rotates (clockwise) from an electric motor 27 through a reducing gear 28.

When the binding head starts rotating, the front end and the rear end of the wire are cut by the knives 8' of the binding head and the stationary knives 8 of the head housing. While the binding head 6 rotates the wire ends are twisted producing a twist joint 9. The twist joint getting tighter, the wire ends may be drawn from beneath the clamp owing to the end clamp having an adjustable clamping force. When the wire is drawn from beneath the clamp the tension in the twist joint 9 will never come up to the ultimate value and thereby wire breakage is precluded.

When the wire is twist-jointed, the binding head 6 turns three times: 2.5 turns are performed while the wire is clamped by the end clamp 7 after which the clamp 7 is brought to its foremost position. After the clamped ends of the wire are released, the bogie 1 is rolled off by gravity to the extreme rear position until it rests against the stop 12 ensuring an escape of the wire ends from the slots of the binding head 6. The remaining one half turn of the head is performed at a lower rate after which the head stops in its initial position.

The tying cycle is thus completed and the tied pack is removed from the machine.

If hot coils or packs are to be handled on the machine, water-cooled screens 29 should be mounted at the side of the pack to prevent overheating of the machine.

We claim:

1. In a machine for wire tying coils and packs of iron, preferably rolled iron, a tying station adapted to receive a coil to be tied, a frame, wire delivering rollers carried by said frame, tong type guideways including fixed and movable tongs for receiving and guiding wire around the pack to be tied as such wire is delivered by said rollers, a twisting head having slots and clamping means for producing a twist joint and cutting means for cutting off the ends of the wire after it has been twisted and the pack tied, said head likewise being carried by the frame, beams mounted to incline in a direction downwardly away from the tying station and accommodating said frame, rolling contact means carried by one of said frame and beams so that the frame freely rolls off to an extreme rear position after the wire has been twisted and cut off and rolls up to the tying station when the latter is embraced with wire to be twisted.

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